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Determinants of Customer Decisions to Pay Utility Water Bills Promptly

by

JOSSES MUGABI

A Doctoral Thesis

Submitted in Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy of Loughborough University

September 2007

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ABSTRACT

Over a decade ago the ‘Dublin Principles’ shifted global thinking towards treating water as an economic good. Accompanying this conceptual shift has been a wider move towards focusing on water consumer’s needs and preferences and their willingness to pay (WTP). WTP studies are now widely considered as forming part of an improved planning methodology for water supply, because they provide a basis for distinguishing financially viable water supply projects from those that are destined for failure. However, experience in several low-income countries suggests that cost recovery is still a major problem even for those projects with seemingly good initial financial models. For water utilities, one of the key determinants of overall cost recovery efficiency is the ability to recover payment, within a reasonable timeframe, for all the water bills sent to customers.

This study used empirical data, obtained through a cross-sectional survey in eight small urban centres in Uganda, to establish the determinants of customer decisions to pay utility water bills promptly. Using a two-phase sequential qualitative/quantitative approach, a questionnaire was developed, pre-tested, piloted and refined, before it was administered to a probability sample of 505 registered water utility customers. Regression analysis of the obtained results showed that customer attitude towards prompt payment, perceived ease or difficulty of paying on time (perceived control), as well as social pressure, strongly influence intentions to pay, which in turn directly affects actual prompt bill payment behaviour. Furthermore, the findings show that gender, income level, occupation of the head of household and house tenure status have statistically significant direct relationships with intentions to pay, but their effects are much smaller compared to the joint influence of attitudes, perceived control and perceived social pressure. Moreover, the effects of gender and occupation are completely mediated by perceived control and social pressure respectively.

The research also revealed the following perceived barriers to prompt bill payment: (i) high water bills; (ii) frequent service interruptions; (iii) mistakes in meter readings; (iv) increase in water consumption; (v) unanticipated circumstances that place extra demands on household budget; (vi) coloured or unclear water; and (vii) financial difficulties. With the exception of unanticipated circumstances and financial difficulties, the rest of the factors perceived to impede prompt bill payment, relate to service delivery issues that are within the full control of a water utility. These findings have one major implication for water utilities and their regulators in Uganda and elsewhere: cost recovery strategies that rely heavily on revenues from customers are unlikely to succeed if aspects relating to the service itself are not addressed.

Keywords: Bill Payment Behaviour; Theory of Planned Behaviour; Consumer Behaviour; Willingness to Pay; Water Services; Small Towns; Uganda; Developing countries
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LIST OF ABBREVIATIONS

AT Attitude towards paying for water bills promptly
DWD Directorate of Water Development
IIED International Institute for Environment and Development
IRC International Water and Sanitation Centre
MWLE Ministry of Water, Lands and Environment
NPM New Public Management
OFWAT Office of Water Services
PB Prompt Bill Payment Behaviour
PC Perceived Control
PO Private Operator
PSP Private Sector Participation
SN Subjective Norm
SPSS Statistical Package for Social Scientists
SSP Small Scale Providers
TPB Theory of Planned Behaviour
TRA Theory of Reasoned Action
UFW Unaccounted For Water
UNDP United Nations Development Programme
UNESCAP United Nations Economic and Social Commission for Asia and the Pacific
UNHSP United Nations Human Settlement Programme
UNICEF United Nations International Children’s Education Fund
WHO World Health Organisation
WSP Water and Sanitation Program
WSSC Water Supply and Sanitation Collaborative Council
WTP Willingness to Pay
CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Provision of adequate water supply and sanitation services to the global population has been an ongoing quest which has occupied the minds of development experts, engineers and governments for the past three decades. Safe and sufficient water is not only regarded as a basic human need, but also the lack of it is a major hindrance to achieving equitable and sustainable development. There is substantial evidence that when people have no access to adequate and affordable water supply, they become more susceptible to diseases and less productive (Esrey et al., 1990; 1991; Evans, 1992; Hutton and Haller, 2004).

The 2000 global water supply and sanitation assessment report (WHO and UNICEF, 2000) estimated the annual death toll due to diarrhoeal diseases at 2.2 million deaths per year in low-income countries. Further estimates indicate that about 10 percent of the total population in developing countries are infected with intestinal worms, six million people are blind from trachoma, and that 160 million people are infected with schistosomiasis (WHO and UNICEF, 2000; WHO, 2004). However, studies carried out in various low-income countries have shown that water supply and sanitation interventions can reduce diarrhoeal diseases and trachoma by at least 25 percent and reduce guinea worm and schistosomiasis by about 77 percent (Esrey et al., 1991; Fewtrell et al., 2005). Apart from these direct benefits, improved water supply and sanitation provides benefits in terms of savings in time and effort, leading to economic productivity (Evans, 1992; Hutton and Haller, 2004).

In pursuit of the above benefits, a great deal has been done and enormous amounts of money spent. However, service coverage levels remain unacceptably low. A recent report (WHO and UNICEF, 2006) on the global state of water and sanitation provision paints a gloomy picture of the situation in developing countries, especially in Sub-Saharan Africa. The report shows that of an estimated 735 million people in Sub-Saharan Africa at the time of the study in 2004, only 56 percent were served by an improved water source, while 37 percent were served by an improved sanitation facility. Improved water supply was described as one of the following service options: household connections, public standpipes, boreholes, protected dug wells, protected springs, or rainwater collection. Improved sanitation included public sewer
connections, septic tank connections, pour-flush latrines, simple pit latrines, and ventilated improved latrines. Although statistics reported for the period 1990 to 2004 indicate substantial gains in the number of people served, net gains in service coverage remained negligible due to high population growths. In Sub-Saharan Africa, for example, access to improved drinking water sources increased by seven percent in the period between 1990 and 2004, but due to population growth, the actual number of people without access to drinking water from an improved source increased by 60 million (WHO and UNICEF, 2006).

Moreover, the challenge of keeping up with population increase is greater in urban areas of developing countries where the highest growth rates today are reported. According to the United Nations Population Division, over the next 10 years, the population of the less developed regions of the world (excluding China) is predicted to increase from 3.9 billion to 4.6 billion, with half of this living in urban areas (United Nations, 2007). Recent analysis of a number of censuses show that much of this population is expected to live in small market towns and administrative centres with between 5,000 and 100,000 inhabitants (Satterthwaite, 2006; United Nations Human Settlements Programme, 2006). In view of these developments, there is global consensus that the water supply and sanitation sector in general faces four major challenges (WHO and UNICEF, 2000): (i) keeping pace with the net population growth; (ii) closing the coverage and service gap; (iii) ensuring sustainability of existing and new services; and (iv) improving service quality.

The magnitude of the above challenges can be seen clearly in the context of international development targets for water supply and sanitation coverage developed by the Water Supply and Sanitation Collaborative Council (WSSC) and endorsed by the United Nations Millennium Declaration (WSSC, 2000). The targets to be achieved are: to halve the proportion of people without sustainable access to safe water and hygienic sanitation facilities by the year 2015. A recent assessment of progress suggests that at current trends, most of the world's regions are on track to achieve this target, save for sub-Saharan Africa and Oceania (WHO and UNICEF, 2006). However, these targets still present a daunting challenge globally. For instance, available statistics suggest that achieving the targets requires the building of drinking water infrastructure to provide services to an additional 1.1 billion people and sanitation to an additional 1.6 billion people by 2015 (WHO and UNICEF, 2006). It will also require actions to prevent current and future infrastructure from falling into disrepair as a result of inadequate institutional arrangements and insufficient cost recovery.
Cost recovery is indeed a key prerequisite for sustainable water services provision (Katko, 1991; Evans, 1992). The chief means of recovering the costs of service provision is through user-payments for the services provided. As a result, a key determinant of overall cost recovery efficiency is the service provider's ability to recover payment, within a reasonable timeframe, for all the bills sent to customers. However, available data show that bill collection ratios for some urban water utilities in Africa can be as low as 50 percent (Kayaga et al., 2004). In addition, many utility customers struggle to pay up their water bills and eventually get disconnected, leading to accumulation of huge unpaid bills.

Moreover, it appears that this problem is not unique to less-developed countries. According to a study commissioned by OFWAT (the economic regulator of the UK water industry), the levels of arrears, the amount of revenue written off, and the numbers of customers in water debt within the UK water industry have continued to rise since 1998-99 (the last full year in which disconnection of domestic water supplies was permitted for non-payment of water bills). The report estimates that the total household revenue outstanding for up to 48 months for the period 2002-03 stood at £781 million, an increase of £115 million (17%) since 1998-99 (Accent Marketing and Research, 2003). Recent figures from OFWAT reveal that on average, UK water companies are demanding £763 million per year in outstanding revenue for up to 48 months, of which close to £100 million is eventually written off as bad debt.

The effect of delayed bill payments and huge arrears on a utility’s capacity to deliver water services is evident. If a water utility is not able to collect in time, all the bills that are sent out, cash flow problems set in, which in turn, impacts on the ability to cover operating expenses and extend service coverage. Such a situation may result in low service coverage, and potentially, poor customer service – leading to customer dissatisfaction - which may breed more ‘non-payers’ and trigger a cycle of poor performance. Thus, minimizing the levels of ‘bad debts’ and increasing the rates of revenue collection is critical for sustainable service provision.

However, in order to respond to problems involving delayed or irregular payments, water utility managers need to determine precisely why customers might not pay their water bills in time. Little empirical research exists in the literature on the factors influencing customer decisions when it comes to paying water bills in time. It is against this background that this research was undertaken.
1.2 PURPOSE STATEMENT AND THEORETICAL BASE

The overall intent of this research is to examine the influence of attitudinal and socio-demographic factors on customer decisions relating to paying for water services promptly. The theoretical framework for the study is derived from Ajzen’s (1988; 1991; 2005) Theory of Planned Behaviour (TPB) — one of the most widely used and successful socio-cognitive models for understanding human decision-making and behaviour.

The TPB proposes that the immediate determinant of behaviour is the individual’s intention to perform, or not to perform that behaviour. Behavioural intentions are in turn, influenced by three factors: (i) the attitude towards the behaviour, which refers to the individual’s favourable or unfavourable evaluation of performing the behaviour; (ii) the subjective norm, which is a social factor referring to the perceived social pressure to perform or not to perform the behaviour; and (iii) the degree of perceived control over the behaviour, which refers to the perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated impediments and obstacles.

An important aspect of the TPB is that it goes beyond merely identifying the direct determinants of intentions and behaviour. The theory also proposes that beliefs about a particular behaviour provide the cognitive foundation from which attitudes, perceived social norms, and perceptions of control are assumed to follow. The effects of demographic factors on behaviour are thought to be mediated through the main components of the model.

Guided by this theoretical framework, the present study set out to achieve the following specific objectives:

- To explore what water utility customers perceive as the benefits and sacrifices of, facilitating factors and barriers to paying their water bills promptly;
- To determine the factors that are the independent predictors of customer intentions to pay water bills promptly and of actual prompt bill payment behaviour, in order to identify which variables may require changing to bring about desirable changes in intentions and behaviour;
- To identify specific beliefs underlying customer attitudes, subjective norms, and perceived control that might be useful targets for countermeasures aimed at encouraging prompt and regular payment of water bills; and
- To identify and recommend specific managerial actions that can be taken by water utility managers to promote positive bill payment behaviours among their customers.
The strategy of inquiry used in the study was a cross-sectional survey, with data collected from households connected to piped water services in eight small urban centres in Uganda. For data collection purposes, the above objectives were refined further into research questions as reported in the next section.

1.3 RESEARCH QUESTION, PROPOSITIONS AND CONTRIBUTIONS

The principal question addressed in this research is:

What factors are critically important for motivating customer decisions about paying for water services promptly?

Essentially I argue that customer intentions to pay or not to pay water bills promptly are motivated to a large extent by three factors: attitude towards the behaviour informed by perceptions of benefits and sacrifices of engaging in the behaviour; perceived social pressure from family members, neighbours and the utility itself; and the degree of perceived control over the behaviour reflecting both internal and external impediments and obstacles. I also conclude that the effect of some socio-demographic characteristics on customer intentions is mediated by perceived control and social pressure.

The specific questions examined are:

1. Do attitudes, subjective norms, and perceived control with respect to paying water bills promptly influence customer intentions to actually engage in this behaviour?
2. What do utility customers believe to be the benefits, sacrifices, facilitating factors and barriers to paying their water bills promptly?
3. Are socio-demographic effects on intentions to pay mediated by attitudes, subjective norms and perceived control?
4. Do expressed intentions to pay water bills promptly translate into actual prompt bill payment behaviour?

Based on the above research questions, testable hypotheses were derived and used to examine the various relationships among the variables and offer insight into customer motivations. The development of hypotheses for this research is reported in section 4.4 and operational definitions of the research variables are presented in section 5.5. Answering the research questions provided contributions that will be presented in section 8.3.
In summary, this research made three major contributions. Firstly, the application of a socio-cognitive theoretical perspective to understand domestic water demand behaviour has complemented the economic perspective that is dominant in the water sector. Secondly, this is the first reported study to examine the influence of both attitudinal and socio-demographic factors on customer decisions to pay for water, and whether the effect of socio-demographic variables on intentions to pay can be explained by attitudinal variables. Thirdly, the research extends knowledge that supports the utility of the theory of planned behaviour as a useful conceptual framework for understanding consumer decision-making and behaviour in the urban water supply sector.

1.4 JUSTIFICATION FOR THE RESEARCH

A study of factors influencing bill payment behaviour in the context of urban water services is important for several reasons. First, researchers have often studied domestic water demand behaviour focusing mainly on external influences, such as socio-economic/demographic characteristics and service characteristics, with little attention to internal psychological influences. As such, their findings, although useful to utility managers and policy makers, may be limited in providing a full explanation of behaviour.

Secondly, and at a more practical level, knowledge of how consumers make decisions and the factors that influence their behaviour patterns is an important input in the design or development of service delivery strategies. In the current context, water utility managers could potentially address the problem of cost recovery by paying closer attention to the factors that influence consumer’s bill payment behaviour, and designing intervention strategies that promote positive bill payment.

Thirdly, for policy makers involved in service regulation and consumer education aspects, knowledge of consumer behaviour provides useful insights into consumer problems, and the nature of the exchange relationship between water consumers and suppliers. In addition, such knowledge would guide the development of interventions to encourage good management practices, promote bill payments and deter undesirable behaviour.
1.5 METHODOLOGY

A two-phase sequential qualitative/quantitative approach was adopted in this study (Creswell, 2003; Tashakkori and Teddlie, 2003). Following the procedure for TPB research recommended by Ajzen (2002b), a preliminary qualitative study was conducted in the first phase to elicit customer beliefs relating to paying water bills promptly, and to generate questionnaire items for the main variables of interest. A questionnaire developed in the preliminary phase underwent a process of multiple pre-testing and piloting before it was administered through a cross-sectional survey design to customers of water operators in eight towns in Uganda. Both unsupervised self-administration and supervised face-to-face administration by trained interviewers was utilised for the collection of relevant data. Justification of the methodology and details of the entire research design are discussed in Chapter 5.

1.6 THESIS OUTLINE

The contents of the rest of this thesis are structured as follows:

- Chapter 2 of the thesis provides a background to the research problem by examining the generic trends in sustainable management of water services in low-income countries, highlighting problems faced by urban water utilities in recovering costs of services and operating in a financially sustainable manner;
- Chapter 3 examines literature on domestic water demand behaviour in low-income countries and identifies the main research issues;
- Chapter 4 presents the main research question and a conceptual framework for the research;
- Chapter 5 provides details of the research design and methods used in collecting relevant field data, as well as an overview of the statistical data analysis techniques used;
- Chapter 6 provides an overview of data analysis and presents the findings of the research;
- Chapter 7 provides a detailed discussion of the findings within the context of this and prior research; and
- Chapter 8 sums up the entire research, identifies the distinct contribution to knowledge made by the entire research undertaking, and draws implications for theory, policy and practice.
1.7 DEFINITION OF KEY TERMS USED

In order to clearly establish the positions taken in this study, and to add precision to the study's propositions, the following key terms used in this study are defined as follows:

- **Small urban centre**: For the purpose of this study, a *small urban centre* is a settlement that is characterised by a densely populated core trading centre and relatively scattered settlements around the commercial zone. It exhibits a mixture of urban and rural characteristics, and usually has populations in the range of 1,500 to 30,000 inhabitants (Satterthwaite, 2006).

- **Small urban water utility**: For the purpose of this study, a *small urban water utility* is an institution that is either owned by local or central government or a corporatised enterprise, a local government institution, or a private company that is charged with the responsibility of providing or managing water services (with or without wastewater services) to inhabitants of a small urban centre.

- **Prompt bill payment behaviour**: At the theoretical level, prompt bill payment behaviour is defined in this research as the action of paying an outstanding water bill at the utility office within 15 days of receiving the bill. The use of the 15-day window is consistent with the service agreement terms used by service providers in all the study towns. All the water utilities in the towns studied require their customers to pay their water bills within 15 days after receiving the bills (which are distributed between 29th and 31st of every month).

- **Intention to pay water bills promptly**: This is defined in accordance with the theory of planned behaviour (Ajzen, 1988; 1991; 2005), as the perceived likelihood that a customer will pay his/her water bill within 15 days of receiving the bill.

- **Attitude towards paying water bills promptly**: The degree to which paying water bills within 15 days is positively or negatively valued by utility customers (Ajzen, 1988).

- **Subjective norm with respect to paying water bills promptly**: Similar to attitudes, *subjective norms* are defined with respect to prompt bill payment behaviour, as the perceived social pressure to perform or not to perform the behaviour (Ajzen and Fishbein, 1980; Ajzen, 1988; 1991).

- **Perceived control over paying water bills promptly**: Consistent with Ajzen's (1991; 2002a) conceptualisation of this construct, it is defined in this study as the customer's perceived ease or difficulty of performing the behaviour (i.e. pay a water bill within 15 days of receiving it).
1.8 DELIMITATIONS OF SCOPE

This research was limited to small urban centres in Uganda, with piped water services that are managed by private companies under management contracts. The decision to limit the study to privately managed services was based on recent evidence that private sector management of small town water services in Uganda has achieved notable improvements in terms of better records and reporting (Tumusiime and Njiru, 2004). As a result, it was possible to compile a sampling frame, and perform probability sampling of customers.

The target population included all households that are registered customers of the private operators contracted to manage piped water services in the towns. This study limited itself to the category of domestic customers with private connections (yard or in-house), as they constitute the majority of the customer base in small urban centres. The conclusions from this study are therefore limited to domestic customers, and are not generalised to other categories of customers such as industrial, institutional/commercial. Furthermore, this study was confined to only water services because sanitation/sewerage services are either non-existent or not institutionalised in many small urban centres in Uganda.

The author does not make generalisations beyond the above scope, although implications of the findings beyond these boundaries are drawn in Chapter 8 (sections 8.4, 8.5 and 8.6). Other limitations that became apparent during the progress of this research are acknowledged in section 8.7.

1.9 CHAPTER SUMMARY

This chapter has provided the foundation for this research. A background to the research was presented, in which the major challenges facing the water supply and sanitation sector in general were highlighted. Within the context of international development targets for water supply and sanitation, it is recognised that there are still huge constraints affecting the sustainability of water supply services. Chief among these is the insufficient or low levels of cost-recovery in the sector. After briefly highlighting knowledge gaps in literature and in practice, this chapter presented the purpose statement for this research.

The purpose statement was further refined into specific research questions which formed the focus of this study. The significance of the study for water utility managers, policy makers and researchers was highlighted. The methodology was briefly described, and the boundaries and exceptions inherent in the study were highlighted. Based on these foundations, the thesis can proceed with a detailed description of the entire research undertaking.
Chapter 1 provided an introduction to the research. The research problem was briefly introduced, and the purpose and significance of the research was presented. The current chapter provides a background to the research problem. It examines generic trends in the management of urban water services in low-income countries, and highlights the problems faced by water utilities in recovering costs of services and operating in a financially sustainable manner. The chapter is structured as follows:

- Section 2.2 provides a generic overview of trends in sustainable management of water services in low-income countries, identifying major milestones and paradigmatic shifts that have shaped current thinking;
- Section 2.3 provides an overview of cost-recovery problems and issues in low-income countries;
- Section 2.4 examines some of the management and policy strategies that are shaping current management reforms to improve cost recovery and financial performance of water service delivery in low-income countries;
- Section 2.5 presents the case for the current study in terms of its contribution to addressing the problem of low cost recovery in the urban water sector.
- Section 2.6 concludes the chapter, identifying the key background issues and context for the research.

2.2 OVERVIEW OF TRENDS IN MANAGEMENT THINKING

Recent times have seen considerable attention given to water services management issues in low-income countries. Following decades of emphasis on technical/engineering aspects of service provision, sector practitioners now agree that institutional and management deficiencies are at the heart of water supply problems in many low-income countries. Indeed,
the Global Water Forum recently described the water crisis in low-income countries as a crisis of governance (Global Water Partnership, 2002). The solution to the crisis lies in institutional reform. Consequently, many governments in low-income countries have taken steps to reform the institutional and management practices for water services in order to improve the governance framework.

Trends in water service management practices in general have been shaped by the evolution of global sector development strategies and policy thinking. The 1960s post-colonial era was largely characterised by free or heavily subsidised and centrally-managed water services. A series of water crises during the 1970s prompted a number of development cooperation initiatives (Grover, 1998). These initiatives largely followed a classical public health paradigm of engineering solutions in tackling the challenges (Black, 1998). Water was considered a social good, and national governments assumed responsibility for its provision. The mode of delivery was highly centralised and supply-driven. It was however during this period that the first reports of the concept of ‘community involvement’ emerged from Taiwan and Columbia (Wijk-Sijbesma, 1979).

The community involvement paradigm was officially adopted by the international community during the 1977 World Water conference in Mar del Plata, Argentina. The conference also adopted a declaration in which it announced the International Drinking Water Supply and Sanitation Decade, which officially started in 1981. The period 1981-1990 was the first major international initiative to address the problem of water supply in developing countries. During this period, the water sector still witnessed a largely supply-driven approach, with particular emphasis on low-cost affordable technologies and public health aspects. Decentralisation was gradually adopted with the belief that lower levels of government are better placed to respond to local conditions and consumer preferences.

Half way through the decade, community involvement became community management, as it turned out that sustainable services could not be achieved without involving people, not just in the manual work during the construction phase, but also in the planning of programmes and selection of technology. A variety of different actors, with different agendas signed up to the concepts of community management. Governments viewed this approach as a way of reducing demands on over-stretched resources. Donor organisations saw an opportunity to focus and stretch development budgets towards effective implementation of water supply and sanitation facilities, and to bypass what was said to be the problems posed by corrupt and inefficient governments. Finally, multilateral and bilateral donors saw community
management as an ideal vehicle for their messages about reduced government involvement, and increased private sector and civil society roles.

Towards the end of the decade, debates about the economic value of water - as well as issues of cost-recovery, cost-sharing and sustainable development started to unfold on the international agenda. The post water decade period (1991-2000) was characterised by a number of international conferences to reflect on the achievements and failures of earlier initiatives. The most notable one was the 1992 International Conference on Water and the Environment held in Dublin.

Participants of 1992 Dublin conference adopted a set of principles, including a declaration that water has an economic value in all its competing uses and should therefore be recognised as an economic good. The need to manage and use water as part of environmental protection and sustainable development was echoed in many subsequent international forums. In addition, concerns about water scarcity and pollution brought in an extra item on the agenda - that is, resource management. Both resource management (i.e. the allocation of water between competing uses and the control of pollution) and services management (i.e. the provision of water supply) became key issues in the new global focus on sustainable development. Yet, in developing countries the search for innovative approaches to sustainable service delivery was the more pressing issue. The Dublin principles, as they came to be known, also advocated for management of water at the lowest possible level, which further accelerated the drive towards decentralised service delivery. Furthermore, early in the post water decade, the World Bank, and later the Water and Sanitation and Program (WSP) developed the demand responsive approach, which advocated for increased focus on user needs, preferences and willingness to pay (Garm, 1998).

As the post-water decade period came to an end in 2000, a number of paradigmatic shifts in sector strategy and policy thinking had taken place as summarised in table 2.1. However, the problems of lack of sustainability and failure to increase service coverage continued to be even more serious. A lot had been achieved in rural areas, but for urban and peri-urban areas, the achievements were modest. Highly centralised supply-driven public utilities continued to prevail in many urban areas of the developing world – with their services only reaching a small section of the population, mainly the rich. With increasing urban populations, the challenge of increasing coverage and sustaining services remained on the international agenda. In November 2000, the Fifth Global Forum of the Water Supply and Sanitation Collaborative Council (WSSCC) in Brazil reached consensus on the way forward for water
supply and sanitation sector: the Iguacu Action Programme (IAP). IAP’s mainspring was Vision 21- a shared vision for hygiene, sanitation and water supply (Water Supply and Sanitation Collaborative Council, 2000). IAP translates this vision into practical activities to improve hygiene, sanitation and water supply.

Table 2.1: Major paradigmatic changes in water and sanitation policy thinking

<table>
<thead>
<tr>
<th>Old thinking</th>
<th>New thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water development</td>
<td>Water allocation</td>
</tr>
<tr>
<td>Emphasis on water quantity</td>
<td>Emphasis on water quality and quantity</td>
</tr>
<tr>
<td>Water and sanitation as basic human needs</td>
<td>Water &amp; sanitation as basic human rights</td>
</tr>
<tr>
<td>Water and sanitation as social good</td>
<td>Water as an economic good</td>
</tr>
<tr>
<td>Centralised management</td>
<td>Decentralised management</td>
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<tr>
<td>Government (state) provision</td>
<td>Government facilitation</td>
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<tr>
<td>Administrative domain</td>
<td>Service domain</td>
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<tr>
<td>Supply-driven approach</td>
<td>Demand Responsive Approach</td>
</tr>
<tr>
<td>Water supply projects</td>
<td>Water services</td>
</tr>
<tr>
<td>Production orientation</td>
<td>Customer orientation</td>
</tr>
<tr>
<td>Hardware projects</td>
<td>Software projects</td>
</tr>
</tbody>
</table>

Adapted from: Seppälä (2002)

Vision 21 covers many subjects, but the most relevant to water services management include the promotion of people-centred approaches, institutional reform, good governance, capacity building of public sector agencies, engagement of all stakeholders, including the establishment of partnerships with the private sector, and the adoption of commercial principles in management to improve efficiency and financial sustainability. Today, it is these issues that dominate the debate on water services management reform. It is clear that the need to ensure sustainability of water services is the main driving force behind water services management reforms in low-income countries.

However, the term sustainability, although widely mentioned and acknowledged in contemporary development circles, does not have a clear, distinct and wholly accepted meaning. In the global debate, sustainability is considered primarily in terms of continuing to improve human well-being, whilst not undermining the natural resource base on which future generations will depend. In the context of water supply in a developing country, the term sustainability is often used not to refer to the tension between development and the natural environment, but rather to refer to the narrow context of service.
Put simply, a water service is sustainable if it continues to deliver an acceptable level of benefits for an extended period of time (Abrams, 2000; Doe, 2003). For this to happen there must be sufficient funds to cover recurring expenses; routine and capital maintenance; system expansion as population increases; there must be acceptance from the users of the service; the source supplying the water must be adequate; the design must be properly done; and there must have been sound construction. These elements represent a multi-dimensional approach to assessing sustainability (Mukerjee, 1999; WHO and UNICEF, 2000), which includes technical issues, social factors, financial elements, the natural environment and institutional arrangements. Studies have shown that each one of these dimensions of sustainability is vitally important and necessary for the ongoing process of water service provision, but none of them is sufficient in itself (Abrams, 2000).

Indeed, the process of providing water services has two important phases that are critical to sustainability (Abrams, 2000): the initiation phase and the continuation phase. The initiation phase is the establishment of the service, from the recognition that a service is needed, through the articulation of demand, the planning of the service, the design and construction of the physical infrastructure and the establishment of the institutional framework. The continuation phase is the rest of the service's life, and it includes operating the services to the satisfaction of the consumers, collecting revenues, maintenance of infrastructure, expansion of infrastructure to meet growth, and administration.

In terms of sustainability, Abrams (2000) points out that there are actions which can be done or which can be omitted in both the initiation and continuation phases which will either promote or diminish the likelihood of a service being sustainable. Getting the initiation phase right has been the subject of intense research in the last decade, especially in rural water supply - with factors such as beneficiary participation (Nayaran, 1995), capacity building, and demand responsiveness (Katz and Sara, 1997; Isham and Kähkönen, 2001) recognised as pre-conditions for a sustainable service. By comparison, the continuation phase of service provision has generated more debate than pragmatic action, and it is here that sector practitioners have taken various positions. Nonetheless, there is agreement on the need for urban water services to be operated in a financially viable manner through recovery of costs and application of commercial principles in management. The next section provides an overview of cost recovery issues in low-income countries.
2.3 RECOVERING COSTS OF URBAN WATER SERVICES

2.3.1 Overview of cost recovery issues in low-income countries

Reforms towards cost recovery have long been a controversial issue among water sector practitioners. During the International Drinking Water Supply and Sanitation Decade (1981-1990), there were two competing arguments (Cardone and Fonseca, 2003). At one hand, many developing country governments and their development partners argued that health and social benefits fully justified the use of public and donor funds to deliver basic water and sanitation services to everyone who did not have them. However, some of those who took this position were ready to concede that funds for operation and maintenance of the new systems needed to be generated locally to avoid the facilities from falling into disrepair and disuse. The more radical advocates of “water and sanitation for all” maintained that millions of unserved people would never be able to afford anything until they were provided with access to water services. They argued that providing access to water services was a prerequisite for income generation and poverty alleviation, which would bring with it affordability and willingness to pay.

On the other hand, the argument advanced mainly by economists was that affordability and willingness to pay were the prerequisites. They maintained that delivering water and sanitation services to those unable or unwilling to meet the costs was a recipe for failure. The main reasons advanced in support of this position can be summarised as follows (Evans, 1992):

- Available public funds are usually inadequate to achieve full coverage and meet recurrent costs
- Subsidies disempowered users by denying them choice, and they also discourage cost-effectiveness and the development of low-cost solutions
- User payments increase a sense of value and commitment
- Evidence of demand and willingness to pay is strong with many low-income people already paying high rates for services
- State intervention and control has proved to be inefficient and ineffective

The above arguments were the subject of intense research and discussion throughout and after the International Drinking Water Supply and Sanitation Decade. Field studies carried out in many developing countries showed that the provision of free or heavily subsidised water services limited the expansion of water supply coverage to all as proponents had hoped.
Instead, services were accessed by a few influential better-off people in society (Briscoe and De Ferranti, 1988; Katko, 1990; Evans, 1992; Komives et al., 2005). Inadequate cost recovery was also shown to affect the effectiveness of operation and maintenance, as between 30-40 percent of water supply facilities constructed during the decade became inoperative (Evans, 1992).

Consequently, policy makers in developing countries, together with their development partners, acknowledged the importance of cost recovery in the continuance of improved water services, as neither could afford to subsidise services on a sustainable level. Indeed, some considered the progress towards cost recovery as one the main achievements of the International Drinking Water Supply and Sanitation Decade (Katko, 1990). The current debate is no longer on whether consumers should pay for water services, but rather on what level or costs need to be included in cost recovery strategies and the sources from which "recovery" might be considered to come.

Costs related to providing a public service such as water supply or sanitation are traditionally classified into two broad categories: financial costs (i.e. operating costs, capital costs, cost of servicing capital) and economic costs/benefits (i.e. lost value of water for other uses, gains from productive use, pollution created or alleviated). The traditional approach to cost recovery considers only the financial costs, such as operations and management costs, capital costs and sometimes investments for future growth and rehabilitation. National sector policies then give guidance on whether part or all of these costs should be recovered from consumers, making tariff design and billing a crucial element in the recovery of financial costs. A less narrow economic perspective considers, in addition to the financial costs, opportunity and environmental costs and benefits to society, and the broader water resources issues surrounding the delivery of safe water and sanitation services, in addition to the external impacts on individuals or communities (Cardone and Fonseca, 2003).

However, other authors argue that even full recovery of the financial costs associated with the operation and management and those related with the environment does not guarantee a sustainable water service. For instance, Cardone and Fonseca (2003) point out the importance of what they termed as 'support costs', i.e. costs related to developing and maintaining institutional frameworks, capacity building and human resource development, information systems, monitoring and regulation, planning and strategy development. They argue that cost recovery should be seen "as the matching of all costs related to providing a sustainable service, with all the available sources of funding" (Cardone and Fonseca, 2003 p.17).
Whether all these costs are to be met by consumers through tariffs, or some external funding is needed from governments and donors is still a contentious issue. Nonetheless, it is generally accepted that water tariffs must, at the minimum, be able to recover operating costs.

2.3.2 Level of cost recovery in low-income countries

The 2000 global water and sanitation assessment report revealed that all developing countries levied a tariff on urban water services (WHO and UNICEF, 2000), suggesting that the importance of cost recovery as a prerequisite for sustainable services is now acknowledged even among the poorest countries. However, data available in the report shows that most water tariffs levied are less than the unit cost of production of the water. Figure 2.1 shows the regional comparison of median water supply tariff, production costs and tariff to cost ratios. The figure shows little variation in the median unit production cost of water between developing regions of the world.

![Regional comparison of median water production costs, tariffs and tariff/cost ratios](image)

Fig. 2.1: Regional comparison of median water production costs, tariffs and tariff/cost ratios

Source: WHO and UNICEF (2000)

However, more than half of the countries of each region (except for Europe and North America) charge an urban water tariff that is less than the unit cost of production of water (WHO and UNICEF, 2000). These statistics are only indicative of the global trend towards cost recovery, as there can be greater variations between sub regions and between countries. A better picture of the situation can be obtained by examining data from individual water service providers across different countries.
Some statistics from small urban centres in selected developing countries is shown in figures 2.2, 2.3 and 2.4. Data from Colombia and Lao PDR was obtained from field notes compiled by the World Bank’s Water and Sanitation Program as part of the global small towns water and sanitation study (Water and Sanitation Program, 2001; 2002). Data from Uganda was obtained from a government funded study on tariffs and subsidies for small towns water supply systems (Carl Bro Group, 2003).

Figure 2.2 shows unit production costs, average tariffs and tariff/cost ratios for a sample of 10 small municipalities in Colombia, Latin America. The data obtained shows that, contrary to the regional trend, all the 10 small municipalities charged a tariff higher than the production cost, with an average tariff/cost ratio of 2.4.

![Figure 2.2: Comparison of average water production costs, average tariff and average tariff/cost ratio for selected small towns in Colombia, Latin America](image)

Data source: Water and Sanitation Program (2001)

Figure 2.3 shows the same indicators for four small towns in Lao PDR, East Asia. The average tariff is lower than the production cost in each of the four small towns with an average tariff/cost ratio of 0.7. Field data from Lao is therefore consistent with the Asian regional trend obtained by WHO and UNICEF (2000). Figure 2.4 shows similar data from a sample of nine small towns in Uganda, East Africa. All the nine towns are managed by private operators under management contracts, and the management fee is inclusive of operating costs. The figure shows that only five of the small towns charge a tariff equal or higher than the management fee, with Busia and Malaba towns having the highest tariff/management fee ratios.
Apart from non-cost reflective tariffs, there are other challenges to improving cost recovery levels in developing countries. Although tariffs may be set to cover or exceed production costs, it may not be practically possible to account, in revenue terms, for all the water that is produced. Cost recovery is affected by factors such as unaccounted-for-water (UFW) due to physical and commercial losses, and bill collection efficiency.

Billing customers and getting paid are two different things. The effectiveness of a utility's bill collection process can be assessed by two indicators: (i) collection period – which is the amount of outstanding revenues at year end compared to the total billed revenue for the year,
in day equivalents; and (ii) collection efficiency – which is the total amount collected as a percentage of the billed amount. Indeed, Kayaga (2002, p.26) defines overall cost recovery efficiency as “the ratio of the volume of water for which payment has been received, to the volume of water that has been delivered to the distribution system”. This definition implies that for a water utility to have good overall cost recovery efficiency, it should perform highly in minimising water losses, and at the same time be able to recover payment, with in a reasonable time, for all the water bills sent to customers.

However, international comparison of the performance of water utilities on these key attributes of cost recovery shows that utilities in developed regions of the world consistently outperform their counterparts in developing regions. This comparison is illustrated in figures 2.5 and 2.6. Figure 2.5 compares UFW levels for 208 water utilities (115 from developed countries and 93 from developing countries). More than two thirds of utilities from developed countries are in the lower UFW range (i.e. 5 to 20%). But for many water utilities in developing countries, as much as a third of water production is lost, either through physical or commercial losses.

A similar comparison for collection periods (figure 2.6) shows that in general, most utilities in developing countries take longer to collect their debts compared to those in developed countries. Long bill collection period affects service delivery since inability to collect all water bills sent out can cause cash flow problems that impact on the ability to cover operating expenses and extension of coverage.

![Unaccounted for water levels](https://example.com/unaccounted_water_levels.png)

Fig. 2.5: International comparison of unaccounted for water levels.
Data source: IBNET (2006)
A closer look at a 4-year (2000-2004) data set from selected African water utilities reveals greater variations in performance with regard to bill collection period and efficiency, with some utilities showing an upward trend. Figure 2.7 and 2.8 give graphical presentations of trends in collection period and efficiency for four African utilities.

Data presented in figure 2.7 shows an upward trend for Lilongwe (Malawi) and Chipata (Zambia), while SODECA (Cote d’Ivoire) and Lusaka (Zambia) maintain relatively shorter collection periods. On average, it takes Chipata Water and Sewerage Company seven months to collect its debts compared to under a month for SODECA and Lusaka Water and Sewerage Company. In addition, compared to the other utilities, SODECA and Lilongwe demonstrate good performance with respect to bill collection efficiency. However, while SODECA is able to recover payment, in just under a month, for almost all the bills sent out, Lilongwe’s performance on collection period averages three months, suggesting that its high collection efficiency could be due to collection of arrears.
It is also worthwhile noting that in 2000, Lusaka Water and Sewerage Company had bill collection efficiency as low as 50 percent. Indeed, most water utilities in sub-Saharan Africa report very low bill collection efficiencies—a factor that has contributed to their being fiscally strapped and unable to meet operating expenses or to expand services. Other barriers and challenges to improving cost recovery include (Cardone and Fonseca, 2003): (i) political interference in utility operations; (ii) lack of management transparency and distrust of cost collection systems; (iii) insufficient willingness to pay; (iv) low or variable income, and land
tenure issues; (v) poor financial management on the part of the utility; and (vi) inappropriate and expensive system designs.

In summary, despite major efforts in the sector over the past decades, cost recovery is still today one of the major obstacles to achieving sustainable drinking water supply in developing countries. Most countries set water tariffs below production costs making it difficult for utilities to generate sufficient revenues for sustaining services. Even when cost-reflective tariffs are present, utilities struggle to collect revenues from customers consistent with billed amounts. The problem of bill collection has two parts: lower collection ratios and the long periods that utilities take to recover payments from customers. This research is concerned with the latter. It identifies ways through which utilities can, through their service offering, influence customer decision-making with regard to paying water bills promptly. The next section examines some of the strategies that are shaping current management reforms to improve cost recovery and financial sustainability of water services in low-income countries.

2.4 STRATEGIES FOR IMPROVING COST RECOVERY

Once a controversial issue, recovering costs of service provision and ensuring the financial viability of service providers has come to be accepted as key conditions for the continued delivery of improved water services to all. However, the low levels of cost recovery, and consequently the poor coverage and quality of services in most developing countries has prompted a number of reform measures aimed at changing the status quo.

Two related trends have emerged during the past decade. At one hand, there are those who argue that the root cause of poor cost recovery, and hence poor utility performance, is the system of rules and incentives, which cause policy makers and utility managers to act against the public interest (World Bank and PPIAF, 2006). For instance, government policy makers may know that higher tariffs are needed to improve services, but refuse to allow the increase, because the political and social pain of the increase will be felt immediately, whereas it may take longer for higher revenues to translate into better services. It may also be the case that utilities are incurring unreasonably high costs due to inefficiencies and overstaffing, making it difficult to cover these costs through tariff increases. Also, utility field staff may cause loss of revenue by illegally accepting bribes from non-paying disconnected customers, in return for reconnection to the network.
To fix these problems, governments have initiated reforms aimed at changing the institutional framework for water service provision, with a particular focus on creating better incentives for service providers to operate in a financially viable manner. Chief among these reforms has been the restructuring of ownership and corporate governance regimes within public water utilities, as well as increased private sector involvement in management of water services. These trends are examined in more detail in section 2.4.1.

On the other hand, given that the chief means of recovering costs of service provision is through user payments, many sector professionals now argue for approaches that place the customer at the centre of efforts to improve recovery. Indeed, recent studies show that irrespective of ownership or corporate governance structure, utilities in developing countries can improve cost recovery and financial performance by simply being customer-focused (Kayaga, 2002; Njiru, 2002; Njiru and Sansom, 2003; Sansom et al., 2004). Section 2.4.2 examines this proposition in more detail.

2.4.1 Private sector participation

The trend towards involvement of the private sector in provision of services traditionally provided by the public sector is what is commonly referred to as private sector participation (PSP). The increasing role of the private sector, particularly in developing countries can be attributed to three key factors: lack of government resources, low-quality public provision and donor pressure to extend economic liberalisation to the water sector (United Nations Development Program, 2003). Low-cost recovery is one of the often stated problems that have led to poor water service provision by the public sector.

Several modes of PSP in water services management are to be found across the developing world, including (Njiru, 2004): short-term service contracts; management contracts lasting about three to five years; lease contracts lasting over five years and up to 10 years or more; and concession contracts lasting over 10 years. Models that involve transfer of infrastructure and assets to the private sector have not been embraced as a reform strategy by many developing countries. Instead, countries have adopted or are in the process of adopting PSP models involving service contracts, management contracts, leases and concessions.

The rationale for increasing interest in PSP is the belief that the approach offers a genuine means of improving financial performance through increased cost recovery levels, efficiency and effectiveness. However, these perceived benefits are not always guaranteed (Njiru et al.,
Indeed, research shows mixed performance, which is largely context-dependent (Bayliss, 2003). Evidence from Africa suggests that the performance of utilities with PSP has not changed dramatically. Utilities have continued to perform well, or not so well, depending on their state when the private sector was involved and on the wider economic context (Bayliss, 2003). Other evidence points to substantial improvements in financial management and record keeping (Njiru et al., 2004). On the other hand, developing country governments face considerable difficulties in regulating private operators and attracting investments (Hukka and Katko, 2003).

The PSP strategy in water services has been the most controversial in recent times, and still generates a lot of passionate debate. Proponents of the strategy often quote the proven record of poor performance and mismanagement that characterise most publicly owned and operated utilities. They argue that substantial efficiency gains exist in allowing the profit-driven private sector to deliver services. In contrast, opponents question the efficiency claim, urging that in a less competitive environment like water services, private companies will naturally focus on only economic efficiency in order to maximise the profit objective. Further arguments against PSP concern transparency, accountability, especially in cases where the procurement process is flawed, without proper clauses to safeguard the public interest (Hall, 2001).

As the PSP debate increasingly takes on a normative nature, other authors tend to urge from a neutral ground. Some contend that public water service provision is not inherently better or worse than private management, less corrupt or more corrupt, less accountable or more accountable. Rather, it all depends on the governance arrangements (Helming and Kuylenstierna, 2001). Similarly, Wolf and Palaniappan (2004, p.1) urge that “public versus private is not the bright line that separates efficient from inefficient management".... the real solution lies in creating system conditions under which both forms can succeed". Indeed, numerous good and bad examples exist for both forms of service delivery (Janssens, 1999; Slattery, 2003), and so the key issue is to gain greater insight into how and why effective performance is achieved in some circumstances and not others (Bayliss, 2003).

Other critiques of the PSP approach have urged that the approach is not the only means of adopting commercial principles in management of public services (Brown and Ryan, 2000). There is an increasing trend towards reorienting public sector service provision from a traditional administrative approach to delivering services on a commercial or quasi-commercial basis (Brown and Ryan, 2000). In developed countries, this reorientation of public service provision has been ongoing for the past two decades, and has ushered in a...
management revolution and radical reorganisation based on application of marketing principles (Walsh, 1994).

Despite the conflicting and often passionate debates about the PSP trend, water sector professionals are now increasingly taking a pragmatic view of water service management issues in low-income countries. One such pragmatic view is that water service providers, whether public or private, need to adopt a marketing approach to improve service delivery and ensure sustainability of services (Kayaga, 2002; Njiru, 2002; Nickson and Franceys, 2003; Njiru and Sansom, 2003; Sansom et al., 2004). The issue of whether services should be in public or private hands should be secondary. The following section examines the key propositions of the marketing approach, and their relevance to improving cost recovery and overall financial sustainability of water services in low-income countries.

2.4.2 Marketing approach

Over the past two decades, the political right in developed countries has developed a critique of public services as unresponsive, inefficient and not accountable to the recipients (Walsh, 1994). The way forward, it has been argued, is to treat users of public services as customers rather than mere passive recipients and that the function of service providers is to serve and satisfy user’s needs (Walsh, 1994). This view has its origins in a perceived need to redress the imbalance of power that exists between those who provide services and those for whom they are provided (Potter, 1988). It is based on the reasoning that a power advantage rests with public sector monopoly service providers while users may only exercise their preferences through indirect and imperfect means of choice such as voting or relocating (Advani and Borins, 2001).

Consequently, the public services have undergone a management revolution during the past two decades, with radical reorganisation based on application of marketing principles (Walsh, 1994). This revolution, which is collectively referred to as the New Public Management (NPM), has taken place mainly in developed countries, but is increasingly being applied in low and middle income countries (Nickson and Franceys, 2003). NPM has become a collective term used to describe a bundle of management techniques introduced to the public sector, many of which are borrowed from the private sector (Walsh, 1995).

As “managerialism” takes over the traditional administrative style of the public sector, NPM has been presented in terms of the following key components (Advani and Borins, 2001): (i)
emphasis on providing high quality services that are demand driven and are valued by all citizens; (ii) increased managerial autonomy, particularly by reducing central agency controls; (iii) demanding, measuring, rewarding both organisational and individual performance; (iv) providing the human and technological resources that managers need to meet their performance targets; and (v) maintaining a receptiveness to competition and open-mindedness about which public purposes should be performed by public servants, as opposed to private sector or non-governmental organisations.

The emphasis on markets, competition and giving ‘choice and voice’ to users is believed to promote cost savings and customer responsiveness (Nickson and Franceys, 2003). Today, the language of market orientation, market segmentation, market position and the market mix has become commonplace, even in the water sector (Njiru, 2002; Njiru and Sansom, 2003; Sansom et al., 2004). But what exactly is the nature of urban water supply market in developing countries?

There is strong evidence that urban water utilities in developing countries operate in an environment where both their existing and potential customers have access to alternative water sources and service providers. Case studies carried out in Africa and South Asia have revealed a dynamic water market, supported by socially complex networks of access and distribution (Whittington et al., 1988; Collignon and Vezina, 2000). Across a typical town or city, residents use private water vendors, individual household on-selling/buying, family and institutional boreholes, hand-dug wells, streams, rainwater and springs to supplement, replace or substitute direct utility water.

Although these alternative supplies are often unregulated, unreliable and costly, a big proportion of urban dwellers use them regularly either through necessity or choice. Indeed, these sources of water supply attract reasonably loyal customers, and therefore, could be said to represent a certain degree of competition to conventional water utilities. Whether this level of competition is sufficient to drive urban water utilities into new larger markets (such as informal settlements) is yet to be resolved. Nonetheless, utilities do have a social responsibility to provide sustainable clean water services to all urban residents at an equitable price, as well as ensuring increased levels of cost recovery. Consequently, in light of the mounting social and commercial pressures, water utilities in developing countries are being urged to change their business approach from being supply-driven to being market oriented (Kayaga and Franceys, 1998; Kayaga, 2002; Njiru, 2002; Nickson and Franceys, 2003; Njiru and Sansom, 2003; Kayaga et al., 2004; Sansom et al., 2004).
In the marketing literature, being market oriented is essentially being customer-focused (Kohli and Jaworski, 1990). The core proposition of marketing is identification, creation and maintenance of mutually satisfying exchange relations with customers (Barker, 1995). Having a customer focus means that services and outputs are organised and directed towards the demand and desires of the customer, with the aim maximising the number of satisfied customers. There is some evidence in the water services industry to the suggestion that consumers who are satisfied with services are more likely to accept and pay reasonable water charges (Kayaga, 2002; Kayaga et al., 2004). Where there are cost-reflective tariffs, increased numbers of paying consumers means higher revenues. Increased revenues can then be invested in improving services, which in turn increases customer’s satisfaction levels and so a cycle of continuing improvement can develop (Sansom et al., 2004).

Furthermore, it is urged that being customer focused also involves an appreciation of the differences in customer needs and preferences, thus promoting a strategy of service differentiation for different consumer groups (Njiru and Sansom, 2003). Paying attention to customer relations is another characteristic of customer oriented service providers, and this has more relevance in developing countries than richer countries because of the presence of alternative source and providers such as water vendors (Sansom et al., 2004). Customer oriented service providers have workable means in which to address customer’s complaints and allow them to make suggestions for improving service.

However, although a marketing approach seems much more relevant to the cost recovery problems faced by water utilities in developing countries, guidance is needed on how to operationalise the marketing concept and its propositions in a water utility context. In considering how marketing concepts can be applied to the water sector, Njiru (2002) distinguishes between marketing as a business philosophy; marketing as an integrated set of tools; and marketing as a management process.

A water service provider with a market oriented philosophy would have its entire operations, its personnel and technical systems, being geared to providing improved customer satisfaction and to contribute towards achieving its financial objectives (Njiru, 2002). This represents a strategic approach to marketing water services, which captures the fact that water utilities need to generate sufficient funds to cover their costs and carry out future investments (Njiru, 2002; Sansom et al., 2004). However, due to the monopolistic nature of the water industry, the question remains of whether a true market orientation philosophy or culture can be developed by an organisation that is not fully subject to the market principles of competition.
In view of this unresolved question, the way forward, it is has been argued, is for water utilities to apply marketing tools or techniques in pursuit of their social and economic objectives (Njiru, 2002).

Marketing as a set of tools has the potential to improve the efficiency and responsiveness of a public service (Walsh, 1994). The use of surveys, for instance, of public attitudes and values, has greatly increased over the last few years, and their contribution to improved decision making in public service delivery has been acknowledged (Walsh, 1994). In addition marketing techniques such as market segmentation, service differentiation and appropriate pricing have found application to water utilities in sub-Saharan Africa (Njiru, 2002).

On the other hand, marketing as a management process adapted to the water sector, typically involves the following key steps (Sansom et al., 2004): (i) investigating customer demand for different service options; (ii) identifying groups of consumers whose requirements could be better satisfied; (iii) developing reliable service options to meet changing demands; (iv) pricing the service at a level which the market will bear and which will meet the financial objectives of the utility; and (v) promoting the service so that a desired unit or revenue volume of demand is achieved. Such a process is considered key to improving business performance, and in the water sector, it represents a holistic approach to water service delivery (Njiru, 2002). By seeking to understand the perceptions and preferences of different consumer groups and their willingness to pay for different types of services, utilities can develop viable business plans that target and provide reliable services to each consumer group (Sansom et al., 2004).

In sum, as the water sector reform agenda calls for water service providers to demonstrate more commercial or business-like practices and move away from supply-driven to demand driven approaches, marketing as a management process and as a set of tools is increasingly being advocated (Njiru, 2002; Njiru and Sansom, 2003). Like many contemporary marketing authors have argued, marketing is no longer just a commercial tool aimed at developing, selling and delivering products or services for financial gain (Bansal, 2004). It is increasingly more concerned with the development and maintenance of mutually satisfying long-term relationships with consumers, and can be applied successfully to sectors and organisations in which profit is not the major motive for existence (Buttle, 1996).

This new perspective in water services management has resulted in increased emphasis on the central role of the customer and encourages water service providers to be customer focused in
order to improve levels of cost recovery. However, the degree to which its implementation will succeed is heavily dependent on how well water utilities understand the customer. For utilities to be customer focused, they require an understanding of the capabilities of consumers, and the factors that influence their decisions and behaviour patterns, especially with respect to paying for services. The following section presents the case for the current study in terms of its contribution to addressing the cost recovery problem through customer-centred approaches.

2.5 THE NEED TO STUDY CONSUMER BEHAVIOUR

Marketing functions within the business realm are heavily dependent on knowledge of consumer behaviour (Loudon and Dell Bitta, 1993). This is attributed in part to the desire of business firms to obtain a competitive advantage by basing marketing decisions on information about the factors that determine the customers’ preferences among products or services and their willingness to pay. In a similar way, water utilities seeking to become market oriented will need detailed knowledge of water consumer behaviour in order to tailor their management processes to better serve their customers, while at the same meeting their financial objectives.

Within the marketing realm, consumer behaviour has been described as the “dynamic interaction of affect and cognition, behaviour and environmental events by which human beings conduct and exchange aspects of their lives” (Blythe, 1997). This description implies a dynamic process by which consumers acquire knowledge, form perceptions and reason before engaging in behaviour. It also suggests that the behaviour of consumers is dynamic in nature, and is influenced by factors both internal and external to the consumer. Understanding consumer behaviour, therefore, involves knowing what consumers think, what they feel, what they do, and the things and places that influence, and are influenced by what they think, feel and do (Howard, 1989; Blythe, 1997).

Consumer behaviour studies have widespread applications in the marketing of goods and services. In the business domain, knowledge of consumer behaviour is used as a tool in the design and marketing of goods and services to enhance consumer satisfaction and increase profitability (Loudon and Dell Bitta, 1993; Evans et al., 1996; Gabbot and Hogg, 1998; Mowen and Minor, 2001). Indeed, the study of consumer behaviour is considered the cornerstone of the marketing concept, and is regarded as being essential to the long-term success of a marketing approach, as it enables firms to be more effective in reaching their
target consumers (Loudon and Dell Bitta, 1993). Knowledge of consumer behaviour can be used to predict and influence consumer’s decisions, and provides innovative ideas for new products and services (Evans et al., 1996).

The above applications in the business domain suggest that consumer behaviour studies can be a useful tool for promoting sustainability in the water sector (Addo-Yobo and Njiru, 2006). For instance, knowledge of how consumers get, use and manage water, as well as how they make decisions regarding service options/levels can provide important clues for service improvement. In addition, an understanding of the benefits consumers expect from an improved service, and the factors that influence their behaviour patterns would be an important input in the design or development of services that consumers will readily appreciate. With such knowledge, a service provider would be able to develop service options that meet the needs of different consumers.

Moreover, the problem of cost recovery can also be addressed by paying closer attention to the factors that influence consumer’s bill payment behaviour, and designing intervention strategies that promote bill payment. For policy makers involved in service regulation and consumer education aspects, knowledge of consumer behaviour provides useful insights into consumer problems, and the nature of the exchange relationship between water consumers and the suppliers. Such knowledge would guide the development of interventions to encourage good management practices, promote bill payments and deter undesirable behaviour.

However, despite the above applications, understanding consumer behaviour is problematic in that, consumers are all different, act differently at different times and often responded differently to the same stimulus at different times (Loudon and Dell Bitta, 1993). In a broader context, consumer behaviour is essentially a subset of human behaviour, and it is often difficult to draw a distinct line between consumer-related behaviour and other aspects of human life (Loudon and Dell Bitta, 1993). In spite of these challenges, studies in consumer behaviour have demonstrated that it is possible to study and accurately predict the behaviour of consumers, and that attitudes are learnt, hence consumers can be persuaded to change their attitudes and behaviours (Ajzen and Fishbein, 1980; Evans et al., 1996; Gabbot and Hogg, 1998). This study sought to understand the factors that influence prompt bill payment behaviour with a view of identifying and isolating those specific influences that are amenable to change and are within the control of the utility. This would provide important clues to
2.6 CHAPTER SUMMARY

This chapter provided an overview of trends in urban water services management in low-income countries. The overview shows evidence of a global interest in water supply issues in the developing world. The trends discussed in this chapter have been shaped by the evolution of global sector development strategies and policy thinking, in a continuing attempt to improve performance and sustainability of service delivery. The shift from water supply projects to water services was critical in generating international consensus on key factors that can promote service provision as an ongoing process.

Cost recovery, which was once a controversial issue has come to be generally accepted as a key condition for the continued functioning of water services in a financially viable manner. The assumption that people in low-income countries are too poor to pay for water services was not supported by various studies carried out in the past two decades. Thus, the cost recovery debate shifted from whether to recover costs, to how to recover costs in a sustainable and socially equitable manner. Available data showed that most tariffs are set at a level lower than the production costs. But it was also acknowledged that setting water tariffs above production costs does not guarantee that costs will be recovered. Problems of bill collection efficiency were highlighted and the effects of delayed payments by customers were discussed.

Further, the chapter noted that current trends towards adopting commercial principles in urban water services management represent a shift from the traditional civil service style of service delivery to more business style and orientation. There is consensus on the importance of this shift in improving cost recovery and financial viability. But there is still contention on the means to achieving that shift, with sector professionals taking positions on either side of the debate about increased private sector participation versus public sector reform.

Nevertheless, strategic business cultures such as market/customer orientation are increasingly taking root, in recognition of water users as customers rather than mere passive recipients of services. It is clear that the marketing literature, where these concepts are rooted, is indeed having an influence on contemporary management thinking in the water services sector. The implication for such a trend is that water utility managers will need to gain a better understanding of the behaviour of consumers, and thus consumer behaviour studies will
become central to the successful application of the marketing approach in water services management.

In summary, this chapter has revealed two key issues that provide the background to this research:

- Low cost recovery is still today one of the major obstacles to achieving sustainable drinking water supply in developing countries, despite major efforts in the sector over the past decades.
- In the context of urban water services, the adoption of commercial principles in management, particularly business orientations such as market/customer orientation is considered crucial to improving cost recovery.

There is therefore need to carry out research on how urban water service providers can, through their service offering, influence consumer decision making in relation to payment for water services in order to improve cost recovery and enhance financial sustainability. The next chapter provides a critical review of available literature on domestic water demand behaviour in low-income countries, and identifies the key research issues.
CHAPTER THREE

BEHAVIOURAL STUDIES OF DOMESTIC WATER DEMAND AND WILLINGNESS TO PAY IN LOW-INCOME COUNTRIES

3.1 CHAPTER INTRODUCTION

Chapter 2 provided a background to the research, and highlighted the problem of low cost recovery as one of the major challenges facing water utilities in developing countries. This chapter examines the extant literature on domestic water demand and willingness to pay in low-income countries in order to identify the research issues and gaps.

The specific objectives of the literature review were to: (i) discover some of the factors that influence household willingness to use, or to pay for, an improved water supply; (ii) discover some of the factors that influence actual water bill payment behaviour; (iii) identify the main methodologies and research techniques that have been used; and (iv) identify knowledge gaps, i.e. issues that are relevant to the research problem but have not been fully addressed in the existing literature.

As discussed in Chapters 1 and 2, the main challenge for urban water utility managers is to increase coverage of services while at the same time ensuring that customers pay their water bills, in order to attain sustainable cost recovery levels. During the 1980-1990 International Water Supply and Sanitation Decade, many piped water schemes in both rural and urban areas did not live up to expectations, in terms of the anticipated number of connections and coverage (World Bank, 1992). Today, the same problem persists in many developing countries. In Uganda’s small towns for instance, system utilisation levels can be as low as 10 percent of design capacity (Carl Bro Group, 2003). Many people supposedly “served” by new water facilities have chosen not to use these facilities and have, instead, continued to rely on traditional sources or vendors.

Various explanations have been given for the low utilisation levels of many water supply investments. Public health professionals often cite people’s lack of knowledge of the health benefits of improved water supplies. Some political leaders often doubt whether tariffs are affordable. Anthropologists often point to the insensitivity of many projects to local customs and beliefs. Others, mainly economists, have argued that one of the principal problems is the
lack of sound economic analysis prior to water supply project design and construction (Whittington and Swarna, 1994). Amongst the various explanations, the ‘economic analysis’ perspective has become the most dominant in recent times, and from it, emanates the popular policy view that water services should be provided on the basis of what people actually want and are willing to pay for. This view is grounded on the assumption that individual household willingness to pay is a clear indication that households perceive the benefits of the improved service, value the service, and therefore will most likely use and sustain it.

In the following sections, the literature on behavioural aspects of household water demand is critically examined in order to identify key variables that are likely to influence bill payment behaviour. The literature review is structured as follows. Section 3.2 reviews literature on the benefits and costs of improved water services in order to provide a foundation for the discussions on demand and willingness to pay. Sections 3.3 and 3.4 introduce the concepts of demand and willingness to pay and the techniques used in their prediction. Section 3.5 examines literature on the determinants of water demand and willingness to pay, while section 3.6 reviews literature on determinants of bill payment behaviour. A summary of the key research issues emanating from the literature review is presented in section 3.7.

3.2 BENEFITS AND COSTS OF IMPROVED WATER SERVICES

In the context of small urban centres in developing countries, a piped water supply network is seldom the only water supply available to the community. Rather, such a service simply changes the range of options available to households in the community. The range of options available for improving access to water is wide, especially in low-income settings where large proportions of population have access only to the most basic facilities. Water supply options such as boreholes, protected springs or wells, collected rainwater, and water disinfected at the point of use, are generally considered as ‘improved’ (WHO and UNICEF, 2000). Other options such as unprotected wells or springs, vendor-provided water, and water provided by tanker trucks are regarded as ‘unimproved’ due to being either unsafe or costly.

Many sector professionals have argued that the more benefits which can be obtained from water supply improvements, the greater the prospects of sustainability will be (Evans, 1992). For the case of a piped water supply, direct and immediate advantages to households include the delivery of water in greater quantity and closer to home on a more reliable basis; better water quality; and more convenience. Although these direct advantages may be perceived by
consumers as benefits in themselves, they often create a situation where greater and long-term benefits can be achieved (Hutton and Haller, 2004).

The benefits of improved water and sanitation services are commonly treated in two broad categories (Evans, 1992; Hutton and Haller, 2004): (1) benefits to health; (2) savings in time and effort, leading to economic and social benefits. Health benefits are usually the main driver behind public investments in improved water and sanitation services. Although the link between improved water and sanitation services and improved health is a difficult one to prove (Churchill, 1987), studies carried out in various low-income countries have shown that water supply and sanitation interventions can reduce diarrhoeal diseases and trachoma by at least 26 percent and reduce guinea worm and schistosomiasis by about 77 percent (Esrey et al., 1990). One study in Argentina reports a 24 percent reduction in child mortality as a result of increased house connections to piped water services (Galiani et al., 2002).

Whereas investments in improved water services are justified on the basis of health benefits, consumers are often more aware of other benefits such as the added convenience and the time savings (Cairncross, 1988). To the consumer, time savings and convenience may mean that water collection is less of a burden, and that more effort can be directed towards other economically productive activities. In addition, increased water quantity and availability means that water is more accessible for other productive uses (such as livestock and garden irrigation), leading to economic and financial benefits. Improved water services can also lead to cash savings especially when a new system replaces water vending and delivers water at a lower cost.

Furthermore, there is evidence that what water supply project planners and managers perceive as benefits may not be what prospective customers perceive as benefits. For instance, Weitz and Franceys (2002) provide evidence from women focus groups in Indonesia and Philippines in which other benefits mentioned include more time for household chores and leisure; less stress from queuing for water; more money for other household needs; more water to take a shower. In the Philippines, newly connected customers estimated their savings from the new water connection to be USD 14.3 per month (Franceys, 2005). Consequently, as the water sector moves towards an approach to service improvement that is based on user demand, and a strong emphasis on cost recovery, sector professionals are increasingly arguing for new ways to actively pursue and optimise consumer perceived benefits from water service improvements (Evans, 1992).
On the other hand, while service improvements can bring benefits, they also have costs. Evans (1992) rightly points out that the value of benefits can only be known if they are set against the costs involved. The costs of water and sanitation service improvements are influenced by a broad range of factors, from technology choice and service level, to less tangible factors such as management and administrative procedures. For instance, to connect to a piped water service, consumers have to incur both connection charges (i.e. fees charged by the water utility) and connection costs (i.e. physical costs for pipes and other plumbing materials), as well as paying consumption charges or tariffs once they are connected.

Moreover, compared to consumption tariffs, there is limited literature on costs and charges associated with connections to a piped water service. According to Franceys and Kayaga (2004), connections charges seem to have developed over time in different locations without any particular underlying theory. Recent research on connection charges and costs in selected low-income countries reveals that the cost of acquiring a household water connection represents 12.9 months average Gross National Income (GNI) per capita in Ghana, 5.3 months in India; 0.9 months in Philippines and 26.2 months in Uganda (Franceys, 2005). Such costs, which may include many ‘add-ons’ over and above the official fees may lower household willingness to acquire connections.

However, once connected to the water supply system, consumers effectively recover costs through enjoyment of the benefits of improved services. The analysis they make on the basis of weighing costs and benefits from their own point of view, largely determines their demand or willingness to pay for the services (Evans, 1992).

3.3 DOMESTIC WATER DEMAND AND WILLINGNESS TO PAY

Providing water services which people are able and willing to pay for is regarded as a key precondition for improving cost recovery, and it is the guiding principle behind the demand responsive approach. However, the concept of responding to user demand is made more complicated by differing perceptions of what is meant by demand.

The term ‘demand’ has different meanings to different people (Webster, 1999). To the engineer or technician, water demand is a technical design parameter used to describe the quantity and quality of water that users consume or are expected to consume. Engineers tend to see water demand as directly proportional to consumption, and as a result, water supply
schemes are often designed according to volumes supplied per household, with little consideration of the long term costs and financial sustainability.

Other stakeholders, particularly politicians, often interpret demand as equivalent to 'felt needs' or aspirations of the community. In this case, provision of services is likely to be driven by political or equity considerations. Used in an economic sense, and in contrast to the idea of 'felt need', demand has a very different significance – being equated with an individual's willingness to pay (WTP) for a specified good or service (Evans, 1992).

From an economist's perspective, demand is only real when it is accompanied by willingness to and ability to pay for the goods or services offered. Demand expressed in this way is often termed effective demand (Webster, 1999; Deverill et al., 2002). Although the word 'pay' could refer to any form of financial or economic contribution, in practice it is commonly equated with a cash payment. Willingness to pay is considered a more reliable measure of demand than one based on assumed affordability levels because it reflects how people value an improved water service (Deverill et al., 2002).

Various techniques have been developed to measure WTP in order to facilitate planning and investment decisions in water service delivery, and to understand the determinants of willingness to pay. It is worthwhile reviewing some of these techniques before assessing the contribution of various studies to our knowledge of domestic water demand behaviour. Section 3.4 accomplishes this purpose.

### 3.4 TECHNIQUES FOR PREDICTING WILLINGNESS TO PAY

Predicting consumer's behaviour regarding payment for water services involves consideration of both the consumer's ability and willingness to pay (Katko, 1991). During the early 1980s, traditional affordability analysis involved the use of a 'rule of thumb' which stated that household can and will pay at least 3 to 5 percent of their income for improved water services (Katko, 1990). However, owing to difficulties in measuring income levels in developing countries, research has concentrated on what households will pay, rather than what they can pay (Evans, 1992).

Three approaches are commonly used to estimate WTP for water services: (i) parallel surveys, i.e. observing the prices that others in similar circumstances are paying for improved services; (ii) observing individual expenditures of money, time, and labour to obtain safe drinking
water as well coping strategies; and (iii) contingent valuation survey, i.e. asking people directly what they are willing to pay for services in the future. The first two approaches are based on observations of behaviour and are called revealed preference techniques, while the third is based on stated preferences. These approaches are briefly reviewed as follows.

### 3.4.1 Revealed preference techniques

Revealed preference techniques are sometimes referred to as indirect methods. One of these techniques is called parallel surveying, and it involves analysing what others in similar circumstances to the target population are already paying for services (Evans, 1992). Successful application of parallel survey techniques is reported in Katko (1989) for studies in Burkina Faso, Indonesia and Mauritania. Regarding its shortcomings, Briscoe and de Ferranti (1988) pointed out the difficulty in matching any two communities, and the inherent top-down nature of the approach.

A second technique uses coping strategies as proxy measures. A coping strategy is a behaviour or practice employed by people to maintain or improve an existing lifestyle or livelihood (Deverill et al., 2002). For instance, use of water vendors can be a coping strategy for intermittent or total absence of a reliable and convenient water supply. In low-income countries, use of case studies of water vending to provide indicators of willingness to pay is a common proxy approach (Whittington et al., 1988; 1989). Although the service level provided by water vending does not generally correspond to the proposed services levels in the improvement schemes, the results of the study may provide an indicator of the value which people actually attach to improved services, and the likely upper limits of willingness to pay (Evans, 1992).

Another proxy method of estimating WTP is based on the evaluation of costs incurred by a household to cope with intermittent or total absence of a water supply system. These costs can be categorised into financial and economic components (Choe et al., 1996). The financial component is composed of funds used to pay for alternative sources of water; and/or purchase such items as rainwater storage tanks and motor pumps. The economic costs include efforts expended in walking, waiting in the queue; and time and energy spent boiling the unsafe water. Other economic costs include the wage loss and expenditure on health care; as a result water related diseases. The WTP for improved water services may be estimated by adding these financial and economic costs (Choe et al., 1996).
Despite the insights that can be gained from these indirect methods, stated preference methods such as the contingent valuation (CV) survey, are currently the most dominant approaches for estimating willingness to pay.

### 3.4.2 Contingent valuation surveys

This is a direct method that involves asking people to say what they would be prepared to pay in the future for improved services, and their likely reaction to price changes in a hypothetical market (Katko, 1989; Whittington, 1997). Household surveys are carried out in which decision makers in each household are asked structured questions that are designed to determine the maximum amount of money their respective households are willing to pay for the service.

In practice, the survey involves the use of ‘bidding games’ – a technique which has become popular in recent years, and used in many studies. There are a number of variants of this approach, but all involve a process of negotiation between the interviewer and respondent. The bidding game involves moving up and down a range of possible prices for particular types and standards of service until a level is reached at which the respondents expresses willingness to pay a particular amount and no more (Evans, 1992).

The contingent valuation method has been increasingly advocated by economists and sector specialists as a useful tool for gathering reasonably accurate data about how much a household is willing to pay for particular water and sanitation options presented to them (Whittington, 1997; Gunatilake et al., 2006; Pattanayak et al., 2006). The method has three main advantages over other techniques: (i) it can be used to estimate people’s maximum willingness to pay for different levels of service, and thus helping to inform tariff policy; (ii) the respondent’s answers can be easily understood by non-economists and simple financial models can be developed using the results; and (iii) it aids demand-based planning of water supply systems by allowing users to define service and technology choices.

On the other hand, a major concern with the contingent valuation method is that the hypothetical nature of the questions posed might lead to biased responses because respondents are not well acquainted with the service improvements sought (Evans, 1992; Piper and Martin, 1997). Survey design and conduct itself has also been shown to influence responses. For instance, giving people more time to think about their responses led to a lowering of bids in a contingent valuation study conducted in Nigeria (Whittington et al., 1992). The range of
prices offered to respondents has also been observed to influence survey responses. Two other possible sources of bias include: (i) strategic bias, where the respondents may want to influence the provision of the service in his/her favour by not answering questions truthfully; (ii) compliance bias, where the respondents may give answers which are influenced by his/her desires to please the interviewer.

A study by Griffin et al. (1995) analysed the impact of these biases on the validity of WTP estimates in Kerala, India. They assessed validity by comparing actual consumer responses to a new water supply system in Kerala to an earlier CV study conducted in the area. Although Griffin and colleagues found the net effect of biases to be small, they stressed certain caveats to their conclusion. The authors noted that the Kerala CV study was particularly carefully designed and conducted, but noted that hypothetical bias was still a problem as respondents were not familiar with service characteristics such as reliability.

In sum, despite the insights that can be gained from contingent valuation methods, economists and sector specialists alike, stress that care should be taken in their use, and the limitations and constraints of the approach noted. Owing to the hypothetical nature of the methodology, and its sensitivity to a number of biases, great attention should be given to survey design and administration. A large number of well designed CV studies in the water sector in developing countries have been undertaken which demonstrate good survey design and administration, and the many lessons learnt from this experience have been well documented (Whittington, 1997). These studies did not only yield estimates for willingness to pay, but have also revealed some of the underlying determinants of household decisions.

3.5 DETERMINANTS OF WATER DEMAND AND WILLINGNESS TO PAY

Understanding domestic water demand behaviour in low-income countries has been a top priority for many international financing institutions since the end of the 1980-1990 International Water and Sanitation Decade. The increased interest in demand studies was in recognition that policy, planning and financing decisions need to be based on a better understanding of what improvements in water services people really want and are willing to pay for. Since many water supply systems constructed during the decade had either fallen into disrepair or failed to recover enough revenues for expansion, the thinking among international financing agencies was that an improved planning methodology was required that included a procedure of eliciting information on the value placed on different levels of
service, and design tariffs to recover the full costs of service provision (Whittington et al., 1990a). Consequently, there was an upsurge of research looking at the determinants of household demand for services and willingness to pay.

The most influential research in this area was that sponsored by the World Bank between 1987 and 1990, and carried out by what came to be known as the World Bank Water Demand Research Team. Using mostly contingent valuation methods, the team conducted willingness to pay studies in several developing countries including Uganda (Whittington et al., 1998), Nigeria (Whittington et al., 1990; Whittington et al., 1991), Philippines (Bohm et al., 1993; North and Griffin, 1993), Pakistan (Altaf et al., 1993), India (Singh et al., 1993), Haiti (Whittington et al., 1990), Brazil (Briscoe et al., 1990), and Kenya (Mu et al., 1990). Most of these studies were conducted in the context of rural water supply. Their common point of departure were two related questions: why households opt for an improved water service rather than their current supply and what determines how much they are willing to pay for the improved service.

The World Bank Water Demand Research Team (1993) elegantly summarised the determinants of household willingness to use, or to pay for, improved water services into three sets of characteristics: (i) the socio-economic and demographic characteristics of the household, including gender, education and occupation of household head; (ii) the characteristics of the existing or traditional supply versus those of the improved water supply, including the cost, quality and reliability; and (iii) household attitudes towards government policy in the water supply sector and their sense of entitlement to government services.

The team goes on to emphasize that household responses to an improved water supply is not due to any one set of determinants alone, but to their joint effect. For instance, Mu, Whittington and Briscoe (1990) used multivariate analysis techniques to model how households in Ukunda – a small market town in Kenya – decide to purchase water from a kiosk rather than buy water delivered to its door by vendors, or draw water from a well. They find that richer, better educated households with more women are likely to use a kiosk; and that kiosks are used more when alternative water sources (wells or vendors) are more expensive, farther away, and provide lower quality water.

Moreover, empirical findings from the various studies conducted by the research team revealed that contrary to conventional wisdom at that time, willingness to pay did not depended solely on household income, but equally on the characteristics of both the existing
and the improved supplies (Whittington and Choe, 1992; World Bank Water Demand Research Team, 1993). Indeed, income was not even the principal determinant in many of the studies, and its lesser role in determining WTP has also been confirmed in a few recent studies (e.g., Casey et al., 2006; Yang et al., 2006).

Subsequent to the prolific work by the World Bank Water Demand Research Team, several researchers have adapted the methodology and conducted similar studies in different contexts (e.g. Perez-Pineda, 1999; Whittington et al., 2002; Hopkins et al., 2004; Fujita et al., 2005; Gulyani et al., 2005; Casey et al., 2006; Pattanayak et al., 2006; Venkatachalam, 2006; Yang et al., 2006). The findings from this research generally confirm the set of WTP determinants revealed in earlier studies. For instance, Perez-Pineda’s (1999) study in four rural communities of El Salvador, Central America, showed that existing service characteristics, price of the improved service, together with a number of socio-economic features of respondents, are important determinants of willingness to pay. Similar findings are reported in studies conducted in four rural communities of Rwanda (Hopkins et al., 2004), the city of Manaus in Brazil (Casey et al., 2006), the town of Negombo in Sri Lanka (Pattanayak et al., 2006; Yang et al., 2006) and the peri-urban area of Mandapam in Coimbatore, India (Venkatachalam, 2006).

Furthermore, a study in five urban municipalities in Kathmandu valley, Nepal examined household demand for improved piped water supply in the midst of a reform proposal to involve the private sector in operation of services (Whittington et al., 2002). The study found that a household preference for improved services was influenced not only by socioeconomic/demographic factors and the existing water situation, but also by their perceptions of water quality and public policy. For the households connected to the existing service, the study found that high income, more educated respondents, house owners, and households who were familiar with the privatisation plan were more likely to stay connected and pay higher bills, compared to low-income, less educated, renters, and those unfamiliar with the privatisation plan. For the unconnected household, it was found that demographic factors and perceptions of service quality did not have a significant influence on probability of connecting (Whittington et al., 2002). Similarly, a study in three Kenyan cities of Nairobi, Mombasa and Kakamega (Gulyani et al., 2005) found that for unconnected households, socioeconomic/demographic factors did not have a statistically significant influence on a household preference and willingness to use or pay for improved services. Instead, only three factors exhibited a significant influence, and these were: (i) current unit cost of water; (ii) current per capita use; and (ii) time spent daily in collecting water.
From the above review, it is clear that the range of factors influencing willingness to pay is wide. In the context of urban water services, the set of factors as revealed by past research can be broadly categorised into: (i) factors within the *full control* of the water service provider organisation, such as service level, service quality and reliability, reputation of service provider, and transparency of financial management; (ii) factors within the *partial control* of the service provider, such as customer perceived benefits and opportunity cost of time, and (iii) factors beyond the *control* of the service provider, e.g. characteristics of alternative sources, income levels and a myriad of other socio-economic/cultural factors.

However, despite the insights gained from the numerous studies, critical gaps still remain about WTP research. A major weakness of the studies reviewed above is that they have focused mainly on demographic, socio-economic and service factors which are external influences on behaviour. Little or no attention has been paid to internal psychological factors such as beliefs, attitudes and societal factors that influence water demand and willingness to pay. Researchers in social psychology and behavioural sciences have long established that both internal and external factors play an important role in shaping any form of human behaviour (e.g., Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Ajzen, 1988; 1991; 2001; Armitage and Conner, 2001; Ajzen and Fishbein, 2005). Yet, only a few studies have included internal factors such as attitudes in the determination of WTP.

A few of the studies carried out by the World Bank Water Demand Research Team (e.g. Whittington et al., 1990; Altaf et al., 1993; World Bank Water Demand Research Team, 1993) found that household's general attitudes towards government policy in the water supply sector and their sense of entitlement to free government services, significantly influenced their willingness to pay values. Similarly, CV studies conducted in the midst of reform proposals to involve the private sector in provision of services in the town of Negombo, Sri Lanka (Pattanayak et al., 2006) and in Kathmandu, Nepal (Whittington et al., 2002), showed that customer perceptions about private sector participation have an influence on willingness to pay.

These studies however have several methodological problems. Firstly, the authors confuse the attitude construct with related concepts of perceptions and values, thus introducing some question as to what was actually measured. Secondly, the authors elicit general attitudes towards specific targets (e.g. governments, service provider), but not attitudes towards a particular action (e.g. paying for the service). Studies have shown that attitude towards a target is not a reliable predictor of a specific behaviour (Ajzen and Fishbein, 1980;
Meyerhoff, 2006). Thus, a positive attitude towards a water service provider does not mean that such an attitude will predict the actual behaviour of paying water bills. The reason for this is that a single behaviour is typically influenced by a broad variety of factors in addition to the attitude towards a target (Meyerhoff, 2006). Notwithstanding these methodological weaknesses, these studies show that where internal psychological influences exist, contingent valuation questions alone will fail to elicit the “true” economic value of improved water services to the household (World Bank Water Demand Research Team, 1993).

Another question about WTP research that remains largely unanswered in the literature is how socio-economic and demographic factors influence willingness to pay for water services. Micro-economic theory suggests that willingness to pay should vary across individuals with different socio-economic and demographic characteristics (Casey et al., 2006). But it does not explain why two individuals with similar socio-economic profile would have different willingness to pay levels. The World Bank Water Demand Research Team (1993) found that better-educated household members were willing to pay more for an improved water supply; that women were willing to pay more for better services than male respondents; and that respondents employed in the formal sector have better willingness to pay for improved services than those employed in informal sector.

However, similar to many other WTP studies, the question of how these socio-demographic factors influence willingness to pay was not analysed. Instead, the authors offer what amounts to empirically unsupported hunches about explanations for the observed effects. For instance, on the effect of education, it is assumed that better-educated household members are more aware of the health and economic benefits of improved water supplies and are thus more likely to have a higher willingness to pay. On gender effects, it is assumed that because women in developing countries bear the burden of collecting water, they would attach more importance to improved water supplies than would men and therefore likely to have a higher willingness to pay. On the other hand, the World Bank Water Demand Research Team (1993) acknowledged that in most of their WTP studies, it was not clear how gender influences the respondents’ indicated willingness to pay. Therefore, given that gender and other demographic variables are beyond the control of the utility, it is important that attempts are made to examine whether other modifiable variables account for the relationship between demographic variables and willingness to pay.

Finally, one of the most important questions about WTP research is the extent to which willingness to pay is translated into actual payment behaviour, and whether the factors
influencing household decisions are constant over time or subject to change. In the extant literature reviewed, only one study by Griffin et al. (1995) has examined this question. Their “test-retest” type of contingent valuation (CV) study conducted ex-ante in 1988 and ex-post in 1991 in the Indian state of Kerala attempted to assess the extent to which willingness to pay for a house connection – which was assessed in 1988 - translated into actual behaviour (connection) following installation of the new piped water system three years later. Although a majority (91 percent) of households who said they would connect were actually found to have connected, the behavioural model estimated using the previous CV data did not predict behaviour quite as well as the simple descriptive statistics. This implies that household decisions in the ex-post situation were influenced by factors different from those in the ex-ante situation. Moreover, of those households who said they would connect but had not connected, more than 75 percent reported inability to pay the connection cost as the major reason for their decision, while those who said they would not connect, but actually connected, cited “changed economic circumstances” as the major reasons for their decision (Griffin et al., 1995). These results suggest that the factors influencing an individual’s willingness to pay are likely to be different from those influencing their actual behaviour.

3.6 DETERMINANTS OF BILL PAYMENT BEHAVIOUR

The above review of existing literature revealed a wide range of factors influencing household willingness to pay for improved water services. However, nearly all the studies reviewed were conducted within hypothetical service settings, in which willingness to pay for future service improvements was estimated. While these studies are important for the current research, they do not provide a complete picture of consumer behaviour. Since this research is concerned with consumer behaviour in an actual service setting rather than a hypothetical one, a key objective of the literature review was to discover some of the factors that influence how water utility customers react to water bills, in terms of the decisions they make regarding when to pay outstanding water bills.

However, a literature search carried out on this aspect of domestic water demand behaviour revealed only limited interest in this area. This is not entirely surprising because water sector practitioners are usually only interested in consumer behaviour studies at the front-end of new water supply projects or improvements, as input to the planning process. Once service improvements are in place, the nature of the exchange relationship between consumers and service providers has rarely been subjected to the necessary empirical scrutiny.
One study conducted in Uganda’s urban water sector provides some insights regarding the factors influencing consumer behaviour with respect to paying water bills (Kayaga, 2002; Kayaga et al., 2003; Kayaga et al., 2004). Through a cross-sectional survey of 690 registered customers of a major urban water utility in Uganda, Kayaga (2002) attempted to establish the influence of customer perceptions of utility services on bill payment behaviour. The findings of this study showed that customer perceptions of service quality, service value and corporate image were strong predictors of customer satisfaction, which in turn, significantly predicted favourable customer attitudes towards paying water bills (Kayaga, 2002). The study also found that for the same level of satisfaction, female heads of households, households in formal employment, households staying in owned houses, and household heads with a higher level of education had a more favourable attitude towards paying water bills (Kayaga et al., 2003).

Furthermore, in an attempt to predict actual bill payment behaviour (measured as mean bill payment period), Kayaga, Franceys and Sansom (2004), modelled the effect of various attitudinal variables (i.e., service value perceptions, corporate image, customer satisfaction and, attitudes towards paying water bills). With the exception of attitudes towards paying water bills, all other variables did not have a significant influence on a customer’s mean bill payment period. Moreover, the size of the variation in mean bill payment period explained by the regression model was quite small (seven percent), hence suggesting the presence of other potential influences on bill payment behaviour.

Similar studies have been conducted within the UK water industry (Herbert and Kempson, 1995; Accent Marketing and Research, 2003; UK Water Industry Research, 2004). Although not a developing country context, it is worthwhile reviewing some of these studies to identify differences and similarities in the water bill payment behaviour of customers in the developing and developed world contexts. Herbert and Kempson’s (1995) pioneering study on water debt and disconnection in the UK water industry revealed a number of factors that lead water utility customers to fall behind with their bills. Using logistic regression on responses from a sample of 1,895 household heads, the authors found household incomes to be the major contributor to water debt. Attitudes to payment also had an independent effect, with those who felt that they must pay their water bills on time being less likely to have had arrears (Herbert and Kempson, 1995). Similar findings are reported in a study commissioned by OFWAT - the economic regulator of the UK water industry (Accent Marketing and Research, 2003). This study categorised customers with water debt into three main groups: (i) those who take the line “why should I pay” – i.e. negative attitude to paying for water
generally; (ii) those who genuinely struggle financially; and (iii) poor money managers. The study recommended among others, tailoring of debt management and recovery strategies to the different customer groups.

Furthermore, UK Water Industry Research (2004) used data from 14 UK water companies to analyse the socio-economic and demographic effects on bill payment behaviour. The analysis revealed that customers with outstanding balances on their bills were more likely to have other debts and a history of indebtednesses; that a significant proportion of the water debt was associated with recent relocation; that younger generation were less likely to pay than older generations and that single people were more likely to default than couples. This study also noted that despite robust collection performance across the industry, a surprising number of customers with otherwise good payment habits were slow in paying their water bills. This suggests that the way customers react to water bills and the decisions they make regarding when to pay is not yet fully understood.

Moreover, for low-income countries, hardly any studies have focused on understanding this aspect of consumer behaviour. Although previous research has increased our knowledge of the determinants of willingness to pay, still relatively little is known on what explains variations in actual payment behaviour. Water utility managers facing difficulties in recovering bills from their existing customers would greatly benefit from research that provides a deeper understanding of the factors influencing water bill payment behaviour, in particular prompt payment.

### 3.7 RESEARCH ISSUES

The literature reviewed above shows that domestic water demand behaviour in low-income countries has not received the research attention that it deserves. Paradoxically, the demand responsive/marketing approach that has been advocated by many sector professionals as the way forward for improving cost recovery and financial sustainability of water services in low-income countries requires that service providers have a greater understanding of the behaviour of their existing and potential customers. The major themes emerging from the reviewed literature are summarised in the following paragraphs.

The first wave of studies conducted in the 1990s focused mainly on the determinants of household willingness to use, or to pay for an improved water supply (e.g. Briscoe et al.,
1990; Mu et al., 1990; Whittington et al., 1990; Whittington et al., 1990; Whittington et al., 1991; Altaf et al., 1993; Bohm et al., 1993; North and Griffin, 1993; Singh et al., 1993; World Bank Water Demand Research Team, 1993; Whittington et al., 1998; Perez-Pineda, 1999). These studies, many of which were conducted in the context of rural water supply, revealed a wide range of socio-economic/demographic and service characteristics that influence willingness to use, or to pay for an improved water service. But socio-economic, demographic and service characteristics represent only the external influence on behaviour (Ajzen and Fishbein, 1980; Blythe, 1997). The studies did not adequately address the influence of internal psychological factors (e.g. beliefs and attitudes) on behaviour.

Subsequent to the intensive research effort in the 1990s, several researchers adapted a similar methodology and conducted willingness to pay studies in different contexts (e.g. Whittington et al., 2002; Hopkins et al., 2004; Fujita et al., 2005; Gulyani et al., 2005; Casey et al., 2006; Pattanayak et al., 2006; Venkatachalarn, 2006; Yang et al., 2006). The findings from this recent research generally confirmed the set of willingness to pay determinants revealed in earlier studies. However, similar to earlier studies, the influence of internal psychological factors was not adequately addressed. Worse still, there is virtually no literature that has fully examined the factors that influence actual payment behaviour in low income countries.

Therefore, because the existing literature does not provide sufficient knowledge on the water demand behaviour of consumers in low-income countries, it may be inadequate in helping water utility managers to address the problem of low cost recovery using customer-focused initiatives as currently advocated. In particular, the following knowledge gaps were identified, and these provide the foundation upon which the current research is based:

- The factors that influence payment for water services in an actual service setting are not yet fully understood;
- Attitudinal influences on bill payment behaviour have not been fully addressed in the existing literature;
- The existing literature dwells much on factors that are beyond the water utility's control (e.g. socio-economic factors), and offers less guidance to managers on what policy and managerial actions to take in order to fully or partially influence behaviour. Moreover, there is no research that has examined whether other modifiable variables account for the relationship between socio-economic/demographic variables and willingness to pay.
Most of the studies found in the literature were conducted in the context of rural or large urban (city) water supplies. Their findings may not be directly inferred to small urban settings.

3.8 CHAPTER SUMMARY

This chapter examined literature on domestic water demand behaviour in low-income countries and identified the research issues. The review uncovered some of the factors that influence household willingness to use or pay for water services and actual bill payment behaviour. The main methodologies and research techniques that have been used were also identified. The review concluded by identifying issues that are relevant to the research problem but have not been fully addressed in the existing literature.

By highlighting the research issues and gaps, this chapter has laid a foundation upon which the current study is based, and established the study's potential to make a contribution to the existing body of literature. The next chapter builds on the research gaps revealed to develop research questions and a conceptual framework for the study.
CHAPTER FOUR
CONCEPTUAL FRAMEWORK

4.1 CHAPTER INTRODUCTION

Chapter 2 reviewed generic trends in water services management in low-income countries and identified low-cost recovery as the problem leading to this research. The chapter also identified a trend towards adoption of a marketing approach in management, as a way of addressing this problem. Since such an approach requires a good understanding of consumer behaviour, Chapter 3 reported on a review of literature on domestic water demand behaviour in low-income countries and identified the research issues that need to be addressed.

The current chapter combines the findings of Chapters 2 and 3, in order to develop a researchable question and a conceptual framework to guide the research. Chapter 4 is structured as follows: Section 4.2 discusses the research problem in the context of water services for small urban centres and translates it into a researchable question. Section 4.3 discusses the guiding theoretical perspective for this research. Based on this theoretical perspective, section 4.4 develops the research model, hypotheses and provides conceptual definitions of the variables. Section 4.5 concludes the chapter.

4.2 RESEARCH PROBLEM AND MAIN RESEARCH QUESTION

As discussed in Chapter 2, low cost recovery is still today one of the major obstacles to achieving sustainable drinking water supply in developing countries. Achieving sustainable water supply in urban areas is currently a key concern for governments and practitioners as much of the projected increase in global population is likely to live in urban areas of low-income countries (WHO and UNICEF, 2006). Of particular concern are small market towns and administrative centres where the highest population growth rates are reported (United Nations, 2002), and currently believed to host an estimated one billion people (United Nations Human Settlements Programme, 2006).

During the 1980-1990 International Water Supply and Sanitation Decade, most of the investment in water and sanitation services was concentrated in rural areas. But during the 90s it became clear that the majority of the underserved were actually living in urban centres,
either in large conurbations or in small towns. In response to this imbalance, many developing country governments supported by their development partners have made considerable investments in piped water supply infrastructure in small urban centres over the last decade. The current trend however is that funding for recurring operation and maintenance expenditures and expansion costs is becoming a major concern as more systems come on-board and government subsidy burden increases. Today, the main operational problems for service providers in such areas are two-fold: the low utilisation levels of the new or rehabilitated piped water systems and the inability to recover costs related to providing the improved services.

Studies have shown that many urban water utilities in low-income countries do not recover the production costs incurred in the delivery of services, and for some the tariffs charged are lower than the production costs. Apart from non-cost reflective tariffs, cost recovery is also affected by factors such as unaccounted-for-water (due to physical and commercial losses) and bill collection efficiency. This implies that for a water utility to have good overall cost recovery efficiency, it should perform highly in minimising water losses, and at the same time be able to recover payment, with in a reasonable time, for all the water bills sent to customers.

As discussed in the introduction to this research (section 1.1), delayed bill payments impact on a utility’s capacity to deliver water services in a sustainable manner, and in order to respond to such problems, utility managers need to determine why customers might not pay their bills in time. However, the extant literature as reviewed in Chapter 3 does not sufficiently address this issue. Most of the studies reviewed (e.g. Briscoe et al., 1990; Mu et al., 1990; Whittington et al., 1990; Whittington et al., 1991; Altaf et al., 1993; Singh et al., 1993; Whittington et al., 1998; Perez-Pineda, 1999; Whittington et al., 2002; Hopkins et al., 2004; Gulyani et al., 2005; Casey et al., 2006; Venkatachalam, 2006) have focused on understanding the determinants of willingness to pay for hypothetical services or improvements, but not actual bill payment behaviour.

A few studies carried out in an actual service setting revealed that customer perceptions of utility services have an effect on attitudes towards paying water bills (Kayaga, 2002; Kayaga et al., 2004). Although as reported in this study, attitudes towards paying water bills had a statistically significant relationship with measures of mean payment period, the proportion of variance in mean payment period explained was quite small, hence suggesting that the way customers react to water bills and the decisions they make regarding when to pay is not yet fully understood.
Moreover, other studies reviewed (e.g., Herbert and Kempson, 1995; Kayaga et al., 2003; UK Water Industry Research, 2004) attempt to explain bill payment behaviour in terms of socio-economic and demographic characteristics. While knowledge of socio-demographic effects is useful in targeting utility responses to the problem, such knowledge offers little guidance to utility managers on how to influence consumer decision making in relation to payment of water bills in time. These inadequacies in the literature therefore motivated the following research question:

**What factors are critically important for motivating customer decisions about paying for water services promptly?**

In order to answer this question comprehensively, the study looked to socio-cognitive theories on human decision-making and behaviour for theoretical guidance. The theoretical perspective taken in this study is discussed in section 4.3 as follows.

### 4.3 THEORETICAL PERSPECTIVE

Theories of consumer decision-making vary, depending on one’s assumption about the nature of humankind. The two dominant perspectives found in the literature include (Schiffman and Kanuk, 1997): (i) the economic perspective; and (ii) the cognitive perspective. The economic perspective characterises a consumer as a rational decision-maker; aware of all available alternatives and capable of correctly ranking each alternative in terms of its benefits and costs in order to identify the one best alternative. This perspective dominates most of the earlier research on domestic water demand behaviour in developing countries.

However, consumer researchers have often criticised the economic perspective as unrealistic because consumers rarely have all of the information, or sufficiently accurate information, or even an adequate degree of involvement or motivation, to make the so called perfect decision (Schiffman and Kanuk, 1997). In the water sector, the major weakness of the economic perspective is that it takes a narrow view of water demand behaviour, explaining it only in terms of price, quantity and time. The cognitive perspective, on the other hand portrays the consumer as a thinking problem solver (Schiffman and Kanuk, 1997), who seeks not to make a perfect decision, but a satisfactory one. It focuses on the processes by which consumers seek and evaluate information about alternative courses of action. Within the context of the
cognitive model, consumers are viewed as information processors, information processing leads to the formation of preferences, and ultimately to satisfactory decisions.

4.3.1 The theories of reasoned action and planned behaviour

A cognitive model that has enjoyed widespread application is that based on the "reasoned action approach" as advanced by Ajzen and Fishbein (1980) and Ajzen (1988; 1991). This conception of behaviour is based on the assumption that human beings make systematic use of available information, and consider the implications of their actions before they decide to engage or not to engage in a given behaviour (Ajzen and Fishbein, 1980). It rejects the view that human social behaviour is controlled by unconscious motives or overpowering desires (Ajzen and Fishbein, 1980). Basically, this theoretical framework approaches the explanation and prediction of human behaviour in terms of people’s behavioural intentions, which are assumed to follow reasonably and consistently from their beliefs about performing the behaviour (Ajzen and Fishbein, 1980; Ajzen and Fishbein, 2005).

An earlier conceptualisation of the above framework referred to as "the Theory of Reasoned Action (TRA)" (Ajzen and Fishbein, 1980), assumed that most actions of social relevance are under complete volitional control – i.e. person can decide at will to perform or not to perform the behaviour, with no personal or environmental constraints on action. Consistent with this assumption, the TRA proposed that a person's intention to perform (or not to perform) a given behaviour is the immediate determinant of action (Ajzen and Fishbein, 1980), and that intentions are a function of two basic determinants, one personal and the other reflecting social influence. The personal factor is the attitude towards the behaviour, which refers to an individual’s favourable or unfavourable evaluation or appraisal of performing the behaviour. The second determinant of intentions is the person’s perception of the social pressures put on him or her to perform or not to perform the behaviour in question, and this is termed the subjective norm (Ajzen and Fishbein, 1980).

However, following years of empirical testing and application to different behavioural situations, the TRA’s limitations in dealing with behaviours over which people have incomplete volitional control was exposed (Ajzen, 1988). It was urged that although most human action is indeed volitional, the performance of most behaviours depend to some degree on such factors as availability of requisite opportunities and resources (e.g. time, money, skills, and cooperation of others).
Consequently, the TRA was expanded to include a control factor, and this led to the "Theory of Planned Behaviour" (TPB) (Ajzen, 1988; 1991) as a modified theoretical framework for predicting and explaining human behaviour in specific contexts. In addition to attitude and subjective norm, the TPB postulates a third conceptually independent determinant of intentions to perform any behaviour. This third antecedent of intentions is the degree of perceived control over the behaviour, which refers to the perceived ease or difficulty of performing the behaviour (Ajzen, 1991). Perceived control is also held to exert a direct effect on behaviour (Ajzen, 1991; Ajzen and Fishbein, 2005). This is based on the rationale that however strongly held the implementation of an intention into action is at least partially influenced by personal and environmental barriers.

As a general rule, the more favourable the attitude and subjective norm with respect to the behaviour, and the greater the perceived control, the stronger should be an individual's intention to perform the behaviour under consideration. Given a sufficient degree of actual control over the behaviour, people are expected to carry out their intentions when the opportunity arises (Ajzen, 2002b). According to Ajzen (1991), the relative importance of attitude, subjective norm, and perceived control in the prediction of intention is expected to vary across behaviours and situations. Thus, in some applications it may be found that only attitudes have a significant impact on intentions, in others that attitude and perceived control are sufficient to account for intentions, and still in others that all three predictors make independent contributions.

An important aspect of "reasoned action" approaches as advanced by Ajzen and Fishbein (1980) and Ajzen (1988; 1991) is that they go beyond merely identifying the direct determinants of intentions and behaviour by theorising about factors that underlie these determinants. According to the TPB, a person's attitude towards a particular behaviour is formed through consideration of the likely positive or negative outcomes of the behaviour, and the associated evaluation (good or bad) of those outcomes. Considerations of the likely consequences of a behaviour are referred to as behavioural beliefs (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). Similarly, a person's perception of normative support (i.e. subjective norm) is thought to follow from considerations of the likely approval or disapproval of the behaviour by respected referents (e.g. family, friends, neighbours etc). Considerations of this sort are referred to as normative beliefs (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). Finally, perceptions of control are proposed to emerge from a person's beliefs about the presence or absence of factors that facilitate or act as barriers to perform the behaviour, and the expected impact that these factors would have if they were to
be present. Beliefs concerning the presence or absence of factors that make performance of behaviour easier or more difficult are referred to as control beliefs (Ajzen, 1991). It is also held that beliefs, attitudes, subjective norms and perceived control about performing a given behaviour can vary as a function of a wide range of background factors including individual, socio-demographic characteristics (Ajzen and Fishbein, 2005). For a given behaviour, these background factors are assumed to influence intentions and behaviour only indirectly through their effects on the main determinants (Ajzen and Fishbein, 2005).

The TRA/TPB theoretical framework has been used extensively to understand human decision-making. In particular, the TPB has been used to predict a range of human behaviours including health related behaviours such as condom use, smoking and exercise (Sheeran and Taylor, 1999; Ajzen, 2001); hygiene behaviours such as hand washing (Jenner et al., 2002), pro-environmental behaviours such as recycling (Boldero, 1995; Cheung et al., 1999; Tonglet et al., 2004), riparian zone management (Fielding et al., 2005), composting (Taylor and Todd, 1995), and water conservation (Kantola et al., 1982; Lynne et al., 1995). A meta-analysis of 185 independent studies published up to the end of 1997 revealed that the TPB accounted for 27 percent and 39 percent of the variance in behaviour and intentions, respectively (Armitage and Conner, 2001). Other meta-analyses confirming the efficacy of the TPB include Notani (1998), Randall and Wolff (1994), as well as Godin and Kok (1996) and Sheeran (2002) for health-related behaviours.

However, despite its widespread appeal, behavioural scientists and researchers applying the theory of planned behaviour have sometimes encountered problems. One problem relates to the temporal stability of the theory’s constructs, particularly intentions and perceived control, which are assumed to jointly predict behaviour. Being a predictive model, measures of these constructs must remain stable in order to ensure good prediction of behaviour at later point in time (Ajzen, 2002b). Indeed, several researchers (e.g. Sheeran et al., 1999; Conner, 2000; Ajzen and Fishbein, 2005) have demonstrated that changes in intention stability over time tend to lower the predictive validity of the theory. Yet, temporal stability has sometimes been difficult to achieve, and there is no theoretical guideline regarding an optimal time interval between measuring intentions and behaviour.

A second problem relates to the role of perceived control - the variable that distinguishes the TPB from the TRA. Given Ajzen’s (1991; 2002a) assertion that perceived control is only capable of influencing behaviour to the extent that it reflects actual control, there has been much debate among social psychologists on whether the link between perceived control and
behaviour is empirically tenable (e.g. Godin and Kok, 1996; Notani, 1998; Sheeran et al., 1999; Conner, 2000; Armitage and Conner, 2001; Sheeran et al., 2003). For instance, Notani (1998) in a meta-analysis found that out of 35 tests of the perceived control– behaviour relationship, only 17 were statistically significant.

Furthermore, Godin and Kok's (1996) analysis of 87 applications of the TPB to health-related behaviours revealed that intentions were the most important determinants of behaviour, accounting for 22.5 percent of the 34 percent explained variance in behaviour. Similarly, Armitage and Conner's (2001) meta-analysis of 185 studies shows that on average, perceived control only explains an additional 2 percent of the variance in behaviour. Based on these studies, researchers applying the TPB have concluded that perceived control can only serve as an independent predictor of behaviour to the extent that it is stable, accurate and reflects actual control (Sheeran et al., 1999; Conner, 2000; Sheeran et al., 2003). This requirement has been difficult to achieve in practice (Notani, 1998; Armitage and Conner, 2001).

Notwithstanding these problems, the TPB provides a useful conceptual framework that summarises the complex phenomenon of human behaviour in a simple, yet valid model. Indeed, Ajzen and Fishbein (2004) maintain that the problems discussed above relate to empirical issues, and do not in any way invalidate the theory's key propositions. The theory has been successfully applied to a wide range of behavioural domains. It is especially applicable to behaviours that are not entirely under personal control, and it encompasses the relatively thoughtful process involved in considering personal costs and benefits of engaging in various kinds of behaviours (Petty et al., 1991). This study adopted the TPB because the behaviour of 'paying water bills promptly' is not entirely under the control of the customer. It can be influenced by external factors such as irregular bill delivery (or non-billing), as well as personal factors such as lack of money and time. The next section looks at how the TPB can be applied to study bill payment behaviour in urban water services by conceptualising willingness to pay as a behavioural intention.

### 4.3.2 Willingness to pay as a behavioural intention

As discussed in Chapter 3, exiting studies of willingness to pay for water services have largely been conducted using the contingent valuation (CV) methodology, with values estimated on the basis of economic theory. However, the fact that people only state a hypothetical willingness to pay in CV surveys still causes much debate. Despite advances in
survey techniques, critiques are still sceptical about the reliability and validity of CV estimates, i.e. whether people will actually pay the amount stated in the survey.

Early on in this debate, Bishop and Heberlein (1979) suggested that the work done by social psychologists on the relationship between attitudes and behaviour might be useful in understanding the intentions underlying an individual's willingness to pay response. Since then, a number of studies in the field of environmental economics (e.g. Ajzen and Driver, 1992; Ajzen et al., 1996; Luzar and Cosse', 1998; Moisseeinen, 1999; Pouta and Rekola, 2001; Meyerhoff, 2006) have shown that the predictive ability of contingent valuation models can be greatly improved by treating willingness to pay as behaviour intention and including attitudinal variables in CV models. For instance, Luzar and Cosse' (1998) use Ajzen and Fishbein's (1980) TRA variables to estimate a model explaining variations in willingness to pay for changes in rural water quality in the agricultural regions of Louisiana state (USA). By estimating the standard WTP model with and without the TRA variables (i.e. attitudes and subjective norms), the authors were able to show that TRA variables significantly improve the explanatory power of WTP models by more than twice. Similarly, a recent study on willingness to pay for riparian ecosystem protection measures along river Elbe in Germany (Meyerhoff, 2006), shows that TPB variables significantly increase the predictive validity of standard WTP models.

Furthermore, Addo-Yobo et al (2006) have recently applied the TRA to study household willingness to pay (conceptualised as "intention to pay") for improved water services in the peri-urban areas of Accra, Ghana. The authors however did not elicit actual WTP values or generate a WTP model to evaluate the contribution of TRA variables vis-à-vis the standard socio-economic variables. Nevertheless, their study demonstrates applicability of the reasoned action approach to studying the factors that influence the behaviour of the urban poor towards paying for improved water services. In particular, the findings show that both perceived social pressure (subjective norms) and household's attitude have similar importance in predicting and explaining households' intention to pay for improved water services. Concern for a more comfortable life was found to be the most important predictor of households' attitude, while "the family" was the most important referent group. The major determinants of households' intention to pay for improved water services were the reliability of the service and the time of supply (Addo-Yobo et al., 2006).

In summary, these studies show that there is potential to apply socio-cognitive theories of human behaviour to improve our understanding of domestic water demand behaviour,
particularly the internal psychological influences on behaviour, which have not been adequately investigated in previous research. As already mentioned above, the current study used the theory of planned behaviour as a theoretical base, because the behaviour under study (i.e. paying water bills promptly) is not entirely under the control of the customer.

As applied to this study, the theory holds that a customer’s actual act (behaviour) of promptly paying a water bill due to him or her will be determined by his or her intention to pay the bill promptly. Also, a customer’s perception of the ease or difficulty of paying the water bill promptly (i.e. perceived control) is expected to exert a direct effect on actual behaviour. Intention will in turn be determined by customers’ attitude towards the behaviour of paying water bills promptly, the subjective norm with respect to that behaviour, and the perceived control. In addition, behavioural, normative and control beliefs with respect to the behaviour of paying water bills promptly are expected to provide the underlying cognitive foundation for attitudes, subjective norms and perceived control respectively. Socio-demographic characteristics (such as gender, education level, occupation, income) are expected to influence intentions and behaviour indirectly through their effects on attitudes, subjective norms, and perceived control. Section 4.4 discusses the details of the research model as developed from the TPB framework, and offers conceptual definitions of the key variables as applied to this study.

4.4 RESEARCH MODEL AND HYPOTHESES

In accordance with the TPB theoretical framework discussed above, the role of attitudes, subjective norms, perceived control and socio-demographic characteristics in explaining customer decisions and behaviour with respect to paying water bills promptly is hypothesised as shown in figure 4.1. The behaviour of interest in this study is defined at both the theoretical and operational levels (Ajzen, 2002b). At the theoretical level, prompt bill payment behaviour (PB) is defined in this research as the action of paying an outstanding water bill at the utility office within 15 days of receiving the bill. The use of the 15-day window is consistent with the service agreement terms used by the service providers in all the study towns. All the water utilities in the towns studied require their customers to pay their water bills within 15 days after receiving the bills (which are distributed between 29th and 31st of every month). Prompt bill payment behaviour is operationalised as the ratio of the amount paid by the customer within the 15 days period, to the total amount due over the billing month under consideration.
The intention to perform this behaviour herein referred to as *intention to pay a water bill promptly* (I) is defined as the perceived likelihood that a customer will pay his/her water bill within 15 days of receiving the bill. As mentioned in Chapter 2, long bill collection periods is a major problem faced by urban water utilities in low-income countries, and it impacts on overall cost recovery efficiency. Furthermore, the inability to collect all water bills sent out can cause cash flow problems that impact on the ability to cover operating expenses and extension of coverage. The model in figure 4.1 is an attempt to understand the factors that influence consumer decisions regarding payment of water bills within the stipulated 15 days window.

Consistent with Ajzen (1988; 1991), *attitude* (AT) is defined as the degree to which performance of the behaviour (i.e. paying water bills promptly) is positively or negatively valued by customers. Similar to attitudes, *subjective norms* (SN) are defined with respect to prompt bill payment behaviour, as the perceived social pressure to perform or not to perform the behaviour (Ajzen and Fishbein, 1980; Ajzen, 1988;1991). Also, in line with Ajzen (1991; 2002a), *perceived control* (PC) is defined in this study as the customer’s perceived ease or difficulty of performing the behaviour (i.e. paying a water bill within 15 days of receiving it).

As shown in figure 4.1, the three variables of attitude, subjective norms and perceived control are predicted to have a positive direct influence on intentions. In addition, perceived control and intentions are expected to predict prompt bill payment behaviour, in line with the argument that however strongly held the implementation of an intention into action is at least partially influenced by personal and environmental barriers, whether real or perceived (Ajzen,
1991; Ajzen and Fishbein, 2005). In the context of urban water supply, such barriers may include but not be limited to, irregular or late bill delivery, non-billing, lack of money and time.

Socio-demographic variables (otherwise referred to as household characteristics) which have been treated in previous studies as direct determinants of both willingness to pay (e.g., World Bank Water Demand Research Team, 1993; Whittington et al., 2002; Gulyani et al., 2005) and the likelihood of being in water debt or arrears (Herbert and Kempson, 1995; UK Water Industry Research, 2004), are treated in this model as ‘background factors’. In other words, they are predicted to influence intentions and behaviour indirectly by their effects on attitudes, subjective norms, and perceptions of control (Ajzen and Fishbein, 2005). Thus, consistent with Ajzen (1991) and Ajzen and Fishbein (2005), we do not expect significant direct effects of these household characteristics on intentions, after taking into account the effects of attitudes, subjective norms and perceived control. The household characteristics of interest to this study include: gender of household head; household size; education level of household head; occupation of household head; house ownership status; and income level.

The main research hypotheses emerging from the above conceptualisations can be summarised as follows:

1. The three variables of attitude, subjective norms and perceived control with respect to prompt bill payment will significantly predict, either individually or as part of a group of variables, some of the variation in a customer’s intentions to pay a water bill promptly.

2. The two variables of intentions and perceived control will significantly predict, either individually or as part of a group of variables some of the variation in actual prompt bill payment behaviour.

3. The effect of various household characteristics (i.e. gender of household head; household size; education level of household head; occupation of household head; house ownership status; and income level) on intentions to pay a water bill promptly is mediated by the variables attitude, subjective norms and perceived control.
4.5 CHAPTER SUMMARY

This chapter has provided the detailed problem statement from which the main research question was derived. The research model was schematically presented in figures 4.1. This model is based on the theory of planned behaviour, which was selected as the theoretical framework for this study. The model conceptualised the influence of various attitudinal and socio-demographic variables on customer decisions to pay water bills promptly. The relationships shown were discussed, and a summary of the research hypotheses provided. The next chapter reports on the research design and methodology that was used in collecting relevant field data for testing the hypotheses and answering the research question.
CHAPTER FIVE

RESEARCH DESIGN AND METHODOLOGY

5.1 CHAPTER INTRODUCTION

Chapter 4 of the thesis discussed the research problem and main research question arising from the problem. The guiding theoretical perspective was also presented and discussed. Based on this perspective, testable hypotheses were developed to examine the factors that influence behaviour in relation to prompt payment of water bills. The current chapter details the research design and methods used in collecting relevant field data for testing the hypotheses and answering the research questions.

The study adopted a two-phase, sequential qualitative/quantitative approach (Creswell, 2003; Tashakkori and Teddlie, 2003). The first phase utilised a qualitative approach to explore and generate modal themes about customer beliefs relating to prompt payment of water service bills. However, since this study is concerned with identifying factors that influence customer decisions and behaviour, a quantitative approach was adopted during the second phase of data collection. Following standard procedure for research involving the theory of planned behaviour (Ajzen, 2002b; Francis et al., 2004), the main independent variables were measured using a questionnaire that was tailored to the specific behaviour of interest, with item content determined from themes generated during the first phase.

A brief introduction to the research design and methodology was presented in section 1.5 of Chapter 1. This chapter builds on that introduction, and aims to provide assurance that appropriate procedures were followed during the conduct of this study. The chapter is structured as follows:

- Section 5.2 describes the entire research design, its components and their justifications;
- Section 5.3 provides a description of the research setting;
- Section 5.4 discusses the sampling design;
- Section 5.5 describes the procedures followed in developing a measurement instrument for the variables identified as relevant to the research problem;
- Section 5.6 reports on the procedures and results of the pilot study;
Section 5.7 describes the procedures followed during main data collection; and
Section 5.8 describes the techniques used for data analysis

5.2 RESEARCH DESIGN

This section describes the research design, its components and their justifications. A research design is essentially a logical sequence of steps linking a study's initial research questions to the empirical data collected and, ultimately, to its conclusions (Yin, 2003). In developing the research design for this study, a framework for design suggested by Creswell (2003) was used. Under this framework, three elements are suggested: (i) an assessment of the knowledge claims brought to the study; (ii) a consideration of the strategy of inquiry; and (iii) identification of the specific methods to be used. Using these three elements enables the researcher to identify either a quantitative, qualitative or mixed methods approach to research.

5.2.1 Methodological Approach

There exist two major distinguishable research traditions in the social sciences: the quantitative approach and qualitative approach. A quantitative approach to research is one in which the researcher "primarily uses post-positivist claims of developing knowledge (i.e. cause and effect thinking, reduction to specific variables, hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data" (Creswell, 2003, p.18).

On the other hand, a qualitative approach is one in which the researcher makes knowledge claims based either on constructed social and historical meanings of individual experiences (constructivist perspective) or advocacy/participatory perspectives (i.e. political, collaborative or change oriented) or both. It employs strategies of inquiry such as narratives, phenomenology, ethnography, grounded theory and case studies, and the researcher mainly collects open-ended, emerging data with the primary intent of developing themes from that data (Creswell, 2003).

An alternative approach to research which has emerged in recent years is the mixed methods approach (Creswell, 2003; Tashakkori and Teddlie, 2003). In this approach the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-
centred, and pluralistic), employing a strategy of inquiry that involves collecting both qualitative and quantitative data, either sequentially or simultaneously in order to provide a better understanding of the research problem.

In this study, the standpoint of the researcher is pragmatic; water service providers in small urban centres are failing to achieve sustainable cost recovery levels, mainly due to irregular or late payment of water bills by their customers. In order to address this problem, the researcher used both qualitative and quantitative approaches. The strategy of inquiry was a two-phase sequential approach as illustrated in Figure 5.1. The first phase involved collection of qualitative data through focus group discussions in order to explore and generate themes relating to customer beliefs with respect to paying water bills promptly. Then, based on these themes, a quantitative research instrument was developed and administered in the second phase. However, although a qualitative approach was used in the development of the research instrument, the main data for the research was collected, analysed and interpreted using procedures that are consistent with the quantitative research tradition (Creswell, 2003).

The two-phase sequential qualitative/quantitative approach was adopted for a number of reasons. Firstly, exploratory research is needed to elicit behavioural, normative and control beliefs within the study population in order to construct suitable measures for the main TPB variables (i.e. attitude, subjective norms and perceived control). Consistent with Ajzen (2002b), beliefs elicited in this way can be used as indirect measures for the main TPB variables. Moreover, correlations between direct and indirect measures of attitude, subjective
norms and perceived control can be used to establish convergent validity (Francis et al., 2004b).

Similarly, it is anticipated that by using measures developed from consumer generated themes rather than themes intuitively generated by the researcher, results obtained from investigating the underlying cognitive foundation for attitudes, subjective norms and perceptions of control, are likely to reflect the actual situation more accurately, thus providing utility managers with opportunities to target the relevant beliefs in order to influence behaviour.

A second reason for choosing the mixed methods approach is that it is recommended in the literature as the most appropriate approach when a measurement instrument is to be developed (Creswell, 2003; Tashakkori and Teddlie, 2003). In addition, there is increasing recognition by most disciplines in the social sciences that both quantitative and qualitative approaches are important for a good research study (Kumar, 1999). The following sub-sections describe the research strategy in more detail, including justifications of the different choices made.

5.2.2 Research Strategy

Research strategy is central to the design of a study, and is defined as the “set of ideas by which the study intends to proceed in order to answer its research questions” (Punch, 1998). There is agreement among several authors on the five main types of research strategies, which include: experiments, survey, analysis of archival records, history and case studies (Punch, 1998; de Vaus, 2001; Yin, 2003).

In selecting a strategy for this study, a criteria suggested by Yin (2003) was used. According to Yin (2003), selection of a research strategy is determined by three key conditions: (i) the type and form of research questions posed; (ii) the extent of control a researcher has over actual behavioural events; and (iii) the degree of focus on contemporary as opposed to historical events. Experiments, history and case study strategies are suitable for “how” and “why” questions but the choice between these three depends on the extent of control and access a researcher has over actual behavioural events (Yin, 2003). Experiments are the preferred strategy when a researcher can manipulate behaviour directly, precisely and systematically either in a laboratory or a field setting (Yin, 2003). Histories are the preferred strategy when there is virtually no access or control; whereas the case study is preferred in examining contemporary events, but when the relevant behaviours cannot be manipulated (Yin, 2003).
The primary question for this study is a "what" question, and for such a question, Yin (2003) suggests a survey or an archival research strategy. These strategies are considered advantageous when the research goal is to be predictive about certain outcomes, in an environment where the researcher has no control over behavioural events (Yin, 1984). As mentioned in Chapter 1, this study aimed to find out what factors influence consumer behaviour in relation to prompt payment of water bills. Thus, consistent with Yin's (2003) criteria, a survey research strategy emerged as the most appropriate strategy for the current study.

A survey strategy can either be cross-sectional, with data collected at one point in time, or longitudinal, with data collected over time (Babbie, 1990). This study utilised a cross-sectional survey design to collect data from households connected to piped water services. A cross-sectional survey design was preferred mainly because of its advantages in terms of economy of the design, the rapid turnaround in data collection, and the ability to identify attributes of a population from a sample (Babbie, 1990; Creswell, 2003).

5.2.3 Data Collection Methods

A variety of data collection methods exist for survey designs. Fink (1995b) identifies four types: questionnaires; interviews; structured record reviews; and structured observations. Although there is nothing about the logic of cross-sectional survey designs that requires a particular method of collecting data, it is essential that the data obtained constitutes a structured set to enable systematic comparisons between cases, or groups of cases (de Vaus, 2001). Consistent with the two-phase sequential mixed methods approach (Fig 5.1), focus group discussions were used to collect qualitative data in the first phase. The information collected in the first phase was used in the design of a structured questionnaire for collecting quantitative data in the second phase. Detailed procedures followed in data collection are reported in sections 5.4 to 5.7

5.3 RESEARCH SETTING

This study was conducted in the small urban areas of Uganda. Urban areas in Uganda are generally defined as gazetted cities, municipalities, and town councils with a population of at least 1,000 inhabitants (Uganda Bureau of Statistics, 2004). A recent survey carried out in 2002 revealed that Uganda's population was 24.4 million people, of which nearly 3 million
people (12 percent) lived in urban areas and the majority (88 percent) lived in rural areas (Uganda Bureau of Statistics, 2004). Table 5.1 shows key socio-economic characteristics of the urban population in Uganda.

There are a total of 75 gazetted urban centres in Uganda as of 12th September 2002 (Uganda Bureau of Statistics, 2004). Of these, only one was gazetted as a city (Kampala city), hosting about 1,189,142 persons (40 percent of the urban population); 13 were gazetted as municipalities with a total population of about 745,053 persons (25 percent of the urban population); and 61 were gazetted as town councils, with a total population of 1,065,209 persons, representing about 35 percent of the urban population (Uganda Bureau of Statistics, 2004). Most of the municipalities have populations in the range of 30,000 to 120,000 persons, and are therefore the next largest to Kampala city in the upper end of Uganda’s urban spectrum.

On the other hand, the majority of town councils are to be found predominantly on the lower band of the urban spectrum, with populations in the range of 1,500 to 15,000 people. It is these smaller urban centres that comprise the setting for the current study. Within this lower band, Uganda’s water sector strategy documents use the term ‘small towns’ to refer to those urban centres (whether gazetted as town councils or not) with population ranging from 5,000 to 15,000 inhabitants. Those with populations less than 5,000 inhabitants are generally referred to as ‘rural growth centres’.

Small towns and rural growth centres generally have similar structural characteristics. They are both characterised by a core trading centre and relatively scattered settlements around the commercial zone or core, which tends to be densely populated. The core is a centre of commercial establishments, and generally exhibits urban characteristics. The fringe on the other hand tends to be more rural in nature, with mainly residential houses, widely spaced from each other compared to the core. The main sources of income for populations in these areas are small-scale trade followed by peasant farming and a few agro-based industries. The presence of institutions, such as schools, health and administrative centres is a significant phenomenon which adds to their prominence, in terms of boosting overall population and water demand.

Water service provision in small towns has only recently moved up the international agenda having been neglected in earlier efforts which concentrated on rural areas (United Nations Human Settlements Programme, 2006). Today, many governments and the international donor community now acknowledge that most of the service provision needed to meet the
Millennium Development Goals is indeed located in small urban centres (United Nations Human Settlements Programme, 2006).

Table 5.1: Key Socio-economic Characteristics of Uganda’s Urban Population

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>48.4</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>51.6</td>
</tr>
<tr>
<td>Age distribution</td>
<td>0-14 years old</td>
<td>45.6</td>
</tr>
<tr>
<td></td>
<td>15-64 years old</td>
<td>53.3</td>
</tr>
<tr>
<td></td>
<td>Over 65 years old</td>
<td>1.1</td>
</tr>
<tr>
<td>Education</td>
<td>Education attainment of population aged 15 yrs and above:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 7 years of formal education</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>• Between 7 and 12 years of formal education</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>• More than 12 years of formal education</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Literacy rate for population 10 years and above</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Adult literacy rate (for population aged 18 years and above)</td>
<td>87</td>
</tr>
<tr>
<td>Monthly household expenditure (Mean = U-Shs. 266,100)</td>
<td>Expenditure on food, drink and tobacco</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Expenditure on clothing and footwear</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Expenditure on rent, fuel, power, appliances and equipment</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Expenditure on transport/communication</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Expenditure on education and health</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Expenditure on others</td>
<td>9</td>
</tr>
<tr>
<td>Economic activity/occupation</td>
<td>Self employed</td>
<td>44.9*</td>
</tr>
<tr>
<td></td>
<td>Unpaid family worker</td>
<td>9.3*</td>
</tr>
<tr>
<td></td>
<td>Government employees</td>
<td>9.1*</td>
</tr>
<tr>
<td></td>
<td>Private employees</td>
<td>36.7*</td>
</tr>
<tr>
<td>Household monthly income (U-Shs.)</td>
<td>Monthly household income of U-Shs. 0-50,000</td>
<td>12*</td>
</tr>
<tr>
<td></td>
<td>Monthly household income of U-Shs. 50,000-100,000</td>
<td>24*</td>
</tr>
<tr>
<td></td>
<td>Monthly household income of U-Shs. 100,000-150,000</td>
<td>14*</td>
</tr>
<tr>
<td></td>
<td>Monthly household income of U-Shs. 150,000-200,000</td>
<td>12*</td>
</tr>
<tr>
<td></td>
<td>Monthly household income above U-Shs. 200,000</td>
<td>38*</td>
</tr>
<tr>
<td>Dwelling type</td>
<td>Independent house</td>
<td>34*</td>
</tr>
<tr>
<td></td>
<td>Tenement (Muzigo)</td>
<td>56*</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>10*</td>
</tr>
<tr>
<td>Occupancy tenure of dwelling unit</td>
<td>Owned</td>
<td>34*</td>
</tr>
<tr>
<td></td>
<td>Rented</td>
<td>56*</td>
</tr>
<tr>
<td></td>
<td>others</td>
<td>10*</td>
</tr>
<tr>
<td>Water supply</td>
<td>Household having access to safe drinking water¹</td>
<td>84*</td>
</tr>
<tr>
<td>Type of toilet facility</td>
<td>Pit latrine</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Flush toilet</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>2</td>
</tr>
</tbody>
</table>

Sources: (Uganda Bureau of Statistics, 2001; 2003)
Data marked * was extracted from Uganda Bureau of Statistics (2001)

¹ In Uganda, water is normally classified as safe if it is drawn from a tap (piped), boreholes or protected wells and/or springs
Consequently, there has been considerable investment in piped water supply infrastructure in small towns of developing countries over the last decade. For instance, in Uganda, the government has for the past few years been facilitating the implementation of five major projects each supported by different donors as follows: support to Small Towns Water and Sanitation Project (13 towns); North Eastern Towns Water and Sanitation Project (11 small towns); Mid Southern Towns Water and Sanitation Project (10 small towns); Small Towns Water and Sanitation Project (7 small towns); and Mid Western Towns Water Supply and Sanitation Project (10 small towns).

Furthermore, many independent observers agree that the government of Uganda has made significant strides in reforming the country’s water sector and has developed policies, enacted laws, drawn up plans, programmes and strategies aimed at improving water service provision (Robinson, 2002). The Directorate of Water Development (DWD) under the Ministry of Water, Lands and Environment (MLWE) is the leading central government agency for water supply services, and is responsible for overall planning and supervision of urban and rural water and sanitation programmes in liaison with relevant agencies. Indeed, until the onset of the Local Government Act of 1997, DWD was also involved in provision of services to 45 small urban centres.

Subsequent to the Local Government Act 1997, the role of service provision reverted to local governments institutions in each of these small urban centres (Consult 4, 1999). For larger urban areas, a public agency called the National Water and Sewerage Corporation (NWSC) is responsible for provision of water and sanitation services to Kampala (the only gazetted city), and 14 other large towns (mainly municipalities). The urban areas served by NWSC are estimated to host about 67 percent of Uganda’s urban population (Uganda Bureau of Statistics, 2004), thus making NWSC a major player in the urban water services sector of Uganda.

As part of the ongoing sector reform implementation, a Water Authorities Division was formed within the Urban Water Supply Department of DWD, and is charged with coordinating central government assistance towards operation and maintenance of the piped water supply systems in small urban centres. A total of 67 small towns have been gazetted by the MWLE as Water Supply areas with appointed Local Water Authorities, although only 62 of these centres have operational water services. Out of the 62 small urban centres with operational water services, 56 of them are currently being managed by professional private operators (POs) under management contracts with local water authorities and in line with the
reform recommendations of ensuring commercially viable services for these centres (Water Authorities Division, 2005).

It is worthwhile noting that private sector management of water services in small towns in Uganda is still in its infancy, having started in 2001. Consequently, there is still limited independent evidence of the impact of this policy recommendation on the performance of water services in small towns. However, preliminarily evidence from a few case studies suggests that private sector management has achieved some performance improvements in terms of service reliability, better records and reporting, metering and billing (Tumusiime and Njiru, 2004). Other studies indicate that the problem of low system utilisation and low cost recovery levels is still a major concern (Carl Bro Group, 2003; Garvey, 2004).

5.4 SAMPLING DESIGN

The target population in this study included all households that are registered customers of the private operators contracted to manage piped water services in Uganda's small towns. A multi-stage probability sampling procedure involving both stratified and cluster samples was utilised (Neuman, 1994; Kemper et al., 2003). A cluster refers to "a unit that contains the final sampling elements but can be treated temporarily as a sampling element itself" (Neuman, 1994, p.205). Multistage sampling 'is an extension of cluster sampling in which clusters are selected and a sample is drawn from the cluster members by simple random sampling' (Fink, 2003, p.15). Thus, for this study, the researcher first sampled towns, each of which contained the final sampling elements (i.e. households), and then extracted random samples of elements from within the selected towns in the second stage of sampling. This procedure was adopted because it was deemed impractical to compile an exhaustive list of households constituting the target population, due to the diversity of operators managing water services in the towns.

The multistage probability sampling procedure proceeded as follows. First, a national sampling frame of all eligible small towns was created using data centrally available from the Water Authorities Division of the Directorate of Water Development. As of November 2005, there were a total of 56 small towns with piped water services managed by 15 local private operators (Water Authorities Division, 2005). A sampling frame consisting of 32 towns (clusters) was created from this list. Towns were included that met one or more of the following criteria: (1) more than 10 percent inactive customer accounts; (2) monthly collection efficiency of less than 50 percent; (3) towns with monthly collection efficiency of
more than 100 percent (indicative of a problem of arrears). These criteria were designed to maximise the number of towns with operational problems related to bill payment during the reporting period 2004-2005 and ensure homogeneity of the resulting sample.

A further consideration in creating the initial sampling frame was the availability of usable and up-to-date records of connected customer accounts, which would enable a probability sampling procedure in the subsequent stage. This was assessed using the presence of monthly operational reports as an indicator. Towns which had not submitted any reports to DWD (for the 2004-2005 reporting period) were not included in the sampling frame.

The sampling frame of eligible towns was then stratified according to geographical location (i.e. western, eastern, northern and central regions). The rationale for using geographical location as a characteristic for stratification was to increase representativeness in a broad range of attitudes as well as in social class and ethnicity (Babbie, 1973). A general guideline followed in multi-stage sampling is to maximise the number of clusters so as to avoid the logistical difficulties involved in extracting a large number of final sampling elements from very few clusters (Fink, 2003). In this study, a sample of 10 towns was deemed appropriate. Following stratification, the lists of towns from each of the regions were saved as SPSS data. Based on the relative proportion of towns in each geographical region, a number of towns proportional to the desired sample size were randomly extracted from each region using the SPSS random sampling facility.

However, following a preliminary field visit to all 10 sampled towns, operators in two of the towns (Masindi in the western region, and Kapchorwa, in the east) were found not to have a usable and up to date record of their customers. These two towns were therefore dropped, resulting in an effective sample of eight towns. Table 5.2 summarises the results of this initial sampling procedure.

Following the selection of study towns, the second sampling stage involved drawing random samples of registered customers from each of the selected towns. In the period between November and December 2005, access was made to the customer database of the private operator in each of the study towns. The criteria for inclusion in the sampling frame were (i) a household registered with the private operator; (ii) a household with a private connection (yard or in-house); and (iii) an active customer, i.e. a household that had water services at the time of sampling. The household was therefore, the sampling unit as well as the unit of analysis.
### Table 5.2: Results of the First Stage Sampling Procedure

<table>
<thead>
<tr>
<th>Strata/Regions</th>
<th>Number of towns in sampling frame</th>
<th>Percentage proportion of towns in each stratum (%)</th>
<th>No. of towns randomly and proportionally extracted from each strata</th>
<th>Number towns excluded</th>
<th>Effective sample size</th>
<th>Final list of towns selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>4</td>
<td>12.5</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Ibanda</td>
</tr>
<tr>
<td>Central</td>
<td>8</td>
<td>25.0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>Nkokonjeru, Rakai</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kamuli, Busembatia, Kumi, Kayunga</td>
</tr>
<tr>
<td>Eastern</td>
<td>17</td>
<td>53.1</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>Busembatia, Kumi, Kayunga</td>
</tr>
<tr>
<td>Northern</td>
<td>3</td>
<td>9.4</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Moyo</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>32</strong></td>
<td><strong>100</strong></td>
<td><strong>10</strong></td>
<td><strong>2</strong></td>
<td><strong>8</strong></td>
<td></td>
</tr>
</tbody>
</table>

The required sample size was determined using a combination of statistical estimation (Cohen, 1988; Miles and Shevlin, 2001; Field, 2005) and rule-of-thumb methods (Neuman, 1994; Fink, 1995a; Perry, 2002). Statistical estimation methods were used to determine the minimum sample size, and rule of thumb methods were applied to arrive at the desired sample size. Statistical estimation methods are based on two statistical properties: effect size and statistical power. Effect size refers to how well the researcher expects the predictors to predict the outcome, while statistical power is the probability that a given statistical test will detect an effect assuming that one exists in the population (Field, 2005).

In this study, it is expected that the predictor variables derived from the theory of planned behaviour will have a medium to large effect. This expectation is based on Armitage and Conner’s (2001) meta-analysis of 185 independent studies which revealed that the variables in the theory of planned behaviour accounted for 27 percent and 39 percent of the variance in behaviour and intentions, respectively. This proportion of explained variance represents a medium to large effect, according to Cohen’s (1988) benchmarks for effect sizes. On statistical power, Cohen (1988), a respected authority on statistical methods for behavioural sciences, recommends that researchers should aim to achieve a power of 0.8, or an 80 percent chance of detecting an effect if one genuinely exists.

According to Field (2005), the determination of sample size should, in part, be guided by the two statistical properties explained above, and for this, Field (2005) recommends using Miles and Shevlin’s (2001) graphs that illustrate the sample sizes needed to achieve different levels of power, for different effect sizes, as the number of predictors vary. Based on these graphs,
the minimum sample size for this study was determined as 100 respondents. However, using a rule of thumb suggested by Perry (2002) for PhD research, this study aimed for a usable total sample size of at least 300 respondents. Other key factors that were considered in determining the sample size were bad addresses and non-response (Bourque and Fielder, 1995).

For research using the TPB, response rates are often about 50 percent (Francis et al., 2004). But other previous research with customers of an urban water utility in Uganda (Kayaga, 2002) registered a response rate of 78 percent in hand delivered, self-administered questionnaire survey. This means that to achieve the desired number of respondents, a survey over-sample was necessary. Consequently, this study targeted an effective total sample size of about 600 respondents. Furthermore, to cater for any inaccuracies in the customer databases of the operators, as well as bad addresses, the total sample size was set at 640. Consistent with the logic of multi-stage sampling (Fink, 2003), this sample size was divided into eight equal portions, to obtain the required sample for each of the eight towns (clusters) selected in the first stage.

For those towns with a computerised customer database, a computer program ‘Microsoft Excel’ was utilised to extract the category of “domestic consumers” as of December 2005. This category was further filtered in order to retain only those consumers with private connections (i.e. yard or in-house), excluding public water kiosks owned or contracted to individuals. The spreadsheets generated for these towns had the following entries: (i) a serial number; (ii) customer’s name; (iii) customer reference number; and (iv) customer’s physical address (represented only by the name of the road). For towns without a computerised customer database, the required customer category was manually extracted from the handwritten lists using customer reference codes which were subsequently entered in an Excel spreadsheet. In order to save time, the initial spreadsheet generated for these towns had only the reference codes since it was considered time consuming to enter names and addresses for all the customers. In this case, entries for customer names and addresses were made only after the random sample had been generated.

The sampling frame for each town was saved as SPSS data, from which a probability sample of exactly 80 customers was extracted using the SPSS Random Sampling Facility. This procedure was repeated for each town. Although extra care was taken during preparation of each sampling frame, some of the samples generated had to be refined by excluding elements (i) which did not fall into the category of domestic customers or did not meet the criteria for
inclusion; (ii) that did not have clear customer names; and (iii) that had double or multiple entries, either due to typographical errors or customers having multiple properties with in the same town. Table 5.3 shows the results of the above sampling procedure. Out of the estimated total sample size of 640 subjects, a total of 9 subjects were excluded, due to various reasons discussed above.

Table 5.3: Results of the second-stage sampling procedure

<table>
<thead>
<tr>
<th>Town</th>
<th>Private Operator</th>
<th>Total number of active connections (all categories)</th>
<th>Sampling frame size</th>
<th>Required sample size</th>
<th>Effective sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rakai</td>
<td>WSS Services Ltd.</td>
<td>217</td>
<td>173</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Nkokonjeru</td>
<td>Kalebu Ltd.</td>
<td>222</td>
<td>174</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Busembatia</td>
<td>Bika Ltd.</td>
<td>204</td>
<td>198</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Kamuli</td>
<td>Bika Ltd.</td>
<td>755</td>
<td>633</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Kumi</td>
<td>JOWA Engineering</td>
<td>229</td>
<td>165</td>
<td>80</td>
<td>77</td>
</tr>
<tr>
<td>Kayunga</td>
<td>Bisons International</td>
<td>297</td>
<td>287</td>
<td>80</td>
<td>77</td>
</tr>
<tr>
<td>Moyo</td>
<td>Able Holdings</td>
<td>304</td>
<td>233</td>
<td>80</td>
<td>77</td>
</tr>
<tr>
<td>Ibanda</td>
<td>George &amp; Co. Ltd.</td>
<td>600</td>
<td>553</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td><strong>2828</strong></td>
<td><strong>2416</strong></td>
<td><strong>640</strong></td>
<td><strong>631</strong></td>
</tr>
</tbody>
</table>

5.5 DEVELOPMENT OF THE MEASUREMENT INSTRUMENT

The variables of interest in this study were measured using a structured questionnaire as the measurement instrument. Although several authors on research methods (e.g. Kervin, 1992; Punch, 1998; Rudestam and Newton, 2001) recommend the use of standard measurement instruments with established validity and reliability, the nature of the research questions/hypotheses in this study and their theoretical grounding, did not support the use of a standard instrument. For instance, in order to understand the specific beliefs underlying attitudes, Ajzen (1991) recommends that the set of beliefs statements used must be elicited anew from a study population and not intuitively generated.

Furthermore, as discussed in Chapter 3, most studies reviewed in the literature on domestic water demand behaviour were not based on theoretical models from the behavioural sciences. Consequently, no standard measurement instrument was available for the key variables of attitude, subjective norms, perceived control and intention. However, instruments used in other non-water related studies adopting the TPB theoretical framework (e.g. Armitage and
Prompts, 2001; Ajzen, 2002a; Fielding et al., 2005) were reviewed, and direct measures for these key variables were adapted to the behavior of interest in the current study. Measures for these variables were obtained using multiple-item scales. A scale is defined as a “combination of individual measures of the same variable, each measure reflecting a different aspect of the variable” (Kervin, 1992, p.291). Multiple-item measures were preferred to single-item measures because they are usually more reliable and have the ability to tap complex multi-dimensional concepts (Kervin, 1992).

Therefore, consistent with recommendations by several authors (e.g. Kervin, 1992; Sekaran, 1992; Spector, 1992; Bourque and Fielder, 1995; Punch, 1998), the process of developing a measurement instrument for this study proceeded as follows. First, operational definitions of the study variables were developed. Secondly, using focus group discussions with consumers, items were generated to operationalise each variable. Thirdly, an appropriate response scale format for each item was selected and a draft questionnaire was produced. Finally, the draft questionnaire underwent a process of multiple pre-testing. A pilot study was also conducted from which item/reliability analyses were carried out to assess the suitability of the measurement scales. The following sections provide a description of each of the above procedures. Description of the procedures followed in the pilot study is given in section 5.6.

5.5.1 Operational definitions

Operational definitions developed for the main constructs in the research model (Figure 4.1) are outlined as follows:

a) Prompt bill payment behavior (B): At the theoretical level, a customer’s prompt bill payment behavior was defined in Chapter 4 as the action of paying an outstanding water bill at the water utility office within 15 days of receiving the bill. This variable was operationalised objectively as the ratio of the amount paid by the customer within the 15 days period, to the total amount due over the billing month under consideration.

b) Intention to pay a water bill promptly (I): Within the theory of planned behavior, behavioural intentions are an indication of how hard people are willing to try, and of how much an effort they are planning to exert, in order to perform a particular behavior (Ajzen, 1991). In accordance with the principle of compatibility (Ajzen and Fishbein, 1980), which requires that intentions to perform a behavior are defined in terms of exactly the same elements as the behavior, intentions to pay water bills
promptly (hereinafter referred to as “intentions”) is operationalised in terms of the perceived likelihood that a customer will pay his or her water bill for the month within 15 days of receiving the bill for that month. This construct was measured directly using a multi-item scale designed to capture overall intentions, as well as desires (e.g. ‘I want to pay my next water bill within 15 days of receiving it’) and self-predictions (e.g. ‘how likely is it that you will pay your next water bill within 15 days of receiving it’). In the questionnaire, items were separated and presented in a non-systematic order, interspersed with items for other constructs in order to minimise possible item non-response due to the similarity of items.

c) Attitude towards paying water bills promptly (AT): Attitude towards behaviour is a psychological pre-disposition that is expressed by evaluating a particular behaviour with some degree of favour or disfavour (Ajzen, 1988). As mentioned earlier, the behaviour of interest in this study is the payment of a water bill at the utility office within 15 days of receipt of the bill. Consistent with the principle of compatibility (Ajzen and Fishbein, 1980), attitude towards paying water bills promptly (hereinafter referred to simply as “attitudes”) is defined in terms of a consumer’s favourable or unfavourable evaluation of this particular behaviour. Empirical research has shown that overall evaluation often contains two separable components (Ajzen, 2002b). One component is considered influential in nature and is represented by such adjective pairs as valuable – worthless, and harmful – beneficial. The second component is reflected in such scales as pleasant–unpleasant and enjoyable–unenjoyable. Congruent with this position, the set of items used in the attitude scale for the current study included both types, as well as the good–bad scale which tends to capture overall evaluation (Ajzen, 2002b).

d) Subjective norms (SN): Similar to attitudes, and in accordance with the TPB, subjective norms are defined with respect to the behaviour of paying water bills promptly, as the perceived social pressure to perform or not to perform that particular behaviour. This construct captures the perception about what important “others” (e.g. family, neighbours etc) think about the behaviour – whether they disapprove or approve (Ajzen, 1991). However, because important “others” are generally perceived to approve of desirable behaviours and disapprove of undesirable behaviours, there is a risk that responses obtained for such a measure will have low variability (Ajzen, 2002b). For this reason, subjective norms were measured directly using a combination of items that captured perceptions about what important others think the person should
do, and perceptions about whether important "others" themselves actually perform the behaviour in question.

e) **Perceived control (PC):** With respect to paying water bills promptly, *perceived control* refers to the perceived ease or difficulty of engaging in that behaviour (Ajzen, 1991). A direct measure of *perceived control* was obtained using items that captured: (i) people's confidence that they are capable of performing the behaviour; (ii) perceived difficulty of performing the behaviour or the likelihood that the participant could do it; and (iii) the degree of control a person has over performance of the behaviour, i.e. whether performance of the behaviour is or is not up to them (Bandura, 1997; Ajzen, 2002a).

### 5.5.2 Direct and indirect measures of attitude, subjective norms and perceived control

With the exception of intentions and behaviour, the key predictor variables specified by the TPB framework (i.e. attitude, subjective norms and perceived control) can be measured both directly (based on the above operational definitions) and indirectly using the associated behavioural, normative and control beliefs (Ajzen, 1991; 2002b; Francis et al., 2004a). Direct and indirect measurement approaches make different assumptions about the underlying cognitive structure for attitudes, subjective norms and perceived control. For this reason, Francis et al (2004a) recommend the use of both approaches in order to better understand the underlying cognitive foundation and also to establish convergent validity.

Direct measures of attitude make the assumption that individuals can give a summary estimate of their global attitude towards behaviour and the underlying cognitive structure that may include components that are ambivalent (i.e. consisting of some positive and some negatives beliefs) or irrelevant (i.e. unlikely to influence behaviour). Indirect measures, in contrast, assume a cognitive or information-processing approach to attitude formation (Ajzen, 1991). This approach is illustrated by Fishbein and Ajzen's (1975) expectancy-value model of attitude formation which has been extensively used in attitude research, and also applied to the other TPB variables (Ajzen, 1991).

According to the expectancy-value model, attitudes develop reasonably from the beliefs people hold about the object of the attitude. In the case of attitudes towards behaviour, it is assumed that people form beliefs about the behaviour by associating it with certain outcomes.
or consequences. As discussed in Chapter 4, these beliefs are referred to as *behavioural beliefs* (Ajzen and Fishbein, 1980; Ajzen, 1991). Each belief links the behaviour to a certain outcome, that may be a cost incurred or a benefit gained from performing the behaviour. Since the attributes that come to be linked to the behaviour are already valued positively or negatively, a person automatically and simultaneously acquires an attitude toward the behaviour (Ajzen, 1991). In this way, a person learns to favour behaviours they believe have largely desirable consequences and form unfavourable attitudes towards behaviours they associate with mostly undesirable consequences. Specifically, the model posits that the outcome's subjective value - herein referred to as *outcome evaluation* - contributes to the attitude in direct proportion to the strength of the belief (i.e. the subjective probability that the behaviour will produce the outcome in question, herein referred to as *behavioural belief strength*). As shown in Equation 5.1, the *behavioural belief strength* \( b \) is combined in a multiplicative fashion with *outcome evaluation* \( e \) of the belief's attribute, and the resulting products are summed over \( n \) salient beliefs. A person's attitude is directly proportional to this summative belief index (Fishbein and Ajzen, 1975; Ajzen, 1991).

\[
\text{Attitude} \propto \sum b_i e_i \text{ ................. Eqn. 5.1}
\]

The above conceptualisation allowed for an exploration of the underlying belief structure or information foundation for customer attitudes towards paying water bills promptly, by eliciting salient beliefs about the behaviour and then assessing the subjective probabilities and values associated with the different beliefs. In addition, by combining behavioural belief strength and outcome evaluation in accordance with Equation 5.1, an estimate of the attitude itself was obtained. Such an estimate is referred to as a *belief-based* measure of attitude and is expected to correlate well with a standard direct measure of the same attitude (Ajzen and Fishbein, 1980; Ajzen, 1991).

Similarly, to obtain an indirect measure of *subjective norm*, normative beliefs relating to prompt bill payment behaviour were elicited from the study population. Normative beliefs as used in the theory of planned behaviour refer to normative expectations of others and motivation to comply with these expectations (Ajzen, 1991; 2002b). In this study, *normative beliefs* with respect to paying water bills promptly refer to perceptions of important other's preferences about whether a customer should pay their water bill within 15 days of receiving the bill or not. According to Ajzen and Fishbein (1980), a person who believes that most referents with whom he/she is motivated to comply think he/she should perform the behaviour, will perceive social pressure to do so. Thus, it follows that *normative beliefs*...
consist of two components: (i) perceptions of specific referents’ opinions on whether an individual should or should not perform the behaviour herein referred to as *normative belief strength* (*n*); and (ii) *motivation to comply* (*m*) with the wishes of the specific referents. Similar to attitudes, a belief-based measure of *subjective norms* was obtained by applying the expectancy-value formulation to these measures as shown in Equation 5.2.

\[
\text{Subjective norm } \alpha \sum n_i m_i \quad \text{Eqn. 5.2}
\]

Furthermore, to obtain an indirect measure of *perceived control*, control beliefs relating to prompt bill payment behaviour were elicited from the study population. Consistent with Ajzen (1991), *control beliefs* as used in this study refer to customer beliefs about the presence or absence of factors that may facilitate or impede performance of the behaviour under study, and the perceived power of these factors. Similar to behavioural and normative beliefs, *control beliefs* are broken down into two components in line with the original conceptualisation by Ajzen (1991): (i) frequency of occurrence of the facilitators or inhibitors of the behaviour, herein referred to as *control belief strength* (*c*); and (ii) perception of the power of the facilitators or inhibitors in influencing behaviour, herein referred to as *control belief power* (*p*). Similar to attitudes and subjective norms, a *belief-based* measure of perceived behavioural control was obtained by combining control belief strength and control belief power in accordance with the expectancy-value formulation as shown in Equation 5.3.

\[
\text{Perceived control } \alpha \sum c_i p_i \quad \text{Eqn. 5.3}
\]

From the above discussion, it is clear that questionnaire items for indirect measures of attitude, subjective norm and perceived control have to be tailored to the specific behaviour under study, since different behaviours will be associated with different beliefs. To do this, a qualitative study was conducted to elicit the beliefs about prompt bill payment behaviour that are salient among the study population. The next section 5.5.3 gives a description of the procedures followed during belief elicitation.

### 5.5.3 Belief elicitation study

Following standard procedure for conducting TPB research (Ajzen, 2002b; Francis et al., 2004; Holt, 2005), an elicitation study was conducted to identify salient beliefs associated with the behaviour of paying water bills promptly. The elicitation study was exploratory in
nature, designed to obtain insight into question wording for questionnaire items for indirect (or belief-based) measures of the main constructs as discussed in section 5.5.2.

Researchers (e.g. Francis et al., 2004a) recommend the use of either focus groups or individual interviews for belief elicitation. In this study, focus groups were preferred to individual interviews mainly because they provide access to a wide range of perspectives in a short time (Morgan, 1997). In addition, several authors recommend the use of focus groups as a means to construct questionnaires (Rossi et al., 1983; Converse and Presser, 1986; Fuller et al., 1993; O'Brien, 1993; Morgan, 1997).

With the help of the Area Managers in each study town, potential participants for the focus groups were identified from the sample lists produced using the sampling procedure described in section 5.4. Participants were purposely selected to maximise attendance, gender mix and differences in water bill payment patterns. A key decision in designing focus groups concerns the size of each group and the number of groups to be used. Using a ‘rule of thumb’ suggested by Morgan (1997), this study aimed for a total of three to five groups, and a minimum of six participants per group. Accordingly, only five towns (out of the eight sampled towns) were initially considered. These were: Nkokonjeru, Kamuli, Kayunga, Ibanda, and Rakai. Invitation letters (written on company headed paper and signed by the Area Managers) were sent out to 20 potential participants in each of the five towns. A sample of the letter used is given in Appendix A-1. The turn up ranged from 6 to 20 participants, with Kayunga focus group registering the lowest number of participants (six participants) and Rakai registering the highest (20 participants). The low attendance in Kayunga town was probably due to a late change made in the date and time of the discussion which was not communicated adequately.

In the period between 25th November and 12th December 2005, one focus group discussion was conducted for each town, making a total of five discussions with a total of 60 participants. The discussions were relatively structured with high moderator involvement. Competent and experienced moderators were recruited and briefed on the objectives of the study before facilitating the discussions. Appendix A-2 shows the pro forma used to guide all focus group discussions. Typically, all discussions proceeded systematically as follows. First, behavioural beliefs (relating to paying water bills promptly) were elicited by guiding group discussions around the following questions:
(i) What do you believe are the **advantages** of paying your next water bill within 15 days of receiving it?

(ii) What do you believe are the **disadvantages** of paying your next water bill within 15 days of receiving it?

(iii) Is there anything else you associate with your paying water bill within 15 days of receiving the bill?

Secondly, normative beliefs were elicited by guiding discussions around the following questions:

(i) Are there any individuals or groups who would **approve** of your paying the next water bill within 15 days of receiving it?

(ii) Are there any individuals or groups who would **disapprove** of your paying the next water bill within 15 days of receiving it?

(iii) Are there any other individuals or groups who come to mind when you think about paying your next water bill within 15 days of receiving it?

Finally, control beliefs were elicited by guiding discussions around these questions:

(i) What factors or circumstances would enable you to pay your next water bill within 15 days of receipt of the bill?

(ii) What factors or circumstances would make it difficult or impossible for you to pay your next water bill within 15 days of receiving it?

(iii) Are there any other issues that come to mind when you think about the difficulty of paying your next water bill within 15 days of receiving it?

Notes from the discussions were written out properly using a word processor. As is customary with qualitative approaches, analysis of the resulting information involved identifying important factors and themes, as well as making sense of emerging meanings. In particular, responses to the above open questions were used to construct a list of **modal accessible beliefs**, i.e. a list of the most commonly held beliefs (about paying for water promptly) within the study population (Ajzen, 2002b). To aid this process, a procedure was adopted in which emerging issues based on the above discussion questions were each given a count equal to the number of participants in the group. If a particular issue did not emerge from a group, it was given a count of zero for that group. The counts for each theme were summed across all the five groups to generate an aggregate count, which was used to rank the emerging issues and give an indication of the most commonly held perceptions. Appendix A-3 shows the detailed results of the belief elicitation study. The elicited beliefs formed the basis for constructing questionnaire items for the belief-
based measures of attitude, subjective norms and perceived control as given in the research model.

5.5.4 Design of a response format

Selecting an appropriate response format is an important step in developing a measurement instrument because response formats are considered to have an effect on response rates for structured questionnaires (Bourque and Fielder, 1995). A response scale refers to the response format for a single question in a questionnaire (Kervin, 1992). There are a variety of response scales for closed format questionnaires (Kervin, 1992), but this study utilised summated rating scales (or Likert-type scales) to measure the variables in the research model. Summated rating scales were chosen because they: (i) are cheaper and easier to develop; (ii) are usually quicker and easier to administer; and (iii) are more reliable and valid than other scales (Oppenbeim, 1992). Further, although technically an ordinal measure, Likert scales are often treated as interval data, especially in multivariate analysis (Kervin, 1992).

Regarding the number of response categories or choices, Likert scales only need a minimum of two categories which are usually of the form: “agree” or “disagree”. However, to increase precision in measurement, many researchers recommend four to nine choices, depending on the measurement sensitivity of respondents (Spector, 1992; Neuman, 1994). Research has shown that seven response choices are usually optimal, but some investigators prefer to use five-point or three-point response scales for particular purposes (Oppenheim, 1992). Furthermore, survey researchers have debated about whether to offer a neutral or middle category (e.g. “don’t know”, “uncertain/undecided”) in scales (Kervin, 1992; Neuman, 1994). Many recommend the use of a middle position to tap neutral responses espoused by some respondents (Babbie, 1990; Kervin, 1992; Spector, 1992; Neuman, 1994). In this study, an odd number of response categories (five) incorporating a middle point was used for all measures. The main reason for choosing only five categories was to avoid confusion in differentiating scale intensity during questionnaire interpretation in the local languages best understood by the respondents.

5.5.5 Development of questionnaire items

Following selection of a response scale format, item measures or stems for the questionnaire were developed for each variable in the research model. In drafting these stems, a number of guidelines given by different authors on social science research methods (e.g., Babbie, 1990;
Oppenheim, 1992; Spector, 1992; Bourque and Fielder, 2003) were followed. These included: (i) ensuring that items are clear, short and containing a single idea; (ii) ensuring that questions are as neutral as possible; (iii) providing an exhausting range of response categories; (iii) ensuring that questions are user-friendly, avoiding jargon and colloquial expressions; and (iv) using simple language that matches the literacy level of the target population, and is easy to translate to local dialect. Questionnaire items for direct measures of attitude, subjective norms, perceived control and intention were adapted from standard items used widely in TPB research (Ajzen, 2002b; Elliot, 2004; Francis et al., 2004a).

In the case of behavioural, normative and control beliefs, questionnaire items were developed to assess selected themes that emerged from the elicitation study. The elicitation study revealed a number of belief themes relating to the behaviour of interest, but only a few frequently cited beliefs were considered in the draft questionnaire (see appendix A-3). Although including many themes would almost certainly improve the validity of the study (Francis et al., 2004a), this was weighed against the issues of questionnaire length and its consequences in terms of participant fatigue and response rates.

Regarding measurement scales for belief items, there is controversy among researchers on how belief items in TPB research should be scaled (French and Hankins, 2003; Francis et al., 2004b), and there is nothing in the theory to justify one scaling method over another (Ajzen, 1991). Some researchers have urged that it is statistically meaningless to use a bipolar scale with an arbitrary zero score in a multiplicative formulation such as the expectancy-value model. They argue that multiplying entities by zero, when zero is part of an arbitrary scale rather than a “true score” is problematic (French and Hankins, 2003). On the other hand, some have defended the expectancy-value formulation. Notable among these is Francis et al (2004b), who convincingly argue that the multiplication process in the expectancy-value formulation is simply a weighting process that is not subject to the constraint of a ‘true’ zero (Francis et al., 2004b). They recommend that scaling decisions should be based on the meaning of concepts and not only the properties of the numbers. Hence, a unidirectional concept such as subjective probability (e.g. in behavioural beliefs) is better reflected by a unipolar measurement scale, whereas an evaluative concept (e.g. outcome evaluation) is better reflected by a bipolar measurement scale.

Consequently, based on Francis et al’s (2004b) recommendation, behavioural belief strength was assessed in this study using questionnaire items that asked respondents to indicate the likelihood on a 5-point scale (+1 extremely unlikely to +5 extremely likely) that certain
outcomes would arise from performing the target behaviour (i.e. paying the forthcoming water bill within 15 days of receiving the bill). **Outcome evaluations** were measured using another set of items that asked respondents to rate how good or bad, important or unimportant, necessary or unnecessary the various outcomes would be for them.

Similarly, in order to assess **normative belief strength**, items were developed that asked respondents to indicate the likelihood on a 5-point scale that different groups of people (or referents) would want them to perform the target behaviour. The referents groups/individuals identified in the elicitation study included: (i) neighbours; (ii) family members; (iii) water service provider (private operator); and (iv) water vendors. **Motivation to comply** was measured using a set of items that asked respondents to rate on a 5-point scale how much they cared about doing things that these referents would be happy with.

Finally, to assess **control belief strength**, questionnaire items were developed that asked respondents to indicate on a 5-point scale (+1 never to +5 always) how often they thought they would encounter various facilitating and inhibiting factors/barriers to paying water bills promptly. **Control belief power** was assessed using items that asked respondents to rate the extent to which they agreed or disagreed with a number of statements about whether the above factors, if encountered, would make it more difficult or much easier for them to pay their next water bill within 15 days.

### 5.5.6 Design of questionnaire format

In order to improve response rates, great care was taken in designing the general format of the questionnaire. Formatting guidelines suggested by Babbie (1973; 1990) and Bourque and Fielder (2003) were generally followed. First, the questionnaire was formatted in a manner that ensured it was properly spread out and uncluttered. Close-ended questions were preferred to open-ended questions because: (i) most people in the research setting have a low education level (Uganda Bureau of Statistics, 2003); and (ii) data coding and entry is easier for closed-ended questionnaires than open-ended questionnaires (Bourque and Fielder, 2003).

The order of the questions was such that relatively easy and less sensitive questions were asked first, proceeding through to more complex or sensitive ones. For instance, demographic classification questions were placed at the end of the questionnaire because they were considered too sensitive to be placed at an early stage. Furthermore, questions relating to one variable or dimension of a variable were placed in the same section of the questionnaire. For
instance, the two dimensions of behavioural beliefs (i.e. outcome evaluation and behavioural belief strength) were placed in separate sections A and E respectively. The same treatment was applied to normative beliefs and control beliefs. The exception to this was the direct measures of attitude, subjective norms, perceived control and intention, which, as recommended by Ajzen (2002b), were all placed in the same section, in a non-systematic order, and interspersed with each other. The reason for this non-systematic ordering was to minimise possible item non-response due to the similarity of items.

A second consideration in formatting was the design of the cover page and instructions to respondents. The cover page was designed to include the following information: (i) the sponsoring organisations; (ii) title of the survey; (iii) questionnaire identification information such as serial numbers, customer reference number, town, zone and address of respondent; and (iv) introductory instructions to respondents. The Area Managers in each study town requested to have the private company managing water services in the town included on the cover page as a sponsoring organisation, in addition to Loughborough University. This was remarkable as it demonstrated a commitment to use the results of this study to improve service delivery. Introductory comments to respondents emphasized this unique undertaking in order to motivate participation. Also, introductory instructions included an explanation of the overall purpose of the study, how the questionnaire is arranged and how to respond to the questions. An assurance of confidentiality of responses was also provided. Furthermore, in line with the recommendations of Babbie (1973), short, clear and unbiased introductory statements were provided at the beginning of each section in the questionnaire. Such short section introductions enable respondents to understand the content and purpose of each section, thus helping to put them in the proper frame of mind for answering the questions (Babbie, 1973). At the end of each section introduction, additional instructions were provided on how to respond to each question or statements in that section.

5.5.7 Pre-testing the Instrument

Several researchers recommend carrying out a pre-test before using a measurement instrument (Kervin, 1992; Neuman, 1994; Punch, 1998). However, there seems to be some ambiguity in the use of the terms 'pre-test' and pilot study' in the literature on social science research methods. Some authors use the terms interchangeably (e.g., Kervin, 1992). In the context of this study, pre-testing refers to the preliminary testing and evaluation of one or more aspects of the study design (e.g. questionnaire pre-test), while pilot study refers to miniaturised
walkthroughs of the entire study design (Babbie, 1990). The procedures followed in the pilot study are described in section 5.6.

Following the development and formatting of the draft questionnaire, preparations were made to pre-test the questionnaire in line with social science research practice. The process of pre-testing involved: (i) asking colleagues, i.e. fellow researchers, to review both the form and content of measures, and clarity of cover letter and instructions; (ii) soliciting comments from friends and relatives who know neither the research area nor anything about research methods; and (iii) asking experienced researchers in the area to comment on the form and content of measures (Kervin, 1992; Neuman, 1994). Appendix B-1 shows the cover letter sent out to colleagues and friends, requesting them to participate in the pre-test.

The draft questionnaire was sent to a total of 21 participants; including seven fellow PhD research scholars in the Department of Civil and Building Engineering, Loughborough University, 10 experienced researchers (including one social scientist) working in the same department, four friends and one family member. A total 10 out of the 21 people who were contacted responded with corrective comments. A summary of the comments made by the pre-test respondents is presented in Appendix B-2. Most of the comments related to form, content and clarity of questions and response categories. There were also concerns about the unfavourable length of the questionnaire.

5.6 PILOT STUDY

Several researchers (e.g., Babbie, 1990; Bourque and Fielder, 1995; Tabachnick and Fidell, 2001; Sekaran, 2003) agree on the need to carry out a pilot study for any research design, especially for those studies that utilise a new measurement instrument. Therefore, following the instrument pre-test, a pilot study was carried out with a small random sample of the target population in order to further test the suitability of the instrument and the procedures for data collection. Due to time and resource constraints, the pilot study was conducted in only two towns: Kamuli and Nkokenjeru. These two towns were chosen because of their relatively large sampling frame size, which allowed samples for both the pilot and main study to be extracted.

Following the pre-test, a number of changes were made to the first draft of the questionnaire before it was used for the pilot study: (i) the 'good/bad' evaluation scale was replaced with 'important/unimportant' in order to bring out the evaluative meaning of some of the items in
the outcome evaluation section; (ii) response categories for all the items were bolded to make them stand out; (iii) some of the items and response categories (e.g. for the dimensions of motivation to comply and control belief strength) were re-worded to make them clearer and less confusing; (iv) space was provided for respondents to give open-ended comments and or suggestions about the questionnaire items; and (v) ‘escape routes’ were provided for those questions identified as not applying to all respondents. A copy of the questionnaire used for the pilot study is shown in Appendix C. Details of the procedures followed in the pilot study and the results now follow.

5.6.1 Recruitment and training of interviewers

In the view of the author, the pilot questionnaire written in the English language could not easily be understood by respondents with educational attainment below secondary level. According to a recent Uganda National Household Survey, 50 percent of mature urban residents in Uganda do not have a secondary level of education (Uganda Bureau of Statistics, 2003). Consequently, it was deemed necessary to recruit and train interviewers to interpret and or administer the questionnaire to those respondents who may not comprehend the contents of the questionnaire.

In order to obtain quality interviewers, a rigorous recruitment process was followed, with the help of a survey researcher/English language expert from the Institute of Languages, Makerere University (Kampala Uganda). First, an advertisement was prepared and displayed for five days at several locations within Makerere University campus. Over 80 applications from both undergraduate and postgraduate students of different faculties were received and reviewed. A total of 32 applicants (four applicants per study town) were short-listed for interviews. The objective was to recruit and train at least two interviewers per town for both the pilot and the main study.

The interviews were conducted on the 19th December 2005 by a three-person panel that included the author, the survey research/English language expert and an independent observer with experience in recruitment. The criteria for selection comprised key interviewer person specifications adapted from various text books on survey research (Babbie, 1973; 1990; Neuman, 1994). Also, during the interview, the terms of reference developed for the assignment were explained to each candidate. Details of these are given in Appendix D-1. Following the interview, 16 applicants were selected for the role, and were informed of the training session scheduled a month later.
The survey researcher from Makerere University helped in organising a two-day training session for the recruited interviewers. The training was held from 19th January 2006 to 20th January 2006 at Makerere University, Institute of Languages, Lecture room UB4. On the first day of the training session, the objectives of the study were outlined (including the theoretical grounding), definitions and instructions were reviewed and all items in the questionnaire discussed. It was particularly made clear to the participants that although they were being referred to as ‘interviewers’, they were hired to facilitate understanding of the questionnaire items to the respondents, but not to carry out probing interviews.

The trainees were given copies of the blank questionnaires for training purposes. They were briefed on the intended meanings of the various statements/questions, and discussions were encouraged on possible ambiguities in the wording. A copy of the questionnaire was translated by translation experts from the Institute of Languages (Makerere University) into two local languages spoken in six of the study towns. The translated versions were used to facilitate in-depth discussions on interpretation of various items and response categories in these two local languages. Due to resource constraints, it was not possible to translate the questionnaire to the other two languages spoken in the remaining two study towns. The trainees assigned to these towns discussed among themselves and identified descriptive local words or phrases that each one of them could use so as to minimise distortions and loss of meaning.

The second part of the training focused on operational issues and field administration procedures. A presentation was also made on general interviewing guidelines and rules as adapted from Babbie (1973) and Bourque and Fielder (1995), followed by a practice interview session. At the end of the training, the trainees who showed leadership skills and a high sense of motivation were requested to act as team leaders in their respective locations. Interviewers for the pilot study towns of Kamuli and Nkoko were briefed on the objectives and importance of the pilot study, and when it was scheduled to take place. The other interviewers were asked to be on stand-by, awaiting their deployment following the pilot study.

5.6.2 Pilot study sampling and questionnaire administration

Samples for the pilot and main study were selected at the same time to avoid overlap of respondents in the two studies. After extracting samples for the main study, the remaining customer reference numbers in the original Excel-based sampling frames for Kamuli and
Nkokenjeru towns were saved as SPSS data. A total of 160 customers (80 customers per town) were randomly selected for the pilot study. Identification particulars for each respondent (i.e. questionnaire serial number, town, customer reference number, and address/zone) were then transferred from the sample lists to the blank questionnaires.

Four trained interviewers were required for the pilot study; each assigned a total of 40 respondents. The processed questionnaires were therefore arranged in packs of 40, and placed in transparent document wallets, together with the sample list, clip board, and pen ready for each interviewer. The sample list form also acted as a reporting form for the interviewers to track aspects such as mode of administration, follow up details for self-administered respondents, and questionnaire audit. An example of this sample list/reporting form is presented in Appendix D-2. It was not possible to establish at the onset which customers would be able to self-administer the questionnaire. Consequently, interviewers were also given return envelopes labelled “Private and Confidential, Return to Josses Mugabi, c/o [Area Manager’s Name]” for those respondents who would opt to complete the questionnaire themselves.

The pilot study was conducted in the period between 24th January 2006 and 28th January 2006. Out of the 160 questionnaires sent out, a total of 67 questionnaires were returned uncompleted because they could not be delivered due to various reasons including, rejection by respondents who were too ill or were disconnected at the time; households sent two copies due to inaccuracies in the customer database; vacant premises etc. The net sample size was therefore reduced to 93. Seven questionnaires were delivered but not returned, and three were returned but with only partially completed sections, which rendered them unusable in the analysis. A total of 83 useable questionnaires were returned, providing an effective response rate of 89.2 percent.

5.6.3 Psychometric properties of the pilot measurement scales for attitude, subjective norm, perceived control and intention variables

In accordance with Ajzen’s (2002b) recommendation, the measurement scales used to directly measure the four main independent variables in the model (i.e. AT, SN, PC and Intention) were checked for acceptable psychometric qualities using both item and reliability analysis (Spector, 1992). The rationale of an item analysis “is to find those items that form an internally consistent scale and to eliminate those items that do not” (Spector, 1992, p. 29).
Internal consistency is widely used as the standard criterion for assessing the reliability of a scale composed of multiple items (Eagly and Chaiken, 1993; Litwin, 2003).

However, some researchers using the TPB model have criticised the use of internal consistency as a criterion for assessing the reliability of belief-based measures of AT, SN and PC (i.e. those based on behavioural, normative and control beliefs) within the model. For instance, Ajzen (2002b) urges that the internal consistency requirement should not be imposed on belief items because people's attitudes towards behaviour can be ambivalent if they believe that the behaviour is likely to produce positive as well as negative outcomes. Other researchers warn that rejecting inconsistent items is akin to rejecting all the negative belief items about behaviour and retaining only positive beliefs (Francis et al., 2004). This results in loss of important information and a threat to content validity (Francis et al., 2004). For these reasons, internal consistency reliability analysis was not performed for behavioural, normative and control beliefs items in the pilot study.

The pilot study data obtained was entered into the computer using SPSS 12.0 for Windows program (SPSS Inc., 2003). The items that had been negatively worded were reverse-scored using the "Transform" facility on the SPSS 12.0 program. In assessing the internal consistency reliability of attitude, subjective norms, perceived control and intention scales, Cronbach's coefficient alpha was preferred to split-half reliability because it provides a direct estimate of all the means of possible split half tests (Pedhazur and Schmelkin, 1991; Field, 2005).

Moreover, Cronbach's coefficient alpha is considered a good measure for conducting item analysis because it is a direct function of both the number of items and their magnitude of inter-correlation (Spector, 1992). Selection of items for each measurement scale was based on iterations which (i) eliminated corrected item-to-total correlations of less than 0.3; and (ii) optimised Cronbach's coefficient alpha (Spector, 1992; Field, 2005). Nunnally (1978) provides a widely accepted rule-of-thumb that alpha should be at least 0.7 for a scale to demonstrate internal consistency. However, for psychological constructs, values below 0.7 can, realistically be expected because of the diversity of the constructs (Kline, 1999). This study adopted a minimum value for Cronbach's coefficient alpha of 0.6, as recommended by Francis et al (2004). Detailed results of reliability analysis for the pilot study are presented in Appendix E. Table 5.4 shows the resulting coefficient alphas for each measurement scale.
Table 5.4: Internal reliability of pilot study scales for AT, SN, PC and intention scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of items</th>
<th>Cronbach’s alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>3</td>
<td>0.64</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>3</td>
<td>0.49</td>
</tr>
<tr>
<td>Perceived control</td>
<td>3</td>
<td>0.40</td>
</tr>
<tr>
<td>Intention</td>
<td>3</td>
<td>0.62</td>
</tr>
</tbody>
</table>

It is evident from table 5.4 that the measurement scales used in the pilot study exhibited low internal consistency and therefore required more work. This could be because of the relatively small number of items used in each scale. Consequently, as recommended by Litwin (2003), the scales were improved by (i) adding more items and (ii) re-examining the existing items for clarity. Details of the improvements made are described in the sub-section 5.6.4.

5.6.4 Improvements made to the instrument

Based on the results of the pilot study, a number of changes were made to the questionnaire. To improve the internal consistency reliability of the scales, extra items were added as follows:

- Three additional items were added to the perceived control scale, increasing the number of items to six;
- Two additional items were added to the subjective norm scale, increasing the number of items to five;
- Three additional items were added to the attitude scale, increasing the number of items to six; and
- Two additional items were added to the intention scale, increasing the number of items to five.

The belief-based items were also reviewed by looking at their descriptive statistics. Belief items with a limited range (i.e. if all the points on the response scale are not used) were removed. For instance, under outcome evaluations (Section A), items “For me to experience interruptions in the supply of water to my home after I have paid my bills in time is (extremely good/extremely bad)” and “For me to have a peace of mind is (extremely good/extremely bad)” were removed because responses resulted in uniformly negative and positive evaluations respectively. Also, within this section, and based on reports from the interviewers, a number of items were reworded to make them simpler and clearer. For items
under *behavioural belief strength*, the response scale was changed from likelihood (i.e. likely/unlikely) to agreement (agree/disagree) because the ‘agreement’ format was found to be easier to administer in local languages than the likelihood scale.

Furthermore, the number of control belief items (i.e. section F and G) was reduced from 16 to 10. This was necessary in order to maintain the length of the questionnaire following the addition of extra items in ATT, SN, PBC and intention measurement scales. Although, the belief elicitation study had revealed a wide range of control beliefs, the decision on how many should be included in the final questionnaire was made taking into account issues of questionnaire length and the need to minimise respondent fatigue. Other general changes made to the questionnaire included: (i) providing space on the cover page for interviewers to record the language used for face-face administration; and (ii) providing code numbers for all questions/statements to facilitate data entry in the computer.

Following the changes, the revised questionnaire was re-tested on a second sample of respondents before using it for main data collection. Kamuli town was selected for this second trial, and the sample size (80) that had been selected for the main study was used. Out of a total of 80 questionnaires sent out, 73 questionnaires were returned with useable answers. Item analysis was redone for the AT, SN, PC and intention scales. Cronbach’s alpha statistics were calculated to ascertain whether the internal consistency of each scale had improved. These statistics are presented in Table 5.5 and show that each measurement scale had acceptable to good internal reliability.

Exploratory factor analysis was not carried out at this stage because of the limited sample of responses (Bryman and Cramer, 1997). As a result, the factorial validity of the scales could not be established. Nevertheless, a decision was made to use the revised questionnaire for main data collection where a sufficiently large sample would allow further reliability tests and validation.

Table 5.5: Internal reliability of AT, SN, PC and intention scales after addition of extra items

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of items</th>
<th>Cronbach’s alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>6</td>
<td>0.896</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>5</td>
<td>0.652</td>
</tr>
<tr>
<td>Perceived control</td>
<td>5</td>
<td>0.830</td>
</tr>
<tr>
<td>Intention</td>
<td>5</td>
<td>0.759</td>
</tr>
</tbody>
</table>
5.7 MAIN DATA COLLECTION PROCEDURES

5.7.1 Production of final questionnaires

Following improvements to the questionnaire and subsequent re-testing using the Kamuli sample, preparations were made to use this revised version of the questionnaire for main data collection in the other seven towns. First, the questionnaire was proofread several times to check for any errors that might have been missed. It was then sent for mass reproduction using commercial copiers. A total of 700 questionnaires were produced. A copy for the final questionnaire is presented in Appendix F-1.

During the first week of February 2006, one Advanced level student and one undergraduate student from Makerere University Business School, Kampala were utilised to transfer respondents identification information from the sample lists to the blank questionnaires. Before transferring identification particulars, each questionnaire was thoroughly checked to make sure all the sections and pages were in the right order. As in the pilot study, questionnaires for each town were properly packed in two separate transparent document wallets, one for each interviewer assigned to the town.

5.7.2 Field administration procedures

As in the pilot study, two modes of questionnaire administration were used: unsupervised self-administration for respondents who claimed to understand all the contents of the questionnaire; and supervised face-to-face administration by trained interviewers for respondents who claimed not to understand some or all the contents of the questionnaire. Although supervised administration helps to reduce item non-response, it is likely to bring about distortions due to interviewer characteristics (Bourque and Fielder, 2003). For this reason, respondents who could understand the contents of the questionnaire were encouraged to complete it themselves.

During the period between 6th February 2006 and 8th February 2006, the author made contact individually, with each of the interviewers who had been trained before the pilot study, to brief them about the changes made to the questionnaire following the pilot phase. To further ensure that interviewers familiarise themselves with all the changes and field procedures, a three page briefing note titled “IMPORTANT INFORMATION, PLEASE READ BEFORE STARTING THE WORK” was included in each individual survey pack. A copy of this briefing note is shown in Appendix F-2.
Questionnaire administration commenced on Thursday, 9th February 2006 for most of the study towns, while for others, administration commenced on the weekend of 10th February 2006. In all cases, each team of interviewers reported first to the Area Manager of the private operator company in charge of managing water services in the town, who assigned them two technical field staff to assist them in locating the sampled households. Company field staff were however asked to keep away from the premises during the interview, in order to allow the respondents to respond freely and to minimise any bias. In order to minimise non-response, interviewers were instructed to arrange follow-up visits with respondents who opted for self-administration.

Interviewers were also required to note reasons for non-response by the sample customers, using the same reporting procedure as used in the pilot study. One of the interviewers in each town was requested to act as a team leader, to handle minor field logistical issues and to act as the author’s main point of contact. In line with Babbie’s (1973) recommendation, the author carried out impromptu random checks with a few respondents to verify that the interviews had been carried out.

Furthermore, in order to establish temporal stability of belief-based measures of AT, SN, and PC, a test-retest procedure was carried out in line with the recommendations of Ajzen (2002b). However, in order to save time and resources, only those respondents who had self-administered the questionnaire were considered for the re-test. After a period of two weeks, these respondents were contacted and requested to complete a shortened version of the same questionnaire. A copy of the cover letter sent out to request participation is given in Appendix F-3.

5.7.3 Ethical issues

Ethical issues in research are the concerns, dilemmas and conflicts that arise over the proper way to conduct research (Neuman, 1994). The main ethical issues in research involving human subjects can be summarised as harm (physical, psychological, or legal), consent, deception, privacy, anonymity and confidentiality (Neuman, 1994; Punch, 1998). Researchers conducting research involving human subjects are required to anticipate ethical issues involved and to show how they will be dealt with (Punch, 1998; Rudestam and Newton, 2001). In the current study, the following ethical issues were anticipated and addressed:
• *Psychological stress:* Data collection using a questionnaire written in English may cause some respondents to experience stress as a result of their inability to understand the contents of the questionnaire. In order to minimise this stress, interviewers were hired and trained to interpret and explain the contents of the questionnaire to those respondents who needed these services.

• *Informed consent of the respondents:* Interviewers were instructed to solicit informed consent of the respondents before administering the questionnaires. The same also applied to participants of the focus group discussions. In addition, the cover page of the questionnaire and the invitation letter for focus group discussions, provided a brief description of the purpose of the study, and a statement that participation in the study was completely voluntary (Neuman, 1994).

• *Privacy, anonymity, and confidentiality:* Many of the ethical issues relating to privacy and anonymity were minimised by the cross-sectional nature of the study design (Punch, 1998). Firstly, tracking of participants was through reference numbers in order to ensure anonymity. Secondly, with exception of a few respondents requested to participate in the test-retest procedure, most of the data collection was a ‘one-off’ undertaking, hence making it less intrusive and less of an imposition on a respondent’s privacy. Respondents were also assured of confidentiality of their responses, and that the results would be published only in summary statistical form. In addition, the researcher provided return envelopes for those respondents who preferred their completed questionnaires to be in sealed envelopes.

5.7.4 Response rate

A key consideration in survey research is the study’s response rate, that is, how many of the individuals selected for the survey actually participated (Babbie, 1973). Non-response bias is created when non-respondents’ would-be responses differ from the responses of those who participate in the study. Studies have shown that the magnitude of non-response bias depends on a study’s response rates (Chen, 1996). In addition, overall response rate is considered by many survey researchers as an indicator of the representativeness of sample respondents (Babbie, 1990; Neuman, 1994). Response rates of at least 50 percent, 60 percent and more than 70 percent are considered adequate, good and very good, respectively (Babbie, 1973).

In computing the response rate for this study, a procedure recommended by Babbie (1973) was adopted. According to Babbie (1973, p. 165), response rate is “...a measure of the researcher’s success in persuading sample members to participate, and he [or she] does not
count against himself [or herself] those whom he [or she] could not even contact". Thus, computation of response rate was based on only those questionnaires that were delivered.

The initial sample size for this study was 631. Out of these, a total of 126 questionnaires could not be delivered due to various reasons such as bad addresses, death, ill customers and disconnected customers. As a result, the net sample size is 505. The total number of filled questionnaires returned was 492. However, two questionnaires were excluded from the analysis because less than half of the questions were answered. This resulted in an effective response of 490 questionnaires, which when divided by the net sample size gives a response rate of 97 percent. Details of the computation are presented in Appendix F-4. This is a very good response rate according to Babbie's (1973) classification – one that is rarely achieved in surveys of this kind. It is likely that the use of both self-administration and face-to-face administration helped to increase the response rate. In fact, a total 161 respondents (33 percent) opted to self-administer the questionnaire, while the majority (329) had face-to-face administration by interviewers.

5.7.5 Bill payment behaviour monitoring

Data for prompt bill payment behaviour (B), the main dependent variable, was obtained using a specially designed monitoring form. The form was designed to monitor customer response to the water bill for the end of February 2006 following questionnaire administration. Only those customers who had responded to the questionnaire were monitored. The bill payment behaviour monitoring form, designed using MS Excel, consisted of the following fields/columns (copy of the monitoring form is given in appendix F-5):

- An SPSS data row number: this is the row number within the SPSS data base in which data on all the questionnaire items was entered for a particular customer. This number was included on the monitoring form in order to track and match bill payment behaviour data with questionnaire data for each respondent.
- Customer reference number: this is the same reference number used to identify each respondent. It was included on the monitoring form to further help in tracking and corresponding questionnaire data with bill payment behaviour data.
- Road/zone or address of the customer/respondent (where applicable)
- Billing amount (in Uganda Shillings) for February 2006, denoted by B_r: this was recorded by the manager of the billing department in each of the towns.
• Outstanding bills at end of last month (i.e. at end of January), denoted by $B_o$: data obtained from the billing database.
• Payments made during the month of February (i.e. prepaid balance brought forward), denoted by $B_p$: data for this was obtained from the billing database.
• Total outstanding debt at end of February 2006, denoted by $B_t$: computed by the researcher using $B_t = B_f + B_o - B_p$
• Billing date: this was recorded by the billing departments.
• Date customer actually received the February billing note: this was recorded by the field staff who distributed the bills at the end of the month.
• Total payments (in Uganda Shillings) made within the 15 days window: this was recorded by the managers of the billing departments in each town and confirmed by the researcher using receipt records.
• Proportion of total debt paid within 15 days (i.e. prompt bill payment behaviour): this was computed by the researcher.

5.8 TECHNIQUES FOR DATA ANALYSIS

The process of data analysis for this study followed three main steps: (i) cleaning and organising data, i.e. data preparation; (ii) exploring the data using descriptive statistics and checking for reliability and validity of measures; and (iii) testing hypotheses using inferential statistics. The main computer software used for statistical analysis of the data was SPSS for Windows 12.0. In setting up the SPSS database, all variables (questionnaire items) were arranged in the same order in which they appeared in the questionnaire. This was done in order to make data entry quick and undemanding. As the response categories in the questionnaire were not pre-coded, a scoring key was created to facilitate direct data entry for all the variables. For each questionnaire that was entered, a classification number (same as the SPSS data row number) was allocated according to the sequence of data entry.

Data entry errors were checked and cleaned using a combination of random spot checks on the main database view window, and preliminary analyses involving frequency summaries and maximum/minimum scores. All entries falling outside acceptable limits and boundaries were tracked down to individual cases and corrected accordingly. A further step in data preparation was to transform reversed items on the AT, SN, PC and intention scales such that all scores on scale items were in the same direction.
In the second step of the data analysis process, a series of univariate analyses were conducted, yielding descriptive statistics for the various data items. As is customary with quantitative analysis of data, descriptive statistics were used to provide a powerful summary of the data using frequency distributions, measures of central tendency and dispersion (Bryman and Cramer, 1997; Trochim, 2002). All descriptive statistics were displayed in tables and graphs for easy inspection and interpretation. Scatter and box plots of scores were inspected to identify and deal with any extreme values or outliers.

Furthermore, because the measurement instrument utilised multi-item measures for the main independent variables, statistical procedures were carried out to combine items into composite scales for use in subsequent data analyses. First, it was necessary to test whether the sets of items used to measure the independent variables within the model (i.e. AT, SN, and PC) were independent from one another. This was done using exploratory principal component factor analysis to establish factorial validity. The second step in producing composite scales was to calculate global measures by obtaining the mean of scores for all items which consistently loaded together in the factor analysis. Internal consistency reliability of each scale was then examined using item-to-scale correlation and Cronbach’s alpha analysis. For reasons already given in section 5.6.3, internal consistency reliability analysis was not performed for belief-based measures. Instead, test-retest reliability or temporal reliability of belief-based measures was assessed based on the correlation coefficients between scores obtained from the two administrations of the same measures as described in section 5.7.2. Correlation coefficients equal or exceeding 0.7 were taken to mean good test-retest reliability (Litwin, 2003). In addition, a series of simple bi-variate correlations between direct and belief-based measures of AT, SN, and PC were carried out to confirm the validity of belief-based measures.

The above procedures constituted the preliminary analysis of the data. The final step in the data analysis process involved testing the hypotheses posited in this study. Inferential statistical methods were utilised for this purpose. The main requirement for using such methods is probability sampling (Bryman and Cramer, 1997). As reported in section 5.4, probability sampling techniques were utilised in selecting the study sample, hence satisfying the requirements for using inferential statistical methods in hypothesis testing.

Multiple regression analyses were carried out to examine the relative importance and explanatory power of the predictors of intentions and prompt bill payment behaviour. Two separate analyses were performed. The first analysis utilised regression techniques with ordinary least squares (OLS) estimation to examine the relative importance and explanatory
power of the three hypothesised predictors of intention, i.e. attitude, subjective norms and perceived control. The second set of analyses utilised logistic regression techniques to examine the relative importance and explanatory power of the two hypothesised predictors of prompt bill payment behaviour, i.e. intentions and perceived control. Finally, mediator regression analysis (Baron and Kenny, 1986) was carried out to examine the extent to which the effects of household characteristics on intentions are mediated by attitudes, subjective norms and perceived control.

5.9 CHAPTER SUMMARY

This chapter described the research design and methods used in collecting relevant field data for testing the main hypotheses and answering the research questions. A two-phase sequential qualitative/quantitative approach was adopted in this study. The main justification for adopting this approach was the need to elicit from the study population, modal accessible beliefs relating to paying water bills promptly. The first phase utilised a qualitative approach to explore and generate these modal themes which were then used in constructing a measurement instrument for quantitative main data collection in the second phase.

Detailed procedures followed in developing the instrument were presented, including multiple pre-testing of the instrument and pilot study. Based on the results of reliability analysis, the instrument was refined and improved. It was then utilised in a cross-sectional survey design to investigate how independent variables specified in the conceptual framework influence prompt bill payment behaviour among customers of small urban water utilities in Uganda. The cross-sectional survey utilised both unsupervised self-administered questionnaire and supervised face-to-face administration by trained interviewers in the collection of relevant data. The procedures for sampling and questionnaire administration were reported. Finally, the techniques used in analysing the data obtained were briefly discussed. The next chapter presents the patterns of results and analyses them for their relevance to the research hypotheses.
6.1 CHAPTER INTRODUCTION

Chapter 5 described the research design and procedures followed in collecting relevant field data for testing the main hypotheses and answering the research question posed in this study. Chapter 5 also briefly discussed the process and statistical techniques used in analysing the collected data. The current chapter presents the patterns of results and analyses them for their relevance to the research hypotheses. Detailed discussions of the significance of the findings within the context of the reviewed literature are presented in Chapter 7.

Chapter 6 is organised according to the following sections:

- Section 6.2 presents descriptive data on the demographic characteristics of the study sample;
- Section 6.3 presents psychometric properties of the multi-item scales used to measure the main constructs in the study;
- Section 6.4 presents results of a preliminary analysis, including descriptive statistics, and pair wise correlations;
- Section 6.5 presents the results of multiple regression;
- Section 6.6 reviews the various assumptions of regression analysis and provides evidence of the robustness of the resulting models;
- Section 6.7 presents results of mediator analyses examining the extent to which effects of household characteristics on intentions are mediated by attitudes, subjective norms and perceived behavioural control.

For all hypothesis tests, significance of test statistic is reported in the three ways suggested by Coolican (1990), based on the $p$ probability level as follows:

- 'significant': $0.05 > p \geq 0.01$
- 'highly significant': $0.01 > p \geq 0.001$
- 'very highly significant': $p < 0.001$
All probabilities reported are based on two-tailed tests as the hypotheses did not specify the direction of the relationships. There is a long standing controversy among social scientists on whether it is ever appropriate to use a one-tailed test. A one-tailed test has more power to detect significant results, but it requires that the researcher specifies the direction of a hypothesis before analysing the data (Coolican, 2004). Although the theoretical base of the current research would intuitively point to directional hypotheses, it is deemed safer not to specify the direction of the hypotheses (Coolican, 2004).

Finally, effect sizes for all relevant statistical tests are described according to Cohen’s (1988) conventions of ‘small’, ‘medium, and ‘large’. For correlation analysis, this corresponds to $r = .1$ (small effect), $r = .3$ (medium effect) and $r = .5$ (large effect). In terms of proportion of variance explained, a small effect explains one percent of the total variance, a medium effect accounts for nine percent of total variance and a large effect accounts for more than 25% of total variance (Cohen, 1988).

### 6.2 SAMPLE CHARACTERISTICS

As reported in Chapter 5 (Section 5.7.4), a total of 490 useable questionnaires were returned. Respondents provided information on the following household characteristics: (i) gender of the household head; (ii) household size; (iii) number of years the household head has spent in formal education; (iv) occupation of the household head; (v) ownership status of the premises occupied by the household; and (vi) monthly household income. To reduce response bias in income reporting, respondents were not asked to state precise income figures. Instead, respondents were given seven income brackets, and asked to indicate which bracket they were in. This technique is well tested and commonly used in the marketing and management literature (Gulyani et al., 2005). Table 6.1 displays a summary of the categorical data obtained on all the above characteristics.

Results shown in Table 6.1 indicate that slightly more males (51.5 percent) than females (48.5 percent) completed the questionnaire. Given that the questionnaire only targeted household heads, this results is fairly comparable with a recent national household survey (Uganda Bureau of Statistics, 2003), which found that 64 percent of households in Uganda’s urban areas are headed by males. The table also shows that over half (52 percent) of the sampled households have 6 to 10 people. The household size modal statistic for the study sample is fairly consistent with the Ugandan National Household Survey 2001/02, which found that
about 40 percent of households in urban areas have a household size of 5-10 people (Uganda Bureau of Statistics, 2001).

Table 6.1: Sample Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Valid Cases (N)</th>
<th>Category Description</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender of household head</td>
<td>487</td>
<td>Male</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>48.5</td>
</tr>
<tr>
<td>Household size</td>
<td>462</td>
<td>1 – 5 people</td>
<td>30.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 – 10 people</td>
<td>52.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Over 10 people</td>
<td>17.5</td>
</tr>
<tr>
<td>Ownership status of the premises occupied by the household</td>
<td>487</td>
<td>Privately owned by family</td>
<td>79.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Government/company owned and allocated/rented to household</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Privately owned and rented to household</td>
<td>14.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>1.0</td>
</tr>
<tr>
<td>Number of years household head has spent in formal education</td>
<td>475</td>
<td>Less than 7 years</td>
<td>13.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 7 and 12 years</td>
<td>32.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 13 and 16 years</td>
<td>29.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than 16 years</td>
<td>23.8</td>
</tr>
<tr>
<td>Occupation of household head</td>
<td>486</td>
<td>Civil servant</td>
<td>25.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employed by private company</td>
<td>6.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self employed professional</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self employed in business</td>
<td>38.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other (e.g. housewife, no formal employment etc)</td>
<td>25.1</td>
</tr>
<tr>
<td>Monthly household income (Uganda Shillings)</td>
<td>480</td>
<td>Less than or equal to 50,000</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 50,000 and 100,000</td>
<td>21.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 100,000 and 150,000</td>
<td>17.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 150,000 and 200,000</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 200,000 and 250,000</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between 250,000 and 300,000</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than 300,000</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Source: Survey Data
House premises are predominantly privately owned by the household (79 percent). This finding is inconsistent with results of a survey by the Uganda Bureau of Statistics Survey (2001) which reported that a large percentage (56 percent) of urban dwellings are rented. The discrepancy could be because small urban centres, the setting of the current study, also tend to have characteristics of rural areas (Mugabi, 2005; Mugabi and Njiru, 2006), where 90 percent of households live in family-owned dwellings (Uganda Bureau of Statistics, 2001).

Table 6.1 further shows that 86 percent of the respondents completed at least seven years of formal education. This figure is consistent with the recent Uganda National Household Survey which estimated the percentage of adults in urban areas who have completed at least seven years of formal education at 87 percent (Uganda Bureau of Statistics, 2003). Formal education was taken to include basic primary and secondary education, vocational, undergraduate and postgraduate studies, as well as other professional training courses.

Sample results also reveal that more household heads (43 percent) are self-employed in business and professional sector, compared to 32 percent in formal employment (mainly as civil servants). A sizeable number (25 percent) are without formal employment. In addition, self-reports of income revealed that a majority (73 percent) of sample respondents have monthly household income below 200,000 Uganda Shillings (equivalent to about 57 GBP). This percentage is fairly consistent with Uganda Bureau of Statistics (2001) estimate of 62 percent for urban areas. Based on Uganda Bureau of Statistics (2001) criteria, these households can be classified as low to middle income households, with those earning 50,000 Uganda Shillings or less (26 percent) classified in the low-income class. A sizeable number (27 percent) of the respondents reported a monthly income above 200,000 Uganda Shillings, and can be classified in the high income class using the same criteria.

In summary, comparisons with the Uganda Bureau of Statistics (2001; 2003) population and housing data indicate that the sample is similar in many ways to the population from which it was drawn. The following section (6.3) examines the psychometric properties of the measurement instrument used to collect the data that is reported and analysed in Section 6.4 onwards.
6.3 PSYCHOMETRIC PROPERTIES OF THE MEASUREMENT SCALES

6.3.1 Factorial validity

Validity in scientific investigation means measuring what one claims to be measuring. This property is difficult to assess and has many dimensions (Fink, 1995b). For measurements involving the use of questionnaires, one of the dimensions usually assessed is factorial validity. This type of validity is concerned with assessing how well questionnaire items cluster into groups (or factors) which make intuitive sense to the investigator.

As discussed in Chapter 4 (Sections 4.3 and 4.4), this study adapted three main constructs from theory to explain customer intentions and bill payment behaviour. These were: attitude towards paying water bills promptly (AT), subjective norm (SN) and perceived control (PC) with respect to paying water bills promptly. Operational definitions of these constructs were provided in Chapter 5 (Section 5.5.1), and measurement scales were developed, piloted and refined before using them to collect data from respondents. Although the pilot study revealed an acceptable level of internal consistency for the pool of items used to measure each construct (Table 5.5), the factor structure of the items was not established due to the small samples involved. It is therefore necessary to establish the factorial structure of the measurement scales used and re-examine their reliability before proceeding with detailed analysis and hypothesis testing.

In order to define the internal structure of the set of items and assess whether they measured what they were intended to measure, we performed an exploratory factor analysis (Pett et al., 2003). The objective was to test whether the items used to measure AT, SN and PC correlate highly onto meaningful groups representing those constructs. Detailed results of the factor analysis are presented in Appendix G-1. Prior to extracting the underlying factors in the set of items, it was necessary to assess: (i) whether factor analysis was appropriate for this data set, and (ii) whether the technique could be expected to yield common factors (Hutcheson and Sofroniou, 1999; Tabachnick and Fidell, 2001; Pett et al., 2003; Field, 2005). For these two assessments, the following procedure was adopted. First, the correlation matrix presented in Appendix G-1 was closely examined to determine the extent to which the items measuring AT, SN and PC correlate with each other. Secondly, statistical tests were performed to evaluate the strength of the linear associations among the items in the correlation matrix, and to assess the adequacy of the sample size.
Examination of the correlation matrix indicates that 14 out of the 17 items correlated ≥ |.30| with at least one other in the matrix (range: 1-7). Eight of the 17 items (50%) had four or more shared correlations that exceed |.30|. No inter-item correlation exceeded r = .714, thus indicating no problems with multicollinearity (Pett et al., 2003). Bartlett’s test of sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were used to evaluate the strength of the linear associations among the 17 items in the correlation matrix. Bartlett’s test was very highly significant ($\chi^2 = 2371.190$, $p = .000$), indicating that the correlation matrix is not an identity matrix (Tabachnick and Fidell, 2001; Pett et al., 2003). The KMO statistic (.88) was higher than the recommended index of .60, and the individual indices for all variables were above .70, suggesting a sufficient sample size relative to the number of items in the entire scale (Field, 2005). These results suggest that exploratory factor analysis is appropriate for this data set, and could be expected to yield common factors (Hutcheson and Sofroniou, 1999; Tabachnick and Fidell, 2001; Pett et al., 2003; Field, 2005).

In order to locate the underlying dimensions of the data set, principal components analysis was preferred to principal-axis factoring, as it is a straightforward, easily understood technique recommended by several authors (Guadagnoli and Velicer, 1988; Stevens, 1992; Pett et al., 2003; Field, 2005). To define the initial number of factors, Keiser’s criterion (i.e. Eigenvalue > 1) was used in conjunction with the scree plot (Nunnally and Bernstein, 1994; Pett et al., 2003; Field, 2005). Keiser’s criterion initially extracted four factors. However, examination of the item communalities revealed an average communality of less than .6, thus indicating the possibility that the criterion is inaccurate for this data set (Stevens, 1992; Field, 2005). Consequently, a scree plot was used to define the number of initial factors. The scree plot yielded three factors explaining 50 percent of the total amount of variance in the 17 items. To assess the fit of the model, residuals were computed between the original/observed correlations and the reproduced correlations. There were less than 50 percent non-redundant residuals with absolute value greater than .05, indicating a good fit (Field, 2005).

Rotation of factors was carried out to improve interpretation and provide a simple structure. Pedhazur and Schmelkin (1991) describe a simple structure as one in which each item has a high, or meaningful loading on one factor only, and each factor has high or meaningful loadings for only some of the items. Such a simple structure serves as evidence for discriminant validity (Straub, 1989). Consistent with Pett et al. (2003), both orthogonal and oblique rotations were performed, and these yielded similar results. The orthogonal rotation was however retained because of the moderate component correlations obtained from the oblique rotation. For orthogonal rotation, the varimax method was preferred to other methods.
because it results in more interpretable clusters, and is considered by some researchers as the definitive orthogonal solution (Nunnally and Bernstein, 1994; Tabachnick and Fidell, 2001; Field, 2005). To ensure highly significant factor loadings, the variables/items for a factor were selected only when the size of the factor loading had an absolute value greater than .4 (Stevens, 1992).

Based on the initial rotated factor matrix, all the six items intended to measure AT clustered into one group. Similarly, five out of six items intended to measure PC clustered in one group, and four out of five items for SN clustered together. Item B12 ('It is expected of me that I pay my next water bill promptly' - strongly disagree/agree) loaded highly on the attitude group, but it was intended to measure subjective norms. Another item B4 ('Whether or not I pay my next water bill within 15 days is completely up to me' - strongly disagree/agree) had a weak loading on PC. It is likely that respondents misunderstood these items. The analyses were therefore re-run with these two items (B4 and B12) removed. The results of the final solution are summarised in Tables 6.2 and 6.3.

Table 6.2: Total variance explained by the three factors extracted*

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial eigenvalues</th>
<th>Extracted sums of squared loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of variance</td>
</tr>
<tr>
<td>1</td>
<td>5.18</td>
<td>34.54</td>
</tr>
<tr>
<td>2</td>
<td>1.80</td>
<td>12.01</td>
</tr>
<tr>
<td>3</td>
<td>1.24</td>
<td>8.24</td>
</tr>
</tbody>
</table>

* Extraction method: Principal Components Analysis

Source: Survey data

Table 6.2 shows that the three rotated factors together explained 54.8 percent of the variance in the remaining 15 items, which is higher than the 50 percent guideline for factorial validity (Pedhazur and Schmelkin, 1991). Table 6.3 shows that all attitude items loaded highly onto one factor, the remaining perceived control items loaded highly onto a second factor, and the remaining subjective norm items loaded onto a third factor. These results provide strong evidence for the validity of items used to measure attitude, subjective norms and perceived control (Straub, 1989; Pedhazur and Schmelkin, 1991).
Table 6.3: Rotated component matrix for AT, SN and PC scale items*

<table>
<thead>
<tr>
<th>Item Label</th>
<th>Item description/end points</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>B15</td>
<td>Generally speaking, I think paying water bills within 15 days is <em>(a very good practice/a very bad practice)</em></td>
<td>0.57</td>
</tr>
<tr>
<td>B16</td>
<td>Overall, I think that paying water bills within 15 days is <em>(extremely wrong/extremely right)</em></td>
<td>0.77</td>
</tr>
<tr>
<td>B17</td>
<td>Generally speaking, I think that paying my next water bill within 15 days is <em>(not beneficial at all/extremely beneficial)</em></td>
<td>0.81</td>
</tr>
<tr>
<td>B18</td>
<td>Generally speaking, I think that paying my next water bill within 15 days is <em>(extremely worthless/extremely valuable)</em></td>
<td>0.80</td>
</tr>
<tr>
<td>B19</td>
<td>Overall, I think that paying water bills within 15 days is <em>(extremely unfair/extremely fair)</em></td>
<td>0.65</td>
</tr>
<tr>
<td>B20</td>
<td>For me to pay my next water bill within 15 days of receiving the bill will be <em>(very pleasant/very unpleasant)</em></td>
<td>0.68</td>
</tr>
<tr>
<td>B9</td>
<td>I believe I have the ability to pay next water bill within 15 days of receiving it <em>(strongly disagree/strongly agree)</em></td>
<td>0.74</td>
</tr>
<tr>
<td>B7</td>
<td>For me to pay my next water bill within 15 days will be <em>(extremely impossible/extremely possible)</em></td>
<td>0.74</td>
</tr>
<tr>
<td>B1</td>
<td>For me to pay my next water bill within 15 days of receiving it will be <em>(very difficult/very easy)</em></td>
<td>0.74</td>
</tr>
<tr>
<td>B13</td>
<td>I am confident that I can pay my next water bill within 15 days, If I want to <em>(strongly disagree/strongly agree)</em></td>
<td>0.67</td>
</tr>
<tr>
<td>B6</td>
<td>How much control do you believe you have over your ability to pay for water bills within 15 days <em>(no control at all/complete control)</em></td>
<td>0.63</td>
</tr>
<tr>
<td>B11</td>
<td>The people in my life whose opinions I value pay their monthly water bills promptly <em>(strongly disagree/strongly agree)</em></td>
<td>0.83</td>
</tr>
<tr>
<td>B5</td>
<td>Most people who are important to me pay their water bills within 15 days <em>(completely false/completely true)</em></td>
<td>0.77</td>
</tr>
<tr>
<td>B22</td>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days <em>(extremely likely/extremely unlikely)</em></td>
<td>0.56</td>
</tr>
<tr>
<td>B2</td>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it <em>(strongly disagree/strongly disagree)</em></td>
<td>0.39</td>
</tr>
</tbody>
</table>

* Rotation Method: Varimax

Source: Survey data

The same procedure described above was applied to the measures of intention to pay water bills promptly. Detailed results for this analysis are presented in Appendix G-2, and a summary is shown in Table 6.4. From Table 6.4, it can be noted that all the five items used to measure intention clustered onto one factor as predicted a priori. This single factor solution...
accounted for 54 percent of the total variance in intention items, thus providing evidence of factorial validity (Pedhazur and Schmelkin, 1991).

Table 6.4: Rotated component matrix for intention scale items

<table>
<thead>
<tr>
<th>Item Label</th>
<th>Item description/end points</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3</td>
<td>I plan to pay my next water bill within 15 days of receiving it <em>(strongly agree/strongly disagree)</em></td>
<td>.65</td>
</tr>
<tr>
<td>B8</td>
<td>I will make an effort to pay my next water bill within 15 days of receiving it <em>(definitely false/definitely true)</em></td>
<td>.78</td>
</tr>
<tr>
<td>B10</td>
<td>I want to pay my next water bill within 15 days of receiving it <em>(definitely false/definitely true)</em></td>
<td>.82</td>
</tr>
<tr>
<td>B14</td>
<td>How likely is it that you will pay your next water bill within 15 days of receiving the bill <em>(extremely likely/extremely unlikely)</em></td>
<td>.61</td>
</tr>
<tr>
<td>B21</td>
<td>I intend to pay my next water bill within 15 days of receiving it <em>(strongly disagree/strongly agree)</em></td>
<td>.77</td>
</tr>
</tbody>
</table>

Rotation Method: Varimax

Source: Survey data

6.3.2 Convergent validity of belief-based measures

Convergent validity concerns the correspondence between a measure and other measures of the same theoretical construct. To the extent that a correlation exists (i.e. the measures converge) the internal validity of each measure is confirmed (Mitchell and Carson, 1989). As discussed in Chapter 5 (Section 5.5.2), the variables AT, SN and PC were measured both directly and indirectly using the associated behavioural, normative and control beliefs.

Consistent with the expectancy value formulations (Eqn. 5.1, 5.2, and 5.3), *behavioural belief strength* (bₙ) was weighted (multiplied) with the corresponding score of *outcome evaluation* (eₙ) to create a new variable that represents the weighted score for each behavioural belief. Similarly, *normative belief strength* (nₙ) was weighted by the score for *motivation to comply* (mₙ) and *control belief strength* (cₙ) by the score representing the *control belief power* (pₙ). Weighted behavioural, normative and control beliefs were averaged to create belief-based measures of AT, SN and PC respectively. Belief-based measures are expected to correlate significantly with the respective direct measures of AT, SN and PC (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Ajzen, 1991; Francis et al., 2004b). Direct and belief-based
measures of AT correlated at $r = .28$ (p<.001), while those of SN and PBC correlated at $r = .33$ (p<.001) and $r = .19$ (p<.001) respectively. All correlation coefficients were moderate but very highly significant, thus confirming the convergent validity of belief-based measures (Francis et al., 2004b).

6.3.3 Reliability analysis

An instrument must not only be valid, but also reliable. All instruments, especially those that examine behaviours, are subject to measurement error. The reliability of an instrument refers to the extent to which scores on an instrument are free from this measurement error (Pedhazur and Schmelkin, 1991). In this study, reliability assessment focused on two aspects: internal consistency and temporal stability (Pett et al., 2003). Internal consistency refers to how well the items that make up an instrument or one of its subscales fit together. As discussed in Chapter 5 (section 5.6.3), this criterion of assessing reliability can reasonably be applied to direct measures of AT, SN, and PC, but not to belief-based measures (Ajzen, 2002b).

For reasons already explained in Chapter 5 (section 5.6.3), internal consistency of attitude, subjective norms, perceived control and intention scales was assessed using Cronbach’s coefficient alpha (Pedhazur and Schmelkin, 1991; Spector, 1992; Field, 2005). Details of internal consistency reliability analysis are presented in Appendix G-3. A summary of the analysis, showing Cronbach’s coefficient alpha for each scale are presented in Table 6.5. Cronbach’s alpha statistics show that each scale had acceptable to good internal reliability (Nunnally, 1978; Kline, 1999; Francis et al., 2004).

Temporal stability, which is concerned with the consistency of repeated measures of the same construct, was also assessed for the intention variable, as well as for the direct and belief-based measures of AT, SN, and PC constructs (Ajzen, 2002b).

Table 6.5: Internal consistency reliability of AT, SN, PC and intention scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Valid cases (N)</th>
<th>Final scale items</th>
<th>Cronbach’s alpha</th>
<th>Item-to-total correlations (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>485</td>
<td>6</td>
<td>.84</td>
<td>.45 - .72</td>
</tr>
<tr>
<td>SN</td>
<td>483</td>
<td>4</td>
<td>.65</td>
<td>.38 - .49</td>
</tr>
<tr>
<td>PC</td>
<td>482</td>
<td>5</td>
<td>.79</td>
<td>.39 - .67</td>
</tr>
<tr>
<td>Intention</td>
<td>478</td>
<td>5</td>
<td>.77</td>
<td>.43 - .65</td>
</tr>
</tbody>
</table>

Source: Survey data
As reported in Chapter 5 (section 5.7.2), a test-retest procedure was carried out in which a sample of those respondents who self-administered the questionnaire, were requested to respond to the same questions after a period of two weeks – a recommended time period between testing times for test-retest reliability analysis (Pedhazur and Schmelkin, 1991; Nunnally and Bernstein, 1994). Out of a total of 85 re-test questionnaires sent out, only 35 useable questionnaires were returned. Table 6.6 shows a series of bivariate correlations between measures at the two time points.

Table 6.6: Test-retest correlations

<table>
<thead>
<tr>
<th>Measure</th>
<th>Valid cases (N retest)</th>
<th>Test-retest Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct measure of attitude</td>
<td>35</td>
<td>.10**</td>
</tr>
<tr>
<td>Direct measure of subjective norm</td>
<td>34</td>
<td>.31*</td>
</tr>
<tr>
<td>Direct measure of perceived control</td>
<td>35</td>
<td>.70***</td>
</tr>
<tr>
<td>Weighted behavioural beliefs ((b_i \times e_i))</td>
<td>35</td>
<td>.49**</td>
</tr>
<tr>
<td>Weighted normative beliefs ((n_i \times m_i))</td>
<td>35</td>
<td>.10**</td>
</tr>
<tr>
<td>Weighted control beliefs ((c_i \times p_i))</td>
<td>34</td>
<td>.31*</td>
</tr>
<tr>
<td>Intention</td>
<td>34</td>
<td>.19**</td>
</tr>
</tbody>
</table>

*** Significant at p<.001  ** significant at p<.01  * Significant at p<.05  ns - not significant at p<.05

Source: Survey data

The results displayed in table 6.6 reveal that that measures for behavioural beliefs, subjective norms and perceived control had significant medium to large test-retest correlation coefficients, while those of normative beliefs, control beliefs, attitude, and intention had low to medium test-retest correlation coefficients. However, with the exception of perceived control, none of the other measures have a test-retest correlation coefficient equal or exceeding .7 – a level recommended by Litwin (2003) as indicating good temporal stability. Therefore, based on the magnitude of the test-retest correlation coefficients, the perceived control variable appears to have good temporal stability (test-retest r =.7), while subjective norms, behavioural beliefs and control belief measures have only moderate stability (test-retest r values = .31, .49, and .31 respectively).

On the other hand, the low test-retest correlations obtained for attitude (r =.10), normative beliefs (r =.10) and intentions (r =.19) suggests that these measures lacked temporal stability.
For the prediction of intentions from attitudes, lack of temporal stability is unlikely to be a major concern since both variables are measured at the same time. However, low stability of the intention measure tends to affect the ability of intentions to predict behaviour at a later point in time (Sheeran et al., 1999; Conner, 2000; Ajzen and Fishbein, 2005).

6.3.4 Summary of psychometric properties of the measurement scales

On the whole, the above assessment suggests that the measurement scales used to collect data on the primary variables had good levels of validity and reliability. Exploratory factor analysis of items intended to measure attitude, subjective norm and perceived control yielded a three factor structure that explained more than 50 percent of the variance, implying good scale validity (Pedhazur and Schmelkin, 1991). Moreover, the moderate but very highly significant correlation coefficients between direct and belief-based measures of these constructs confirmed the convergent validity of belief-based measures. Similarly, all items on the intention scale clustered onto one factor accounting for 54 percent of the total variance in intention items, thus providing evidence of scale validity.

Internal consistency reliability analysis for all scales revealed acceptable to good levels of reliability. But test-retest reliability for direct measures of attitude and intentions, as well as for normative beliefs was low, implying that the temporal stability of these measures was suspect. Having established these properties, the thesis can now proceed with presenting the results of various analyses carried out on the data.

6.4 PRELIMINARY ANALYSIS

Following the psychometric evaluation presented in the preceding sections, composite measures for the predictor and outcome variables in the research model were created. Based on the results of the exploratory factor analysis, items which loaded together were averaged to create composite scores for AT, SN, PC and intention variables. In order to minimise measurement bias, cases with missing responses on any one of the scale items were omitted.

Data for prompt bill payment behaviour (PB), the main outcome variable, was obtained using a specially designed monitoring form as described in Chapter 5 (section 5.7.5). The bill payment behaviour monitoring data was used to compute a PB score, given as the proportion of the total water bill/debt paid by the customer within the 15-day window allowed by the
service provider. Although data on the actual payments made by customers was readily available from the billing databases, information on the actual payment dates needed to be cross-checked with actual receipts records. In some cases, discrepancies were discovered between the date recorded on the monitoring form and the date on the copy of the customer’s receipt retained by the service provider. For such cases, the date on the customer’s receipt was used, because it was assumed that customers would normally demand their receipts upon making payments, and therefore, the date on the receipt would most probably be the actual date on which payment was made.

A further consideration in preparation of PB data was the date the customer actually received the water bill. This was a critical piece of information because it determines the beginning of the 15-day window. In cases where this information was missing or suspected to be erroneous, entries for PB data were omitted altogether. In addition, those respondents whose end of February 2006 water bill was not delivered to them were also omitted. Consequently, out of a total of 490 respondents who participated in the survey, 41 entries for prompt bill payment behaviour were omitted. A big proportion (27) of these cases came from Kayunga town, where most of the water bills for the month of February 2006 were not delivered to customers because the service provider experienced technical problems with the billing software.

6.4.1 Descriptive statistics

As discussed in Chapter 5 (section 5.5.5), a combination of bipolar (-2 to +2) and uni-polar (1 to 5) scoring was utilised depending on the nature of the construct. For descriptive purposes, mean scores on each of the 5-point scales are classified into six categories as shown in table 6.7. A summary of the descriptive statistics for all variables is presented in tables 6.8 to 6.11.

On the basis of mean scores, it is apparent from table 6.8 that respondents had a favourable attitude towards paying water bills promptly, as shown by the high mean attitude score (4.25). It is also clear that they perceived high social pressure to pay water bills in time, and had high perceived control over the behaviour (i.e. they strongly believed they could do it). Respondents also indicated a fairly strong intention to pay their next water bill promptly, as shown by the high mean intention score (3.91).
Table 6.7: Mean score classification on 5-point scales

<table>
<thead>
<tr>
<th>Score on bi-polar scale ($S_b$)</th>
<th>Score classification/description</th>
<th>Score on uni-polar scale ($S_u$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_b &gt; 1.5$</td>
<td>Very high</td>
<td>$S_u &gt; 4.5$</td>
</tr>
<tr>
<td>$0.5 &lt; S_b \leq 1.5$</td>
<td>High</td>
<td>$3.5 &lt; S_u \leq 4.5$</td>
</tr>
<tr>
<td>$0 &lt; S_b \leq 0.5$</td>
<td>Fairly high</td>
<td>$3 &lt; S_u \leq 3.5$</td>
</tr>
<tr>
<td>$S_b = 0$</td>
<td>Uncertain</td>
<td>$S_u = 3$</td>
</tr>
<tr>
<td>$-0.5 \leq S_b &lt; 0$</td>
<td>Fairly low</td>
<td>$2.5 \leq S_u &lt; 3$</td>
</tr>
<tr>
<td>$-1.5 \leq S_b &lt; -0.5$</td>
<td>Low</td>
<td>$1.5 \leq S_u &lt; 2.5$</td>
</tr>
<tr>
<td>$S_b &lt; -1.5$</td>
<td>Very low</td>
<td>$S_u &lt; 1.5$</td>
</tr>
</tbody>
</table>

Indeed, a majority (78 percent) had intentions to pay their next water bill within 15 days of receiving the bill. A very small number (2 percent) expressed no intentions, while a sizeable proportion (19 percent) was uncertain. However, actual behaviour data (PB data) suggests that on average respondents were able to pay only 33 percent of their total water bill within the 15-day window.

Table 6.8: Descriptive statistics for main composite variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Valid cases (N)</th>
<th>Max score</th>
<th>Min score</th>
<th>Mean score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>485</td>
<td>5</td>
<td>2</td>
<td>4.25</td>
<td>0.54</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>483</td>
<td>5</td>
<td>2</td>
<td>3.54</td>
<td>0.62</td>
</tr>
<tr>
<td>Perceived control</td>
<td>482</td>
<td>5</td>
<td>1</td>
<td>3.83</td>
<td>0.64</td>
</tr>
<tr>
<td>Intention</td>
<td>478</td>
<td>5</td>
<td>1</td>
<td>3.91</td>
<td>0.62</td>
</tr>
<tr>
<td>Prompt bill payment behaviour</td>
<td>450</td>
<td>1</td>
<td>0</td>
<td>0.33</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Source: Survey data

Categorising the behaviour data further reveals that only 19 percent of the respondents fully paid their bill within the 15 days of receipt of the bill. Over half (58 percent) of the respondents did not pay anything within the 15-day window, while a sizeable number (15 percent) paid 50 percent or more of their water bill. A small number of respondents (8 percent) only paid less than half of their water bill.
Table 6.9 shows the descriptive statistics for the belief-based measures of attitude. The mean scores for behavioural belief strength reveal that customers believed strongly that paying water bills in time is likely to result in (i) a reliable service with no interruptions; (ii) being served by staff that have the necessary facilities and motivation to perform their job; (iii) being served by a properly maintained piped water supply system; (iv) foregoing other household needs; (v) avoiding huge accumulated debts; and (vi) avoiding disconnection.

**Table 6.9: Descriptive statistics for belief-based measures of attitude**

<table>
<thead>
<tr>
<th>Variable (label)</th>
<th>Valid cases</th>
<th>Max score</th>
<th>Min score</th>
<th>Mean score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome evaluation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective value of a reliable supply (A1)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>1.61</td>
<td>0.73</td>
</tr>
<tr>
<td>Subjective value of being served by well equipped and motivated staff (A2)</td>
<td>488</td>
<td>2</td>
<td>-2</td>
<td>1.52</td>
<td>0.62</td>
</tr>
<tr>
<td>Subjective value of being served by a properly maintained water system (A3)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>1.65</td>
<td>0.55</td>
</tr>
<tr>
<td>Foregoing other household needs (A4)</td>
<td>487</td>
<td>2</td>
<td>-1</td>
<td>1.26</td>
<td>0.65</td>
</tr>
<tr>
<td>Value of avoiding accumulated bills (A5)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>1.24</td>
<td>1.06</td>
</tr>
<tr>
<td>Subjective value of remaining connected (A6)*</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>1.63</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>Behavioural belief strength</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood of a reliable supply</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>3.54</td>
<td>1.14</td>
</tr>
<tr>
<td>Likelihood of being served by well equipped and motivated staff (E2)</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>3.83</td>
<td>0.95</td>
</tr>
<tr>
<td>Likelihood of being served by a properly maintained water system (E3)</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>3.77</td>
<td>1.01</td>
</tr>
<tr>
<td>Likelihood of foregoing household needs (E4)</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>3.43</td>
<td>1.22</td>
</tr>
<tr>
<td>Likelihood of avoiding accumulated bills (E5)</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>4.43</td>
<td>0.71</td>
</tr>
<tr>
<td>Likelihood of avoiding disconnection (E6)</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>4.46</td>
<td>0.70</td>
</tr>
</tbody>
</table>

* Item reverse scored because it was negatively worded in the questionnaire

Evidence for these strong beliefs is given by the high mean score on the behavioural belief strength for each behavioural outcome. Also, the mean outcome evaluation scores indicate that customers value these behavioural outcomes highly positively. For four out of the six behavioural outcomes, the mean scores were very high (>1.5) and identical, suggesting that all these outcomes were very important to the customers, and that none of them would exert an overwhelming influence on attitudes.

Regarding normative beliefs, descriptive statistics presented in table 6.10 show that 'family' and 'service provider' have the highest mean scores on normative belief strength (mean scores 115...
= 1.58, 1.63), and that respondents were more motivated to comply with their family members and water service provider (mean scores = 4.94, 4.71). Respondents also believed that water vendors were unlikely to approve their paying water bills promptly (mean score = -0.7).

Table 6.10: Descriptive statistics for belief-based measures of subjective norms

<table>
<thead>
<tr>
<th>Variable (label)</th>
<th>Valid cases</th>
<th>Max score</th>
<th>Min score</th>
<th>Mean score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normative belief strength</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighbours (C1)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>0.76</td>
<td>0.92</td>
</tr>
<tr>
<td>Family members (C2)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>1.58</td>
<td>0.63</td>
</tr>
<tr>
<td>Service provider (C3)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>1.63</td>
<td>0.64</td>
</tr>
<tr>
<td>Water vendors (C4)</td>
<td>487</td>
<td>2</td>
<td>-2</td>
<td>-0.70</td>
<td>1.36</td>
</tr>
<tr>
<td><strong>Motivation to comply</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With neighbours (D1)</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>4.30</td>
<td>1.02</td>
</tr>
<tr>
<td>With family members (D2)</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>4.94</td>
<td>0.35</td>
</tr>
<tr>
<td>With service provider (D3)</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>4.71</td>
<td>0.63</td>
</tr>
<tr>
<td>With water vendors (D4)</td>
<td>486</td>
<td>5</td>
<td>1</td>
<td>3.28</td>
<td>1.32</td>
</tr>
</tbody>
</table>

Sources: Survey data

In the case of control beliefs, it is clear from table 6.11 that the given range of eight barriers of prompt bill payment behaviour were perceived as occurring less frequently, as shown by the fairly low mean scores (<3) for control belief strength relating to these factors. In contrast, the low mean score (1.71) for ‘how often are your water bills delivered to you in time .... ’ and the high mean score (3.79) for ‘how often do you receive reminder visits or notices.... ’ suggests that customers regularly receive their monthly water bill in time, but rarely receive reminder visits or notices from the service provider to remind them of any outstanding bills.

In terms of how these perceived inhibitors/facilitators influence behaviour, the low mean scores for control belief power suggests that perceived inhibitors, if they occurred, would make it difficult to pay water bills promptly. Customers were however almost uncertain (mean score = -0.07) whether the coloured or unclear appearance of their tap water would make it difficult for them to pay water bills promptly. The mean scores also reveal that customers believe it would be difficult to pay a water bill in time if the bill is not delivered in time. It is also believed, as shown by the high mean score (0.72), that receiving reminder visits or notices from the service provider would make it much easier to pay water bills promptly.
### Table 6.11: Descriptive statistics for belief-based measures of perceived control

<table>
<thead>
<tr>
<th>Variable (label)</th>
<th>Valid cases</th>
<th>Max score</th>
<th>Min score</th>
<th>Mean score</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control belief strength</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly water bill too high (F1)</td>
<td>489</td>
<td>5</td>
<td>1</td>
<td>2.64</td>
<td>1.19</td>
</tr>
<tr>
<td>Frequent of service interruptions (F2)</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>2.97</td>
<td>1.04</td>
</tr>
<tr>
<td>Water bills delivered on time (F3)*</td>
<td>485</td>
<td>5</td>
<td>1</td>
<td>1.71</td>
<td>0.87</td>
</tr>
<tr>
<td>Inability to understand the water bill (F4)</td>
<td>486</td>
<td>5</td>
<td>1</td>
<td>2.17</td>
<td>1.26</td>
</tr>
<tr>
<td>Mistakes in meter readings/incorrect bills (F5)</td>
<td>473</td>
<td>5</td>
<td>1</td>
<td>1.80</td>
<td>1.13</td>
</tr>
<tr>
<td>Increase in water consumption (F6)</td>
<td>478</td>
<td>5</td>
<td>1</td>
<td>1.74</td>
<td>1.05</td>
</tr>
<tr>
<td>Unanticipated circumstances (F7)</td>
<td>486</td>
<td>5</td>
<td>1</td>
<td>2.59</td>
<td>0.10</td>
</tr>
<tr>
<td>Reminder visits or notices (F8)*</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>3.79</td>
<td>1.26</td>
</tr>
<tr>
<td>Coloured and unclear water (F9)</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>2.12</td>
<td>1.12</td>
</tr>
<tr>
<td>Financial difficulties (F10)</td>
<td>488</td>
<td>5</td>
<td>1</td>
<td>2.87</td>
<td>0.89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Control belief power</strong></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly water bill too high (G1)</td>
<td>489</td>
<td>2</td>
<td>-2</td>
<td>-0.67</td>
<td>1.09</td>
</tr>
<tr>
<td>Frequency of service interruptions (G2)</td>
<td>488</td>
<td>2</td>
<td>-2</td>
<td>-0.54</td>
<td>1.16</td>
</tr>
<tr>
<td>Water bills not delivered on time (G3)</td>
<td>489</td>
<td>2</td>
<td>-2</td>
<td>-0.65</td>
<td>1.11</td>
</tr>
<tr>
<td>Inability to understand the water bill (G4)</td>
<td>490</td>
<td>2</td>
<td>-2</td>
<td>-0.60</td>
<td>1.09</td>
</tr>
<tr>
<td>Mistakes in meter readings/incorrect bills (G5)</td>
<td>487</td>
<td>2</td>
<td>-2</td>
<td>-0.67</td>
<td>1.08</td>
</tr>
<tr>
<td>Increase in water consumption (G6)</td>
<td>487</td>
<td>2</td>
<td>-2</td>
<td>-0.71</td>
<td>1.06</td>
</tr>
<tr>
<td>Unanticipated circumstances (G7)</td>
<td>488</td>
<td>2</td>
<td>-2</td>
<td>-0.77</td>
<td>1.02</td>
</tr>
<tr>
<td>Reminder visits or notices (G8)*</td>
<td>487</td>
<td>2</td>
<td>-2</td>
<td>0.72</td>
<td>1.06</td>
</tr>
<tr>
<td>Coloured and unclear water (G9)</td>
<td>487</td>
<td>2</td>
<td>-2</td>
<td>-0.07</td>
<td>1.15</td>
</tr>
<tr>
<td>Financial difficulties (G10)</td>
<td>489</td>
<td>2</td>
<td>-2</td>
<td>-0.94</td>
<td>0.94</td>
</tr>
</tbody>
</table>

* Item reverse scored because it was negatively worded in the questionnaire

Source: Survey data

#### 6.4.2 Correlation analyses

As a first step in investigating the relationships posited in the research model (Fig 4.1), pairwise correlations between the predictor and outcome variables were calculated. SPSS data outputs of pairwise correlations for all the major composite variables are displayed in table 6.12. From table 6.12, it can be seen that, in line with the predictions made in the conceptual framework, attitude, subjective norm and perceived control are all positively and highly significantly (p<0.001) associated with intentions. Thus, the more positive respondents' attitudes were to paying their next water bill within 15 days, the more social pressure they perceived, and the more control they perceived they had over the behaviour, the more likely they were to have strong intentions to fully pay their next water bill within the 15-day window.
Table 6.12: Pairwise correlation matrix for the main composite variables

<table>
<thead>
<tr>
<th></th>
<th>Attitude</th>
<th>Subjective norm</th>
<th>Perceived control</th>
<th>Intention</th>
<th>Prompt bill payment behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>.36***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived control</td>
<td>.45***</td>
<td>.47***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>.53***</td>
<td>.52***</td>
<td>.73***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Prompt bill payment</td>
<td>.09**</td>
<td>.05*</td>
<td>.11*</td>
<td>.14**</td>
<td>1</td>
</tr>
<tr>
<td>behaviour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** Significant at p<.001  ** significant at p<.01  * Significant at p<.05  ns - not significant at p<.05

Source: Survey data

Similarly, perceived control and intention were positively and significantly (at p <.05, and p<.01 respectively) associated with the objectively measured variable of prompt bill payment behaviour, implying that the stronger the respondents intentions to pay their next bill within 15 days, and the more control they perceived they had over this behaviour, the bigger the proportion of the total bill actually paid. Also, consistent with the theoretical predictions of the theory of planned behaviour (Ajzen, 1991), attitude-behaviour and subjective norm-behaviour relationships were small and statistically insignificant, suggesting that even for the behaviour of paying water bills in time, intentions are likely to be the immediate determinants of behaviour.

Furthermore, correlation analyses between the main composite variables (i.e. attitude, subjective norms, and perceived control) and their respective belief-based measures were computed. Table 6.13 shows the correlation coefficients for behavioural belief strength, outcome evaluation and weighted behavioural beliefs with attitude. With the exception of the belief relating to a reliable service, behavioural beliefs (weighted and strengths) for all other beliefs are positively and significantly associated with attitude. The correlation coefficients can be described as weak (r<.3) to moderately strong (r>.3). The belief that ‘paying the bill in time ensures that water is not disconnected’ has the strongest positive association (r = .42, p<.001) with attitude, suggesting that service disconnection plays a critical role in shaping customer attitudes towards prompt payment of bills.
From the magnitude of all the correlation coefficients, it is not apparent whether it is the outcome beliefs per se or their evaluation (outcome evaluation) that are more important in attitude formation. Nevertheless, it is clear from table 6.13 that the likelihood of not being disconnected for non-payment is more important in forming positive attitudes towards prompt bill payment than the subjective value attached to remaining connected. These results are discussed in more detail in the next chapter.

Table 6.13: Correlation of behavioural belief strength, outcome evaluation and weighted behavioural belief with attitude

<table>
<thead>
<tr>
<th>Behavioural beliefs</th>
<th>Belief strength (b)</th>
<th>Outcome evaluation (e)</th>
<th>Weighted behavioural belief (b x e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliable water supply</td>
<td>.01* ns</td>
<td>.07* ns</td>
<td>.05* ns</td>
</tr>
<tr>
<td>Served by well equipped and motivated staff</td>
<td>.11*</td>
<td>.12*</td>
<td>.11*</td>
</tr>
<tr>
<td>Served by properly maintained water system</td>
<td>.12**</td>
<td>.16**</td>
<td>.15**</td>
</tr>
<tr>
<td>Foregoing other household needs</td>
<td>.13**</td>
<td>.23***</td>
<td>.26***</td>
</tr>
<tr>
<td>Avoiding accumulated bills</td>
<td>.36***</td>
<td>.16***</td>
<td>.20***</td>
</tr>
<tr>
<td>Avoiding disconnection</td>
<td>.42***</td>
<td>.07* ns</td>
<td>.19***</td>
</tr>
</tbody>
</table>

*** Significant at p<.001  ** significant at p<.01  * Significant at p<.05  ns - not significant at p<.05

Source: Survey data

Regarding the underlying beliefs for subjective norms, the correlation analysis results displayed in table 6.14 show that customer perceptions of the normative expectations of neighbours (r = .39, p<.001) and family members (r = .25, p<.001) have the largest correlations with subjective norms, even after taking into account (or weighting) the customer's motivation to comply with these referents. However, customer's motivation to comply with family members appears to have no relationship (r=.00) with their perception of social pressure. A possible explanation for this can be traced to the fact that family is closer to the individual than any other referent group, and therefore, one is likely to feel some family pressure irrespective of whether they are motivated to comply with family member wishes or not.
Table 6.14: Correlation of normative belief strength, motivation to comply and weighted normative belief with subjective norm

<table>
<thead>
<tr>
<th>Normative referents</th>
<th>Belief strength ($n_i$)</th>
<th>Motivation to comply ($m_i$)</th>
<th>Weighted normative belief ($n_i \times m_i$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighbours</td>
<td>.39***</td>
<td>.24***</td>
<td>.39***</td>
</tr>
<tr>
<td>Family members</td>
<td>.25***</td>
<td>.00ns</td>
<td>.25***</td>
</tr>
<tr>
<td>Service provider</td>
<td>.15*</td>
<td>.12**</td>
<td>.16***</td>
</tr>
</tbody>
</table>

*** Significant at p<.001  ** significant at p<.01  * Significant at p<.05  ns - not significant at p<.05

Source: Survey data

Finally, the results of a correlation analysis of perceived control with control belief strength, control belief power and weighted control belief are presented in table 6.15. For control factors considered barriers to prompt bill payment, the correlation coefficients for control belief strength although small in magnitude ($r<.3$), have the expected negative signs, implying that the higher the perceived frequency of occurrence of these barriers, the lower the perceived control over performing the behaviour (i.e. paying the water bill in time). Out of a total of 10 control beliefs elicited, 8 have statistically significant (at p<.05 and p<.01) associations with perceived control.

However, on the basis of significant correlation coefficients between control belief power and perceived control, it can be noted that only three out of the eight control beliefs (i.e. occurrence of service interruptions, unanticipated circumstances, and financial difficulties) have the power to influence payment decisions – a finding that is discussed in more detail in the next chapter.
Table 6.15: Correlation of control belief strength, control belief power and weighted control belief with perceived control over the behaviour of paying water bills promptly

<table>
<thead>
<tr>
<th>Control beliefs</th>
<th>Belief strength (c₁)</th>
<th>Control belief power (p₁)</th>
<th>Weighted control belief (c₁ x p₁)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water bill too high</td>
<td>-.25***</td>
<td>.09 ns</td>
<td>.14**</td>
</tr>
<tr>
<td>Frequent service interruptions</td>
<td>-.11*</td>
<td>.10*</td>
<td>.12**</td>
</tr>
<tr>
<td>Water bills delivered on time</td>
<td>-.05ns</td>
<td>.06 ns</td>
<td>.02ns</td>
</tr>
<tr>
<td>Inability to understand the water bill</td>
<td>-.05ns</td>
<td>.04 ns</td>
<td>-.00ns</td>
</tr>
<tr>
<td>Mistakes in meter readings/incorrect bills</td>
<td>-.13**</td>
<td>.06 ns</td>
<td>.09*</td>
</tr>
<tr>
<td>Increase in water consumption</td>
<td>-.10*</td>
<td>.01 ns</td>
<td>.04ns</td>
</tr>
<tr>
<td>Unanticipated circumstances (e.g. illness)</td>
<td>-.14*</td>
<td>.18***</td>
<td>.21***</td>
</tr>
<tr>
<td>Reminder visits or notices</td>
<td>.23***</td>
<td>.03 ns</td>
<td>.07ns</td>
</tr>
<tr>
<td>Coloured and unclear water</td>
<td>-.09*</td>
<td>.04 ns</td>
<td>.08ns</td>
</tr>
<tr>
<td>Financial difficulties</td>
<td>-.28***</td>
<td>.23***</td>
<td>.27***</td>
</tr>
</tbody>
</table>

*** Significant at $p<.001$  ** significant at $p<.01$  * Significant at $p<.05$  ns - not significant at $p<.05$

Source: Survey data

6.5 REGRESSION ANALYSES

Following the pairwise correlations reported in the preceding section, regression analyses were carried out to examine the relative importance and explanatory power of the predictors of intentions and behaviour. Two separate sets of analyses were performed. The first analysis utilised linear multiple regression techniques with ordinary least squares (OLS) estimation to examine the relative importance and explanatory power of the three hypothesised predictors of intention to pay a water bill promptly (I), that is, attitude toward the behaviour (AT), subjective norms (SN) and perceived control (PC). The results of this analysis are discussed in section 6.5.1.

The second set of analyses utilised logistic regression techniques to examine the relative importance and explanatory power of the two hypothesised predictors of prompt bill payment behaviour (PB), that is, intention and perceived control. Logistic regression was deemed the
most appropriate technique because of the nature of the outcome variable. Although measured as the proportion of total water bill paid within 15 days, PB data exhibited little variation between the zero and 100 percent limits, as the descriptive analysis revealed in section 6.4.1. The distribution was positively skewed, with a majority of respondents (58 percent) clustering on the zero score and a small minority (13 percent) on the 100 percent score.

Although linear regression techniques do not make the assumption that the outcome variable is normally distributed (Allison, 1999a; Miles and Shevlin, 2001), the use of such a technique with a heavily skewed outcome variable would almost certainly lead to a poor model because the assumption of normally distributed residuals is difficult to sustain (Miles and Shevlin, 2001; Field, 2005). Therefore, logistic regression was utilised for the second set of analyses because, unlike linear regression, the technique makes no distributional assumptions about residuals (Allison, 1999a; Miles and Shevlin, 2001; Field, 2005). Details of model specification and a summary of the results for this analysis are discussed in section 6.5.2.

6.5.1 Predictors of intentions

To examine the relative importance and explanatory power of the three hypothesised predictors of intentions, a linear regression model was estimated with AT, SN and PC as the predictors. The preferred regression procedure was the 'forced entry' method, in which all three predictor variables were entered into the model simultaneously. This method was preferred because it is considered the only appropriate method for theory testing (Studenmund and Cassidy, 1987; Field, 2005). Regarding missing data, the method of list-wise deletion was employed to handle cases with missing data as recommended for large samples (Field, 2005). The regression model was specified as follows:

\[ I = \alpha + \beta_1 AT + \beta_2 SN + \beta_3 PC + \varepsilon \quad \text{Eqn 6.1} \]

where: \( I \) is intention to pay water bill promptly; \( AT \) is attitude towards paying water bill promptly; \( SN \) is subjective norm; \( PC \) is perceived control; \( \alpha \) is the regression constant and \( \varepsilon \) is the residual term.

The null hypothesis \( (H_0) \) tested for the above model is \( H_0: \beta_1 = \beta_2 = \beta_3 = 0 \), where \( \beta_1, \beta_2, \beta_3 \) are the standardised regression coefficients. The alternative hypothesis for the model is that at
least one of the regression coefficients is not equal to zero. Details of SPSS outputs for the regression model are presented in Appendix H-1, and a summary is presented in table 6.16.

The results displayed in table 6.16 show that all the three predictor variables of attitude (t (447) = 7.04, p<.001), subjective norms (t (447) = 4.81, p<.001) and perceived control (t (447) = 15.52, p<.001) are very highly significantly related to intentions, and hence the null hypothesis that \( H_0: \beta_1 = \beta_2 = \beta_3 = 0 \) is rejected at p<.001. Subjective norm has the smallest Beta coefficient (\( \beta_2 = .163, t = 4.8 \)), and perceived control has the largest (\( \beta_3 = .550, t = 15.52 \)), implying that subjective norm is the least important and perceived control the most important predictor. The 95% confidence intervals for the Beta coefficients are relatively tight, indicating that the coefficient estimates for this model are likely to be representative of the true population (Field, 2005). All three predictors jointly account for a large percentage (61 percent) of the variation in intentions (\( R^2 = .61 \)) and the F-ratio (F= 234.29, p<.001) is very highly significant, suggesting that there is a relationship between the predictor variables and the outcome variable that cannot be attributed to chance.

Table 6.16: Summary of results for multiple regression analysis with “intention” as the outcome variable and attitude, subjective norm and perceived control as the predictors

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardised coefficients</th>
<th>Standard error</th>
<th>Standardised coefficients (( \beta ))</th>
<th>t - ratio</th>
<th>95% CI for beta coefficients</th>
<th>Semi-partial correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Constant</td>
<td>0.16</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>0.29</td>
<td>0.04</td>
<td>0.24</td>
<td>7.04***</td>
<td>0.21 0.37</td>
<td>.09</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.15</td>
<td>0.03</td>
<td>0.16</td>
<td>4.81***</td>
<td>0.09 0.22</td>
<td>.46</td>
</tr>
<tr>
<td>Perceived control</td>
<td>0.52</td>
<td>0.03</td>
<td>0.55</td>
<td>15.52***</td>
<td>0.46 0.59</td>
<td></td>
</tr>
</tbody>
</table>

Model summary: \( R^2 = .611 \); adjusted \( R^2 = .609 \); F = 234.29***; N = 451  

Source: Survey data

Furthermore, the difference between the value of \( R^2 \) and the adjusted \( R^2 \) is very small (.002), implying that the cross-validity of this model is very good (Field, 2005). To check whether the model fits the data well, we examined outliers and influential cases. An outlier is a case that differs substantially from the main trend of the data, and can bias the regression model through its effects on the estimated regression coefficients (Field, 2005). To check for
outliers that may be biasing the model, standardised residuals were examined using the following rules proposed by Field (2005, p.164):

(i) standardised residuals with an absolute value greater than 3 are cause for concern;
(ii) if more than one percent of the sample has standardised residuals with an absolute value greater than 2.5, there is evidence that the level of error within the model is unacceptable, i.e. the model is a fairly poor fit of the sample data; and
(iii) if more than 5 percent of cases have standardised residuals with absolute value greater than 2, then there is also evidence that the model is a poor representation of the actual data.

Based on the SPSS casewise diagnostics (Appendix H-1), there were 20 cases (4 percent) with standardised residuals outside the $\pm 2$ limits, and 8 cases (1 percent) outside the $\pm 2.5$ limits. Only two cases had standardised residual greater than $\pm 3$, but further investigation did not reveal any plausible reasons for their exclusion. Therefore, the sample appears to conform to what is expected for a fairly accurate model (Field, 2005).

As well as testing for outliers, we also examined whether certain cases exert undue influence over the parameters of the model (i.e. if the case is deleted, different regression coefficients are obtained). This type of analysis can help to determine whether the regression model is stable across the sample, or whether it is biased by a few influential cases (Field, 2005). To check for influential cases, we examine a number of residual statistics provided by SPSS output (Appendix H-1), together with case summaries. The key statistics examined included: (i) Cook’s distance (Cook and Weisberg, 1982); (ii) leverage (Stevens, 1992); and (iii) Mahalanobis distances (Barnett and Lewis, 1978). Cook’s distance is a measure of the overall influence of a case on the model, and Cook and Weisberg (1982) have suggested that values greater than 1 may be cause for concern (Field, 2005). From the residual statistics presented in Appendix H-1, the maximum cook’s distance (.069) is less than 1, and so it is unlikely that any of the cases is having an undue influence on the model.

The leverage value gauges the influence of the observed value of the outcome variable over the predicted values, and for this Stevens (1992) recommends a cut-off value of three times the average. Examining the case summaries revealed only a few cases (3) with leverage greater than three times the average. However, it is unlikely that such cases will have a large influence on the regression coefficients because they are measured on the outcome rather than the predictors (Field, 2005). Related to the leverage value, the Mahalanobis distances
measure the distance of cases from the mean (s) of the predictor variables. Barnett and Lewis (1978) recommend a cut-off value of 25 for large samples and three or more predictors. From the residual statistics presented in Appendix H-1, the maximum Mahalanobis distance (20.97) is less than 25, suggesting that there are likely to be no influential cases within the data.

A further diagnostic statistic recommended by Field (2005) is the DFBeta statistic. This statistic measures the difference between a model parameter estimated using all cases and the one estimated when one case is excluded. Absolute values greater than 1 indicate cases that substantially influence the model parameters (Field, 2005). For the current data, we examined DFBeta statistics produced by SPSS to see whether any case would have a large influence on the regression parameters. In all cases, the values lie within ±1, which shows that none of the cases have undue influence over the regression model parameters. Therefore, the evidence presented above suggests that there are no influential cases within the data, and that we appear to have a fairly reliable model that has not been unduly influenced by any subset of cases.

### 6.5.2 Predictors of prompt bill payment behaviour

For reasons already explained earlier, logistic regression was used to examine the influence of intentions and perceived control on prompt bill payment behaviour (PB). Unlike OLS regression, logistic regression applies maximum likelihood estimation (MLE) after transforming the outcome variable into a logit variable – i.e. the natural log of the odds of the outcome occurring or not. MLE seeks to maximise the log likelihood (LL), which reflects how likely it is that the observed values of the outcome variable may be predicted from the observed values of the predictor variables (Menard, 2002).

Consistent with this analytical technique, prompt bill payment behaviour, the outcome variable, was transformed into a dichotomous variable as illustrated in table 6.17. In order to provide a more complete analysis, two dichotomous variables are extracted. The first variable categorises PB data into those customers who fully paid their water bill within the 15-day window (58 cases) and those who did not pay (243 cases). The second variable is a dichotomy of those who paid half or more (151 cases), and those who did not pay or paid less than half their water bill within the 15-day window (278 cases). For both variables, the numerical coding (i.e. 1 and 0) is arbitrary, and logistic regression does not attempt to predict these arbitrary values. What is important for this analysis is whether the classification of cases into one or the other of the categories of the dependent variable can be predicted by the
independent variables. Thus, the analysis is concerned with predicting the probability that a case will be classified into one as opposed to the other of the two categories of the dependent variable.

Table 6.17: Dichotomous variables extracted from prompt bill payment behaviour (PB) data

<table>
<thead>
<tr>
<th>PB dichotomy 1</th>
<th>PB dichotomy 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid fully (100%)</td>
<td>Did not pay (0%)</td>
</tr>
<tr>
<td>Did not pay (0%)</td>
<td>Paid half or more (≥ 50%)</td>
</tr>
<tr>
<td>Did not pay (0%) or paid less than half (&lt;50%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valid cases (N)</th>
<th>58</th>
<th>243</th>
<th>151</th>
<th>278</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable coding</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on these dichotomies, two regression models were specified. The first model is concerned with predicting the probability that a customer belongs to the category of those who fully paid their water bill within the 15-day window, given their scores on the predictor variables of intentions and perceived control. This model (hereinafter referred to as logistic regression model 1 or simply, LRM-1) is specified as follows:

\[
\text{LRM-1: } P(\text{paid fully}) = \frac{1}{1 + e^{-(\alpha + \beta I + \beta PC + \varepsilon)}} \quad \text{Eqn. 6.2}
\]

where:  
\( P(\text{paid fully}) \) - is the probability that a customer belongs to the category of those who fully paid their water bill within the 15-day window;  
\( I \) is intention to pay water bill promptly;  
\( PC \) is perceived control;  
\( e \) is the base of natural logarithms;  
\( \varepsilon \) and \( \alpha \) are the error and constant terms respectively.

The second model is concerned with predicting the probability that a customer belongs to the category of those who paid 50 percent or more of their water within the 15-day window, given their scores on the predictor variables of intentions and perceived control. The rationale for this part of the analysis is to find out whether similar results as those obtained in LRM-1 can be replicated. This model (hereinafter referred to as logistic regression model 2 or simply, LRM-2) is specified as follows:
LRM-2:  \[ P \text{ (paid half or more)} = \frac{1}{1 + e^{-(a + b_1 I + b_2 PC + \varepsilon)}} \]  \( \ldots \ldots \text{Eqn 6.3} \)

where:  
- \( P \text{ (paid half or more)} \) - is the probability that a customer belongs to the category of those who paid 50 percent or more of their water within the 15-day window;  
- \( I \) is intention;  
- \( PC \) is perceived control;  
- \( e' \) is the base of natural logarithms;  
- \( e \) and \( a \) are the error and constant terms respectively.

For both LRM-1 and LRM-2, the null hypothesis \( (H_0) \) tested is \( H_0: \beta_1 = \beta_2 = 0 \), where \( \beta_1, \beta_2 \), are the logistic regression coefficients. The alternative hypothesis is that at least one of the regression coefficients is not equal to zero. Details of SPSS outputs for both models are presented in Appendix H-2. A summary of the results of model estimation is presented as follows.

Summary of results for LRM-1:

Tables 6.18 and 6.19 show a summary of the results for LRM-1 estimation. From table 6.18, the model chi-square for LRM-1, \( \chi^2 (2) = 8.82 \) (\( p = .01 \)) is statistically significant at \( p < .05 \), implying that it is unlikely that chance effects alone would predict the outcome variable as well as the model. To test the explanatory power of the model, statistical goodness-of-fit tests were applied. These tests compare the amount of information gained by constructing the model to the amount of information available without the model (the null case).

One of the tests is the Hosmer and Lemeshow (H-L) goodness-of-fit test (Hosmer and Lemeshow, 2000). This statistic tests the hypothesis that observed data are significantly different from the predicted values from the model. Thus, a non-significant test would indicate a model that does not differ significantly from the observed data. For LRM-1, the H-L goodness-of-fit test statistic \( (\chi^2 = 9.84, p = .28) \), is non-significant at \( p < .05 \), implying the model is a fairly good fit to the data. Therefore, we reject the null hypothesis that knowing the two predictors variables makes no difference in predicting the outcome variable (Miles and Shevlin, 2001; Field, 2005).
Table 6.18: Initial estimation results for LRM-1

<table>
<thead>
<tr>
<th>Model</th>
<th>Logistic regression coefficients</th>
<th>95% CI for exp β</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>Standard error</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.70</td>
<td></td>
</tr>
<tr>
<td>Intention (I)</td>
<td>0.45(^{*})</td>
<td>0.39</td>
</tr>
<tr>
<td>Perceived control (PC)</td>
<td>0.37(^{ns})</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Note: Model \(\chi^2 (2) = 8.82\) \((p = .01)\); Hosmer and Lemeshow \(\chi^2 = 9.84\) \((p = .28)\)
\(^{*}\) Significant at \(p<.05\), \(^{ns}\) - not significant at \(p<.05\)

Source: Survey data

In order to assess the individual contribution of predictors, SPSS logistic regression uses the Wald statistic, which tests whether the \(\beta\)-coefficient for a predictor is significantly different from zero (Menard, 1995). However, researchers (Menard, 1995; Field, 2005) have warned that the Wald statistic should be used cautiously because inflated standard errors tend to underestimate its value, thus increasing the Type II error - i.e. the probability of rejecting a predictor as being significant when in reality it is making a significant contribution. The results displayed in table 6.18 shows that although the overall model is significant, the coefficient estimates for the predictor variables intention \((\beta_1 = 0.45, p = .25)\) and perceived control \((\beta_2 = 0.37, p = .33)\) are both non-significant at \(p<.05\) - a situation that would either indicate a multicollinearity problem (Allison, 1999a; Miles and Shevlin, 2001) or a case of inaccurate test statistics (Menard, 1995; Field, 2005).

To examine the multicollinearity problem, a linear regression analysis was performed using the same outcome and predictors to obtain tolerance and variance inflation factor (VIF) scores (Menard, 1995; Field, 2005). The tolerance statistic for each predictor (.47) and average VIF score (2.126) were all within acceptable limits (Menard, 1995; Allison, 1999b), indicating that multicollinearity problems were unlikely to be biasing the model parameters. Therefore, in the absence of a multicollinearity effect, the only plausible explanation for the non-significance of model parameters (despite significance of the overall model) is that the test statistics for the predictors could be inaccurate, and therefore leading to a Type II error (Menard, 1995; Field, 2005). For this reason, an alternative approach that relies on the incremental likelihood ratio chi-square test was used to ascertain the individual contribution of each predictor (Menard, 1995; Field, 2005). Under this approach, a hierarchy of models
was specified using the SPSS block entry facility. In the first block, intention was entered as the only predictor (reduced model). This is consistent with the 'reasoned action' theoretical framework which considers intentions as the immediate determinant of behaviour (Ajzen and Fishbein, 1980; Ajzen, 1988; Ajzen and Fishbein, 2005). In the second block, perceived control was entered (full model), and the block chi-square was used to check whether the effect of the additional variable was significantly different from zero (Menard, 1995). The results of this analysis are summarised in table 6.19.

Table 6.19: Final estimation results for LRM-1

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>$\beta$</th>
<th>Standard error</th>
<th>exp $\beta$ Lower</th>
<th>exp $\beta$ Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1 (reduced model)</td>
<td>7.85**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-4.70</td>
<td>1.10</td>
<td></td>
<td>1.22</td>
<td>2.06</td>
</tr>
<tr>
<td>Intention</td>
<td>0.72</td>
<td>0.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 2 (with Perceived control)</td>
<td>0.97ns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Reduced model $\chi^2 (1) = 7.85** (p = .005); Hosmer and Lemeshow $\chi^2 = 5.88^{**} (p = .66)$; Model summary statistics: $R^2 = .03$ (Cox & Snell), .04 (Nagelkerke)

** Significant at $p < .01$; ns – not significant at $p < .05$

Source: Survey data

The results displayed in table 6.19 show that the reduced model (with intention as the only predictor) is highly statistically significant (model $\chi^2 = 7.85$, $p = .005$), implying that intention makes a statistically significant contribution to the prediction of the outcome. However, the block chi-square (with perceived control included) is non-significant ($\chi^2 = 0.97$, $p = .33$), implying that the effect of perceived control on the outcome does not significantly differ from zero. Thus, perceived control was dropped from the logistic regression model in favour of a more parsimonious reduced model that works just as well. The value of the odds ratio for intention (exp $\beta = 2.06$) is greater than 1, implying that a one unit increase in the strength of a customer's intentions to pay a water bill within the 15-day window, leads to a twofold increase in the odds of actually paying the bill fully within that period. The confidence interval for this value ranges from 1.22 to 3.48 so we can be fairly confident that the value of exp $\beta$ in the population lies somewhere between these two values.
Regarding the overall fit of the reduced model, the H-L goodness of fit test statistic, \( \chi^2 = 5.88, p = .66 \) is non-significant at \( p < .05 \), implying that the model's estimates fit the data to an acceptable level (Field, 2005).

To further evaluate the predictive accuracy of LRM-1, a classification table showing the predicted and actual values of the outcome variable is shown in table 6.20. The two rows provide the actual (observed) values of the outcome variable (table 6.17), and the two columns the predicted values of the outcome variable, based on the model. From this table, it can be noted that a total of 243 customers did not pay anything at all on their bill. Using the model, we would have predicted that 161 of them would not pay anything, a success rate of 66 percent. Of the 58 customers who fully paid their bill within the 15-day window, we would have predicted that 33 of them would not have paid anything and 25 would have paid fully, a success rate of 43 percent. Overall, according to the classification table, we would have a success rate of 62 percent, which is small compared to what it would be by chance (80 percent) – i.e. the percentage of correctly classified cases that would have resulted if we had simply classified all respondents as the most frequent case.

Table 6.20: Classification table for LRM-1

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted*</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Paid fully</td>
<td></td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>no</td>
<td>yes</td>
<td>correct</td>
<td></td>
</tr>
<tr>
<td>Paid fully</td>
<td>no</td>
<td>161</td>
<td>82</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>33</td>
<td>25</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall percentage</td>
<td></td>
<td></td>
<td>62</td>
<td></td>
</tr>
</tbody>
</table>

* Cut-off probability value is .2

Source: Survey data

Summary of results for LRM-2:
Table 6.21 shows a summary of the results for LRM-2 estimation. The model chi-square, \( \chi^2 (2) = 10.92 (p = .004) \) is highly statistically significant at \( p < .01 \), implying that it is unlikely that chance effects alone would predict the dependent variable as well as the model. Therefore, similar to LRM-1, the null hypothesis \( H_0: \beta_1 = \beta_2 = 0 \) is rejected at \( p < .01 \) (Miles and Shevlin, 2001; Field, 2005). Also, the H-L goodness of fit test statistic \( \chi^2 = 8.52, p = \)
The results also show that the coefficient estimate for intention ($\beta_1 = 0.54$, $p = .044$) is statistically significant ($p<.05$), while that of perceived control ($\beta_2 = .07$, $p = .78$) is non significant ($p>.05$). This result is consistent with LRM-1 in which the incremental likelihood ratio chi-square test showed that the effect of perceived control on the outcome does not significantly differ from zero. Therefore, similar to LRM-1, only intention makes a statistically significant contribution to the prediction of prompt bill payment behaviour. The value of the odds ratio for intention ($\exp \beta = 1.72$) is greater than 1, implying that a one unit increase in the strength of a customer’s intentions to pay a water bill within the 15-day window, leads to a 1.7 increase in the odds of actually paying half the bill or more within that period. The 95% confidence interval for $\exp \beta$ ranges from 1.01 to 2.91. Both these limits are greater than one, implying that the $\exp \beta$ in the population of customers is likely to lie somewhere between these values (Field, 2005).

To further evaluate the predictive value of LRM-2, a classification table showing the predicted and actual values (from table 6.17) of the outcome variable is shown in table 6.22. From the classification table, it can be noted that a total of 278 customers did not pay or paid less than half of their water bill. Using the model, we would have predicted that 268 of them would indeed not pay anything or would pay less than half (a success rate of 96 percent). Similarly, of the 151 customers who paid half or more of their bill within the 15-day window,
we would have predicted that 144 of them would not have paid anything or would have paid less than half, and only 7 would have paid a half or more (a success rate of 5 percent). Overall, LRM-2 has a success rate of 64 percent, which is slightly smaller than what it would be by chance (65 percent) – i.e. the percentage of correctly classified cases that would have resulted if we had simply classified all respondents as the most frequent case.

Table 6.22: Classification table for LRM-2

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted*</th>
<th>Percentage correct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paid half or more</td>
<td></td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Paid half or more</td>
<td>268</td>
<td>10</td>
</tr>
<tr>
<td>yes</td>
<td>144</td>
<td>7</td>
</tr>
<tr>
<td>Overall percentage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Cut-off probability value is .5

Source: Survey data

Substantive significance of the intention-behaviour relationship

The results summarised above provide strong evidence of a relationship between intentions to pay promptly and actual prompt payment behaviour. What is missing in the above summary is an indication of the substantive significance of the models, i.e. whether the relationship is "big enough" or strong enough" for us to be concerned about it. In OLS linear regression, the coefficient of determination, R² or "explained variance" is used as an indicator of substantive significance. For instance, in section 6.5.1, it was found that the three variables of attitude, subjective norms and perceived control explain 61 percent of the variance in intentions – which is a large effect according to Cohen's (1988) benchmarks for effect sizes (Field, 2005).

However, there is no identical measure of R² in logistic regression (Menard, 2002; Field, 2005), and there is some controversy over what would make a good analogue to the R² -value in linear regression (Field, 2005). The model summary statistics Cox-Snell R² and Nagelkerke R² provided in tables 6.19 and 6.21 (footnotes) are attempts to provide a logistic analogy to R² in OLS regression (Cox and Snell, 1989; Nagelkerke, 1991). Although these measures are not entirely analogous to the R²-value used in OLS regression, they nevertheless provide a gauge of the substantive significance of the logistic regression model (Field, 2005).
For both models, LRM-1 and LRM-2, the Cox-Snell $R^2$ (.3) and Nagelkerke $R^2$ (.4) values suggest that the models account for approximately 3 to 4 percent of the variance in prompt bill payment behaviour, which is a small effect according to Cohen’s (1988) benchmarks for effect sizes. This suggests that intentions alone may not be adequate in explaining prompt bill payment behaviour – something that is discussed further in the next chapter.

Another more intuitive way of illustrating the substantive significance of the relationship between intentions and behavior is by use of graphical methods. Graphic presentations in logistic regression provide a richer understanding of a variable’s effects (Hoetker, 2007). Figure 6.1 is a probability plot for both models, LRM-1 and LRM-2. These graphs were plotted using probability values obtained by substituting the estimated model parameters into equations 6.2 and 6.3, for different values of the intention score (including the mean score).

![Probability plot](image)

Fig 6.1: Probability plot for LRM-1 and LRM-2

From figure 6.1, it can be noted that a respondent who scored 5 (the highest score) on the intention scale has a 25 percent chance of actually paying his or her water bill fully and a 41 percent of paying half or more within the 15 days. Corresponding probability values, with the intention score set at the mean level, are 13 percent and 28 percent respectively. For respondents with the lowest intention score, the probability of paying is less than 10 percent, which is low, but nevertheless far from indicating that these respondents never pay their bill promptly. The figure also shows that for the same intention level, the probability of paying
half or more is higher than the probability of paying the entire bill within the 15-day window – a finding that is discussed further in the next chapter.

6.6 TESTS FOR ASSUMPTIONS OF REGRESSION ANALYSIS

In the previous section, results of the regression analyses carried out have been presented and the accuracy of models evaluated. In this section, we assess the extent to which results can be generalised, i.e. whether results can be used to make inferences beyond the sample of data collected. To draw conclusions about a population based on OLS regression analysis done on a sample, several assumptions must be true (Pedhazur and Schmelkin, 1991; Berry, 1993; Allison, 1999a; Miles and Shevlin, 2001; Tabachnick and Fidell, 2001; Field, 2005). These are: (i) measurement without error; (ii) absence of perfect multicollinearity; (ii) homoscedastic residual errors; (iv) normally distributed errors; (v) linearity of residual error terms; and (vi) independence of residual error terms.

On the other hand, drawing population-wide conclusions based on sample logistic regression analysis does not require meeting many of the above assumptions, especially those relating to the distribution of residual terms (Allison, 1999a; Miles and Shevlin, 2001; Field, 2005). However, similar to OLS regression, logistic regression assumes: (i) low measurement error in predictor variables; (ii) no multicollinearity; (iii) independence of error terms; and (iv) a linear relationship between the predictors and the log odds (logit) of the outcome variable.

The assumption that residual error terms are independent, or that there is no autocorrelation, has not been assessed in this study because the problems of autocorrelation are more associated with time series data (Berry, 1993). The following sub-sections examine whether the rest of the assumptions for application of both linear and logistic regression procedures are satisfied.

6.6.1 Measurement errors

One of the basic assumptions for application of linear regression analysis is that all predictor variables must be quantitative (i.e. measured at interval level) or categorical (with two categories), and the outcome variable must be quantitative and continuous, with no constraints on its variability (Bryman and Cramer, 1997; Field, 2005). In this study, both the predictor and outcome variables used in the linear regression model (section 6.5.1) were measured...
using summated rating scales. Although these scales are technically ordinal, they are considered an interval level measure in the social sciences, and are generally assumed so in multivariate analyses (Oppenheim, 1992; Bryman and Cramer, 1997; Field, 2005).

However, measurements using summated rating scales are prone to both non-random and random errors (Berry, 1993). Non-random error may be caused by among others systematic bias in responses to scale items, and scales that measure other variables in addition to the variable of interest. This type of error was minimised by using composite variables whose validity was maximised, through careful development of the measurement instrument. Also, prior to performing regression analyses, each scale was assessed for validity using conventional psychometric procedures as reported in section 6.3.

Random measurement errors on the other hand cause imprecision in data, and may result from such factors as temporary fluctuations in respondents (e.g. fatigue), distortions by enumerators/interviewers, and vagueness of questions (Spector, 1981; Berry, 1993). Occurrence of random errors was minimised by using multi-item summated rating scales, which when combined average out random error (Spector, 1981). In addition, such scales are easier to administer, and thus minimise respondent fatigue and distortions. Prior to carrying out regression analysis, all summated scales were assessed for internal reliability, the results of which are reported in section 6.3.3. Ensuring high internal reliability of a scale is one way of minimising random measurement errors (Spector, 1981; Oppenheim, 1992; Nunnally and Bernstein, 1994; Bryman and Cramer, 1997).

Random measurement errors may also result from the process of instrument administration (Fink, 1995a). As discussed in section 5.6.1, interviewers were hired and trained to administer the questionnaire to those respondents who did not comprehend the contents of questionnaire due to a language barrier. In order to reduce interviewer bias, respondents who were literate and able to understand the contents of questionnaire were encouraged to self-administer the questionnaire unsupervised. Furthermore, in order to ensure consistency and minimise distortions in face-to-face administrations, interviewers underwent a two-day comprehensive training a week before the actual field work. The training covered among other topics, aspects concerned with bias in interviewing such as verbatim translation, maintenance of rapport, rephrasing questions, avoiding careless prompting, and correct recording of responses (Babbie, 1973; Oppenheim, 1992; Bourque and Fielder, 1995).
To further assess the effect of questionnaire administration on response scores, an independent samples t-test was performed to find out if there are significant differences between mean scores for those respondents who self-administered the questionnaire and those to whom the questionnaire was administered by interviewers (details in Appendix J). A total of 161 respondents (33 percent) opted to self-administer the questionnaire, while the majority (329) had face-face administration by interviewers. Table 6.23 summarise the results of the t-tests.

Table 6.23: Summary of independent samples t-test results for the difference in mean scores between self-administered and face-to-face administered questionnaires

<table>
<thead>
<tr>
<th>Variable</th>
<th>Questionnaire administration</th>
<th>Valid cases</th>
<th>Mean</th>
<th>t-value</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>Self-administered</td>
<td>157</td>
<td>4.24</td>
<td>-1.68*ns</td>
<td>.09</td>
</tr>
<tr>
<td></td>
<td>Face-to-face administered</td>
<td>318</td>
<td>4.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>Self-administered</td>
<td>159</td>
<td>3.52</td>
<td>-0.61ns</td>
<td>.54</td>
</tr>
<tr>
<td></td>
<td>Face-to-face administered</td>
<td>324</td>
<td>3.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived control</td>
<td>Self-administered</td>
<td>156</td>
<td>3.78</td>
<td>-1.83ns</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>Face-to-face administered</td>
<td>321</td>
<td>3.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>Self-administered</td>
<td>159</td>
<td>3.84</td>
<td>-2.29*</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Face-to-face administered</td>
<td>316</td>
<td>3.97</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at p<.05; ns – not significant at p<.05
Source: Survey data

All variables except attitude, had non-significant F-values (p>.05) for Levene's test, and thus their t-values are based on the assumption of equal variance. For the attitude variable, the test-statistic is not based on the assumption of equal variances, as it was violated (Field, 2005). The results in table 6.23 indicate that there is no significant difference (at p<.05) in the means of attitude, subjective norms and perceived control for respondents who self-administered the questionnaire and those to whom the questionnaire was administered face-to-face by an interviewer. Therefore, based on the 95 percent confidence interval, there is no evidence that the method of questionnaire administration caused bias in the measurement of these variables.
However, for the intention variable, the results suggest that mean intention scores for those who self-administered the questionnaire differed significantly (at p<.05) from those to whom the questionnaire was administered face-to-face by an interviewer. This implies that the mode of questionnaire administration had a statistically significant influence on the responses obtained from the intention scale. To ascertain the magnitude of this effect, the t-value for intention was converted into an effect size (r) using the following equation (Rosnow and Rosenthal, 2005):

\[ r = \sqrt{\frac{t^2}{t^2 + df}} \]  

Eqn 6.4

Where: t is the t-statistic for intention obtained from Table 6.23 (-2.29); and df is degrees of freedom calculated by adding the two sample sizes and then subtracting the number of samples, i.e. \(N_1+N_2 - 2 = 473\).

Substituting the relevant values in the above equation yields an r-value of .10, which represents a small effect according to Cohen's (1988) benchmarks for effect sizes (Field, 2005). Therefore, although mode of questionnaire administration had a statistically significant influence on intention scores, its effect is small in magnitude, and therefore unlikely to cause substantial bias in measurement.

6.6.2 Tests for multicollinearity

Multicollinearity exists when there is a strong correlation between two or more predictors in a regression model. Presence of multicollinearity poses a threat to the validity of both linear and logistic regression analysis because it: i) limits the size of variance in the outcome explained by the predictors; (ii) makes it difficult to assess the individual importance of a predictor; and (iii) increases the variances of regression coefficients, resulting in unstable predictor equations (Field, 2005).

The most common method of detecting multicollinearity is by use of variance inflation factor (VIF) scores for each predictor variable. Individual VIF scores greater than 10 are considered to indicate a serious problem with multicollinearity (Bowerman and O'Connell, 1990). Also, if the average VIF is substantially greater than 1, then multicollinearity may be biasing the regression model (Bowerman and O'Connell, 1990). Related to VIF scores is the tolerance
statistic, which is the reciprocal of VIF. Tolerance statistics below .2 are considered to indicate a serious problem (Menard, 1995).

Tests for multicollinearity in the logistic regression models were discussed in section 6.5.2. For the linear regression model estimated in section 6.5.1, the VIF scores and tolerance statistics extracted from the SPSS data outputs (Appendix H-1) are displayed in Table 6.24. For this model, the VIF scores are all well below 10 and the tolerance statistics all well above .2; therefore we can safely conclude that there is no multicollinearity within the data. In addition, the average VIF score (1.35) is very close to 1, further confirming that multicollinearity is not a problem for this model.

Table 6.24: Variance inflation factor scores and tolerance statistics for the predictor variables in the linear regression model

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Predictor variables</th>
<th>Variance inflation factor scores</th>
<th>Tolerance statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>Attitude</td>
<td>1.30</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>Subjective norm</td>
<td>1.31</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Perceived control</td>
<td>1.44</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Source: Survey data

6.6.3 Tests for homoscedasticity, normality and linearity

In linear regression, the assumptions of homoscedasticity, normality and linearity are tested by examining the distribution of residual terms. Residual terms refer to the difference between the true and fitted values of the outcome variable. The assumption of homoscedasticity requires that at each level of the predictor variables, the variance of the residual terms should be constant. Normality is the condition that the residuals are normally distributed, and linearity is the requirement that the functional form of the relationship between the predictors and outcome variable is a linear one (i.e. straight line).

Figures 6.2 to 6.3 show three types of residual plots for the linear regression model whose results were presented in section 6.5.1. Scatter plots of regression standardised/studentised residuals against standardised predicted values (figure 6.2) shows that the residuals are scattered randomly around zero. This pattern supports both the assumptions of
homoscedasticity and linearity (Field, 2005). Furthermore, histograms and normal probability plots of regression standardised residuals (figure 6.3) are approximately normal distributions. Hence, the assumption of normally distributed errors has been met. These tests results therefore suggest that the linear regression model estimated in section 6.5.1 meets the distributional assumptions of residual terms, and thus can be generalised to the population.

Logistic regression on the other hand does not require satisfying distributional assumptions about residuals, but it does assume a linear relationship between the predictors and the log odds (logit) of the outcome variable. When the assumption of linearity in the logit is violated, then logistic regression will underestimate the degree of relationship of the predictors to the outcome and will lack power, thus generating Type II errors.

For the logistic regression models estimated in section 6.5.2, the assumption of linearity between the predictors and the logit of the outcome variable was checked using the Box-Tidwell transformation (Menard, 2002). This procedure involves adding a term of the form \((X) \ln(X)\) - i.e. \(X\) multiplied by the natural logarithm of \(X\) - to the logistic regression model in which \(X\) is the predictor variable. If the coefficient for the variable is statistically significant,
there is evidence of nonlinearity in the relationship between the logit of the outcome variable and the predictor variable (Menard, 2002).

Figure 6.3: Histogram and normal probability plot of regression standardized residuals

Table 6.25 displays the results of the Box-Tidwell test for nonlinearity for each of the logistic regression models, with intention \( I \) as the predictor. For each model, the statistical significance of the contribution of the term \( I \ln (I) \) was assessed based on the likelihood ratio chi-square test (Menard, 1995; 2002). In each model, the block chi-square \( (\chi^2) \) with the term \( I \ln (I) \) entered was not significant at \( p<.05 \), implying that the contribution of the term \( I \ln (I) \) is not significantly different from zero. Based on this result, there is no evidence of nonlinearity in the relationship between the logit of the outcome variable in each of the models and the predictor variable.
Table 6.25: Box-Tidwell tests for nonlinearity of the logistic regression models, LRM-1 and LRM-2

<table>
<thead>
<tr>
<th>Model</th>
<th>Predictor variables</th>
<th>$\chi^2$</th>
<th>$\beta$</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRM-1 Block 1</td>
<td>Constant</td>
<td>-3.91</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intention (I)</td>
<td>0.62*</td>
<td>0.26</td>
<td></td>
</tr>
<tr>
<td>Block 2</td>
<td>Constant</td>
<td>0.003ns</td>
<td>-4.39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(I) x ln (I)</td>
<td>-0.12ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LRM-2 Block 1</td>
<td>Constant</td>
<td>-3.91</td>
<td>0.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intention (I)</td>
<td>0.57**</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Block 2</td>
<td>Constant</td>
<td>0.77ns</td>
<td>-8.29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(I) x ln (I)</td>
<td>-1.42ns</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at $p<.01$; * significant at $p<.05$ ns – not significant at $p<.05$

Source: Survey data

### 6.7 EFFECTS OF HOUSEHOLD CHARACTERISTICS

As discussed in Chapter 4 (section 4.4), a number of household characteristics are hypothesised to influence intentions and behaviour through their effects on attitude, subjective norms and perceived control. This section presents results of various analyses carried out to test how household characteristics influence customer intentions to pay water bills promptly. In particular, the hypothesis that socio-demographic effects on intention are mediated by the theory of planned behaviour (TPB) variables is tested.

Mediator effects were tested using the mediator regression analysis framework advanced by Baron and Kenny (1986), and used extensively in process analysis (Kenny, 2006). This analytical procedure consists of four steps that must be taken to establish that a mediated relationship exists. For example, consider three variables, X, the predictor variable, Y, the outcome variable and M, the mediator variable. In order to establish that variable M mediates the relationship between X and Y, the following conditions must be satisfied (Baron and Kenny, 1986; Kenny, 2006):
1. Show that $X$ is a significant predictor of $Y$, thus establishing that there is an effect that may be mediated;
2. Show that $X$ is a significant predictor of $M$;
3. Show that $M$ is a significant predictor of $Y$, when controlling for $X$; and
4. If $M$ is a complete mediator of the relationship between $X$ and $Y$, the effect of $X$, when controlling for $M$, should be zero.

Therefore, to establish whether attitudes, subjective norms and perceived control mediate the relationship between household characteristics and intentions, we started by finding out whether a relationship exist that may be mediated. For each household characteristic, a linear regression analysis was performed; with the household variable as the predictor and intention as the outcome. All household variables, except household size, were measured on categorical level, and so dummy variables were created for use in the regression models. Detailed results for this step of the analysis are presented in Appendix J-1.

Table 6.26 shows a summary of the results showing $R^2$ values, F-statistics and their significance for each household characteristic. From the results displayed in Table 6.26, it can be noted that the only household characteristics related to intentions are gender of the household head ($F = 7.89, p = .005$), occupation of the household head ($F = 2.19, p = .05$), house ownership status ($F = 4.87, p = .002$), and income level of the household head ($F = 3.45, p = .002$). Household size and education level of the household head did not have a statistically significant influence on intention, and were therefore dropped at this stage of the analysis.

Table 6.26: Summary of results of linear regression analysis with household variables as the predictors and intention as the outcome variable

<table>
<thead>
<tr>
<th>Household variable (predictors)</th>
<th>Valid cases (N)</th>
<th>$R^2$ values</th>
<th>F- statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>475</td>
<td>.02</td>
<td>7.89**</td>
</tr>
<tr>
<td>Household size</td>
<td>449</td>
<td>.01</td>
<td>2.67ns</td>
</tr>
<tr>
<td>Education (number of years spent in formal education)</td>
<td>477</td>
<td>.004</td>
<td>0.71ns</td>
</tr>
<tr>
<td>Occupation type</td>
<td>479</td>
<td>.02</td>
<td>2.19*</td>
</tr>
<tr>
<td>House ownership status</td>
<td>477</td>
<td>.03</td>
<td>4.87**</td>
</tr>
<tr>
<td>Monthly income</td>
<td>480</td>
<td>.04</td>
<td>3.45**</td>
</tr>
</tbody>
</table>

** Significant at $p<.01$; * significant at $p<.05$  ns – not significant at $p<.05$

Source: Survey data
The next step was to ascertain whether gender, occupation, house ownership and income were correlated with attitude, subjective norms, and perceived control. For each of these household characteristics, three separate regression analyses were performed with attitude, subjective norms and perceived control as the outcome variables. The results of this analysis are shown in table 6.27, and the details are presented in Appendix J-2. None of the household variables were significantly related to attitude, implying that attitude was unlikely to mediate their effects on intentions.

Table 6.27: Summary of results of linear regression analyses with household variables as the predictors and AT, SN and PC as the outcome variables

<table>
<thead>
<tr>
<th>Household characteristics (predictor variables)</th>
<th>Outcome variables</th>
<th>Valid cases (N)</th>
<th>$R^2$ values</th>
<th>$F$-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>AT</td>
<td>475</td>
<td>.001</td>
<td>0.55*ns</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>483</td>
<td>.002</td>
<td>1.18*ns</td>
</tr>
<tr>
<td></td>
<td>PC</td>
<td>477</td>
<td>.01</td>
<td>3.98*</td>
</tr>
<tr>
<td>Occupation type</td>
<td>AT</td>
<td>479</td>
<td>.02</td>
<td>1.56*ns</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>487</td>
<td>.03</td>
<td>2.74*</td>
</tr>
<tr>
<td></td>
<td>PC</td>
<td>481</td>
<td>.02</td>
<td>1.70*ns</td>
</tr>
<tr>
<td>House ownership status</td>
<td>AT</td>
<td>477</td>
<td>.01</td>
<td>0.84*ns</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>485</td>
<td>.01</td>
<td>1.21*ns</td>
</tr>
<tr>
<td></td>
<td>PC</td>
<td>479</td>
<td>.01</td>
<td>2.10*ns</td>
</tr>
<tr>
<td>Monthly income</td>
<td>AT</td>
<td>480</td>
<td>.02</td>
<td>1.49*ns</td>
</tr>
<tr>
<td></td>
<td>SN</td>
<td>488</td>
<td>.02</td>
<td>1.91*ns</td>
</tr>
<tr>
<td></td>
<td>PC</td>
<td>482</td>
<td>.02</td>
<td>1.72*ns</td>
</tr>
</tbody>
</table>

* Significant at $p<.05$  ns – not significant at $p<.05$

Source: Survey data

Also, occupation of the household head was the only household variable with a statistically significant relationship with subjective norms ($F = 2.74, p = .02$), implying that subjective norm was likely to act as a mediator of the relationship between occupation and intentions, but not for the other household variables. Gender of the household head had a statistically significant relationship with perceived control ($F = 3.98, p = .047$), but all other household variables did not show a relationship. The results of this step therefore suggest that while gender, occupation, house ownership and income have statistically significant direct
relationships with intentions, only the effects of gender and occupation are likely to be mediated by TPB variables.

Therefore, in order to test for mediation effects, the following regression equations are estimated in line with the third and four steps of the mediator regression analysis framework (Baron and Kenny, 1986; Kenny, 2006):

\[ I = \alpha_1 + \beta_1 \text{OCCd}_1 + \beta_2 \text{OCCd}_2 + \beta_3 \text{OCCd}_3 + \beta_4 \text{OCCd}_4 + \beta_5 \text{OCCd}_5 + \beta_6 \text{SN} \quad \text{Eqn.6.3} \]
\[ I = \alpha_2 + \beta_7 \text{GENd}_1 + \beta_8 \text{PC} \quad \text{Eqn.6.4} \]

Where: \( I \) is intention

- \( \text{OCCd}_i \) are dummy variables for household variable OCCUPATION
- \( \text{SN} \) is subjective norm
- \( \text{GENd}_i \) is the dummy variable for GENDER
- \( \text{PC} \) is perceived control

The results for the above regression models are summarised in tables 6.28 and 6.29, and details are presented in Appendix J-3. The results displayed in table 6.28 show that subjective norm is a statistically significant (\( \beta_6 = 0.51, t = 12.69, p < .001 \)) predictor of intention even after controlling for the effects of occupation. This satisfies the third condition of the mediator regression analysis framework. Table 6.28 also shows that the standardised beta coefficients for all the occupation dummy variables are non significant (at \( p < .05 \)), implying that they are not significantly different from zero.

Table 6:28: Summary of results for multiple regression analysis testing for the mediating effect of subjective norms on the relationship between occupation of household head and intention to pay water bills promptly

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Predictor variables</th>
<th>Unstandardised coefficients</th>
<th>Standard error</th>
<th>Standardised coefficients (( \hat{\beta} ))</th>
<th>t - ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention (1)</td>
<td>SN</td>
<td>0.50</td>
<td>0.04</td>
<td>0.51</td>
<td>12.70***</td>
</tr>
<tr>
<td></td>
<td>OCCd1</td>
<td>-0.04</td>
<td>0.12</td>
<td>-0.02</td>
<td>-0.37**</td>
</tr>
<tr>
<td></td>
<td>OCCd2</td>
<td>-0.09</td>
<td>0.08</td>
<td>-0.05</td>
<td>-1.06*</td>
</tr>
<tr>
<td></td>
<td>OCCd3</td>
<td>0.13</td>
<td>0.10</td>
<td>0.05</td>
<td>1.29**</td>
</tr>
<tr>
<td></td>
<td>OCCd4</td>
<td>-0.11</td>
<td>0.06</td>
<td>-0.01</td>
<td>-0.19**</td>
</tr>
<tr>
<td></td>
<td>OCCd5</td>
<td>-0.09</td>
<td>0.07</td>
<td>0.05</td>
<td>-1.26**</td>
</tr>
</tbody>
</table>

Model summary: \( R^2 = .28; \) adjusted \( R^2 = .27; F = 29.26***; \)

**** Significant at \( p<.001 \) ns – not significant at \( p<.05 \)

Source: Survey data
This result provides evidence that the effects of occupation on intentions are completely mediated by subjective norms - i.e. people with different occupations had different behavioural intention strengths because of differences in their perceptions of social pressure to perform the behaviour. Similarly, the results in table 6.29 show that perceived control is a very highly statistically significant ($\beta_8 = 0.73$, $t = 22.79$, $p < 0.001$) predictor of intentions when we control for the effects of gender.

Table 6.29: Summary of results for multiple regression analysis testing for the mediating effect of perceived control on the relationship between gender of household head and intention to pay water bills promptly

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Predictor variables</th>
<th>Unstandardised coefficients</th>
<th>Standard error</th>
<th>Standardised coefficients ($\beta$)</th>
<th>$t$-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentions</td>
<td>PC</td>
<td>0.69</td>
<td>0.03</td>
<td>0.73</td>
<td>22.79***</td>
</tr>
<tr>
<td></td>
<td>GEN&lt;sub&gt;gt&lt;/sub&gt;</td>
<td>-0.06</td>
<td>0.04</td>
<td>-0.05</td>
<td>1.55ns</td>
</tr>
</tbody>
</table>

Model summary: $R^2 = .54$; adjusted $R^2 = .53$; $F = 266.85***$;

**** Significant at $p < .001$ ns - not significant at $p < .05$

Source: Survey data

The standardised beta coefficient for the gender dummy variable is non significant ($\beta_7 = -0.05$, $t = -1.55$, $p = .12$), indicating that the effect of gender on intentions is not significantly different from zero when perceived control is controlled. This result therefore suggests that the effects of gender on intentions are completely mediated by perceived control. Thus, it is likely that males and females differed in the strength of their intentions to pay water bills promptly because of differences in their perceptions of control over the behaviour.

6.8 CHAPTER SUMMARY

This chapter presented the patterns of results and analysed them for their relevance to the research questions and hypotheses. Prior to presenting the results, psychometric properties of the measurement instrument were examined. Based on the results of exploratory factor analysis and reliability analysis, the instrument was found to be both valid and reliable.

After establishing the validity and reliability of the measurement instrument, preliminary analysis was carried, thus providing a powerful descriptive summary of the data. In addition,
a series of pair-wise correlation analyses between the predictor and outcome variables were calculated prior to hypothesis testing. The correlation analysis also examined the beliefs underlying attitudes, subjective norms and perceived control, thus providing insight into the cognitive structure of these variables.

Hypothesis testing was performed using a combination of linear and logistic regression techniques. First, linear regression was used to examine the relative importance and explanatory power of the three hypothesised predictors of intention to pay water bills promptly. The results of this analysis confirmed the hypothesis that attitudes, subjective norms and perceived control with respect to paying water bills promptly significantly predict some of the variation in intentions. The second set of analyses utilised logistic regression techniques to examine the relative importance and explanatory power of the two hypothesised predictors of prompt bill payment behaviour, i.e. intention and perceived control. Results from this analysis showed that intention is the only significant predictor of prompt bill payment behaviour.

Furthermore, regarding the effect of household characteristics on intentions, mediated regression analysis revealed that while gender, occupation, house ownership and income have statistically significant direct relationships with intentions, only the effects of gender and occupation are mediated by subjective norms and perceived control.

Finally, tests carried out on the processed data revealed no evidence of violation of assumptions of regression analysis, and therefore the sample results obtained from both sets of analyses can be safely generalised to the population. The next chapter discusses the significance of these findings within the context of the reviewed literature.
CHAPTER SEVEN

DISCUSSION OF FINDINGS

7.1 CHAPTER INTRODUCTION

Chapter 6 was restricted to presentation and analysis of collected data, without much discussion or comparison with the extant literature. This is in line with the traditional practice in scientific reporting, where presentation of results is separated from discussion of their significance in order to preserve objectivity (Perry, 2002). The current chapter discusses the findings emerging from the analysis carried out in the previous chapter.

The findings from each research hypothesis are summarised and explained within the context of this and prior research examined Chapters 3 and 4. The chapter is organised as follows:

- Section 7.2 summarises the findings about the determinants of intentions to pay water bills promptly, and discusses them within the context of this research and the extant literature;
- Section 7.3 summarises the findings relating to the effect of socio-demographic factors on intentions, and discusses them within the context of this and prior research;
- Section 7.4 discusses the findings relating to the determinants of prompt bill payment behaviour, drawing comparisons with related research that has used the theory of planned behaviour as a theoretical framework;
- Section 7.5 concludes the chapter and presents a revised research model, illustrating the relationships supported by the empirical data.

7.2 DETERMINANTS OF INTENTIONS TO PAY WATER BILLS PROMPTLY

The research hypothesis relating to the determinants of intentions was stated as follows:

*The three variables of attitude, subjective norms and perceived control with respect to prompt bill payment will significantly predict, either individually or as part of a group of variables, some of the variation in a customer's intentions to pay a water bill promptly*

The results displayed in table 6.16 of section 6.5.1 indicate that the three predictor variables of attitude, subjective norm and perceived control jointly account for a large percentage (61

147
percent) of the variation in intentions, with a very highly significant overall fit to the regression model ($F= 234.29, p<.001$). These results provide strong evidence for support of the research hypothesis. The variance in intentions jointly explained by the three variables is larger than the average (39 percent) obtained in a recent meta-analysis of 185 independent studies that have used the TPB theoretical framework to study different behaviours (Armitage and Conner, 2001).

Furthermore, examination of the regression coefficients reveals that all three predictor variables make significant individual contribution to intention: subjective norm has the smallest beta coefficient ($\beta_2 = .163, t (447) = 4.8, p<.001$), and perceived control has the largest ($\beta_3 = .550, t (447) = 15.52, p<.001$). Similarly, examination of the semi-partial correlation coefficients (table 6.16) reveals that perceived control explains 21 percent of the variance in intentions when the effect of the other two variables is controlled. The attitude variable uniquely explains 4 percent while subjective norms alone explain only 2 percent of the variance in intention. This result suggests that when it comes to paying a water bill promptly, customer perceptions of the ease or difficulty of engaging in the behaviour are far more important in determining their decisions than attitude towards the behaviour or their perception of social pressure.

The author did not come across documented empirical research that has directly examined the effects of attitudes, subjective norms and perceived control on intentions to pay for water services promptly. A study that comes close to the present one is that of Addo-Yobo, Njiru and Sohail (2006), which examined the effect of attitudes and subjective norms on intentions to pay for improved services. It is important to contrast their study with the present study. Addo-Yobo, Njiru and Sohail applied Ajzen and Fishbein's (1980) theory of reasoned action (TRA) to examine the factors that influence intentions to pay for an improved water service. They examined these intentions within the context of prospective customers of a likely 'future' water service provider in the peri-urban areas of Accra, Ghana. The current study utilised a variation of the TRA – the theory of planned behaviour (Ajzen, 1991) – to examine the factors that influence intentions to promptly pay for water services provided within the context of an existing utility-customer relationship. Clearly, in the latter case, the issue is not payment *per se*, but rather, prompt payment for the services provided. Notwithstanding the differences in the research objectives, it is important to compare the results, as both studies are intended to address the same problem.
The results of this research support Addo-Yobo, Njiru and Sohail’s (2006) finding that both attitudes and subjective norms have a statistically significant effect on intentions to pay, and therefore are necessary inputs to the customer’s decision-making process. However, it appears that the act of paying for water services promptly is not entirely under personal control and therefore cannot be adequately predicted by the TRA framework which assumes personal control over behaviour. By including the perceived control variable as proposed by the theory of planned behaviour, the current study shows that the decision to pay for a water service is influenced to a large extent by customer perceptions of how much control they have over the behaviour. In other words, customers who believe they have the necessary resources and opportunities to pay their water bills promptly are likely to have a stronger intention to do so, whereas those who believe that they lack some of the requisite resources or opportunities are likely have a much weaker intention.

7.2.1 Beliefs underlying perceptions of control

It is worthwhile re-examining the results of a correlation analysis between belief-based and direct measures of perceived control in order to gain more insight into the underlying belief structure. From the results of the correlation analysis presented in table 6.15, eight out of the ten control beliefs have statistically significant (at p<.05 and p<.01) associations with perceived control. For those control factors considered barriers to prompt bill payment (i.e. high water bill, service interruptions, mistakes in meter readings, increase in water consumption, unanticipated circumstances, coloured/unclear water and financial difficulties), the correlation coefficients for control belief strength although small in magnitude (r<.3) have the expected negative signs, suggesting that the higher the perceived frequency of occurrence of these barriers, the lower the perceived control over paying water bills promptly. The weak and non-significant correlation coefficient (r =.05) for inability to understand the bill suggests that this barrier does not necessarily reduce perceived control over paying the bill in time.

For those control factors considered facilitators, only reminder visits had a significant positive correlation (r = .23, p<.001) with perceived control, implying that those customers who regularly receive reminder visits or notices from the utility, reminding them of unpaid bills, are more likely to perceive more control over paying water bills promptly. This could be because a reminder visit or notice creates an opportunity for the customer, and increases their sense of personal agency to respond. The non- significant correlation (r =.05) for water bill delivered on time suggest that this facilitating factor does not necessarily increase perceived control. A possible explanation for this phenomenon lies in the billing procedures. Most of
the utility companies in the study towns consider the 15 days 'period of grace' starting from the date the customer actually receives the bill. Thus, it does not matter whether the customer receives the monthly bill slightly later than month end.

Furthermore, on the basis of significant correlation coefficients between control belief power and perceived control, it appears that only 3 out of the 8 control beliefs (i.e. service interruptions, unanticipated circumstances, and financial difficulties) have the power to actually influence decisions. Given that all three are barriers, it would appear that addressing barriers to prompt bill payment is more important than putting in place facilitators such as reminder visits or notices. Of particular importance to utility managers is the finding that frequent service interruptions have the power to influence customer response to bills. This finding seems to confirm Addo-Yobo, Njiru and Sohail's (2006) claim that supplying water at suitable times and ensuring a reliable service is an effective means of translating customer's expressed willingness to pay into actual paying behaviour. Service interruptions may be caused by a number of factors, including pipe leakages and bursts, power cuts and low water production. In the study towns, power cuts are a major cause of service interruptions, as the country has for the past two years experienced a major power crisis. The low level of water production in Uganda's small towns is also a major concern, as most of the systems were originally designed with public standpipes in mind rather than individual house connections. The result is that utility companies are unable to ensure service reliability (i.e. consistency and adequacy of supply), and as the findings of this research show, this situation is likely to make customers develop a much weaker sense of personal agency as far as bill payment is concerned.

Another factor perceived to have the power to influence prompt bill payment is the occurrence of unanticipated circumstances such as illness or death of a family member. Related to this is the question of how often customers experience financial difficulties (i.e. lack of money). When customers experience financial difficulties or encounter unanticipated circumstances (such as illness, death of family member) that place extra demands on their household budgets, it becomes more difficult for them to respond quickly to water bills. This, however, does not necessarily mean a chronic lack of ability to pay. Rather, it may reflect situations where a monthly bill exceeds household cash flow. Given the low-incomes of most customers in small towns, this finding has important implications for the development of appropriate payment arrangements – an issue that is discussed further in the next chapter.
7.2.2 Beliefs underlying attitudes towards prompt bill payment

The foregoing discussion on the cognitive foundation of perceived control can be extended to attitudes – the other significant predictor of intentions to pay. For this, reference is made to the correlation analysis results presented in tables 6.13 and 6.14 of section 6.4.2. Again, similar to perceived control, we gain more insight into the underlying belief structure that informs customer attitudes by looking at the correlation of attitude with both the outcome beliefs and evaluations (table 6.13). The outcome beliefs that correlated significantly with attitudes included: the belief that paying the water bill promptly would (i) result in being served by well equipped and motivated staff; (ii) result in being served by a properly maintained water system; (iii) result in foregoing other household needs; (iv) help to avoid accumulated bills; and (v) ensure that the service is not disconnected.

The belief that ‘paying the bill in time ensures that water is not disconnected’ had the strongest positive association with attitude ($r = .42$, $p<.001$). This is not entirely surprising given the vigilance of the utilities in disconnecting non-paying customers. The weak and non-significant correlation ($r = .01$) of the belief relating to reliable service with attitude towards prompt payment may seem to contradict the previous discussion on control factors. However, given that most customers have experienced service interruptions in the past, it is possible that in responding to this belief statement, customers communicated a desired end state, rather than what they perceived could realistically happen if they paid their bills in time.

Furthermore, from the magnitude of all the correlation coefficients reported in table 6.13, it is not apparent whether it is outcome beliefs per se or their evaluation (outcome evaluation) that are important in attitude formation. Nevertheless, it is clear from the correlations for the belief relating to disconnection that the likelihood of not being disconnected is more important in forming positive attitudes towards prompt bill payment than the subjective value attached to remaining connected. Therefore, it appears the disconnection strategy employed by the utilities is working well in shaping positive attitudes towards prompt payment of bills.

7.2.3 Beliefs underlying perceptions of social pressure

Regarding the underlying beliefs for subjective norms (perceived social pressure), the correlation analysis results displayed in table 6.14 show that customer perceptions of the normative expectations of neighbours ($r = .39$, $p<.001$), the service provider ($r = .15$, $p<.05$)
and family members ($r = .25, p<.001$) are positively and significantly related to subjective norms. This indicates that each of the three referent groups exerts some level of normative pressure on customers to pay bills promptly.

Contrary to what Addo-Yobo, Njiru and Sohail (2006) found among peri-urban settlements in the city of Accra, neighbours appear to have a relatively strong normative influence on customer decisions to pay in the current context. Whereas this may not necessarily imply strong social ties in small town settlements compared to peri-urban areas, it serves to highlight an important feature of small towns: their mix of rural and urban characteristics. Social influences are generally more pronounced in rural areas where communities are more cohesive. The fact that these influences appear to operate in small towns suggest that these settlements have indeed a rural side.

A further explanation for the influence of neighbours is the practice of “household on-selling” of water which has become a kind of small-scale business for many yard tap owners. In this case the normative pressure would appear to come from the monetary benefits that household on-selling brings, as well as the need to keep “customers” happy. In terms of promoting prompt bill payment, the normative influence of neighbours could be exploited by utilities in two ways. First, customer's perceived social pressure to pay bills in time could be increased by using targeted interventions (e.g. promotional campaigns) that promote the practice of prompt bill payment as indeed acceptable and desirable to one’s neighbours. Secondly, utilities could promote the practice of household on-selling by: (i) conducting studies to increase their understanding of this practice; and (ii) influencing local policy makers and regulators to recognise the practice and offer regulatory guidelines.

Related to the above is the rather interesting finding that the utility itself, as an organisation, exerts normative pressure on the customer. Both the normative belief strength and the motivation to comply are positively and significantly associated with subjective norms. Although the correlation coefficients indicate a small effect, it appears that those customers who believe that the utility is desirous to receive payments in time, and are motivated to comply with the utility, will perceive more pressure to actually pay their bill in time. This has important implications for the utility’s collection and communication strategy – an issue that is discussed further in the next chapter.

Finally, concerning the role of family, the finding that “family members” increase normative pressure on customers to pay water bills promptly is consistent with what Addo-Yobo, Njiru
and Sohail (2006) found in relation to paying for water services in general. However, a customer's motivation to comply with family member wishes appears to have no relationship (r = .00) with their perception of social pressure — a finding that is also consistent with Addo-Yobo, Njiru and Sohail's (2006) study. A reasonable explanation for this can be traced to the fact that family is closer to the individual than any other referent group, and therefore, one is likely to feel some family pressure irrespective of whether they are motivated to comply with family member wishes or not. Consequently, promoting the practice of prompt bill payment as acceptable and desirable to family members is likely to increase a customer's perceived social pressure to actually engage in the behaviour.

7.3 SOCIO-DEMOGRAPHIC EFFECTS ON INTENTIONS

The hypothesis relating to the effect of socio-demographic factors on intentions to pay was stated as follows:

The effect of various household characteristics (i.e. gender of household head; household size; education level of household head; occupation of household head; house ownership status; and income level) on intentions to pay water bills promptly is mediated by the variables attitude, subjective norms and perceived control.

The results displayed in tables 6.26 through to 6.29 of section 6.7 indicate that four out of the six household variables have statistically significant positive effects on intention. These four variables are: gender (F= 7.89, p = .005), occupation (F = 2.19, p = .05), income level of the household head (F = 3.45, p = .002), and house ownership status (F = 4.87, p = .002). However, while gender, occupation, house ownership and income have statistically significant direct relationships with intentions, only the effects of gender and occupation are mediated by perceived control and subjective norms. From these findings, the research hypothesis that socio-demographic influences on intentions to pay are mediated by the TPB variables of attitude, subjective norm, and perceived control is only partially supported.

The author did not come across published empirical research that has examined whether socio-demographic effects on intentions to pay for water are mediated by attitudinal variables such as those proposed by the TPB. Most studies reviewed in chapter three (e.g., World Bank Water Demand Research Team, 1993; Perez-Pineda, 1999; Whittington et al., 2002; Hopkins et al., 2004; Gulyani et al., 2005; Casey et al., 2006; Venkatachalam, 2006) examined only the direct effects of various household variables on willingness to pay (WTP) for improved water services, relying mainly on the contingent valuation (CV) methodology. Notwithstanding, the
difference in objectives and approach, some of this study’s findings relating to the role of socio-demographic variables can be compared with past studies on willingness to pay.

Regarding gender influences, the results of this study show that men have stronger intentions to pay their water bills promptly compared to women. This result contradicts what is usually reported in CV studies that women are more willing to pay for improved water services than men. The reason most commonly cited to explain the higher WTP exhibited by women is that because women carry the responsibility for basic household necessities that require water (such as food preparation and food hygiene), they are more willing to pay for water provision. The current study shows that this reasoning may not be valid when it comes to the actual behaviour of paying for water.

The results show that gender effects on intention to pay water bills are mediated by the perceived control variable. In other words, males and females differ in the strength of their intentions to pay water bills promptly because of differences in their perception of control over the behaviour. Female-headed households perceive less control over paying water bills in time than male-headed households. This difference could be due to a number of reasons. First, it is likely that some of the control beliefs relating to barriers as discussed in section 7.2.1 (e.g. service interruptions) are held more strongly among women than men. Secondly, in the current context, there is evidence to suggest that female-headed households are more likely to experience financial difficulties than their male counterparts. According to a recent Uganda National Household Survey, more men (61 percent) are engaged in paid employment compared to women (Uganda Bureau of Statistics, 2003). Household heads engaged in paid employment receive a steady income, which may increase the resources and opportunities available to them in the behavioural context.

Furthermore, consistent with many WTP studies, this study detected occupational influences on intention to pay water bills promptly. Customers who are self-employed in business (e.g., shop owners, bar and restaurant proprietors) have stronger intentions to pay their bills promptly compared to those in other types of employment. Intuitively, this finding could be explained as a manifestation of the generally higher cash flows available to self-employed business people. On the contrary, this study has provided evidence that suggests that the effects of occupation type on intentions are mediated by subjective norms. In other words, people with different occupations have different intention strengths because of differences in their perception of social pressure to perform the behaviour. It is likely that business people perceive more social pressure because of their social status, and the likelihood that most
people (e.g. neighbours, family, and the utility) would expect them not to have problems with paying water bills since they are generally believed to possess the necessary resources and opportunities.

The findings of this study also show that house ownership status and income level have a statistically significant influence on intentions to pay water bills promptly – a result that is consistent with many previous WTP studies. Customers staying in houses that they privately own, have strong intentions to pay their bills than those staying in rented or government owned houses. In addition, customers with an average monthly income below Ug.Sh. 50 000 have weaker intentions to pay their bills in time than those with an average income between Ug. Sh. 100 000 to 200 000 or those with more than Ug.Sh.300 000. However, unlike the effects of gender and occupation, the effects of income and house ownership status on intentions are not mediated by any of the TPB variables as hypothesised in Chapter 4. This implies that these household variables maintain independent effects on intentions which cannot be explained by attitudinal variables. The effects of house ownership appear to stem from the fact that customers who stay in rented or government owned premises do not necessarily enter into an agreement with water utility as is the case with house owners. As a result, renters and those staying government houses are likely to be reluctant with paying water bills as they have no obligation to the water utility which has an agreement with the landlord.

Overall, the results of this study seem to suggest that socio-demographic variables directly influence payment for water, not only in a hypothetical market created by a CV methodology, but also in an existing customer-utility relationship. However, from the magnitude of $R^2$ values given in table 6.26, it is clear that the effect of socio-demographic variables on intention to pay water bills promptly is much smaller compared to the joint influence of TPB variables, and the effects of some of the variables (such as gender and occupation) are completely mediated by perceived control and subjective norms variables.

Moreover, some household variables (e.g. size of household and education level of household head) did not show a statistically significant influence on intentions. Although the non-significant effect of household size is consistent with many WTP studies (e.g., World Bank Water Demand Research Team, 1993; Hopkins et al., 2004; Venkatachalam, 2006), the result for education level contradicts what is usually reported in these studies. It is likely that such influences on payment behaviour progressively disappear as country policies on cost recovery
become internalised by the population, and they become more aware that they have to pay for water.

7.4 DETERMINANTS OF PROMPT BILL PAYMENT BEHAVIOUR

The research hypothesis relating to the determinants of prompt bill payment behaviour was stated as follows:

The two variables of intentions, and perceived control will significantly predict, either individually or as part of a group of variables some of the variation in actual prompt bill payment behaviour.

The results displayed in tables 6.19 and 6.21 of section 6.5.2 indicate that only intention makes a statistically significant contribution to the prediction of prompt bill payment behaviour. Results in table 6.19 show that the first logistic regression model (LRM-1) is highly significant (model \( \chi^2 = 7.85, p<.01 \)) with a fairly good fit to the data (H-L goodness of fit test statistic \( \chi^2 = 5.88, p>.05 \)). In the model, only the intention variable makes a statistically significant contribution to prediction of the probability that a customer belongs to the category of those who fully paid their water bill promptly.

Similar results are obtained for the second logistic regression model (LRM-2) which attempts to predict the probability that a customer belongs to the category of those who paid half or more of their water bill promptly, given their score on intention and perceived control variables (model \( \chi^2 = 10.92, p = .01 \); H-L goodness of fit test statistic \( \chi^2 = 8.52, p >.38 \)). Although perceived control displays the correct direction of relationship in both models, it does not make a statistically significant contribution to the prediction of prompt bill payment behaviour. Nonetheless, the fact that the two predictor variables display highly significant regression models with the outcome variable, provides support for the research hypothesis that intention and perceived control predict either individually, or as part of a group of variables, a statistically significant proportion of variation in prompt bill payment behaviour.

Concerning the individual role of perceived control, the non-significant regression coefficient is inconsistent with Ajzen and Fishbein's (2005) suggestion that taking into account perceived control improves the prediction of behaviour. However, it appears such a result is not uncommon in studies using the TPB theoretical framework. For instance, Notani (1998) in a meta-analysis found that out of 35 tests of the perceived control–behaviour relationship, only
17 were statistically significant. Godin and Kok's (1996) analysis of 87 applications of the TPB to health-related behaviours revealed that intentions were the most important determinants of behaviour, accounting for 22.5 percent of the 34 percent explained variance in behaviour. Moreover, Armitage and Conner's (2001) meta-analysis examined the contribution of perceived control for a wide variety of behaviours and found that, on average, perceived control only explained an additional 2 percent of the variance in behaviour.

Within the TPB literature, a non-significant PBC-behaviour link is often explained away as an indication that the behaviour is probably under personal control so that intention alone is sufficient to predict behaviour. However, Notani (1998) warns against such a post-hoc explanation arguing that it can be misleading given that the significance of the relationship also depends on when perceived control is assessed relative to performance of the behaviour. Furthermore, it has been argued by Ajzen (1991) and confirmed by several empirical studies in social psychology (e.g. Sheeran et al., 1999; Conner, 2000; Sheeran et al., 2003) that perceived control can only serve as an independent predictor of behaviour to the extent that it is stable, accurate and reflects actual control.

In this research, perceived control was measured approximately two weeks before the actual performance of the behaviour. The test-retest correlations displayed in table 6.6 of section 6.3.3 indicated good temporal stability (test-retest r = .7). However, despite this level of stability, it appears that perceived control did not really reflect actual control, hence the poor relationship with behaviour. As pointed out by Notani (1998, p.249) "it may be hard for a person to predict in advance his or her perceived control for future behaviours". Hence, it seems likely that perceived control will rarely reflect actual control in a very accurate way (Armitage and Conner, 2001).

Regarding the predictive influence of intentions on behaviour, the models LRM-1 and LRM-2 although statistically significant, had limited predictive value. On the basis of Cox-Snell $R^2$ and Nagelkerke $R^2$, both models appeared to explain only 3 to 4 percent of the variation in prompt bill payment behaviour. Classification statistics further indicated that LRM-1 only correctly classified 62 percent of customers, while LRM-2 correctly classified 64 percent of customers. Also, from figure 6.1 in section 6.5, a customer who scores 5 (the highest score) on the intention scale has only a 25 percent chance of actually paying his or her water bill fully and a 41 percent of paying half or more within the 15 days. Clearly, both models account for only a small amount of variance in prompt bill payment behaviour – a finding,
although not entirely surprising, begs the question: do expressed intentions to pay water bills promptly translate into actual prompt bill payment behaviour?

It is a common observation that people often fail to act in accordance with their stated intentions. For instance, in the health domain where the TPB has found extensive application, many studies report that between 26 percent and 57 percent of respondents failed to carry out their intentions to use condoms, to undergo a cancer screening or to exercise (Sheeran, 2002). However, Sheeran’s (2002) meta-analysis also reports an overall correlation of .53 between intention and behaviour, indicating that there are indeed instances when intentions are predictive of behaviour. Ajzen and Fishbein (2005) point out three main factors that may be responsible for low relations between intentions and behaviour: (i) if there is little or no variance either in intentions or in behaviour; (ii) if intentions change after they are assessed; and (iii) lack of compatibility between measures of intention and behaviour.

In the current study, three possible reasons can be advanced to explain the small amount of variance in prompt bill payment behaviour explained by intentions. First, there was relatively little variance in prompt bill payment behaviour data to explain. As revealed in the descriptive analysis reported in section 6.4.1, more than half (58 percent) of customers did not pay anything on their bill in the 15-days, and only 13 percent fully paid their bill promptly within that period. There is little variation between those who did not pay anything and those who paid fully, and the variance of the entire data set is only 0.18.

A second reason for the low predictive power of intentions could be because the measure of intention exhibited low stability as shown by the test-retest correlation results given in table 6.6 of section 6.3.3 (test retest $r = .19$). As pointed out by several researchers (e.g., Sheeran et al., 1999; Conner, 2000; Ajzen and Fishbein, 2005), changes in intention’s stability over time tend to lower predictive validity. It is worth noting that this study was carried out in the midst of Uganda’s 2006 presidential and parliamentary electioneering. In Uganda, despite the progress made in reforming the country’s water sector, it is not uncommon for local politicians to promise low or no water tariffs to their electorate. It is, therefore, possible that this election event, could have led to changes in intentions measured previously, and that the strong emotions in a behavioural context could have activated beliefs and attitudes that were not anticipated while completing a questionnaire.

Thirdly, most studies have used the TPB to predict self-reported measures of behaviour, and generally, intention has been found to predict self-reported behaviours quite well compared to
objective measures of behaviour (Armitage and Conner, 2001). In this study, we used an objective measure of behaviour, which was obtained without the knowledge of the respondents. Similarly, Randall and Wolff (1994) in their review of TPB studies, found that the type of behaviour was linked to the strength of the intention-behaviour relationship. In the current study, it can be urged that the behaviour of paying a water bill promptly involves performance of a number steps before the action behaviour is realised. These steps may involve: budgeting for the bill, allocating the resources (money), and going to the utility office to pay before the 15 day 'period of grace' elapses. Consequently, the prediction of a behaviour located at one end of this continuum might be too distant to secure a good prediction.

7.5 CHAPTER SUMMARY

This chapter has provided a synthesis of the results of the data analysis, within the context of the extant literature and insight obtained during the course of the research. Based on the foregoing discussion, this section summarises the key issues emerging from this research and draws conclusions about the research hypotheses posed in the current study.

As discussed in Chapter 4, the conceptual framework for the above research question was guided by Ajzen's (1988; 1991) theory of planned behaviour (TPB). The findings of this research provide strong evidence in support of the theory's proposition that attitudes, subjective norms, and perceived control with respect to paying water bills promptly, strongly influence customer's intentions to pay promptly, which in turn directly affect actual prompt bill payment behaviour. This is one of the few studies that have utilised a socio-cognitive model to understand customer decision-making and behaviour in relation to paying for water.

Based on these findings, the prediction research model proposed in chapter four is modified as shown in Figure 7.1. The figure indicates the relationships that are supported by the research findings. Also, using standardised regression coefficients, the direction and strength of relationships are indicated. The modified research model shows that perceived control has the strongest influence on intentions, implying that the decision to pay water bills promptly is influenced to a large extent by customer perceptions of how much control they have over the behaviour.
Fig. 7.1: Revised model for explaining utility water customer decisions to pay water bills promptly

An inquiry into the belief structure underlying customer perceptions of control revealed the following perceived barriers to prompt bill payment: (i) high water bills; (ii) frequent service interruptions; (iii) mistakes in meter readings, (iv) increase in water consumption, (v) unanticipated circumstances that place extra demands on household budget; (vi) coloured or unclear water; and (vii) financial difficulties.

The inquiry also revealed that customers, who regularly receive reminder visits or notices from the utility, reminding them of unpaid bills, are more likely to perceive more control over paying water bills promptly. From these revelations, it is noted that with the exception of unanticipated circumstances and financial difficulties, the rest of the factors perceived to impede or facilitate prompt bill payment, relate to service delivery issues that are within the full control of the water utility. By exploring these factors, this study has provided utility managers with a rich informational foundation on which to base strategies and managerial actions aimed at influencing bill payment behaviour.

The research has also provided insights into the underlying belief structure that informs customer attitudes and perceptions of social pressure to engage in the practice of paying water bills in time. In the case of attitudes, customers appear to form beliefs about this behaviour by associating it with certain outcomes or consequences. These include: the belief that paying the water bill promptly would (i) result in being served by well equipped and motivated staff; (ii) result in being served by a properly maintained water system; (iii) result in foregoing other household needs; (iv) help to avoid accumulated bills; and (v) ensure that the service is not
disconnected. Perceptions of social pressure appear to stem from people's beliefs relating to the expectations of (i) neighbours; (ii) family members; and (iii) the service provider organisation. These insights serve to advance Addo-Yobo, Njiru and Sohail's (2006) work on the role of family and neighbours as important referent groups when it comes to paying for water in general.

Furthermore, the study provides evidence that some socio-demographic characteristics have significant direct effects on intentions to pay water bills promptly. However, the effect of these variables is much smaller compared to the joint influence of the TPB variables. The study also shows that the effects of gender and occupation type on intentions are mediated by perceived control and subjective norms respectively. This is the first study reported in public domain that has examined whether other modifiable variables account for the relationship between socio-demographic variables and customer decisions to pay for water. Given that gender and other such demographic variables are not amenable to change, the research makes an important contribution in terms of shedding light on the process variables that can be influenced by water utility managers in order to effect changes in payment behaviour.

In sum, this research project has fulfilled its objectives in that the data obtained were able to show that both attitudinal and socio-demographic factors influence customer decisions relating to paying for water services promptly. The next chapter sums up the entire research undertaking and draws important theory and practical implications.
CHAPTER EIGHT

RESEARCH CONCLUSIONS AND IMPLICATIONS

8.1 CHAPTER INTRODUCTION

This research sought to address the management problem of low cost recovery in urban water services in low-income countries. Chapter 1 provided a brief background and highlighted this problem as indeed one of the major challenges facing the sector. Chapter 2 provided a more detailed background and overview of the problem, and highlighted the trends in management thinking and approaches to improving cost recovery in urban water services. Given that the chief means of recovering costs of service provision is through user-payments for the service provided, Chapter 2 concluded with an observation that contemporary management thinking now places customers at the centre of efforts to improve cost recovery. Such a trend implies that water utility managers must gain a better understanding of the behaviour of their customers with respect to paying for services, and the factors that determine and influence this behaviour.

As part of a process to discover some of the factors that might influence consumer decision-making with regard to timely payment of water bills, a literature review was conducted, and details of the findings are presented in Chapter 3. Section 3.7 of Chapter 3 identified the major research issues and gaps. While there has been a proliferation of research looking at household willingness to pay in a hypothetical service setting, limited research has been carried out on the factors influencing actual payment for water services in an actual service setting. Furthermore, the extant literature does not fully address attitudinal influences on willingness to pay and bill payment behaviour. Instead, it dwells much on factors that are beyond the water utility’s influence (e.g. socio-economic factors), and offers less guidance to managers on what strategic policy and managerial actions to take in order to fully or partially influence bill payment behaviour.

The weaknesses in the literature reported in Chapter 3 led to the development of a research question, a research model and testable hypotheses, as reported in Chapter 4. The primary question relevant to the problem addressed in this study was formulated as follows:
What factors are critically important for motivating customer decisions about paying for water services promptly?

In order to answer this question comprehensively, the study utilised a socio-cognitive theory of planned behaviour (TPB) discussed in Chapter 4 (section 4.3), as a theoretical base. The primary research question was further broken down into four secondary questions as follows:

1. Do attitudes, subjective norms, and perceived control with respect to paying water bills promptly influence customer intentions to actually engage in this behaviour?
2. What do utility customers believe to be the benefits, sacrifices, facilitating factors and barriers to paying their water bills promptly?
3. Are socio-demographic effects on intentions mediated by attitudes, subjective norms and perceived control?
4. Do expressed intentions to pay water bills promptly translate into actual prompt bill payment behaviour?

Based on the above research questions, three testable hypotheses were derived as reported in section 4.4 of Chapter 4. Chapter 5 described the methodology and research procedures adopted in the collection of relevant data for testing the hypotheses. Chapter 6 presented the pattern of results and analysed them for their relevance to the research questions and hypotheses. Then, Chapter 7 summarised and discussed the findings within the context of this and prior research examined in Chapter 3. The current chapter sums up the entire research, identifies the distinct contribution to knowledge made by the entire research undertaking, and draws implications for policy, practice and theory. The remainder of the chapter is organised as follows:

- Section 8.2 draws conclusions about the research questions posed in this study and shows whether or not they have been adequately answered;
- Section 8.3 summarises the knowledge contributions made by the entire research undertaking;
- Section 8.4 discusses the theoretical implications of the research;
- Section 8.5 discusses the practical implications of the research for water utility managers;
- Section 8.6 summarises the broad policy implications derived from the research
- Section 8.7 notes some limitations of this research; and
- Section 8.8 gives suggestions for further research
8.2 CONCLUSIONS ABOUT THE RESEARCH QUESTIONS

Like all research projects, this research sought to address a specific question, which was motivated by a problem in practice – i.e. low-cost recovery in urban water services. Based on the knowledge gaps identified in the literature, the primary research question was broken down into secondary research questions which formed the basis for data collection and hypothesis testing. As a way of summing up the entire research effort, this section draws conclusions about the questions posed in this study. The section demonstrates that all secondary research questions have been answered, and that a firm conclusion can be drawn against the primary question. Below is a summary of the conclusions drawn for each secondary questions and the primary question:

**Secondary question 1:** Do attitudes, subjective norms, and perceived control with respect to paying water bills promptly influence customer intentions to actually engage in this behaviour?

The findings from this research show that customer attitude towards prompt payment of water bills, perceived ease or difficulty of paying on time (perceived control), as well as perceived social pressure (subjective norm), strongly influence intentions to pay water bills promptly. More importantly, the findings also suggest that when it comes to paying a water bill promptly, customer perceptions of the ease or difficulty of engaging in the behaviour are far more important in determining their decisions than attitude towards the behaviour or their perception of social pressure.

**Secondary question 2:** What do utility customers believe to be the benefits, sacrifices, facilitating factors and barriers to paying their water bills promptly?

The findings of the research suggest that customers generally believe that prompt payment of water bills has a lot more benefits than sacrifices – a belief that largely shapes their attitudes towards the behaviour. The primary benefit of paying promptly seems to be the assurance that the service would not be disconnected. This is not entirely surprising given the vigilance of the town water utilities in disconnecting non-paying customers. However, there are also indirect benefits that emerged. For instance, customers believed that when they pay their water bills promptly they will be served by a properly maintained water supply system, and well-equipped and motivated utility staff – a finding that demonstrates customer awareness of the importance of paying for water in time. Customers also believe that paying promptly helps them to avoid accumulation of unpaid bills, but could result in having to forego other household needs.
Regarding facilitating factors, customers considered reminder visits or notices from the utility as a facilitator to prompt payment of water bills. This could be because such visits or notices create an opportunity for the customer, and increases their sense of personal agency to respond to the bill. On the other hand, customers perceive the following as barriers to paying water bills promptly: (i) high water bills; (ii) service interruptions; (iii) mistakes in meter readings; (iv) increase in water consumption; (v) unanticipated circumstances; (vi) coloured/unclear water and financial difficulties. It is worthwhile noting that most of the factors perceived to impede or facilitate prompt bill payment relate to service delivery issues that are within the full control of the water utility. By exploring these factors, this study has provided utility managers with a rich informational foundation on which to base strategies and managerial actions aimed at influencing bill payment behaviour.

*Secondary question 3:* Are socio-demographic effects on intentions mediated by attitudes, subjective norms and perceived control?

The findings of this research showed that while gender, occupation, house ownership and income have statistically significant direct effects on intentions to pay water bills promptly, only the effects of gender and occupation are mediated by perceived control and subjective norms respectively. Attitude did not emerge as a mediator. Home ownership and income maintained independent effects on intentions which could not be explained by attitudinal variables. But their effect on intentions was much smaller compared to the joint effect of attitudes, subjective norms and perceived control.

*Secondary question 4:* Do expressed intentions to pay water bills promptly translate into actual prompt bill payment behaviour?

The findings of the research showed that customer's expressed intentions to pay water bills promptly are significantly associated with their actual prompt bill payment behaviour. However, due to the small effect size, it is likely that intentions alone are insufficient to explain bill payment behaviour.

*Primary research question:* What factors are critically important for motivating customer decisions about paying for water services promptly?

Based on the foregoing conclusions about each secondary question, firm conclusions can be made about the factors that are critically important for motivating customer decisions about paying for water services promptly. The research findings provide strong evidence in support of the theory of planned behaviour, that customer attitude towards prompt payment, perceived
ease or difficulty of paying on time (perceived control), as well as social pressure, strongly influence intentions to pay, which in turn directly affects actual prompt bill payment behaviour. Thus, it follows that attitudes, perceptions of social pressure and control are important factors for motivating customer decisions about paying for water services promptly. However, perceptions of control (i.e. the ease or difficulty of engaging in the behaviour) are far more important than attitude towards the behaviour or the perception of social pressure.

The findings of the research also suggest that addressing perceived barriers to prompt bill payment is more important than putting in place facilitators. Some of the perceived barriers identified include: i) high water bills; (ii) frequent service interruptions; (iii) mistakes in meter readings, (iv) increase in water consumption, (v) unanticipated circumstances that place extra demands on household budget; (vi) coloured or unclear water; and (vii) financial difficulties. With the exception of unanticipated circumstances and financial difficulties, the rest of the factors perceived to impede prompt bill payment, relate to service delivery issues that are within the full control of the water utility. This observation suggests that opportunities exist for water utilities to motivate customer decisions about prompt payment of water bills.

Finally, socio-demographic factors such as gender, income level, occupation of the head of household and house tenure status exhibited statistically significant direct effects on intentions to pay, but their effects were much smaller compared to the joint influence of attitudes, perceived control and perceived social pressure. Moreover, the effects of gender and occupation were completely mediated by perceived control and social pressure respectively. This result implies that even though socio-demographic factors are beyond the control of the water utility, the effect of these factors on a customer’s payment decisions can be explained in terms of other modifiable variables that utilities can at least partially influence.

8.3 KNOWLEDGE CONTRIBUTIONS

The research has made the following knowledge contributions:

- Application of a socio-cognitive theoretical perspective to understand domestic water demand behaviour has complemented the economic perspective that is dominant in the water sector.

- This is the first study to examine the influence of both attitudinal and socio-demographic factors on customer decisions to pay water bills promptly in small towns.
water services, and provides a useful conceptual model that can be utilised by utility managers for both diagnostic and predictive purposes, as well as for the design of behavioural change strategies.

- The reviewed literature shows that most previous research on willingness to pay has utilised the contingent valuation method, either for proposed new water systems or for different characteristics in either rural or large urban areas. This study contributes to knowledge by using cross-sectional data obtained from existing utility customers in a small town setting.

- This is one of the few studies that has examined whether other internal psychological factors account for the relationships between socio-demographic variables and customer intentions to pay for water.

- This research extends knowledge that supports the utility of the theory of planned behaviour as a useful conceptual framework for understanding consumer decision-making and behaviour.

- This is one of the few studies that have empirically tested the role of 'background' factors (e.g. socio-economic factors) in the theory of planned behaviour, and whether their influence on intentions is mediated by the theory's variables.

- This is one of the few studies that have examined the link between behavioural intentions and an objective measure of actual behaviour.

8.4 IMPLICATIONS FOR THEORY

Apart from the knowledge contributions outlined above, the findings of this research also have important implications for the wider body of knowledge reviewed in Chapter 3. In particular, the findings of the research have implications for future application of both the economic and socio-cognitive theories in the study of consumer behaviour in relation to paying for improved water services in developing countries.

As discussed in Chapter 3, the economic perspective dominates most of the existing research on willingness to pay for water services. This approach predicts behaviour using external factors such as income, price and other socio-demographic variables, but fails to account for internal psychological factors. Moreover, selecting suitable socio-demographic factors for
inclusion in prediction models is problematic due to the presence of a multitude of such variables. In light of the vast number of potentially relevant socio-demographic factors, it is difficult to know which should be considered without a theory to guide selection. Moreover, research studies to date have produced conflicting results of the relevance of different socio-demographic variables.

In contrast, the socio-cognitive perspective adopted in this research focuses on the process by which consumers make decisions. At the heart of this approach is the attitude concept, which for the past three decades, has remained central to the various models developed by social psychologists for the purpose of understanding and predicting human behaviour. The most influential models have been those guided by the reasoned action approach, in particular the theories of reasoned action and planned behaviour. For investigators interested in predicting, understanding, and changing specific behaviours, these models have provided a useful conceptual framework and workable methodology. In particular, the theory of planned behaviour has received extensive application in health promotion literature. However, application in the water sector has been limited.

The findings of this study show that the theory of planned behaviour is a useful conceptual framework for understanding customer motivations when it comes to paying for water. The predictor variables adapted from the theory accounted for a large proportion of variance in customer’s intentions to pay water bills promptly. The theory however has limitations. The antecedent beliefs for attitudes, subjective norms and perceived control are problematic, with relatively low correlations between the weighted belief terms as hypothesized by the expectancy value model, and the respective direct measures of the theory’s constructs (see tables 6.13 to 6.14). Although these low correlations do not affect prediction of intentions from direct measures of the theory’s constructs, they seem to indicate that the way beliefs combine to form attitudes, subjective norms and perceived control is more complex than the expectancy value model suggests.

Moreover, it is noted that inaccurate information can produce unrealistic beliefs, attitudes and intentions; unanticipated events can lead to changes in intentions; and strong emotions in a behavioural context can activate beliefs and attitudes that may lead to changes in intentions. It is also noted that perceptions of control over behaviour may not necessarily reflect actual control, and when this happens, the prediction of behaviour from perceived control becomes problematic.
The above limitations notwithstanding, the theory of planned behaviour offers an alternative explanation for variations in willingness to pay values obtained in contingent valuation studies. It is not suggested here that the theory of planned behaviour is superior to the economic perspective. On the contrary, the current study demonstrates that both perspectives are important and can supplement each other. For instance, evidence presented in this study suggests that the theory of planned behaviour can address the question of why two people with similar socio-economic status would have different willingness to pay. The economic perspective on the other hand, is capable of explaining why two people with similar behavioural profiles might still have different willingness to pay and behaviours.

A common criticism of the theory of planned behaviour is that it does not explicitly include socio-demographic and other external factors as predictors of intention. The counter argument provided by the author of the theory is that the effect of socio-demographic and other external factors on intentions are mediated by the theory's constructs. However, the current study did not find full support for the mediation hypothesis. This suggests that customer decisions relating to paying for water are directly influenced by both psychological and economic influences.

In summary, it can be said that the economic and socio-cognitive perspectives represent different but complementary viewpoints for examining customer decisions and behaviour relating to paying for water services. The socio-cognitive perspective focuses on factors internal to the individual, while economic models focus to a large extent on the factors external to the individual. As such, relying on only one perspective ignores a set of potentially valuable explanatory variables. Future research on willingness to pay should consider ways of combining elements from both perspectives, with survey instruments designed to elicit both behavioural and economic information. Such integration of economic models with the more behavioural/social psychology models offers a basis for future research in this direction.

8.5 IMPLICATIONS FOR WATER UTILITY MANAGERS

Beyond the theory, the findings of this research have several practical implications for improving cost recovery in small urban water utilities in low-income countries. As mentioned in Chapters 1 and 4, delayed bill payments and arrears impact on a utility's capacity to deliver water services in a sustainable manner. Water utilities that are not able to
collect revenues in time from the bills they send out are likely to experience cash flow problems. This is especially true for small water utilities that do not have sufficient revenue reserves. Cash flow problems impact on the utility’s ability to cover operating expenses and improve its service offering. As a result, minimising the levels of arrears is a critical concern for water utility managers. The findings of this research provide insights into some of the actions and strategies managers might take to promote and encourage the practice of paying water bills promptly. These strategies are discussed in the following sub-sections 8.5.1 to 8.5.5.

8.5.1 Ensure reliable water supply

The findings of this study suggest that frequent service interruptions influence customer decisions relating to prompt payment of water bills. Therefore, in the current context, it appears that ensuring reliability of supply – i.e. consistency and adequacy of supply as per the promised service level - is the single most important action that managers can take to promote prompt bill payment. This however might require additional investment to increase production levels, where there is a substantial supply deficit. In cases where service interruptions are due to power failures, investing in coping measures such as standby generators or other alternative power and additional storage may be warranted. Also, in order to minimise the impact of service interruptions, utilities need to work on improving customer relations through accurate and timely communications during the period of service failure, and ensuring a quick response to customer complaints.

8.5.2 Improve billing accuracy

Water utility managers need to address customer perceived barriers to prompt bill payment by minimising errors and mistakes in billing, as well as reducing wastage and losses incurred through tap leakages and faulty meters. Findings from focus group discussions revealed that customers often receive high water bills that reflect malfunctioning installations (such as taps and meters) due to infrequent or poor maintenance. In most cases, leakage and wastage is reported as the primary cause of high water bills, leading to non-payment. Understandably, customers would be unwilling to pay for water they did not consume, and therefore, utilities need to be proactive. Initiatives could include more frequent meter readings, increasing customer awareness, facilitating checks and repairs and carrying out demand management and water conservation programs.

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8.5.3 Allow flexible billing and payment arrangements

Given the low disposable incomes of customers in small urban centres, utilities need to design flexible billing and payment arrangements to help customers pay their bills when they have the money on hand rather than on a monthly basis, as is the case in most countries. As discussed in section 7.2.1, there is some evidence to suggest that customers may experience financial difficulties which make it difficult for them to pay large monthly bills. Because most customers have irregular incomes, payment difficulties may be due to cash flow problems, as opposed to an absolute inability to pay.

Utilities therefore need to adapt their billing systems, allowing more payment flexibility in a manner that better suits household budgeting and expenditure. Efforts should be made to investigate what options are relevant to the local context, for instance: increasing the frequency of billings or allowing several smaller payments against a single bill. Allowing more frequent billing may add significantly to the administrative costs of the utility, but the cost impact can be minimised by developing a network of payment points in collaboration with say, local retailers, post offices, banks. Other initiatives may include water stamps or tokens which people can buy anytime and use to pay for water; and subcontracting billing to a small-scale operator or local community representative who becomes responsible for collecting and paying the bills for an entire settlement within the network.

8.5.4 Service disconnection

The findings of this study suggest that the likelihood of not being disconnected plays a big role in shaping positive attitudes towards paying water bills in time. In the current context, it appears that the diligence of utilities in disconnecting non-paying customers is having an influence. This strategy signals to customers the consequences of not paying water bills in time, and therefore, avoiding disconnection becomes the main perceived benefit of paying bills in time.

However, although the disconnection strategy may work well in shaping positive customer attitudes, it can be counterproductive when implemented indiscriminately without due consideration to the particular circumstances of customers. For instance, it would be particularly inappropriate to disconnect customers who are facing short-term payment difficulties resulting from non-permanent situations such as incurring extraordinary medical bills, school fees. These circumstances may not warrant the disconnection of service. Nor would the disconnection of service in these circumstances protect the utility against any future
loss of revenue. Instead, it has the potential to affect customer relations and hence satisfaction levels, which might be damaging in the long term.

Therefore, utilities may need to review their all too familiar “one-size-fits-all” strategy to dealing with customers in arrears, and instead adopt a marketing approach grounded on good knowledge of customer circumstances. For instance, utilities could segment customers into categories based on how quickly they react to water bills. This would enable managers to design targeted strategies for debt management and recovery. Those customers considered to be high risk would be flagged for personal follow-up immediately a payment is missed; those deemed low-risk would be sent a reminder letter and vulnerable customers, who are struggling to pay, can be offered additional help and advice. Adopting such a proactive customer-centric strategy has potential not only to transform revenue collection but also to increase customer satisfaction. Small urban water utilities need to take advantage of their relatively small number of customers by adopting a customised approach to debt management and recovery.

8.5.5 Design behavioural change programmes

The results of the present study have clear implications for the design of publicity and education programmes that aim to encourage prompt bill payment behaviour. The wide range of behavioural, normative and control beliefs identified in the study could be used to develop publicity messages aimed at bringing about desirable changes in customer attitudes, subjective norms and perceptions of control respectively.

In addition, other ways (apart from publicity and education) of bringing about changes in attitudes could be sought. For instance, it might be difficult through publicity alone to alter the belief that “paying a water bill in time will result in foregoing other household needs”. Altering this belief might warrant the need for changes in the billing schedules – e.g. allowing several smaller bill payments against a single bill. Once such a payment arrangement is in place, publicity could then be used to encourage customers to use it.

Furthermore, utilities need to explore incentive mechanisms in the form of discounts or vouchers for prompt and regular payment. Such mechanisms serve to demonstrate to customers that the utility strongly desires to receive payments in time, thereby increasing the normative pressure on customers to respond quickly to bills.
8.6 POLICY IMPLICATIONS

Beyond operational issues, the findings of this research also have implications for policy makers involved in functions such as service regulation and consumer education. First, the research has demonstrated how good knowledge of consumer behaviour provides useful insights into consumer problems, and the nature of the exchange relationship between water consumers and suppliers. Such knowledge can inform decisions on the development of interventions to encourage good utility management practices and to increase cost recovery levels.

Secondly, the evidence gathered in this research suggests that cost recovery through user-payments is affected by different aspects of project design and operation that policy makers and planners may not readily appreciate or take into account during planning of small town water systems. Many urban water projects begin without fully acknowledging the importance of these factors. Thus, when cost recovery is viewed as the need to collect enough revenues from users to cover the cost of installed systems, the challenge of getting people to pay becomes apparent. Although there may be strategies that can be adopted at the operational level to promote bill payment (such as those discussed section 8.5), there are also long-term policy issues that need to be addressed, particularly those relating to tariff structures, technology and service level choices. As the global policy trends reviewed in Chapter 2 suggest, getting customers to cover the cost of services provided is no longer a contested approach to improving cost recovery in urban water supply. However, utilities and their regulators must realise that changing the cost or the characteristics of those services can also contribute to improving cost recovery.

8.7 LIMITATIONS OF THE RESEARCH

The real strength of this study lies in its use of a two-phase sequential qualitative/quantitative methods approach to shed light on the motivations of utility customers when it comes to paying their bills promptly. Although the main variables were measured quantitatively, the preliminary qualitative study conducted in the first phase allowed for a deeper exploration of what customers perceive as the benefits, sacrifices, facilitating factors and barriers to paying their water bills promptly. This qualitative exploration provided a basis for examining the informational foundation underlying attitudes, subjective norms and perceptions of control, thus giving an insight to some the motivational factors.
Some limitations of this study however should be noted. Firstly, the cross-sectional design adopted means that the study could only prove relationships between variables but not causation. However, while it is true that a correlation between two variables does not establish causation, it is a pre-requisite for establishing a causal relationship. Thus, if there is no correlation, a researcher is confident that there is not a causal relationship. Eliminating variables as causes is of as much scientific importance as locating causes.

Secondly, owing to the low literacy levels in the study setting, the survey questionnaire had to be interpreted to a portion of the sample that indicated preference for this method of administration. Interpreting questionnaire items in local languages could have resulted in loss of precision in the meaning of constructs, due to lack of corresponding terminologies. It is also likely that some respondents who opted to self-administer the questionnaire might not have understood all the questions. Nonetheless, the results of the psychometric analysis showed that respondents' answers had good internal consistency.

Thirdly, there is a possibility that responses to questionnaire items create changes in cognitions that can influence subsequent behaviour. Thus, it is possible that this process could have led to bias in our measure of prompt bill payment behaviour, which was observed two weeks after questionnaire administration. However, biases of this kind tend to inflate correlations between intentions and behavioural self-reports, especially for socially desirable behaviours (Ajzen and Fishbein, 2004). Given that our measure of behaviour was obtained objectively using a monitoring procedure unknown to the respondents, it is unlikely that the intention-behaviour relationship was substantially affected by such biases. Moreover, in one study where a TPB questionnaire preceded observation of behaviour (Ajzen et. al, 2004); there was no evidence that responding to a questionnaire affected subsequent behaviour.

Finally, there could have been some inaccuracies in the data collected on household characteristics. Because most people are reluctant to disclose personal or family matters to strangers, it is likely that some respondents may not have been entirely truthful. Nevertheless, comparisons with the Uganda Bureau of Statistics population and housing data showed that most of the household level data were similar to that obtained in recent national census surveys.

The above limitations however do not detract from the study's strengths. Instead, they merely provide platforms for future research (which are discussed in the following section).
8.8 SUGGESTIONS FOR FURTHER RESEARCH

Future research in this area could take on a number of directions. First, as noted above, the cross-sectional design of the current study limited the author to making only correlational inferences. It would be more beneficial to water utility managers if causal research was carried out using a longitudinal research design. Moreover, there is a possibility that over time, customers develop a habit of either paying water bills late or in time. Such habits can only be examined adequately using a longitudinal research design.

Secondly, intention is often theorised as the proximal determinant of one's behaviour, yet the strength of the intention-behaviour relationship as regards paying for water services has been found in this research to be a modest one. Therefore, a potential area for further research is to investigate additional potential influences on bill payment behaviour independent of intentions or mediators of intention-behaviour relationship. Moreover, an alternative approach may be that intention is always the proximal influence of behaviour, but changes for some people across time as a result of fluctuating motivational antecedents. As water sector planners and practitioners are interested in predicting water payment behaviour over extended periods of time (even before improved services are in place), influences on successful and unsuccessful initial intention translation may be a practical research question.

Thirdly, in addition to socio-demographic factors, future research using a similar framework, could examine the role of other background factors such as information (e.g. knowledge of the process and costs involved in producing clean water), and individual factors (such as personality, mood, values). Fourthly, although the current research has provided insights into some of the actions and strategies that may be taken to promote prompt bill payment, further research is needed to investigate the methods for effectively changing customer behaviour. Also, any behavioural change intervention designed on the basis of the results of this study should be fully evaluated to determine its effectiveness.

Fifthly, further research could use a similar conceptual framework, but focus on non-domestic customers, such as institutions (e.g. schools, health centres), and small-scale industries. Such research could examine whether the factors that influence the payment behaviour of domestic consumers differ from those that affect non-domestic customers. Similarly, since consumer behaviour is bound to vary in different contexts, further research should be carried out in a different context (e.g. in other low-income countries or in larger urban centres) in order to generalise the findings.
Finally, utility managers in small urban centres are facing problems of low cost recovery and government subsidy burdens are becoming unbearable. At the same time, strategies to improve financial sustainability cannot be focused on only those who are connected. Increasing service coverage also needs to be considered. Hence, managers will benefit from an understanding of the behavioural issues surrounding piped water use in small urban centres. Predicting customer willingness to use or to pay for water services has been a subject of intense research in the past two decades. The current research showed that transforming that self-reported willingness to pay into actual payment behaviour is much more complex, and points to the need to re-think the way willingness to pay is elicited in the first place.
REFERENCES


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WHO and UNICEF (2006). Meeting the MDG drinking water and sanitation target: the urban and rural challenge of the decade. Geneva, WHO and UNICEF.


APPENDICES
APPENDIX A-1: Letter of Invitation to Focus Group Discussion

[Name of Town] Council Water Supply Authority
[Name of Private Operator Company]

[Date]

Dear esteemed customer,

Re: Invitation to Attend a Focus Group Discussion

This is to request you to attend a focus group discussion on [date], at [time] at the Water Office boardroom. The discussion is intended to gather your opinions or views on the reasons why some of our customers are able to pay their water bills promptly while others struggle to clear bills and eventually get disconnected.

This discussion is part of a research being conducted by Mr. Josses Mugabi of Loughborough University (UK) regarding this issue. We are hopeful that the results of this study will help us improve our services and be more focused to the needs and concerns of our customers. So please kindly attend this discussion, as your views are important to us. The meeting will take approximately 2 hours, and light refreshments will be served.

Thank you.

Yours sincerely,

Area Manager, [Name of Private Operator Company]
[Name of Town] Water Office
APPENDIX A-2: Pro forma for Focus Group Discussions

Town: ___________________ Date/Time: ___________________

Key points before you start:

- Thank the participants for turning up
- Inform them of the purpose of the focus group discussion and how, and why they were selected
- Assure them that their identity will be kept confidential
- Tell them about the approximate length of time for the discussion

Information for Participants

Introduction of the research team:
My name is ___________________. I am working as a facilitator on research being conducted by Mr. Josses Mugabi of Loughborough University in the UK. My role is to guide and moderate this discussion. I will also be writing on a flip chart paper all the issues discussed. Josses will also take note of key points discussed, and will observe the body language and non-verbal forms of communication.

Background to the research:
The research is looking into the factors that influence people's decisions on whether to pay or not to pay for piped water services in small towns. Josses will be collecting data and information for this research from 10 randomly selected small towns in Uganda (this being one of them). In particular, he will be administering a questionnaire to a random sample of registered customers of ___________________________ (the private operator) in the near future. The findings of this study will assist the water utility managers in this town to improve services and be more customer-focused.

During our discussion I will be asking you some questions concerning payment of water bills. Whatever you say will remain confidential, and the results of our discussion will only be presented in aggregate form. Your names will not be used in connection to with any of the information we discuss here.

Ground Rules:

- Participation is voluntary, and you can withdraw at any time. You do not have to answer any question if you feel uncomfortable.
- The opinions of all participants are important to us, and we would like to hear them.
- Please do not reveal any information shared by others during this discussion.
- To ensure we can all hear each other properly, only one person should speak at a time.
- Comments and differences of opinion should be expressed politely.
- Feel free to ask questions to each other, and to my self, the facilitator.
- The discussion is expected to last 2 hours.

Do you have any questions before we start? (After questions, participants introduce themselves)
APPENDIX A-2: Pro forma for Focus Group Discussions - Continued

We are interested in the reasons why households with piped water connections to their homes do or do not fully pay their water bills within 15 days of receiving it as requested by [Name of Private Operator Company], the service provider. In other words, the behaviour of interest in this study is “paying water bills within 15 days of receipt of the bill”. We would appreciate your responses to some questions about this. There are no right or wrong answers. Please tell us what you really think.

Please take a few minutes to voice your thoughts about the following questions:

1. What do you believe are the advantages of paying your next water bill within 15 days of receiving the bill?
2. What do you believe are the disadvantages of paying your next water bill within 15 days of receiving the bill?
3. Is there anything else you associate with your paying next water bill within 15 days of receiving the bill?
4. Are there any individuals or groups who would approve of your paying water bill within 15 days of receiving the bill?
5. Are there any individuals or groups who would disapprove of your paying next water bill within 15 days of receiving the bill?
6. Are there any other individuals or groups who come to mind when you think about paying water bills within 15 days of receiving the bill?
7. What factors or circumstances would enable you to pay your next water bill at the utility office within 15 days of receiving the bill?
8. What factors or circumstances would make it difficult or impossible for you to pay your next water bill at the utility office within 15 days of receiving the bill?
9. Are there any other issues that come to mind when you think about the difficulty of paying your water bills within 15 days of receiving of the bill?

To the facilitator:
Summarise key points of the discussion and ask if there are any other issues or comments
Thank participants for their time
# APPENDIX A-3: Content Analysis of Focus Group Discussion Notes

## Advantages/Benefits of Paying Water Bills Promptly:

<table>
<thead>
<tr>
<th>Item</th>
<th>Aggregate Count</th>
<th>Questionnaire Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Constant supply of water to my home - no disconnection</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• Staff of the service provider will be motivated to serve me better</td>
<td>54</td>
<td>Selected</td>
</tr>
<tr>
<td>• Service provider will be able to meet all operation and maintenance costs so I can continue to get a reliable water supply</td>
<td>48</td>
<td>Selected</td>
</tr>
<tr>
<td>• I can avoid accumulating too many debts</td>
<td>48</td>
<td>Selected</td>
</tr>
<tr>
<td>• Peace of mind</td>
<td>38</td>
<td>Selected</td>
</tr>
<tr>
<td>• There will be funds for helping other community members to get access to piped water (expansion of the system)</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>• Ensures good hygiene in the home</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>• Good service (complaints can be attended to immediately)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>• Protect my children from potential dangers at wells/boreholes when my piped water is disconnected</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>• PO is able to avoid admin costs related to disconnection of customers</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>• Helps you to budget for your household expenditure</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>• I can avoid using expensive alternative sources</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Demonstrates integrity, and keeps your social status in the community</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Saves me time</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>• Enjoy the convenience of piped water in my home</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

## Disadvantages/Sacrifices of Paying Water Bills Promptly

<table>
<thead>
<tr>
<th>Item</th>
<th>Aggregate Count</th>
<th>Questionnaire Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You can pay your bills in time, but the service turns out be very unreliable</td>
<td>48</td>
<td>Selected</td>
</tr>
<tr>
<td>• I may have to forego other household needs and make water a first priority</td>
<td>30</td>
<td>Selected</td>
</tr>
<tr>
<td>• When many customers pay in time, there is no one to disconnect. So the little water we have gets finished quickly because of the high demand.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Difficult to keep consistent</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Sometimes the bill is so small that you prefer paying it later (may be after three months) when it has accumulated.</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Other customers may not comply (i.e. pay in time), so I will still experience the poor service that may result from the service provider not having enough revenue</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

## People or groups who approve the behaviour

<table>
<thead>
<tr>
<th>Item</th>
<th>Aggregate Count</th>
<th>Questionnaire Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Neighbours (because they purchase water from my tap)</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• Family members (especially my wife and daughters)</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• The service provider</td>
<td>48</td>
<td>Selected</td>
</tr>
<tr>
<td>• Other community members who do not have access to water</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

## People or groups who disapprove the behaviour

<table>
<thead>
<tr>
<th>Item</th>
<th>Aggregate Count</th>
<th>Questionnaire Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Water vendors</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• Some jealous people</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX A-3: Content Analysis of Focus Group Discussion Notes (Cont’d)

<table>
<thead>
<tr>
<th><strong>Paying Water Bills Promptly: Facilitating Factors/Circumstances</strong></th>
<th><strong>Aggregate Count</strong></th>
<th><strong>Questionnaire Items</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• If the bill is affordable/tariffs reduced</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• Service reliability (constant supply)</td>
<td>54</td>
<td>Selected</td>
</tr>
<tr>
<td>• Bills delivered to me in time</td>
<td>34</td>
<td>Selected</td>
</tr>
<tr>
<td>• Threat of disconnection</td>
<td>30</td>
<td>Selected</td>
</tr>
<tr>
<td>• Selling water to neighbours</td>
<td>26</td>
<td>Selected</td>
</tr>
<tr>
<td>• Reminder visits/radio announcements</td>
<td>22</td>
<td>Selected</td>
</tr>
<tr>
<td>• Budgeting</td>
<td>20</td>
<td>Selected</td>
</tr>
<tr>
<td>• If those delivering bills move with receipt books we can pay immediately</td>
<td>12</td>
<td>Selected</td>
</tr>
<tr>
<td>• If I am convinced about the benefits of piped water compared to other sources such as springs, boreholes etc</td>
<td>12</td>
<td>Selected</td>
</tr>
<tr>
<td>• Good water quality</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Good customer care</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>• Allow for flexibility in payments (allow prepayments even before the bill comes)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>• Presence of reconnection fees</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>• Fear of losing my social status and standard of living I have set for my home</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Barriers to Paying Water Bills Promptly</strong></th>
<th><strong>Aggregate Count</strong></th>
<th><strong>Questionnaire Items</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Poor customer care/complaints not addressed in time</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• Incorrect bills and mistakes in reading meters</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• If the service is not reliable (no constant supply of water)</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• Faulty meters/leaking taps</td>
<td>60</td>
<td>Selected</td>
</tr>
<tr>
<td>• High tariffs</td>
<td>50</td>
<td>Selected</td>
</tr>
<tr>
<td>• Lack of money</td>
<td>44</td>
<td>Selected</td>
</tr>
<tr>
<td>• Other unexpected/unplanned household expenditures (e.g. death or illness occurs)</td>
<td>40</td>
<td>Selected</td>
</tr>
<tr>
<td>• Poor water quality</td>
<td>38</td>
<td>Selected</td>
</tr>
<tr>
<td>• Failure to understand the water bill</td>
<td>38</td>
<td>Selected</td>
</tr>
<tr>
<td>• If the bill is not delivered in time</td>
<td>24</td>
<td>Selected</td>
</tr>
<tr>
<td>• Unusual increase in consumption sometimes due to illegal collection (theft) of water by other people</td>
<td>22</td>
<td>Selected</td>
</tr>
<tr>
<td>• Presence of alternative water sources</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>• Lack of control over household finances and expenditure</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>• Poor budgeting on my side</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Misappropriation of funds by authorities or their staff (e.g. some technicians collect money but don't register the money at the office)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Ignorance about government water policy</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>• Lack of meters - not knowing exactly how much water you have used</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

* Emerging issues/themes were each given a count equal to the number of participants in the group. If a particular issue did not emerge from a group, it was given a count of zero for that group. The counts for each theme were then summed across all the five groups to generate an aggregate count, which was used to rank the emerging issues and give an indication of the most commonly held perceptions.
04 Jan 2006

Dear Colleague,

Re: Questionnaire Pre-test

This is to request you to take part in a questionnaire pre-test. The questionnaire attached herewith, is designed to measure a number variables relevant to a research we are conducting. The research examines the influence of belief-based customer perceptions of urban water services on bill payment behaviour. The research is guided by concepts in the behavioural sciences, and is being conducted in small urban centres in Uganda. This questionnaire is designed to measure the main constructs as defined in the table below. Prompt bill payment behaviour, the main dependent variable is not measured in this questionnaire. This variable will be measured using data from billing sheets and payment records for the month of Feb 2006, soon after questionnaire administration.

For more information about the research, please visit the project web page: http://www.lboro.ac.uk/departments/cv/research/profile/student/108.html

You are kindly requested to review the information in the table below (showing the main constructs and how they are to be measured), attempt filling the attached questionnaire, and make comments on the following:

- Clarity of the cover page information
- Clarity of the introductions/instructions for each section
- Clarity of the questions
- Whether response categories are clear and exhaustive
- Convenience of questionnaire structure for self administration
- Form and content of measures (pointing out any ambiguous or confusing items)
- Any other comments

Please write your comments on the attached form, and email it to me not later than 10th Jan 2005. My email address is J.Mugabi@lboro.ac.uk. Your comments will help us to further refine the questionnaire before a pilot study is conducted. Should you have any questions or concerns, please don't hesitate to contact me on Tel. +256 77 868 555, or drop me an email on the above address.

Your cooperation and assistance will be highly appreciated.

Thank you.

Yours Sincerely,

Josses Mugabi
PhD Research Scholar
Water, Engineering and Development Centre
Loughborough University, LE11 3TU, UK
## APPENDIX B-2: Summary of Comments Received from Pre-test Participants

| Summary of Comments |  
|---------------------|---
| **Clarity of cover page information** | - Cover page questionnaire instructions are clear  
|  | - Introductory letter is well structured and clear  
| **Clarity of introduction/instructions for each section** | - The instruction “do not omit any questions” is over-stressed in all sections. Some respondents may easily get offended and abandon the whole exercise  
| **Clarity of questions** | - Section C, question 4 is not clear. Do you mean water bill from the water vendors or from the utility?  
|  | - Section A, question 2: What is meant by “highly motivated staff”? Does the customer understand what this means in terms of service delivery in order to appreciate the question and response?  
|  | - Section A question 4: the question is a bit leading  
|  | - Section A, question 5 is not very clear  
|  | - Section F, question 5 would read better if you replace “fail” with “unable”  
|  | - Section F, Question 6 and 7: are respondents easily able to distinguish between errors in recorded consumption resulting from mistakes in meter readings and faulty meter/leakages?  
| **Response categories clear and exhaustive** | - The use of ‘good’ for some response categories may not bring out what you are trying to measure. For question A2 and 3, replace ‘good’ with ‘important’ in order to bring out the evaluative aspect of the measure  
|  | - Section F, question 2 needs an “escape” route for those respondents who have not had any complaints about utility services  
|  | - Classification question 6: Income bands seem to narrow  
| **Convenience of questionnaire structure** | - Overall presentation of questionnaire is OK  
|  | - Questionnaire too long  
| **Form and content of measures** | - Allow space for respondents to give their comments/complaints/suggestions on the questions and content  
| **Any other comments** |  

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APPENDIX C: Pilot Study Questionnaire

Water, Engineering and Development Centre, Loughborough University (UK)
In cooperation with [Private Operator Company]

Customer Survey on Bill Payment Behaviour

| Questionnaire S/No: _______________ | Town: __________________________ |
|_________________________________ |_______________________________ |
| Customer Reference No. __________ | Zone: _________________________ |
|________________________________ |_______________________________ |
| Address (house number and street name): _________________________________ | 

To the translator: Please read the following statement to each customer before you ask the questions. Please request to interview the head of the household or his/her spouse, NOT the children or dependants

My name is [Name of Interviewer] and I am conducting a survey on behalf of Mr. Josses Mugabi, a full time Research Scholar at the Water, Engineering and Development Centre (WEDC) at Loughborough University, UK. This survey is part of a wider investigation being carried out by WEDC, in cooperation with [Private Operator Company] to find out the reasons why some customers are able to pay their water bills promptly while others struggle to clear bills and eventually get disconnected. Specifically, we are interested in your opinions regarding the issue of paying water bills within 15 days of receiving the bill. You are one of the few customers who have been randomly selected to participate in this study. Your opinions are therefore very important. We are hopeful that the results of this study will help the service provider to improve service delivery by focusing on the needs and concerns of customers.

Questions and statements will be read to you. To make your response a lot easier, and use as little of your time as possible, multiple answers have been provided for each of the questions/statements. I shall read or show you the multiple answers on several show cards. You are requested to choose one of the responses that correspond to your answer/opinion. Please note that there are no correct or incorrect responses; we are merely interested in your personal point of view. Each individual is entitled to his/her opinion. All your responses are completely confidential. All information you provide will be published ONLY in summary, statistical form.

Thank you for your cooperation.
APPENDIX C: Pilot Study Questionnaire Continued

Section A: [Outcome Evaluations; and Self reported Past Behaviour]

This first section consists of a set of 7 statements (and 1 question) intended to find out your personal views on piped water supply to your home. Each of the first 8 statements is incomplete, but your response will complete each of these statements. Please make a check mark or tick (✓) in the box that best describes your view. If you do not have an opinion on a particular statement, please tick the choice neither against it. The last question in this section is concerned about how often you pay water bills promptly. Please respond to all statements/questions. DO NOT omit any. Also, DO NOT put more than one check mark (✓) on a single statement/question.

1. Having a continuous supply of piped water to my home is

   extremely necessary  quite necessary  neither  quite unnecessary  extremely unnecessary

2. For me to be served by highly motivated water utility staff is

   extremely important  important  neither  unimportant  extremely unimportant

3. For me to be served by a properly maintained piped water supply system is

   extremely important  important  neither  unimportant  extremely unimportant

4. For me to forego other household needs and pay my water bill as a first priority is

   a very bad idea  quite a bad idea  neither  quite a good idea  a very good idea

5. For me to experience interruptions in the supply of water to my home after I have paid my bills in time is

   Extremely good  quite good  neither  quite bad  extremely bad

6. Delaying to pay my water bills so that they accumulate to a larger amount is

   a very bad idea  quite a bad idea  neither  quite a good idea  a very good idea

7. For me to have a peace of mind is

   Extremely good  quite good  neither  quite bad  extremely bad

8. Ever since you got your piped water connection, how often have you paid your monthly water bill with in 15 days of receiving the bill?

   Every month  almost every month  most months  a few months  never
APPENDIX C: Pilot Study Questionnaire Continued

Section B: [Direct Measures of Perceived Behavioural Control, Subjective Norm, Attitude, and Intention]

The company that manages piped water in your town requires that you pay your monthly water bills promptly. In this section, we would like to know what you think about paying your next water bill within 15 days of receiving it. We make use of the following rating scales. Please make a check mark (\(\checkmark\)) in the box that best describes your view. Please respond to all items. Some of the statements may appear to be similar, but they address somewhat different issues. Please read each statement carefully. Also, DO NOT put more than one check mark (\(\checkmark\)) on a single statement.

1. For me to pay my next water bill within 15 days of receiving it will be

<table>
<thead>
<tr>
<th>Extremely difficult</th>
<th>quite difficult</th>
<th>uncertain</th>
<th>quite easy</th>
<th>extremely easy</th>
</tr>
</thead>
</table>

2. Most people who are important to me (family, friends, neighbours etc) think that I should pay my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>uncertain</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

3. Paying my next water bill within 15 days of receiving it is.

<table>
<thead>
<tr>
<th>Extremely bad idea</th>
<th>quite a bad idea</th>
<th>neither</th>
<th>quite a good idea</th>
<th>extremely good idea</th>
</tr>
</thead>
</table>

4. I plan to pay my next water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>quite likely</th>
<th>uncertain</th>
<th>quite unlikely</th>
<th>extremely unlikely</th>
</tr>
</thead>
</table>

5. Whether or not I pay my next water bill within 15 days of receiving it, is completely up to me

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>agree</th>
<th>uncertain</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
</table>

6. Most people who are important to me pay their water bills within 15 days of receiving them

<table>
<thead>
<tr>
<th>Completely false</th>
<th>quite false</th>
<th>don’t know</th>
<th>quite true</th>
<th>completely true</th>
</tr>
</thead>
</table>

7. I will make an effort to pay my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Definitely false</th>
<th>quite false</th>
<th>uncertain</th>
<th>quite true</th>
<th>definitely true</th>
</tr>
</thead>
</table>

8. For me to pay my next water bill within 15 days of receiving it is

<table>
<thead>
<tr>
<th>Extremely valuable</th>
<th>quite valuable</th>
<th>neither</th>
<th>quite worthless</th>
<th>extremely worthless</th>
</tr>
</thead>
</table>
APPENDIX C: Pilot Study Questionnaire Continued

9. I am confident that if I wanted to I could pay my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Definitely false</th>
<th>quite false</th>
<th>uncertain</th>
<th>quite true</th>
<th>definitely true</th>
</tr>
</thead>
</table>

10. It is expected of me that I pay my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Definitely true</th>
<th>quite true</th>
<th>uncertain</th>
<th>quite false</th>
<th>definitely false</th>
</tr>
</thead>
</table>

11. For me to pay my next water bill within 15 days of receiving it will be

<table>
<thead>
<tr>
<th>Extremely pleasant</th>
<th>quite pleasant</th>
<th>neither</th>
<th>quite unpleasant</th>
<th>extremely unpleasant</th>
</tr>
</thead>
</table>

12. I intend to pay my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>extremely likely</th>
<th>quite likely</th>
<th>uncertain</th>
<th>quite unlikely</th>
<th>extremely unlikely</th>
</tr>
</thead>
</table>

Section C: [Normative Belief Strength]

In this section, we would like to know what you think would be the expectations of most of the people or groups important to you (e.g., family, neighbours etc.) when it comes to your paying water bills promptly. The following set of statements are about your opinion on whether you think most people or groups important to you would approve or disapprove of your paying next month’s water bill within 15 days of receiving the bill. Please make a check mark or tick (✓) in the box that best describes your view. Please respond to all statements. DO NOT omit any. Also, DO NOT put more than one check mark (✓) on a single statement.

1. Most of my neighbours will be happy with me for paying my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>quite likely</th>
<th>uncertain</th>
<th>quite unlikely</th>
<th>extremely unlikely</th>
</tr>
</thead>
</table>

2. Most members of my family will be happy with me for paying my next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>quite likely</th>
<th>uncertain</th>
<th>quite unlikely</th>
<th>extremely unlikely</th>
</tr>
</thead>
</table>

3. The service provider (i.e., private operator) would approve of my paying the next water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>extremely likely</th>
<th>quite likely</th>
<th>uncertain</th>
<th>quite unlikely</th>
<th>extremely unlikely</th>
</tr>
</thead>
</table>

4. The waters vendors (i.e., people who sell water in jerry cans) would approve of my paying the next utility water bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>extremely likely</th>
<th>quite likely</th>
<th>uncertain</th>
<th>quite unlikely</th>
<th>extremely unlikely</th>
</tr>
</thead>
</table>
APPENDIX C: Pilot Study Questionnaire Continued

Section D: [Motivation to Comply]

In the previous section, we sought your personal views on the expectations of most of the people or groups important to you (e.g., family, neighbours, etc.) when it comes to your paying water bills promptly. In this section, we would like to know how much you care about doing things that these people or groups are happy with. We make use of a rating scale with 5 places between two extremes (i.e., not at all and very much); you are to make a check mark or tick (√) in the box that best describes how much you care. Please answer all questions. Also, DO NOT put more than one check mark (√) on a single question.

1. Generally speaking, to what extent do you care about doing things that your neighbours will be happy with?

   [Scale of 5 options: I don’t care at all, I don’t care, I don’t know, I care a little, I care very much]

2. Generally speaking, to what extent do you care about doing things that your family members will be happy with?

   [Scale of 5 options: I don’t care at all, I don’t care, I don’t know, I care a little, I care very much]

3. Generally speaking, to what extent do you care about doing things that your water service provider (private operator) will be happy with?

   [Scale of 5 options: I don’t care at all, I don’t care, I don’t know, I care a little, I care very much]

4. Generally speaking, to what extent do you care about doing things that water vendors (i.e., people selling water in jerry cans in your area) will be happy with?

   [Scale of 5 options: I don’t care at all, I don’t care, I don’t know, I care a little, I care very much]

Do you have complaints, comments or suggestions on any of the items raised in Sections A, B, C and D?

..................................................................................................................................................................

204
### Section E: [Behavioural Belief Strength]

In this section, we would like to know what you think could happen when you pay your next water bill within 15 days. Please read each of the following 7 statements carefully, and indicate how much you think each of the statements is likely to happen as a result of your paying the next water bill within 15 days of receiving it. The rating scale ranges from extremely unlikely to extremely likely. Please make a check mark or tick (✓) in the box that best describes your view. Please kindly respond to all statements. Also, DO NOT put more than one check mark (✓) on a single scale.

1. Paying my next water bill within 15 days of receiving it, will guarantee a continuous supply of piped water to my home

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

2. Paying my next water bill within 15 days of receiving it, will ensure that I am served by highly motivated water utility staff

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

3. Paying my next water bill within 15 days of receiving it, will ensure that I am served by a properly maintained piped water supply system

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

4. Paying my next water bill within 15 days of receiving it, will cause me to reduce expenditure on other household needs or forego them completely

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

5. Paying my next water bill within 15 days of receiving it, will ensure that the service is reliable with no interruptions in the water supply

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

6. Paying my next water bill within 15 days of receiving it, will help me to avoid accumulating huge arrears

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

7. Paying my next water bill within 15 days of receiving it, will cause me to have a peace of mind

<table>
<thead>
<tr>
<th>Extremely unlikely</th>
<th>quite unlikely</th>
<th>uncertain</th>
<th>quite likely</th>
<th>extremely likely</th>
</tr>
</thead>
</table>

205
Section F: [Control Belief Strength]

In this section, we would like to know your personal opinion about the presence of factors that may make it difficult or easy for you to pay your water bills promptly. We invite you to draw on your experience with the piped water service offered to your household in the past year, to answer the questions in this section. Please make a check mark (✓) in the box that best describes your view. Please kindly respond to all questions. Also, DO NOT put more than one check mark (✓) on a single question.

1. How often do you feel that your monthly water bill is too high?

- Never
- a few times
- sometimes
- most times
- always

2. In the period you have been a customer, you may have had several problems or complaints with services offered by your water utility. How often do utility staffs fail to address your complaints in time? (If you have not had complaints with the services please proceed to Q3)

- Never
- a few times
- sometimes
- most times
- always

3. You may have had service interruptions at your premises either due to pipe leakages and bursts, power cuts, or due to low water production. This could have sometimes led to only pressure reduction, or complete lack of water in your premises. Which phrase best describes how frequently you have had such problems?

- Never
- a few times
- sometimes
- most times
- always

4. How often are your water bills delivered to you in time (i.e. at end of month or shortly after)?

- Never
- a few times
- sometimes
- most times
- always

5. How often do you find yourself unable to understand the water bill delivered to you?

- Never
- a few times
- sometimes
- most times
- always

6. How often do you encounter mistakes in meter readings leading to incorrect water bills?

- Never
- a few times
- sometimes
- most times
- always
APPENDIX C: Pilot Study Questionnaire Continued

7. How often do you experience unusual increases in recorded water consumption as a result of faulty meters?
   Never  a few times  sometimes  most times  always

8. How often do you receive 'disconnection of service' notices due to non-payment of water bills?
   Never  a few times  sometimes  most times  always

9. How often do you sell water to your neighbours or other people not connected to the piped network?
   Never  a few times  sometimes  most times  always

10. How often do you encounter unanticipated circumstances (such as illness, death of loved one etc) that place demands on your household's budget?
    Never  a few times  sometimes  most times  always

11. How often do you receive reminder visits or notices from your service provider to remind you of any outstanding water bills?
    Never  a few times  sometimes  most times  always

12. How often do you make an effort to budget for all your household expenditure including expenditure on water?
    Never  a few times  sometimes  most times  always

13. How often do those delivering the water bill to your home carry receipt books to enable you make your payment immediately?
    Never  a few times  sometimes  most times  always

14. How often does your tap water appear coloured or unclear?
    Never  a few times  sometimes  most times  always
APPENDIX C: Pilot Study Questionnaire Continued

15. How often do you make payments for water even before receiving the water bill?

Never  a few times  sometimes  most times  always

16. How often do you experience financial difficulties (lack of money) in your household?

Never  a few times  sometimes  most times  always

Section G: [Control Belief Power]

In the previous section, we sought your opinion on the presence of various factors related to the services you receive and how often they occur. In this section, we would like to know your opinion on whether these factors, if they occur, would make it more difficult or much easier for you to pay your water bill within 15 days as requested by your service provider. Please indicate how much you agree or disagree with each statement below. If you do not have an opinion on a particular statement, please tick the choice uncertain against it. Please respond to all statements. DO NOT omit any. Also, DO NOT put more than one check mark (✓) on a single statement.

1. If I felt that my water bill is too high, it would make it more difficult for me to pay that bill within 15 days of receiving it

   Strongly Agree  Agree  Uncertain  Disagree  Strongly Disagree

2. If utility staff fail to address my complaints quickly, it would make it more difficult for me to pay my water bill within 15 days of receiving it

   Strongly Agree  Agree  Uncertain  Disagree  Strongly Disagree

3. If I experienced service interruptions or complete lack of water in my premises, it would make it more difficult for me to pay my water bill within 15 days of receiving it

   Strongly Agree  Agree  Uncertain  Disagree  Strongly Disagree

4. If I do not receive the water bill in time (i.e. at end of month or shortly after), it would make it more difficult for me to pay it promptly

   Strongly Agree  Agree  Uncertain  Disagree  Strongly Disagree

208
APPENDIX C: Pilot Study Questionnaire Continued

5. If I found myself unable to understand the water bill delivered to me, it would make it more difficult for me to pay within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

6. If I discovered mistakes in meter readings leading to incorrect bills, it would make it more difficult for me to pay within 15 days of receiving the bill.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

7. If I noticed an unusual increase in recorded water consumption as a result of a faulty meter, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

8. If I received a 'disconnection of service notice' from my service provider, it would make it much easier for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

9. If I sold water to my neighbours or other people with no piped water connection, it would make it much easier for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

10. If I encountered unanticipated circumstances (such as illness, loss of loved one etc) that placed demands on my household budget, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

11. If I received reminder visits or notices from the service provider, reminding me of outstanding bills, it would make it much easier for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

12. If I made an effort to budget for all my household expenditure (including expenditure on water) it would make it much easier for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>
APPENDIX C: Pilot Study Questionnaire Continued

13. If those delivering water bills to me carried receipts books with them, it would make it much easier for me to pay my water bill within 15 days of receiving it.

   [Strongly Agree] [Agree] [Uncertain] [Disagree] [Strongly Disagree]

14. If my tap water appeared coloured or unclear, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

   [Strongly Agree] [Agree] [Uncertain] [Disagree] [Strongly Disagree]

15. If I made pre-payments, even before receiving the end of month water bill, it would make it much easier for me to pay my water bill within 15 days of receiving it.

   [Strongly Agree] [Agree] [Uncertain] [Disagree] [Strongly Disagree]

16. If I experienced financial difficulties (i.e. lack of money) in my household, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

   [Strongly Agree] [Agree] [Uncertain] [Disagree] [Strongly Disagree]

Do you have complaints, comments/or suggestions on any of the items raised in Sections E, F and G

Section H: [Classification Questions]

Thank you very much for your patience in answering the previous questions. Now, to help us classify your answers and process them statistically, please answer the following few questions about yourself and your family.

1. What is your gender (sex)?
   [ ] Male
   [ ] Female

2. How many people are in your household (excluding visitors)? _____________

3. What is the total number of years you have spent at school for formal education?
   [ ] Less than 7 years
   [ ] Between 7 and 12 years
   [ ] Between 13 and 16 years
   [ ] More than 16 years

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APPENDIX C: Pilot Study Questionnaire Continued

4. What is your occupation?
   - Civil Servant (Government-employed)
   - Employed by private company
   - Full time-housewife
   - Self-employed professional
   - Self-employed in business
   - Other (please specify) __________________________

5. What is the ownership status of the premises occupied by your household?
   - Privately owned by family
   - Government/Company owned and allocated/rented to our household
   - Privately owned and rented to our household
   - Other (please specify) __________________________

6. What is the average monthly income of your household?
   - Less than or equal to Ug.Shs. 50,000 per month
   - Between Ug.Shs 50,000 and 100,000 per month
   - Between Ug.Shs 100,000 and 150,000 per month
   - Between Ug.Shs 150,000 and 200,000 per month
   - Between Ug.Shs 200,000 and 250,000 per month
   - Between Ug.Shs 250,000 and 300,000 per month
   - More than Ug.Shs 300,000

---

To the enumerator: Please ask the respondent if he/she has any specific comments or suggestions that could be useful in improvement of service delivery by the private operator

........................................................................................................................................................

Thank you for the time and effort you have spent in answering the question.

We are grateful for your support and cooperation.

+++ THE END +++

---

To The Enumerator:

Time taken to find the respondent ............... Time taken to complete the questionnaire............

Any comments?

..........................................................................................................................................................
APPENDIX D-1: Interviewer Terms of Reference

Background to the Research

This is a PhD Research being conducted by Mr. Josses Mugabi of Loughborough University in the UK. The research is looking into the factors that influence people's decisions on whether to pay or not to pay for piped water services in small towns. The overall aim is to investigate the influence of belief-based customer perceptions of urban utility water services on bill payment behaviour. Data and information for this research will be collected from 8 randomly selected small towns in Uganda (i.e. Rakai, Nkokonjeru, Busembatia, Kamuli, Kumi, Kayunga, Moyo and Ibanda). In particular, a questionnaire will be administered to a random sample of registered customers of the water utility in each town. The findings of this study will assist water utility managers in small towns to improve their services and be more customer-focused.

Scope of Work

- The translator is hired to interpret and/or administer at least 40 questionnaires to those respondents who are unable to understand the contents of the questionnaire. The translator is being hired to facilitate the understanding of questionnaire items to respondents, and NOT to carry out probing interviews.
- The translator must attend a 2-day training session, in which the objectives of the study will be outlined, definitions and instructions reviewed, and all items in the questionnaire discussed.

Selection Criteria

The translator has been selected based on the following criteria:
- At least A 'level Education
- Fluency in local language of study area
- Excellent command of the English language
- Pleasant personality
- Relaxed and friendly personality
- Excellent interpersonal skills
- Excellent communication skills
- Team player
- Ability to work under minimum supervision
- Good organisational skills
- Honesty and accuracy
- Confidence
- Reliability/Dependable
- Motivation and appearance
- Previous experience in interviewing

Duration of Assignment

The assignment is expected to take 3 days (excluding travel days).
APPENDIX D-1: Interviewer Terms of Reference Continued

Reporting
The translator will report on a daily basis to his/her designated supervisor throughout the duration of the assignment. The supervisor will check the completed questionnaires on a daily basis, and discuss any problems or issues with the translator. At the end of the assignment all completed and uncompleted questionnaires MUST be returned to the Project Director.

Remuneration

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic pay</td>
<td>UG Shs. 100,000</td>
</tr>
<tr>
<td>Field Allowance</td>
<td>UG Shs. 20,000</td>
</tr>
<tr>
<td>Training Allowance</td>
<td>UG Shs. 20,000</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>UG Shs.</strong></td>
</tr>
</tbody>
</table>

The field allowance will cater for the translator’s travel and living expenses while in the field. This will be calculated depending on the study area, but will not exceed 50,000/-.

Terms of Payment

The translator will be paid his/her basic wage (100,000/-) in cash at the end of the assignment. Payment will only be made after ALL questionnaires (including those that were not administered) are returned to the Project Director. Field allowance will be paid to the translator at the beginning of the assignment, i.e. the day before travelling to the field. Training allowance will be paid in equal instalments of 10,000/-, on each day of the training.

Please Note:
The researcher/project director will not take responsibility of any injuries or death arising from accidents, acts of war, disease etc that might happen to the translator while carrying out the assigned work.

I have read and understood the Terms of Reference for this assignment, and I agree to take on this work as per the terms contained herein

Name: ___________________________ Signature: ___________________________

Date: ___________________________ Town assigned: ___________________________
### Sample Reporting Form

<table>
<thead>
<tr>
<th>S/No.</th>
<th>NAME OF CUSTOMER</th>
<th>Line No.</th>
<th>Road</th>
<th>Q'mnaire admin? (Y/N)</th>
<th>Mode of administration (<em>S</em>-Self, <em>F</em>- face-to-face)</th>
<th>Follow-up details (date &amp; time) for self-administered q'mnaire</th>
<th>Uncompleted Q'mnaire returned could not delivered</th>
<th>Reason Code</th>
<th>Q'mnaire delivered to HH, but not returned</th>
<th>Reason Code</th>
<th>Supervisor's Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**APPENDIX D-2: SAMPLE REPORTING FORM**
APPENDIX E-1: Pilot Study SPSS Output for Reliability Analysis - Attitude (AT) Scale

Case Processing Summary

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases Valid</td>
<td>81</td>
<td>96.4</td>
</tr>
<tr>
<td>Excluded b</td>
<td>3</td>
<td>3.6</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha Based on</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized Items</td>
<td>Alpha</td>
<td>Items</td>
</tr>
<tr>
<td>.638</td>
<td>.654</td>
<td>3</td>
</tr>
</tbody>
</table>

Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Paying my next water bill within 15 days of receiving it is</th>
<th>For me to pay my next water bill within 15 days of receiving it will be</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paying my next water bill within 15 days of receiving it is</td>
<td>1.000</td>
<td>.361</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it is</td>
<td>.361</td>
<td>1.000</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>.307</td>
<td>.492</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paying my next water bill within 15 days of receiving it is</td>
<td>8.96</td>
<td>1.636</td>
<td>.384</td>
<td>.153</td>
<td>.652</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it is</td>
<td>8.67</td>
<td>1.925</td>
<td>.522</td>
<td>.290</td>
<td>.468</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>8.74</td>
<td>1.719</td>
<td>.465</td>
<td>.261</td>
<td>.514</td>
</tr>
</tbody>
</table>
APPENDIX E-1: Pilot Study SPSS Output for Reliability Analysis - Attitude (AT) Scale (Continued)

Reliability analysis of AT scale following addition of three extra items

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Cases Valid</td>
<td>71</td>
</tr>
<tr>
<td>Excluded</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>

- Listwise deletion based on all variables in the procedure.

<table>
<thead>
<tr>
<th>Item Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally speaking, I think paying water bills within 15 days is a</td>
<td>4.54</td>
<td>.651</td>
<td>71</td>
</tr>
<tr>
<td>Overall, I think that paying water bills within 15 days is</td>
<td>4.55</td>
<td>.672</td>
<td>71</td>
</tr>
<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>4.46</td>
<td>.673</td>
<td>71</td>
</tr>
<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>4.44</td>
<td>.670</td>
<td>71</td>
</tr>
<tr>
<td>Overall, I think that paying water bills within 15 days is</td>
<td>4.39</td>
<td>.643</td>
<td>71</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>4.51</td>
<td>.582</td>
<td>71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Multiple Alpha Correlation</th>
<th>Squared Multiple Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally speaking, I think paying water bills within 15 days is a</td>
<td>22.35</td>
<td>7.146</td>
<td>.695</td>
<td>.642</td>
</tr>
<tr>
<td>Overall, I think that paying water bills within 15 days is</td>
<td>22.34</td>
<td>6.713</td>
<td>.811</td>
<td>.744</td>
</tr>
<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>22.42</td>
<td>6.647</td>
<td>.783</td>
<td>.723</td>
</tr>
<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>22.45</td>
<td>6.651</td>
<td>.835</td>
<td>.783</td>
</tr>
<tr>
<td>Overall, I think that paying water bills within 15 days is</td>
<td>22.49</td>
<td>7.739</td>
<td>.513</td>
<td>.384</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>22.38</td>
<td>7.382</td>
<td>.718</td>
<td>.581</td>
</tr>
</tbody>
</table>

Cronbach's Alpha Based on Standardized Items:
- Alpha: .896
- N of Items: 6
APPENDIX E-2: Pilot Study SPSS Output for Reliability Analysis - Perceived Control Scale

### Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.399</td>
<td>.430</td>
<td>3</td>
</tr>
</tbody>
</table>

### Inter-Item Correlation Matrix

The covariance matrix is calculated and used in the analysis.

<table>
<thead>
<tr>
<th>For me to pay my next water bill within 15 days of receiving it will be</th>
<th>Whether or not I pay my next water bill within 15 days of receiving it, is completely up to me</th>
<th>I am confident that if I wanted to I could pay my next water bill within 15 days of receiving it</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>.118</td>
<td>.320</td>
</tr>
<tr>
<td>.118</td>
<td>1.000</td>
<td>.184</td>
</tr>
<tr>
<td>.320</td>
<td>.164</td>
<td>1.000</td>
</tr>
</tbody>
</table>

### Item-Total Statistics

<table>
<thead>
<tr>
<th>Item Deleted</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>7.60</td>
<td>3.056</td>
<td>.258</td>
<td>.107</td>
<td>.203</td>
</tr>
<tr>
<td>Whether or not I pay my next water bill within 15 days of receiving it, is completely up to me</td>
<td>7.72</td>
<td>3.019</td>
<td>.169</td>
<td>.032</td>
<td>.470</td>
</tr>
<tr>
<td>I am confident that if I wanted to I could pay my next water bill within 15 days of receiving it</td>
<td>7.00</td>
<td>3.704</td>
<td>.318</td>
<td>.118</td>
<td>.211</td>
</tr>
</tbody>
</table>
APPENDIX E-2: Pilot Study SPSS Output for Reliability Analysis - Perceived Control Scale (Continued)

Reliability analysis of PC scale following addition of three extra items

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Cases</td>
<td>Valid</td>
</tr>
<tr>
<td>Excluded</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>

a. Listwise deletion based on all variables in the procedure.

<table>
<thead>
<tr>
<th>Item Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>3.90</td>
<td>.754</td>
<td>72</td>
</tr>
<tr>
<td>How much control do you believe you have over your ability to pay for water bills within 15 days</td>
<td>4.15</td>
<td>.744</td>
<td>72</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days will be</td>
<td>4.01</td>
<td>.896</td>
<td>72</td>
</tr>
<tr>
<td>I believe I have the ability to pay my next water bill within 15 days of receiving it</td>
<td>4.13</td>
<td>.730</td>
<td>72</td>
</tr>
<tr>
<td>I am confident that I can pay my next water bill within 15 days, if I want to</td>
<td>4.07</td>
<td>.909</td>
<td>72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>16.36</td>
<td>6.318</td>
<td>.762</td>
<td>.633</td>
<td>.760</td>
</tr>
<tr>
<td>How much control do you believe you have over your ability to pay for water bills within 15 days</td>
<td>16.11</td>
<td>7.396</td>
<td>.451</td>
<td>.246</td>
<td>.841</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days will be</td>
<td>16.25</td>
<td>5.796</td>
<td>.736</td>
<td>.624</td>
<td>.763</td>
</tr>
<tr>
<td>I believe I have the ability to pay my next water bill within 15 days of receiving it</td>
<td>16.14</td>
<td>6.544</td>
<td>.722</td>
<td>.548</td>
<td>.773</td>
</tr>
<tr>
<td>I am confident that I can pay my next water bill within 15 days, if I want to</td>
<td>16.19</td>
<td>6.553</td>
<td>.515</td>
<td>.286</td>
<td>.833</td>
</tr>
</tbody>
</table>
### Case Processing Summary

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>81</td>
<td>96.4</td>
</tr>
<tr>
<td>Excluded</td>
<td>3</td>
<td>3.6</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.490</td>
<td>.478</td>
</tr>
<tr>
<td>.3</td>
<td>3</td>
</tr>
</tbody>
</table>

### Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</th>
<th>Most people who are important to me pay their water bills within 15 days of receiving them</th>
<th>It is expected of me that I pay my next water bill within 15 days of receiving it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
<td>1.000</td>
<td>.256</td>
<td>.402</td>
</tr>
<tr>
<td>Most people who are important to me pay their water bills within 15 days of receiving them</td>
<td>.256</td>
<td>1.000</td>
<td>.045</td>
</tr>
<tr>
<td>It is expected of me that I pay my next water bill within 15 days of receiving it</td>
<td>.402</td>
<td>.045</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

### Item-Total Statistics

<table>
<thead>
<tr>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.47</td>
<td>1.752</td>
<td>.456</td>
<td>.218</td>
<td>.085</td>
</tr>
<tr>
<td>8.11</td>
<td>2.875</td>
<td>.190</td>
<td>.070</td>
<td>.568</td>
</tr>
<tr>
<td>7.26</td>
<td>2.519</td>
<td>.302</td>
<td>.165</td>
<td>.402</td>
</tr>
</tbody>
</table>
APPENDIX E-3: Pilot Study SPSS Output for Reliability Analysis - Subjective Norm Scale (Continued)

Reliability analysis following addition of two extra items to the SN scale

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases Valid</td>
<td>71</td>
<td>98.6</td>
</tr>
<tr>
<td>Excluded</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a. Listwise deletion based on all variables in the procedure.

Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Most people important to me think that I should pay my next water bill within 15 days of receiving it</th>
<th>Most people who are important to me pay their water bills within 15 days</th>
<th>The people in my life whose opinions I value pay their monthly water bills promptly</th>
<th>It is expected of me that I pay my next water bill promptly</th>
<th>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
<td>1.000</td>
<td>.144</td>
<td>.129</td>
<td>.399</td>
<td>.393</td>
</tr>
<tr>
<td>Most people who are important to me pay their water bills within 15 days</td>
<td>.144</td>
<td>1.000</td>
<td>.532</td>
<td>.090</td>
<td>.258</td>
</tr>
<tr>
<td>The people in my life whose opinions I value pay their monthly water bills promptly</td>
<td>.129</td>
<td>.532</td>
<td>1.000</td>
<td>.370</td>
<td>.454</td>
</tr>
<tr>
<td>It is expected of me that I pay my next water bill promptly</td>
<td>.395</td>
<td>.090</td>
<td>.270</td>
<td>1.000</td>
<td>.174</td>
</tr>
<tr>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</td>
<td>.293</td>
<td>.256</td>
<td>.454</td>
<td>.174</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
<td>15.44</td>
<td>4.819</td>
<td>.327</td>
<td>.226</td>
<td>.635</td>
</tr>
<tr>
<td>Most people who are important to me pay their water bills within 15 days</td>
<td>15.96</td>
<td>4.755</td>
<td>.395</td>
<td>.298</td>
<td>.604</td>
</tr>
<tr>
<td>The people in my life whose opinions I value pay their monthly water bills promptly</td>
<td>15.75</td>
<td>4.078</td>
<td>.544</td>
<td>.433</td>
<td>.527</td>
</tr>
<tr>
<td>It is expected of me that I pay my next water bill promptly</td>
<td>15.04</td>
<td>5.470</td>
<td>.333</td>
<td>.216</td>
<td>.634</td>
</tr>
<tr>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</td>
<td>15.56</td>
<td>3.678</td>
<td>.457</td>
<td>.263</td>
<td>.578</td>
</tr>
</tbody>
</table>
APPENDIX E-4: Pilot Study SPSS Output for Reliability Analysis - Intention (I) Scale

Case Processing Summary

<table>
<thead>
<tr>
<th>Cases</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>80</td>
<td>95.2</td>
</tr>
<tr>
<td>Excluded</td>
<td>4</td>
<td>4.8</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>100.0</td>
</tr>
</tbody>
</table>

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.615</td>
<td>.626</td>
</tr>
</tbody>
</table>

Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>I plan to pay my next water bill within 15 days of receiving it</th>
<th>I will make an effort to pay my next water bill within 15 days of receiving it</th>
<th>I intend to pay my next water bill within 15 days of receiving it</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to pay my next water bill within 15 days of receiving it</td>
<td>1.000</td>
<td>.348</td>
<td>.270</td>
</tr>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>.348</td>
<td>1.000</td>
<td>.456</td>
</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>.270</td>
<td>.456</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to pay my next water bill within 15 days of receiving it</td>
<td>8.45</td>
<td>2.428</td>
<td>.360</td>
<td>.137</td>
<td>.625</td>
</tr>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>8.16</td>
<td>2.619</td>
<td>.500</td>
<td>.263</td>
<td>.422</td>
</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>8.19</td>
<td>2.585</td>
<td>.429</td>
<td>.222</td>
<td>.508</td>
</tr>
</tbody>
</table>
APPENDIX E-4: Pilot Study SPSS Output File - Reliability Analysis for Intention Scale (continued)

Reliability analysis following addition of two extra items to the Intention scale

### Case Processing Summary

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>69</td>
<td>95.8</td>
</tr>
<tr>
<td>Excluded</td>
<td>3</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100.0</td>
</tr>
</tbody>
</table>

- Listwise deletion based on all variables in the procedure.

### Reliability Statistics

<table>
<thead>
<tr>
<th></th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach's Alpha</td>
<td>.759</td>
<td>.777</td>
</tr>
</tbody>
</table>

### Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>I plan to pay my next water bill within 15 days of receiving it</th>
<th>I will make an effort to pay my next water bill within 15 days of receiving it</th>
<th>I want to pay my next water bill within 15 days of receiving it</th>
<th>How likely is it that you will pay your next water bill within 15 days of receiving the bill</th>
<th>I intend to pay my next water bill within 15 days of receiving it</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to pay my next water bill within 15 days of receiving it</td>
<td>1.000</td>
<td>.459</td>
<td>.425</td>
<td>.256</td>
<td>.272</td>
</tr>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>.459</td>
<td>1.000</td>
<td>.511</td>
<td>.141</td>
<td>.499</td>
</tr>
<tr>
<td>I want to pay my next water bill within 15 days of receiving it</td>
<td>.425</td>
<td>.511</td>
<td>1.000</td>
<td>.560</td>
<td>.640</td>
</tr>
<tr>
<td>How likely is it that you will pay your next water bill within 15 days of receiving the bill</td>
<td>.256</td>
<td>.141</td>
<td>.560</td>
<td>1.000</td>
<td>.348</td>
</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>.272</td>
<td>.499</td>
<td>.640</td>
<td>.348</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

### Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to pay my next water bill within 15 days of receiving it</td>
<td>16.87</td>
<td>6.086</td>
<td>.462</td>
<td>.273</td>
<td>.741</td>
</tr>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>16.65</td>
<td>5.965</td>
<td>.523</td>
<td>.415</td>
<td>.717</td>
</tr>
<tr>
<td>I want to pay my next water bill within 15 days of receiving it</td>
<td>16.58</td>
<td>6.071</td>
<td>.754</td>
<td>.607</td>
<td>.654</td>
</tr>
<tr>
<td>How likely is it that you will pay your next water bill within 15 days of receiving the bill</td>
<td>16.99</td>
<td>6.250</td>
<td>.401</td>
<td>.349</td>
<td>.786</td>
</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>16.86</td>
<td>6.214</td>
<td>.580</td>
<td>.455</td>
<td>.699</td>
</tr>
</tbody>
</table>
APPENDIX F-1: Main Study Questionnaire

Water, Engineering and Development Centre, Loughborough University (UK)
In cooperation with [Private Operator Company]

Customer Survey on Water Bill Payment Behaviour

Questionnaire S/No: ____________________ Town: ______________________

Customer Reference No. ____________________ Zone: ______________________

Address (house number and street name): ______________________________________

To the translator: Please read the following statement to each customer before you ask the questions. Please request to interview the head of the household or his/her spouse, NOT the children or dependants.

My name is [Name of Interviewer], and I am conducting a survey on behalf of Mr. Josses Mugabi, a full time Research Scholar at the Water, Engineering and Development Centre (WEDC) at Loughborough University, UK. This survey is part of a wider investigation being carried out by WEDC, in cooperation with [Private Operator Company] to find out the reasons why some customers are able to pay their water bills promptly while others struggle to clear bills and eventually get disconnected. Specifically, we are interested in your opinions regarding the issue of paying water bills within 15 days of receiving the bill. You are one of the few customers who have been randomly selected to participate in this study. Your opinions are therefore very important. We are hopeful that the results of this study will help the service provider to improve service delivery by focusing on the needs and concerns of customers.

Questions and statements will be read to you. To make your response a lot easier, and use as little of your time as possible, multiple answers have been provided for each of the questions/statements. I shall read or show you the multiple answers on several show cards. You are requested to choose one of the responses that correspond to your answer/opinion. Please note that there are no correct or incorrect responses; we are merely interested in your personal point of view. Each individual is entitled to his/her opinion. All your responses are completely confidential. All information you provide will be published ONLY in summary, statistical form.

We thank you for your cooperation.

The language being used for the interview is: ______________________________________
Survey date: ________________________________
Section A: [Outcome Evaluations]

This section consists of a set of 5 statements intended to find out your personal views on piped water supply to your home. Each of the statements is incomplete but your response will complete each of these statements. Please make a check mark or tick (√) in the box that best describes your view. If you do not have an opinion on a particular statement, please tick the choice neither against it. Please respond to all statements, and DO NOT put more than one check mark (√) on a single statement.

A1. For me to have a reliable and continuous supply of tap water to my home is

Extremely unnecessary  Unnecessary  Neither  Necessary  Extremely necessary

A2. For me to be served by water utility staffs that have the necessary facilities and motivation to perform their job is

Very unimportant  Unimportant  Neither  Important  Very Important

A3. For me to be served by a properly maintained piped water supply system is

Very unimportant  Unimportant  Neither  Important  Very Important

A4. For me to forego other household needs and pay my water bill as a first priority is

A very bad idea  A bad idea  Neither  A good idea  A very good idea

A5. Paying my water bills before they accumulate to a larger amount is

A very bad idea  A bad idea  Neither  A good idea  A very good idea

A6. Getting disconnected from the water supply network is

Very bad  Bad  Neither  Good  Very good
APPENDIX F-1: Main Study Questionnaire (continued)

Section B: [Direct Measures of Perceived Behavioural Control, Subjective Norm, Attitude, Intention, and Self-reported Past Behaviour]

The company that manages piped water in your town requires that you pay your monthly water bills promptly. In this section, we would like to know what you think about paying your next (end of February) water bill within 15 days of receiving it. We make use of the following rating scales. Please make a check mark or tick (✓) in the box that best describes your view. Please respond to all items. Some of the statements may appear to be similar, but they address somewhat different issues. Please read each statement carefully.

B1. For me to pay my next water bill within 15 days of receiving it will be

- Very difficult
- Difficult
- Uncertain
- Easy
- Very easy

B2. Most people who are important to me (e.g. family, friends, neighbours etc) think that I should pay my next water bill within 15 days of receiving it

- Strongly Disagree
- Disagree
- Uncertain
- Agree
- Strongly Agree

B3. I plan to pay my next water bill within 15 days of receiving it.

- Strongly Agree
- Agree
- Uncertain
- Disagree
- Strongly Disagree

B4. Whether or not I pay my next water bill within 15 days, is completely up to me

- Strongly Disagree
- Disagree
- Uncertain
- Agree
- Strongly Agree

B5. Most people who are important to me pay their water bills within 15 days

- Completely False
- Quite False
- Don’t know
- Quite True
- Completely True

B6. How much control do you believe you have over your ability to pay for water bills within 15 days?

- No control at all
- No control
- Uncertain
- Some control
- Complete control

B7. For me to pay my next water bill within 15 days will be

- Extremely Impossible
- Impossible
- Uncertain
- Possible
- Extremely possible
APPENDIX F-1: Main Study Questionnaire (continued)

B8. I will make an effort to pay my next water bill within 15 days of receiving it

Definitely False  Quite False  Uncertain  Quite True  Definitely True

B9. I believe I have the ability to pay my next water bill within 15 days of receiving it

Strongly Disagree  Disagree  Uncertain  Agree  Strongly Agree

B10. I want to pay my next water bill within 15 days of receiving it

Definitely False  Quite False  Uncertain  Quite True  Definitely True

B11. The people in my life whose opinions I value pay their monthly water bills promptly

Strongly Disagree  Disagree  Uncertain  Agree  Strongly Agree

B12. It is expected of me that I pay my next water bill promptly

Strongly Disagree  Disagree  Uncertain  Agree  Strongly Agree

B13. I am confident that I can pay my next water bill within 15 days, if I want to

Strongly Disagree  Disagree  Uncertain  Agree  Strongly Agree

B14. How likely is it that you will pay your next water bill within 15 days of receiving the bill?

Extremely Likely  Quite Likely  Uncertain  Quite Unlikely  Extremely Unlikely

B15. Generally speaking, I think paying water bills within 15 days is a

A very good practice  A good practice  Neither  A bad practice  A very bad practice

B16. Overall, I think that paying water bills within 15 days is

Extremely wrong  Quite Wrong  Neither  Quite Right  Extremely Right

B17. Generally speaking, I think that paying my next water bill within 15 days is

Not beneficial at all  Not beneficial  Neither  Beneficial  Extremely Beneficial
APPENDIX F-1: Main Study Questionnaire (continued)

B18. Generally speaking, I think that paying my next water bill within 15 days is

- Extremely worthless
- Worthless
- Neither
- Valuable
- Extremely Valuable

B19. Overall, I think that paying water bills within 15 days is

- Extremely Unfair
- Unfair
- Neither
- Fair
- Extremely Fair

B20. For me to pay my next water bill within 15 days of receiving it will be

- Very Pleasant
- Pleasant
- Neither
- Unpleasant
- Very Unpleasant

B21. I intend to pay my next water bill within 15 days of receiving it

- Strongly Disagree
- Disagree
- Uncertain
- Agree
- Strongly Agree

B22. The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days

- Extremely Likely
- Quite Likely
- Uncertain
- Quite Unlikely
- Extremely Unlikely

B23. Ever since you got your piped water connection, how often have you paid your monthly water bill within 15 days of receiving the bill?

- Every month
- almost every month
- most months
- a few months
- Never

Section C: [Normative Belief Strength]

In this section, we would like to know what you think would be the expectations of most of the people or groups important to you (e.g. family, neighbours, etc.) when it comes to your paying water bills promptly. The following set of statements are about your opinion on whether you think most people or groups important to you would approve or disapprove of your paying next month's water bill within 15 days of receiving the bill. Please make a check mark or tick (✓) in the box that best describes your view.

C1. Most of my neighbours will be happy with me for paying my next water bill within 15 days of receiving it

- Extremely Unlikely
- Quite Unlikely
- Uncertain
- Quite Likely
- Extremely Likely
APPENDIX F-1: Main Study Questionnaire (continued)

C2. Most members of my family will be happy with me for paying my next water bill within 15 days of receiving it

Extremely Unlikely  Quite Unlikely  Uncertain  Quite Likely  Extremely Likely

C3. The service provider (i.e. private operator) will be happy with me for paying my next water bill promptly

Extremely Unlikely  Quite Unlikely  Uncertain  Quite Likely  Extremely Likely

C4. The waters vendors (i.e. people who sell water in jerry cans) will be happy with me for paying my next utility water bill within 15 days

Extremely Unlikely  Quite Unlikely  Uncertain  Quite Likely  Extremely Likely

Section D: [Motivation to Comply]

In the previous section, we sought your personal views on the expectations of most of the people or groups important to you (e.g. family, neighbours etc) when it comes to paying your water bills promptly. In this section, we would like to know how much you care about doing things that these people or groups are happy with. We make use of a rating scale with 5 places between two extremes (i.e. not at all and very much); you are to make a check mark or tick (✓) in the box that best describes how much you care.

D1. Generally speaking, to what extent do you care about doing things that your neighbours will be happy with?

I don't care at all  I don't care  I don't know  I care a little  I care very much

D2. Generally speaking, to what extent do you care about doing things that your family members will be happy with?

I don't care at all  I don't care  I don't know  I care a little  I care very much
D3. Generally speaking, to what extent do you care about doing things that your water service provider (private operator) will be happy with?

I don't care at all  I don't care  I don't know  I care a little  I care very much

D4. Generally speaking, to what extent do you care about doing things that water vendors (i.e. people selling water in jerry cans in your area) will be happy with?

I don't care at all  I don't care  I don't know  I care a little  I care very much

Section E: [Behavioural Belief Strength]

In this section, we would like to know what you think could be some of the advantages and disadvantages of paying your next water bill promptly (i.e. within 15 days). Please read each of the following 6 statements carefully, and indicate how much you agree or disagree with each statement. If you do not have an opinion on a particular statement, please tick the choice uncertain against it.

E1. Paying my next water bill within 15 days, will guarantee a reliable service with no interruptions in the water supply to my home

Strongly Disagree  Disagree  Uncertain/Undecided  Agree  Strongly Agree

E2. Paying my next water bill within 15 days, will ensure that I am served by water utility staffs that have the necessary facilities and motivation to perform their job.

Strongly Disagree  Disagree  Uncertain/Undecided  Agree  Strongly Agree

E3. Paying my next water bill within 15 days of receiving it, will ensure that I am served by a properly maintained piped water supply system

Strongly Disagree  Disagree  Uncertain/Undecided  Agree  Strongly Agree

E4. Paying my next water bill within 15 days, will cause me to forego other household needs

Strongly Disagree  Disagree  Uncertain/Undecided  Agree  Strongly Agree
APPENDIX F-1: Main Study Questionnaire (continued)

E5. Paying my next water bill within 15 days, will help me to avoid accumulating a big debt

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain/Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

E6. Paying my next water bill within 15 days, will ensure that my tap water is not disconnected

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain/Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

Section F: [Control Belief Strength]

In this section, we would like to know your personal opinion about the presence of factors that may make it difficult or easy for you to pay your water bills promptly. We invite you to draw on your experience with the piped water service offered to your household in the past year, to answer these questions in this section. Please make a check mark or tick (√) in the box that best describes your view.

F1. How often do you feel that your monthly water bill is too high?

<table>
<thead>
<tr>
<th>Never</th>
<th>A few times</th>
<th>Sometimes</th>
<th>Most times</th>
<th>Always</th>
</tr>
</thead>
</table>

F2. You may have had service interruptions at your premises either due to pipe leakages and bursts, power cuts, or due to low water production. This could have sometimes led to only pressure reduction, or complete lack of water in your premises. Which phrase best describes how frequently you have had such problems?

<table>
<thead>
<tr>
<th>Never</th>
<th>A few times</th>
<th>Sometimes</th>
<th>Most times</th>
<th>Always</th>
</tr>
</thead>
</table>

F3. How often are your water bills delivered to you in time (i.e. at end of month or shortly after)?

<table>
<thead>
<tr>
<th>Never</th>
<th>A few times</th>
<th>Sometimes</th>
<th>Most times</th>
<th>Always</th>
</tr>
</thead>
</table>
F4. How often do you find yourself unable to understand the water bill delivered to you?

- Never
- A few times
- Sometimes
- Most times
- Always

F5. How often do you encounter mistakes in meter readings leading to incorrect water bills?

- Never
- A few times
- Sometimes
- Most times
- Always

F6. How often do you experience unusual increases in recorded water consumption as a result of faulty meters?

- Never
- A few times
- Sometimes
- Most times
- Always

F7. How often do you encounter unanticipated circumstances (such as illness, death of loved one etc) that place demands on your household's budget?

- Never
- A few times
- Sometimes
- Most times
- Always

F8. How often do you receive reminder visits or notices from your service provider to remind you of any outstanding water bills?

- Never
- A few times
- Sometimes
- Most times
- Always

F9. How often does your tap water appear coloured or unclear?

- Never
- A few times
- Sometimes
- Most times
- Always

F10. How often do you experience financial difficulties (lack of money) in your household?

- Never
- A few times
- Sometimes
- Most times
- Always
Section G: [Control Belief Power]

In the previous section, we sought your opinion on the presence of various factors related to the services you receive and how often they occur. In this section, we would like to know your opinion on whether these factors, if they occur, would make it more difficult or much easier for you to pay your water bill within 15 days as requested by your service provider. Please indicate how much you agree or disagree with each statement below. If you do not have an opinion on a particular statement, please tick the choice uncertain against it.

G1. If I felt that my water bill is too high, it would make it more difficult for me to pay that bill within 15 days of receiving it

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G2. If I experienced service interruptions or complete lack of water in my premises, it would make it more difficult for me to pay my water bills promptly

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G3. If I do not receive the water bill in time (i.e. at end of month or shortly after), it would make it more difficult for me to pay it promptly

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G4. If I found myself unable to understand the water bill delivered to me, it would make it more difficult for me to pay within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G5. If I discovered mistakes in meter readings leading to incorrect bills, it would make it more difficult for me to pay within 15 days of receiving the bill

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
**APPENDIX F-1: Main Study Questionnaire (continued)**

G6. If I noticed an unusual increase in recorded water consumption as a result of a faulty meter, it would make it more difficult for me to pay my water bill within 15 days.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G7. If I encountered unanticipated circumstances (such as illness, loss of loved one etc) that placed demands on my household budget, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G8. If I received reminder visits or notices from the service provider, reminding me of outstanding bills, it would make it much easier for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G9. If my tap water appeared coloured or unclear, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

G10. If I experienced financial difficulties (i.e. lack of money) in my household, it would make it more difficult for me to pay my water bill within 15 days of receiving it.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

---

**Section H: [Classification Questions]**

Thank you very much for your patience in answering the previous questions. Now, to help us classify your answers and process them statistically, please answer the following few questions about yourself and your family.

H1. What is your gender (sex)?

- [ ] Male
- [ ] Female

H2. How many people are in your household (excluding visitors)? ________

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APPENDIX F-1: Main Study Questionnaire (continued)

H3. What is the total number of years you have spent at school for formal education?

- Less than 7 years
- Between 7 and 12 years
- Between 13 and 16 years
- More than 16 years

H4. What is your occupation?

- Civil Servant (Government-employed)
- Employed by private company
- Full time-housewife
- Self-employed professional
- Self-employed in business
- Other (please specify) ______________

H5. What is the ownership status of the premises occupied by your household?

- Privately owned by family
- Government/Company owned and allocated/rented to our household
- Privately owned and rented to our household
- Other (please specify) ______________

H6. What is the average monthly income of your household?

- Less than or equal to Ug.Shs. 50,000 per month
- Between Ug.Shs 50,000 and 100,000 per month
- Between Ug.Shs 100,000 and 150,000 per month
- Between Ug.Shs 150,000 and 200,000 per month
- Between Ug.Shs 200,000 and 250,000 per month
- Between Ug.Shs 250,000 and 300,000 per month
- More than Ug.Shs 300,000

To the enumerator: Please ask the respondent if he/she has any specific comments or suggestions that could be useful in improvement of service delivery by the private operator.

Thank you for the time and effort you have spent in answering the question.
We are grateful for your support and cooperation.

+++ THE END +++

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APPENDIX F-2: Information Pack/Briefing Note for Main study Interviewers

IMPORTANT INFORMATION!

Please Read Before Starting the Work

Changes to the Questionnaire

° Cover Page:
We have included a box at the bottom for you to record the language used for the face-to-face interview and the survey date. For fully self-administered questionnaires, please remember to mark ‘S’ on your reporting form.

° Section A:
We have reduced the number of items in this section. We now have only 6 items. Items A1, A2, and A5 were reworded. Please take note of the new wording. We also introduced a new item A6, which was not in the original questionnaire.

° Section B:
This section has undergone a lot of changes because it came out as the most problematic in the first pilot study. We have introduced a lot of new items. We now have a total of 23 items. Please note that although some of the statements may appear to be similar, they address somewhat different issues. You are requested to follow the wording and response categories as they appear. All response categories have been translated for those respondents who prefer to be interviewed in the local language (see response categories sheet in your pack). Please take some time and go through this section carefully, and familiarise yourself with the new changes. The measurements in this section are very sensitive to misinterpretation, so please use the translated version of the questionnaire to guide the respondents.

° Section C and D
No changes were made to these sections

° Section E
This section is linked to Section A, so the changes are reflected here as well. Note that we have changed the response choices from likelihood to agreement. Please note that change.

° Section F and G:
We have reduced the number of items in this section from the original 16 to 10 items.

Response Rate

Please try and recover at least 30 useable questionnaires. Obviously, they will be respondents you cannot even contact (e.g. dead, shifted to another town, on business trips etc). But for those available, try and persuade them to participate.
APPENDIX F-2: Information Pack/Briefing Note for Main study Interviewers (continued)

Please remain in the field for a minimum of 3 days (excluding travel days). Although, you are expected to cover a substantial number of respondents in the first 2 days, we anticipate that some respondents may need following up. Use the 3rd day to follow up those who opted for self-administration but had not returned the questionnaires, and those you did not find at home at the first visit. You can also use the travelling day to do final follow-ups before you depart.

Disconnected Customers

If a customer on your sample list is disconnected, but he is willing to be interviewed, please go ahead and interview him/her. This is because at the time of sampling he/she was connected and active. Obviously, some will not be willing to participate in the study. Attempt to persuade them by telling them that you are there to find out some of the reasons why they struggle to clear bills and get disconnected. They are likely to get hooked by that!

Customer Accounts in Landlord’s Names

You may find some accounts on your sample list are in landlord’s names but the tenant is the one paying the water bill. In such a case, please interview the tenant (if he/she is willing to be interviewed). Indicate in your comment space on the questionnaire that you interviewed a tenant.

Self-administration

For those respondents who can read and understand English, please encourage them to self-administer the questionnaire. This minimises translation/interpretation biases in our final data set. You can start by having a quick run-through of the questionnaire with them. Tell them the estimated time to complete (should between 30-45min), and assure them that you will be coming back to clarify any questions which they may find confusing. Leave them with an A5/A4 envelope labelled as follows:

<table>
<thead>
<tr>
<th>Private and Confidential Questionnaire Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return to: JOSSES MUGABI</td>
</tr>
<tr>
<td>c/o Bika Ltd, Kamuli</td>
</tr>
</tbody>
</table>

Reporting

Please ensure that you prepare accurate reports. Questionnaire numbers MUST balance out, i.e.

Category 1 = Category 2 + Category 3 + Category 4 + Category 5

(See calculation of response rate form)
February 2006

Dear Customer,

Re: Customer Survey on Water Bill Payment Behaviour

We thank you for participating in our recent customer survey on water bill payment behaviour. This survey is part of a research study being conducted by Water, Engineering and Development Centre (WEDC), in conjunction with [Private Operator]. Your responses were of great value in helping us understand the reasons why some customers are able to pay their water bills promptly while others struggle to pay up their bills.

To ensure that our results are reliable, we kindly request you to complete a shortened version of the same questionnaire enclosed. You will notice that most of the questions you answered in the first survey have been repeated in this questionnaire. We kindly request you to bear with us, and answer all the questions again, as naturally as possible, without trying to remember your responses in the first survey.

Similar to the previous survey, this questionnaire has questions and statements on the issue of paying water bills within 15 days. Below each item, multiple answers have been provided to ease your response. You are requested to tick in the box that corresponds to your opinion. Please note that there are no right or wrong answers. You are entitled to your own observation and opinion. This version of the questionnaire has 10 pages and we estimate that it will take you about 30 minutes to complete. Your responses are confidential. All the information you provide will be published ONLY in summary, statistical form.

A self-addressed envelope has been provided for you to put your completed questionnaire. We kindly request you to drop the completed questionnaire at the Water Office when you come to pay your water bill. It is important that we get all completed questionnaires returned before 15 March 2006. For more details, please read the cover page of the questionnaire. If you have any questions or concerns, please feel free to contact Josses Mugabi on Tel. 077 2 868 555.

We thank you very much for your cooperation.

Josses Mugabi
Researcher
## APPENDIX F-4: Response Analysis for Main Study

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
<th>No. of Questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total number of questionnaires given</td>
<td>631</td>
</tr>
<tr>
<td>2</td>
<td><strong>Uncompleted questionnaires returned, because they could not be delivered</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Household has never been connected to the water network</td>
<td>U1</td>
</tr>
<tr>
<td>2</td>
<td>Questionnaire rejected as water was disconnected</td>
<td>U2</td>
</tr>
<tr>
<td>2</td>
<td>Household was sent 2 copies of the questionnaire due to inaccurate records</td>
<td>U3</td>
</tr>
<tr>
<td>2</td>
<td>Address of the household could not be traced</td>
<td>U4</td>
</tr>
<tr>
<td>2</td>
<td>Questionnaire rejected; owner of premises died</td>
<td>U5</td>
</tr>
<tr>
<td>2</td>
<td>Questionnaire rejected; owner too ill to fill it</td>
<td>U6</td>
</tr>
<tr>
<td>2</td>
<td>Questionnaire rejected because it is addressed in landlord's names</td>
<td>U7</td>
</tr>
<tr>
<td>2</td>
<td>Premises vacant</td>
<td>U8</td>
</tr>
<tr>
<td>2</td>
<td>Questionnaire not delivered as premises locked up</td>
<td>U9</td>
</tr>
<tr>
<td>2</td>
<td>Questionnaire not completed for other reasons different from above (please specify below)</td>
<td>U10</td>
</tr>
</tbody>
</table>
# APPENDIX F-4: Response Analysis for Main Study

<table>
<thead>
<tr>
<th>Reason Code</th>
<th>Description</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>16</td>
<td>Questionnaires delivered to the households, but not returned</td>
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</tr>
<tr>
<td>D1</td>
<td>No people at the time of the follow-up visit</td>
<td>16</td>
</tr>
<tr>
<td>D2</td>
<td>Occupants do not understand English or any other local language</td>
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<tr>
<td>D3</td>
<td>Household head not willing to answer the questions</td>
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<tr>
<td>D4</td>
<td>Household head had no time to complete the questionnaire</td>
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<td>D5</td>
<td>Questionnaires not returned for other reasons different from above (please specify below)</td>
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<td>Partially completed questionnaires returned, but could not be used because at least half of the questions did not have answers</td>
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<tr>
<td></td>
<td>Questionnaires returned, whose answers are useable in the analysis</td>
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Response Rate = \( \frac{\text{category 5}}{\text{category 1} - \text{category 2}} \times 100 \)  

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<td>------------------</td>
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APPENDIX G-1: Main Study SPSS Output for Factor Analysis – Final iteration for items measuring AT, PC and SN Scales

Correlation Matrix

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KMO and Bartlett’s Test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | .880 |
| Bartlett’s Test of Sphericity | Approx. Chi-Square | 2371.190 |
| df | 105 |
| Sig. | .000 |
Overall, I think that paying my next water bill within 15 days will be whose opinions I value.

For me to pay my next water bill within 15 days will be receiving it will be.

Generally speaking, I think that paying my next water bill within 15 days is.

Overall, I think that paying water bills within 15 days is.

Overall, I think that paying water bills within 15 days is.

I am confident that I can pay my next water bill within 15 days, if I want to.

For me to pay my next water bill within 15 days of receiving it will be.

For me to pay my next water bill within 15 days of receiving it will be.

Most people who are important to me think that I should pay my next water bill within 15 days of receiving it.

The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days.

Generally speaking, I think paying water bills within 15 days is.

How much control do you believe you have over your ability to pay for water bills within 15 days.

The people in my life whose opinions I value pay their monthly water bills promptly.

Most people who are important to me think that I should pay their water bills within 15 days.

---

**APPENDIX G-1: Main Study SPSS Output for Factor Analysis – Final Iteration for Items measuring AT, PC and SN Scales (Continued)**

**Total Variance Explained**

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
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<tr>
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<td>% of Variance</td>
<td>Cumulative %</td>
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<td>34.543</td>
<td>34.543</td>
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**Component Matrix**

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<th>Component</th>
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<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>.723</td>
<td>-.426</td>
<td></td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days will be</td>
<td>.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe I have the ability to pay my next water bill within 15 days of receiving it</td>
<td>.701</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>.666</td>
<td>-.465</td>
<td></td>
</tr>
<tr>
<td>Overall, I think that paying water bills within 15 days is</td>
<td>.660</td>
<td>-.416</td>
<td></td>
</tr>
<tr>
<td>Overall, I think that paying water bills within 15 days is</td>
<td>.651</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that I can pay my next water bill within 15 days, if I want to</td>
<td>.631</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>.564</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>.572</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
<td>.557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</td>
<td>.519</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally speaking, I think paying water bills within 15 days is</td>
<td>.485</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How much control do you believe you have over your ability to pay for water bills within 15 days</td>
<td>.404</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The people in my life whose opinions I value pay their monthly water bills promptly</td>
<td>.407</td>
<td>.454</td>
<td>.574</td>
</tr>
<tr>
<td>Most people who are important to me think that I should pay their water bills within 15 days</td>
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<td>.444</td>
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**Rotated Component Matrix**

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<tr>
<td>Generally speaking, I think that paying my next water bill within 15 days is</td>
<td>.811</td>
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</tr>
<tr>
<td>For me to pay my next water bill within 15 days will be</td>
<td></td>
<td>.729</td>
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<tr>
<td>I believe I have the ability to pay my next water bill within 15 days of receiving it will be</td>
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<tr>
<td>I am confident that I can pay my next water bill within 15 days, if I want to</td>
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<td>.732</td>
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</tr>
<tr>
<td>The people in my life whose opinions I value pay their monthly water bills promptly</td>
<td></td>
<td></td>
<td>.627</td>
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<tr>
<td>Most people who are important to me think that I should pay their water bills within 15 days</td>
<td></td>
<td></td>
<td>.774</td>
</tr>
<tr>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</td>
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<td></td>
<td>.559</td>
</tr>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
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</table>

**Extraction Method:** Principal Component Analysis.

**Rotation Method:** Varimax with Kaiser Normalization.
APPENDIX G-2: Main Study SPSS Output for Factor Analysis – Final Iteration for the Intention scale

### Total Variance Explained

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<td>Total % of Variance</td>
<td>Cumulative %</td>
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<td>53.591</td>
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<tr>
<td>3</td>
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Extraction Method: Principal Component Analysis:

### Component Matrix

<table>
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<tr>
<th>I plan to pay my next water bill within 15 days of receiving it</th>
<th>Component 1</th>
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<tbody>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>.645</td>
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<td>I want to pay my next water bill within 15 days of receiving it</td>
<td>.784</td>
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<tr>
<td>How likely is it that you will pay your next water bill within 15 days of receiving the bill</td>
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</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>.611</td>
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Extraction Method: Principal Component Analysis.

a. 1 components extracted.
APPENDIX G-3: Main Study SPSS Output for Reliability Analysis – Final Iterations for Attitude, Perceived Control, Subjective Norm and Intention scales

Attitude (AT) Scale:

### Reliability Statistics

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<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
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### Inter-Item Correlation Matrix

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<th>Overall, I think that paying water bills within 15 days is</th>
<th>Generally speaking, I think that paying my next water bill within 15 days is</th>
<th>Overall, I think that paying my next water bill within 15 days is</th>
<th>For me to pay my next water bill within 15 days of receiving it will be</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally speaking, I think</td>
<td>1.000</td>
<td>.413</td>
<td>.383</td>
<td>.385</td>
<td>.285</td>
</tr>
<tr>
<td>paying water bills within 15</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>days is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall, I think that</td>
<td>.413</td>
<td>1.000</td>
<td>.582</td>
<td>.521</td>
<td>.494</td>
</tr>
<tr>
<td>paying water bills within 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>days is</td>
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<td></td>
<td></td>
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<tr>
<td>Generally speaking, I think</td>
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<td>.582</td>
<td>1.000</td>
<td>.719</td>
<td>.493</td>
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</tr>
<tr>
<td>within 15 days is</td>
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</tr>
<tr>
<td>Generally speaking, I think</td>
<td>.383</td>
<td>.521</td>
<td>.719</td>
<td>1.000</td>
<td>.469</td>
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<tr>
<td>that paying my next water bill</td>
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<tr>
<td>within 15 days is</td>
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<tr>
<td>Overall, I think that</td>
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<td>.494</td>
<td>.469</td>
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<td>days is</td>
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<tr>
<td>For me to pay my next water</td>
<td>.281</td>
<td>.458</td>
<td>.493</td>
<td>.446</td>
<td>1.000</td>
</tr>
<tr>
<td>bill within 15 days of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>receiving it will be</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

### Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally speaking, I think</td>
<td>21.18</td>
<td>8.227</td>
<td>.445</td>
<td>.216</td>
<td>.839</td>
</tr>
<tr>
<td>paying water bills within 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>days is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall, I think that</td>
<td>21.20</td>
<td>7.450</td>
<td>.654</td>
<td>.448</td>
<td>.797</td>
</tr>
<tr>
<td>paying water bills within 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>days is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally speaking, I think</td>
<td>21.27</td>
<td>7.194</td>
<td>.723</td>
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<td>.784</td>
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<tr>
<td>that paying my next water bill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>within 15 days is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally speaking, I think</td>
<td>21.22</td>
<td>7.501</td>
<td>.685</td>
<td>.553</td>
<td>.793</td>
</tr>
<tr>
<td>that paying my next water bill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>within 15 days is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall, I think that</td>
<td>21.32</td>
<td>7.400</td>
<td>.582</td>
<td>.358</td>
<td>.814</td>
</tr>
<tr>
<td>paying water bills within 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>days is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For me to pay my next water</td>
<td>21.29</td>
<td>7.702</td>
<td>.586</td>
<td>.336</td>
<td>.816</td>
</tr>
<tr>
<td>bill within 15 days of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>receiving it will be</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Perceived Control (PC) Scale:

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.791</td>
<td>.795</td>
<td>5</td>
</tr>
</tbody>
</table>

Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th>Item</th>
<th>For me to pay my next water bill within 15 days of receiving it will be</th>
<th>How much control do you believe you have over your ability to pay for water bills within 15 days</th>
<th>For me to pay my next water bill within 15 days will be</th>
<th>I believe I have the ability to pay my next water bill within 15 days of receiving it</th>
<th>I am confident that I can pay my next water bill within 15 days, if I want to</th>
</tr>
</thead>
<tbody>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>1.000</td>
<td>.264</td>
<td>.520</td>
<td>.477</td>
<td>.480</td>
</tr>
<tr>
<td>How much control do you believe you have over your ability to pay for water bills within 15 days</td>
<td>.264</td>
<td>1.000</td>
<td>.393</td>
<td>.380</td>
<td>.259</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days will be</td>
<td>.520</td>
<td>.393</td>
<td>1.000</td>
<td>.592</td>
<td>.485</td>
</tr>
<tr>
<td>I believe I have the ability to pay my next water bill within 15 days of receiving it</td>
<td>.477</td>
<td>.360</td>
<td>.592</td>
<td>1.000</td>
<td>.536</td>
</tr>
<tr>
<td>I am confident that I can pay my next water bill within 15 days, if I want to</td>
<td>.480</td>
<td>.259</td>
<td>.485</td>
<td>.536</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>For me to pay my next water bill within 15 days of receiving it will be</td>
<td>15.55</td>
<td>6.539</td>
<td>.571</td>
<td>.354</td>
<td>.752</td>
</tr>
<tr>
<td>How much control do you believe you have over your ability to pay for water bills within 15 days</td>
<td>15.03</td>
<td>7.492</td>
<td>.395</td>
<td>.181</td>
<td>.606</td>
</tr>
<tr>
<td>For me to pay my next water bill within 15 days will be</td>
<td>15.38</td>
<td>6.686</td>
<td>.671</td>
<td>.463</td>
<td>.721</td>
</tr>
<tr>
<td>I believe I have the ability to pay my next water bill within 15 days of receiving it</td>
<td>15.29</td>
<td>6.779</td>
<td>.660</td>
<td>.457</td>
<td>.725</td>
</tr>
<tr>
<td>I am confident that I can pay my next water bill within 15 days, if I want to</td>
<td>15.39</td>
<td>6.603</td>
<td>.578</td>
<td>.370</td>
<td>.749</td>
</tr>
</tbody>
</table>
APPENDIX G-3: Main Study SPSS Output for Reliability Analysis – Final Iterations for Attitude, Perceived Control, Subjective Norm and Intention scales (Continued)

Subjective Norm (SN) Scale:

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.654</td>
<td>.657</td>
<td>4</td>
</tr>
</tbody>
</table>

Inter-Item Correlation Matrix

```
Most people who are important to me think that I should pay my next water bill within 15 days of receiving it
Most people who are important to me pay their water bills within 15 days
The people in my life whose opinions I value pay their monthly water bills promptly
The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days

<table>
<thead>
<tr>
<th></th>
<th>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</th>
<th>Most people who are important to me pay their water bills within 15 days</th>
<th>The people in my life whose opinions I value pay their monthly water bills promptly</th>
<th>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
<td>1.000</td>
<td>.260</td>
<td>.260</td>
<td>.338</td>
</tr>
<tr>
<td>Most people who are important to me pay their water bills within 15 days</td>
<td>.260</td>
<td>1.000</td>
<td>.482</td>
<td>.261</td>
</tr>
<tr>
<td>The people in my life whose opinions I value pay their monthly water bills promptly</td>
<td>.260</td>
<td>.482</td>
<td>1.000</td>
<td>.341</td>
</tr>
<tr>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</td>
<td>.338</td>
<td>.261</td>
<td>.341</td>
<td>1.000</td>
</tr>
</tbody>
</table>
```

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

```
Most people who are important to me think that I should pay my next water bill within 15 days of receiving it
Most people who are important to me pay their water bills within 15 days
The people in my life whose opinions I value pay their monthly water bills promptly
The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people who are important to me think that I should pay my next water bill within 15 days of receiving it</td>
<td>10.37</td>
<td>3.930</td>
<td>.380</td>
<td>.153</td>
<td>.624</td>
</tr>
<tr>
<td>Most people who are important to me pay their water bills within 15 days</td>
<td>10.88</td>
<td>3.934</td>
<td>.449</td>
<td>.256</td>
<td>.578</td>
</tr>
<tr>
<td>The people in my life whose opinions I value pay their monthly water bills promptly</td>
<td>10.81</td>
<td>3.745</td>
<td>.493</td>
<td>.288</td>
<td>.547</td>
</tr>
<tr>
<td>The people in my life whose opinions I value, would agree with my decision to pay the next water bill within 15 days</td>
<td>10.43</td>
<td>3.694</td>
<td>.422</td>
<td>.188</td>
<td>.596</td>
</tr>
</tbody>
</table>
```
APPENDIX G-3: Main Study SPSS Output for Reliability Analysis – Final Iterations for Attitude, Perceived Control, Subjective Norm and Intention scales (Continued)

Intention Scale:

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha Based on Standardized Items</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.769</td>
<td>.779</td>
</tr>
<tr>
<td>.769</td>
<td>5</td>
</tr>
</tbody>
</table>

Inter-Item Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>I plan to pay my next water bill within 15 days of receiving it</th>
<th>I will make an effort to pay my next water bill within 15 days of receiving it</th>
<th>I want to pay my next water bill within 15 days of receiving it</th>
<th>How likely is it that you will pay your next water bill within 15 days of receiving the bill</th>
<th>I intend to pay my next water bill within 15 days of receiving it</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to pay my next water bill within 15 days of receiving it</td>
<td>1.000</td>
<td>.362</td>
<td>.407</td>
<td>.287</td>
<td>.545</td>
</tr>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>.392</td>
<td>1.000</td>
<td>.570</td>
<td>.343</td>
<td>.497</td>
</tr>
<tr>
<td>I want to pay my next water bill within 15 days of receiving it</td>
<td>.407</td>
<td>.570</td>
<td>1.000</td>
<td>.371</td>
<td>.577</td>
</tr>
<tr>
<td>How likely is it that you will pay your next water bill within 15 days of receiving the bill</td>
<td>.287</td>
<td>.343</td>
<td>.371</td>
<td>1.000</td>
<td>.346</td>
</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>.345</td>
<td>.497</td>
<td>.577</td>
<td>.346</td>
<td>1.000</td>
</tr>
</tbody>
</table>

The covariance matrix is calculated and used in the analysis.

Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Squared Multiple Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan to pay my next water bill within 15 days of receiving it</td>
<td>15.75</td>
<td>6.725</td>
<td>.464</td>
<td>.222</td>
<td>.754</td>
</tr>
<tr>
<td>I will make an effort to pay my next water bill within 15 days of receiving it</td>
<td>15.48</td>
<td>6.586</td>
<td>.604</td>
<td>.397</td>
<td>.708</td>
</tr>
<tr>
<td>I want to pay my next water bill within 15 days of receiving it</td>
<td>15.49</td>
<td>6.426</td>
<td>.653</td>
<td>.468</td>
<td>.689</td>
</tr>
<tr>
<td>How likely is it that you will pay your next water bill within 15 days of receiving the bill</td>
<td>15.85</td>
<td>6.500</td>
<td>.434</td>
<td>.190</td>
<td>.771</td>
</tr>
<tr>
<td>I intend to pay my next water bill within 15 days of receiving it</td>
<td>15.67</td>
<td>6.719</td>
<td>.589</td>
<td>.391</td>
<td>.712</td>
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</table>
APPENDIX H-1: Main Study SPSS Output for Linear Regression – Predictors of Intention

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
<th>Change in R Square</th>
<th>Change F</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.782</td>
<td>.609</td>
<td>.611</td>
<td>.356</td>
<td>.34.286</td>
<td>3</td>
<td>447</td>
<td>.000</td>
<td>1.867</td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill), Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)

b. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill

ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>88.881</td>
<td>3</td>
<td>29.627</td>
<td>234.286</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>56.526</td>
<td>447</td>
<td>.126</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>145.407</td>
<td>450</td>
<td>.048</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill), Attitude towards paying water bill within 15 days of receiving the bill, Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)

b. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill

Coefficients

<table>
<thead>
<tr>
<th>Mod</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Confidence Interval Low</th>
<th>Confidence Interval High</th>
<th>Correlations</th>
<th>Linearity Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Err.</td>
<td>Beta</td>
<td>t</td>
<td>Sig.</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td>r</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.162</td>
<td>.164</td>
<td>.987</td>
<td>.324</td>
<td>-.160</td>
<td>.484</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>Attitude towards paying water bill within 15 days of receiving the bill</td>
<td>.287</td>
<td>.041</td>
<td>.236</td>
<td>7.039</td>
<td>.000</td>
<td>.207</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>.153</td>
<td>.032</td>
<td>.163</td>
<td>4.812</td>
<td>.000</td>
<td>.090</td>
<td>.215</td>
</tr>
<tr>
<td></td>
<td>Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>.522</td>
<td>.034</td>
<td>.550</td>
<td>15.522</td>
<td>.000</td>
<td>.456</td>
<td>.588</td>
</tr>
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</table>

a. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill
## APPENDIX H-1: Main Study SPSS Output for Linear Regression - Continued

### Casewise Diagnostics

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Std. Residual</th>
<th>Pred. Value</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2.142</td>
<td>4</td>
<td>.762</td>
</tr>
<tr>
<td>12</td>
<td>2.410</td>
<td>5</td>
<td>.857</td>
</tr>
<tr>
<td>81</td>
<td>2.064</td>
<td>4</td>
<td>.734</td>
</tr>
<tr>
<td>101</td>
<td>-2.061</td>
<td>4</td>
<td>-7.733</td>
</tr>
<tr>
<td>114</td>
<td>-2.116</td>
<td>3</td>
<td>-7.752</td>
</tr>
<tr>
<td>116</td>
<td>-2.383</td>
<td>3</td>
<td>-8.47</td>
</tr>
<tr>
<td>118</td>
<td>-3.130</td>
<td>3</td>
<td>-1.113</td>
</tr>
<tr>
<td>123</td>
<td>-2.917</td>
<td>3</td>
<td>-1.037</td>
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<tr>
<td>129</td>
<td>-2.069</td>
<td>3</td>
<td>-7.32</td>
</tr>
<tr>
<td>134</td>
<td>-2.894</td>
<td>2</td>
<td>-1.029</td>
</tr>
<tr>
<td>138</td>
<td>2.113</td>
<td>4</td>
<td>.751</td>
</tr>
<tr>
<td>173</td>
<td>2.925</td>
<td>5</td>
<td>1.040</td>
</tr>
<tr>
<td>181</td>
<td>2.064</td>
<td>4</td>
<td>.734</td>
</tr>
<tr>
<td>229</td>
<td>-2.302</td>
<td>3</td>
<td>-8.19</td>
</tr>
<tr>
<td>250</td>
<td>-3.423</td>
<td>4</td>
<td>-1.217</td>
</tr>
<tr>
<td>256</td>
<td>2.759</td>
<td>5</td>
<td>.981</td>
</tr>
<tr>
<td>342</td>
<td>2.301</td>
<td>4</td>
<td>.818</td>
</tr>
<tr>
<td>349</td>
<td>-2.593</td>
<td>3</td>
<td>-9.22</td>
</tr>
<tr>
<td>373</td>
<td>-2.331</td>
<td>3</td>
<td>-8.29</td>
</tr>
<tr>
<td>434</td>
<td>2.734</td>
<td>5</td>
<td>.972</td>
</tr>
</tbody>
</table>

*a. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill

### Residuals Statistics

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted Value</td>
<td>2.81</td>
<td>4.97</td>
<td>3.95</td>
<td>.444</td>
<td>451</td>
</tr>
<tr>
<td>Std. Predicted Value</td>
<td>-2.567</td>
<td>2.293</td>
<td>.000</td>
<td>1.000</td>
<td>451</td>
</tr>
<tr>
<td>Standard Error of</td>
<td>.018</td>
<td>.079</td>
<td>.032</td>
<td>.010</td>
<td>451</td>
</tr>
<tr>
<td>Predicted Value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted Predicted Value</td>
<td>2.80</td>
<td>4.97</td>
<td>3.95</td>
<td>.444</td>
<td>451</td>
</tr>
<tr>
<td>Residual</td>
<td>-1.217</td>
<td>1.040</td>
<td>.000</td>
<td>.354</td>
<td>451</td>
</tr>
<tr>
<td>Std. Residual</td>
<td>-3.423</td>
<td>2.925</td>
<td>.000</td>
<td>.997</td>
<td>451</td>
</tr>
<tr>
<td>Stud. Residual</td>
<td>-3.444</td>
<td>2.970</td>
<td>.000</td>
<td>1.002</td>
<td>451</td>
</tr>
<tr>
<td>Deleted Residual</td>
<td>-1.232</td>
<td>1.073</td>
<td>.000</td>
<td>.358</td>
<td>451</td>
</tr>
<tr>
<td>Stud. Deleted Residual</td>
<td>-3.486</td>
<td>2.996</td>
<td>.000</td>
<td>1.004</td>
<td>451</td>
</tr>
<tr>
<td>Mahal. Distance</td>
<td>.108</td>
<td>20.973</td>
<td>2.993</td>
<td>2.644</td>
<td>451</td>
</tr>
<tr>
<td>Cook’s Distance</td>
<td>.000</td>
<td>.069</td>
<td>.003</td>
<td>.006</td>
<td>451</td>
</tr>
<tr>
<td>Centered Leverage Value</td>
<td>.000</td>
<td>.047</td>
<td>.007</td>
<td>.006</td>
<td>451</td>
</tr>
</tbody>
</table>

*a. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill
APPENDIX H-2: Main Study SPSS Output for Logistic Regression Models 1 and 2 – Predictors of Prompt Bill Payment Behaviour

Logistic Regression Model 1 (Initial estimation):

Iteration History

<table>
<thead>
<tr>
<th>Iteration</th>
<th>-2 Log Likelihood</th>
<th>Coefficients</th>
<th>Constant</th>
<th>PBC</th>
<th>BI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>290.106</td>
<td>-3.121</td>
<td>.229</td>
<td>.255</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>286.226</td>
<td>-4.452</td>
<td>.352</td>
<td>.413</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>286.224</td>
<td>-4.691</td>
<td>.372</td>
<td>.446</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>286.224</td>
<td>-4.696</td>
<td>.373</td>
<td>.447</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>286.224</td>
<td>-4.696</td>
<td>.373</td>
<td>.447</td>
<td></td>
</tr>
</tbody>
</table>

a. Method: Enter
b. Constant is included in the model.
c. Initial -2 Log Likelihood: 295.041
d. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th>Step 1 Step</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block</td>
<td>8.817</td>
<td>2</td>
<td>.012</td>
</tr>
<tr>
<td>Model</td>
<td>8.817</td>
<td>2</td>
<td>.012</td>
</tr>
</tbody>
</table>

Hosmer and Lemeshow Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.837</td>
<td>8</td>
<td>.277</td>
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</tbody>
</table>

Variables in the Equation

<table>
<thead>
<tr>
<th>Step</th>
<th>PBC</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BI</td>
<td>.373</td>
<td>.381</td>
<td>.958</td>
<td>1</td>
<td>.328</td>
<td>1.452</td>
<td>.688</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>-4.696</td>
<td>1.161</td>
<td>16.350</td>
<td>1</td>
<td>.000</td>
<td>.009</td>
<td></td>
</tr>
</tbody>
</table>

a. Variables entered on step 1: PBC, BI.

Logistic Regression Model 1 (Final estimation):

BLOCK 1 (with Intention only as the predictor)

Iteration History

<table>
<thead>
<tr>
<th>Iteration</th>
<th>-2 Log Likelihood</th>
<th>Coefficients</th>
<th>Constant</th>
<th>BI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>290.923</td>
<td>-2.883</td>
<td>.420</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>287.251</td>
<td>-4.110</td>
<td>.673</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>287.192</td>
<td>-4.336</td>
<td>.723</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>287.192</td>
<td>-4.341</td>
<td>.724</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>287.192</td>
<td>-4.341</td>
<td>.724</td>
<td></td>
</tr>
</tbody>
</table>

a. Method: Enter
b. Constant is included in the model.
c. Initial -2 Log Likelihood: 295.041
d. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th>Step 1 Step</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block</td>
<td>7.849</td>
<td>1</td>
<td>.005</td>
</tr>
<tr>
<td>Model</td>
<td>7.849</td>
<td>1</td>
<td>.005</td>
</tr>
</tbody>
</table>
APPENDIX H-2: Main Study SPSS Output for Logistic Regression Models 1 and 2 – Predictors of Prompt Bill Payment Behaviour

### Variables in the Equation

<table>
<thead>
<tr>
<th>Step</th>
<th>BI</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constant</td>
<td>-4.341</td>
<td>1.103</td>
<td>15.497</td>
<td>.000</td>
<td>.013</td>
<td>.013 - 3.484</td>
</tr>
</tbody>
</table>

- Variable(s) entered on step 1: BI.

### Model Summary

<table>
<thead>
<tr>
<th>Step</th>
<th>-2 Log likelihood</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>286.224</td>
<td>.029</td>
<td>.046</td>
</tr>
</tbody>
</table>

- Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

### Classification Table

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted Bill payment behaviour dichotomised 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentage Correct</td>
</tr>
<tr>
<td>Step 1</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>Bill payment behaviour no</td>
<td>161</td>
</tr>
<tr>
<td>Bill payment behaviour yes</td>
<td>33</td>
</tr>
<tr>
<td>Overall Percentage</td>
<td></td>
</tr>
</tbody>
</table>

- The cut value is .200

### BLOCK 2 (with both Intention and PC as the predictors)

### Iteration History

<table>
<thead>
<tr>
<th>Iteration</th>
<th>-2 Log likelihood</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>BI</td>
</tr>
<tr>
<td>Step 1</td>
<td>290.106</td>
<td>.121</td>
</tr>
<tr>
<td>1</td>
<td>290.106</td>
<td>.121</td>
</tr>
<tr>
<td>2</td>
<td>286.236</td>
<td>.442</td>
</tr>
<tr>
<td>3</td>
<td>286.224</td>
<td>.469</td>
</tr>
<tr>
<td>4</td>
<td>286.224</td>
<td>.469</td>
</tr>
<tr>
<td>5</td>
<td>286.224</td>
<td>.469</td>
</tr>
</tbody>
</table>

- Method: Enter
- Constant is included in the model.
- Initial -2 Log Likelihood: 287.192
- Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

### Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th>Step</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.968</td>
<td>1</td>
<td>.325</td>
</tr>
<tr>
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<td>.325</td>
</tr>
<tr>
<td>Model</td>
<td>8.817</td>
<td>2</td>
<td>.012</td>
</tr>
</tbody>
</table>

- Initial -2 Log Likelihood: 287.192
- Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.
APPENDIX H-2: Main Study SPSS Output for Logistic Regression Models 1 and 2 – Predictors of Prompt Bill Payment Behaviour

Logistic Regression Model 2:

<table>
<thead>
<tr>
<th>Iteration</th>
<th>-2 Log likelihood</th>
<th>Coefficients</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Constant</td>
<td>BI</td>
<td>PBC</td>
</tr>
<tr>
<td>Step 1</td>
<td>545.631a</td>
<td>-3.046</td>
<td>.541</td>
<td>.072</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Method: Enter
b. Constant is included in the model.
c. Initial -2 Log Likelihood: 556.654
d. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Model Summary

<table>
<thead>
<tr>
<th>Step</th>
<th>-2 Log likelihood</th>
<th>Cox &amp; Snell R Square</th>
<th>Nagelkerke R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>545.631a</td>
<td>.025</td>
<td>.035</td>
</tr>
</tbody>
</table>

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Omnibus Tests of Model Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 Step</td>
<td>10.923</td>
<td>2</td>
<td>.004</td>
</tr>
<tr>
<td>Block</td>
<td>10.923</td>
<td>2</td>
<td>.004</td>
</tr>
<tr>
<td>Model</td>
<td>10.923</td>
<td>2</td>
<td>.004</td>
</tr>
</tbody>
</table>

Hosmer and Lemeshow Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.520</td>
<td>8</td>
<td>.384</td>
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</tbody>
</table>

Variables in the Equation

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>BI</td>
<td>.541</td>
<td>.269</td>
<td>4.049</td>
<td>1</td>
<td>.044</td>
<td>1.718 1.014 2.910</td>
</tr>
<tr>
<td></td>
<td>PBC</td>
<td>.072</td>
<td>.255</td>
<td>.081</td>
<td>1</td>
<td>.776</td>
<td>1.075 .653 1.771</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>-3.046</td>
<td>.782</td>
<td>15.159</td>
<td>1</td>
<td>.000</td>
<td>.048</td>
</tr>
</tbody>
</table>

a. Variable(s) entered on step 1: BI, PBC.

Classification Table*

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted Bill payment behaviour dichotomy</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Step 1</td>
<td>268</td>
<td>10</td>
</tr>
<tr>
<td>Bill payment behaviour dichotomy yes</td>
<td>144</td>
<td>7</td>
</tr>
<tr>
<td>Overall Percentage</td>
<td></td>
<td>64.1</td>
</tr>
</tbody>
</table>

a. The cut value is .500
## APPENDIX I: Main Study SPSS Output for Testing Bias in Methods of Questionnaire Administration

### Group Statistics

<table>
<thead>
<tr>
<th>Method of questionnaire administration</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude towards paying water bill within 15 days of receiving the bill</td>
<td>157</td>
<td>4.24</td>
<td>.430</td>
<td>.034</td>
</tr>
<tr>
<td>Face-to-face using English</td>
<td>318</td>
<td>4.31</td>
<td>.485</td>
<td>.027</td>
</tr>
<tr>
<td>Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>159</td>
<td>3.52</td>
<td>.601</td>
<td>.048</td>
</tr>
<tr>
<td>Face-to-face using English</td>
<td>324</td>
<td>3.55</td>
<td>.626</td>
<td>.035</td>
</tr>
<tr>
<td>Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>156</td>
<td>3.78</td>
<td>.598</td>
<td>.048</td>
</tr>
<tr>
<td>Face-to-face using English</td>
<td>321</td>
<td>3.89</td>
<td>.600</td>
<td>.033</td>
</tr>
<tr>
<td>Intention to pay water bill within 15 days of receiving the bill</td>
<td>159</td>
<td>3.84</td>
<td>.608</td>
<td>.048</td>
</tr>
<tr>
<td>Face-to-face using English</td>
<td>318</td>
<td>3.97</td>
<td>.581</td>
<td>.033</td>
</tr>
</tbody>
</table>

### Independent Samples Test

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variance</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>----</td>
</tr>
<tr>
<td>Attitude towards paying water bill within 15 days of receiving the bill</td>
<td>Equal variances assumed</td>
<td>5.307</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>-1.677</td>
</tr>
<tr>
<td>Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>Equal variances assumed</td>
<td>.197</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>-.623</td>
</tr>
<tr>
<td>Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>Equal variances assumed</td>
<td>.043</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>-1.831</td>
</tr>
<tr>
<td>Intention to pay water bill within 15 days of receiving the bill</td>
<td>Equal variances assumed</td>
<td>.090</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>-2.252</td>
</tr>
</tbody>
</table>
### Gender:

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.128</td>
<td>.016</td>
<td>.014</td>
<td>.589</td>
</tr>
</tbody>
</table>

- Predictors: (Constant), Male vs. Female

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regress</td>
<td>2.737</td>
<td>1</td>
<td>2.737</td>
<td>7.894</td>
<td>.005</td>
</tr>
<tr>
<td>Residual</td>
<td>163.972</td>
<td>473</td>
<td>.347</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>166.709</td>
<td>474</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Predictors: (Constant), Male vs. Female
- Dependent Variable: Intention to pay water bill within 15 days

### Household Size:

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.077</td>
<td>.006</td>
<td>.004</td>
<td>.582</td>
</tr>
</tbody>
</table>

- Predictors: (Constant), How many people are in your household (excluding visitors)

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regress</td>
<td>.906</td>
<td>1</td>
<td>.906</td>
<td>2.672</td>
<td>.103</td>
</tr>
<tr>
<td>Residual</td>
<td>51.542</td>
<td>447</td>
<td>.339</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>52.448</td>
<td>448</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Predictors: (Constant), How many people are in your household
- Dependent Variable: Intention to pay water bill within 15 days

### Education Level:

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.067</td>
<td>.004</td>
<td>-.002</td>
<td>.594</td>
</tr>
</tbody>
</table>

- Predictors: (Constant), More than 16 yrs Vs. less than 13 yrs, more than 16 yrs Vs. Bfn 7 and 12 yrs

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regress</td>
<td>.741</td>
<td>3</td>
<td>.247</td>
<td>.701</td>
<td>.552</td>
</tr>
<tr>
<td>Residual</td>
<td>65.968</td>
<td>471</td>
<td>.352</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66.709</td>
<td>474</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Predictors: (Constant), More than 16 yrs Vs. less than 7 yrs, more than 16 yrs Vs. Bfn 7 and 12 yrs
- Dependent Variable: Intention to pay water bill within 15 days

### Occupation:

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.151</td>
<td>.023</td>
<td>.012</td>
<td>.589</td>
</tr>
</tbody>
</table>

- Predictors: (Constant), self-employed in business Vs. other, self-employed in business Vs professional, self-employed in business Vs employed by private company, self-employed in business Vs. full time housewife, self-employed in business Vs. civil servant

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.761</td>
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<td>Residual</td>
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<td>.347</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66.709</td>
<td>474</td>
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</tr>
</tbody>
</table>

- Predictors: (Constant), self-employed in business Vs. other business Vs professional, self-employed in business Vs company, self-employed in business Vs. full time housewife, self-employed in business Vs. civil servant
- Dependent Variable: Intention to pay water bill within 15 days
### House ownership status

#### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.173(^a)</td>
<td>.030</td>
<td>.024</td>
<td>.586</td>
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</tbody>
</table>

\(^a\)Predictors: (Constant), privately owned by family Vs. Government/Company owned, privately owned by family Vs. rented.

#### ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regress</td>
<td>5.014</td>
<td>3</td>
<td>1.671</td>
<td>4.666</td>
<td>.002(^a)</td>
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<td>Residual</td>
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<td>471</td>
<td>.343</td>
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<tr>
<td>Total</td>
<td>86.709</td>
<td>474</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Predictors: (Constant), privately owned by family Vs. Government/Company owned, privately owned by family Vs. rented.

### Income level

#### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.206(^b)</td>
<td>.042</td>
<td>.030</td>
<td>.594</td>
</tr>
</tbody>
</table>

\(^b\)Predictors: (Constant), less than 50k vs. more than 300k, less than 50k vs. $200k$ and $250k$, less than 50k vs. $15k$ and $200k$, less than 50k vs. $100k$ and $150k$, less than 50k vs. $50k$ and $100k$.

#### ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regress</td>
<td>7.070</td>
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<td>1.178</td>
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<td>Total</td>
<td>166.709</td>
<td>474</td>
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<td></td>
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</tbody>
</table>

\(^b\)Predictors: (Constant), less than 50k vs. more than 300k, less than 50k vs. $200k$ and $250k$, less than 50k vs. $250k$ and $300k$, less than $50k$ and $200k$, less than 50k vs. $100k$ and $150k$, less than 50k vs. $50k$ and $100k$.

\(^b\)Dependent Variable: Intention to pay water bill within 15 days of
APPENDIX J-2: Main Study SPSS Output for Mediator Regression Analysis – Step 2*

Gender – Perceived Control:

### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.091</td>
<td>.008</td>
<td>.006</td>
<td>.599</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Male vs. Female

### ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>1.428</td>
<td>1</td>
<td>1.428</td>
<td>3.978</td>
<td>.047</td>
</tr>
<tr>
<td>Residual</td>
<td>170.497</td>
<td>475</td>
<td>.359</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>171.925</td>
<td>476</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Male vs. Female

b. Dependent Variable: Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill)

Occupation – Subjective Norms

### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.167</td>
<td>.028</td>
<td>.018</td>
<td>.612</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), self-employed in business Vs. other, self-employed in business Vs professional, self-employed in business Vs employed by private company, Self-employed in business Vs. full time housewife, self employed in business Vs. civil servant

### ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
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<td>5</td>
<td>1.025</td>
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<td>.019</td>
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<tr>
<td>Residual</td>
<td>178.589</td>
<td>477</td>
<td>.374</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
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<td>482</td>
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<td></td>
<td></td>
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</table>

a. Predictors: (Constant), self-employed in business Vs. other, self-employed in business Vs professional, self-employed in business Vs employed by private company, Self-employed in business Vs. full time housewife, self employed in business Vs. civil servant

b. Dependent Variable: Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)

* Only statistically significant relationships in Step 2 are reported
APPENDIX J-3: Main Study SPSS Output for Mediator Regression Analysis – Steps 3 & 4

Testing for Mediator Effects of Perceived Control on the Relationship between Gender and Intention

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.732a</td>
<td>.536</td>
<td>.534</td>
<td>.392</td>
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</table>

a. Predictors: (Constant), Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill), Male vs. Female

ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
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</thead>
<tbody>
<tr>
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<td>2</td>
<td>41.042</td>
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<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
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<td>462</td>
<td>.154</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>153.141</td>
<td>464</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill), Male vs. Female

b. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.291</td>
<td>.122</td>
<td>-.049</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male vs. Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-.057</td>
<td>.037</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived Behavioural Control (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>.693</td>
<td>.030</td>
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a. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill
Testing for Mediator Effects of Subjective Norms on the Relationship between Occupation Type and Intention:

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>.275</td>
<td>.266</td>
<td>.508</td>
</tr>
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</table>

* a. Predictors: (Constant), Subjective Norm (with respect to paying water bill within 15 days of receiving the bill), Self-employed in business Vs. full time housewife, self-employed in business Vs professional, self-employed in business Vs employed by private company, self-employed in business Vs. other, self-employed in business Vs. civil servant

**ANOVA**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
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<tbody>
<tr>
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<td>7.544</td>
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<td>.258</td>
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<td></td>
<td>Total</td>
<td>164.646</td>
<td>469</td>
<td></td>
<td></td>
</tr>
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</table>

* a. Predictors: (Constant), Subjective Norm (with respect to paying water bill within 15 days of receiving the bill), Self-employed in business Vs. full time housewife, self-employed in business Vs professional, self-employed in business Vs employed by private company, self-employed in business Vs. other, self-employed in business Vs. civil servant

b. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill

**Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>self-employed in business Vs. professional</td>
<td>-.043</td>
<td>.117</td>
<td>-.015</td>
<td>-.367</td>
</tr>
<tr>
<td>self-employed in business Vs. full time housewife</td>
<td>-.094</td>
<td>.081</td>
<td>-.049</td>
<td>-1.158</td>
</tr>
<tr>
<td>self-employed in business Vs. employed by private company</td>
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<td>.100</td>
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<td>1.295</td>
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<tr>
<td>self-employed in business Vs. civil servant</td>
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<td>self-employed in business Vs. other</td>
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<td>.074</td>
<td>-.054</td>
<td>-1.255</td>
</tr>
<tr>
<td>Subjective Norm (with respect to paying water bill within 15 days of receiving the bill)</td>
<td>.496</td>
<td>.039</td>
<td>.509</td>
<td>12.695</td>
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</tbody>
</table>

* a. Dependent Variable: Intention to pay water bill within 15 days of receiving the bill
PAPERS PUBLISHED ON SIMILAR TOPICS
Title of Paper: Why Customers Don’t Pay their Water Bills Promptly: Evidence from Small Urban Water Utilities in Uganda

Authors: Josses Mugabi and Sam Kayaga

Type of Paper: Refereed Conference paper

Conference Title: 32nd WEDC International Conference

Conference Venue and Dates: Colombo, Sri Lanka; 13th – 17th November 2006

Year of Publication: 2007

Publisher: WEDC, Loughborough University

Available online: http://wedc.lboro.ac.uk/conferences/pdfs/32/Mugabi.pdf [accessed 30 June 2007], pp 211-215
Why customers don’t pay their water bills promptly: Evidence from small urban water utilities in Uganda

Introduction
Field studies carried out in many developing countries have shown that cost recovery is a key prerequisite for sustainable water services provision. The chief means of recovering the costs of service provision is through user-payments for the services provided. However, available data shows that bill collection efficiency for some urban water utilities in Africa can be as low as 50 percent. Many utility customers struggle to pay up their water bills and eventually get disconnected, leading to accumulation of huge unpaid bills. It appears that this problem is not unique to developing countries. According to a recent study commissioned by Ofwat (the economic regulator of the UK water industry), the levels of arrears, the amount of revenue written off, the numbers of customers in water debt within the UK water industry have continued to rise since 1998-99 (the last full year in which disconnection of domestic water supplies was permitted for non-payment of water bills). The report estimates that the total household revenue outstanding for up to 48 months for the period 2002-03 stood at £781 million, an increase of £115 million (17%) since 1998-99 (Accent Marketing and Research, 2003).

The effect of delayed bill payments and huge arrears on a utility’s capacity to deliver water services is evident. If a water utility is not able to collect in time, all the bills that are sent out, cash flow problems set in, which in turn, impacts on the ability to cover operating expenses and extend service coverage. Such a situation may result in low service coverage, and potentially, poor customer service — leading to customer dissatisfaction — which may breed more ‘non-payers’ and trigger a cycle of poor performance. Thus, minimizing the levels of ‘bad debts’ and increasing the rates of revenue collection is critical for sustainable urban water service provision. In order to respond to problems involving delayed or irregular payments, utility managers need to determine precisely why customers might not pay their bills. Unfortunately, very little information is available in the literature regarding the reasons for customer non-payment. As part of a wider research on bill payment behaviour in small urban water utilities in Uganda, we examined customer attitudes towards paying water bills regularly and promptly, and explored what they perceive to be the facilitating factors and barriers to engaging in that behaviour. We also interviewed water utility managers in the study areas to compare their understanding of the reasons for irregular and delayed payments, and that of their customers. The current paper draws on this exploratory research to shed light on the motivations of water utility customers when it comes to paying for water promptly. Basing on these insights, we identify possible ways in which small urban water utilities could encourage prompt and regular payment of water bills.

Study area
The study was conducted in 5 small towns, with populations in the range of 5000 to 25000 inhabitants. The towns included Nkokonjeru, Kamuli, Kayunga, Ibanda and Rakai. The study towns were randomly selected from a sampling frame of 32 towns with more than 10 percent inactive customer accounts in the 2004-05 reporting period. Water services in all five study towns are managed by private operators under management contracts with the respective town water authority. Table 1 shows basic customer data and collection efficiency for the 2004-05 reporting period (Water Authorities Division, 2005). From the table, we note that Kayunga town had half of its customer accounts...
inactive during that period mainly due to disconnections for non-payment. It should also be noted that average monthly collection efficiency of more than 100 percent as reported in Nkokonjeru and Rakai, is evidence that there is a problem of accumulation of customer arrears. All five water utilities require their customers to pay their water bills within 15 days after receiving the bills (which are distributed between 29th and 31st of every month). Disconnection of service is usually effected shortly after Day 15, although the actual deadlines set by the different operators vary from town to town. Those customers with bills outstanding for more than 2 months are usually disconnected first.

<table>
<thead>
<tr>
<th>Town</th>
<th>Popn (2002)</th>
<th>Total customer accounts</th>
<th>% Inactive</th>
<th>% Collection efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nkokonje</td>
<td>11,095</td>
<td>171</td>
<td>27</td>
<td>130.4</td>
</tr>
<tr>
<td>Kamuli</td>
<td>11,344</td>
<td>706</td>
<td>18</td>
<td>80.2</td>
</tr>
<tr>
<td>Kayunga</td>
<td>10,797</td>
<td>545</td>
<td>64</td>
<td>78.1</td>
</tr>
<tr>
<td>Ibanda</td>
<td>22,728</td>
<td>574</td>
<td>10</td>
<td>88.2</td>
</tr>
<tr>
<td>Rakai</td>
<td>5,974</td>
<td>164</td>
<td>21</td>
<td>104.3</td>
</tr>
</tbody>
</table>

**Methods**

The objective of this study was to discover why water utility customers in small towns fail to pay their water bills promptly. This made a qualitative approach the most appropriate methodology for this study. A qualitative approach is concerned with developing explanations of social phenomena. It is concerned with opinion, experience, motivation, feeling, reasons for decision-making and behaviour. This approach thus produces largely subjective data, with limitations to the extent to which results can be generalised. This limitation should be taken into consideration when using the results of this study. Nonetheless, similar and consistent responses obtained from different areas in a qualitative research provide strong indication of a single pattern of behaviour.

In this study, we used a combination of face-to-face interviews and focus group discussions. Between Nov and Dec 2005, a total of 10 interviews were conducted with utility managers in each of the towns. The interviews mainly targeted area managers and commercial managers of the respective private operators charged with the management of water services in each of the towns. The interview with managers was designed to obtain, among others, basic information relating to customer accounts, tariff structures and revenue levels, billing and collection procedures, as well as their perceptions of the reasons why customers fail to pay water bills regularly and promptly.

Following the interviews, access was made to the domestic customer databases, and with the help of the commercial managers, names of potential participants for the focus group discussion were identified. Participants were purposely selected to maximise attendance, gender mix and differences in water bill payment patterns. Invitation letters (written on company headed paper and signed by the area managers) were sent out to 20 potential participants in each town. The turn up ranged from 6 to 20 participants, with Kayunga focus group registering the lowest number of participants (6) and Rakai registering the highest (20). The low attendance in Kayunga was probably due to a late change we made in the date and time of the discussion which was not communicated adequately. One focus group discussion was conducted for each town, making a total of 5 discussions with a total of 60 participants. The discussions were relatively structured with high moderator involvement. Competent and experienced moderators were recruited and briefed on the objectives of the study. Discussions were conducted around the following guiding issues/questions:

1. What do you believe are the advantages and disadvantages of paying your water bills within 15 days of receiving the bill?
2. What factors or circumstances would enable you to pay your water bills at the utility office within 15 days of receiving the bill?
3. What factors or circumstances would make it difficult or impossible for you to pay your water bills at the utility office within 15 days of receiving the bill?
4. Are there any other issues that come to mind when you think about paying your water bills within 15 days of receiving the bill?

The combination of focus group discussions with customers and face-to-face interviews with managers enabled us to obtain valuable insights into ways paying for water services promptly is perceived by both the water utility managers and their customers. Responses from interviews and notes from focus group discussions were reviewed and written out properly using a word processor. As is customary with qualitative research, analysis of the resulting information involved identifying important factors, themes and relationships and making sense of emerging meanings. To aid this process, a procedure was adopted in which emerging issue based on the above discussion questions were each given a count equal to the number of participants in the group. If a particular issue did not emerge from a group, it was given a count of zero for that group. The counts for each theme were summed across all the five groups to generate an aggregate count, which was used to rank the emerging issues and give an indication of the most commonly held perceptions.

**Paying promptly – Benefits and sacrifices**

Across all the five study towns, customers generally believed prompt payment behaviour has a lot more benefits than sacrifices (see Box 1). They generally consider the water bill to be an essential bill that has to be paid in time, although many admitted to deliberately delaying payments, especially...
when the service is unreliable. "It is very frustrating to pay in time and yet the water supply continues to be on- and off. I rather keep my money to pay the water vendors." [Nkokonjeru focus group]

Box 1 shows what most customers believe to be the benefits and sacrifices of paying water bills in time. The primary benefit of paying promptly seems to be the assurance of uninterrupted services - as it is the only way to avoid disconnection. This is not entirely surprising given the vigilance of the utilities in disconnecting non-paying customers.

<table>
<thead>
<tr>
<th>Box 1. Benefits/sacrifices of paying promptly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benefits:</strong></td>
</tr>
<tr>
<td>1. Uninterrupted supply of water to my home (no disconnection)</td>
</tr>
<tr>
<td>2. Staff of the utility will have the necessary facilities, equipment and motivation to serve me better</td>
</tr>
<tr>
<td>3. Utility will be able to meet all operation and maintenance costs so I can continue to get a reliable water supply</td>
</tr>
<tr>
<td>4. Avoids accumulating big debts</td>
</tr>
<tr>
<td>5. Gives me a peace of mind</td>
</tr>
<tr>
<td>6. There will be funds for helping other community members to gain access to piped water</td>
</tr>
<tr>
<td>7. Ensures good home and personal hygiene</td>
</tr>
<tr>
<td>8. Guaranteed access to water service</td>
</tr>
<tr>
<td>9. Demonstrates integrity and keeps a good social image</td>
</tr>
<tr>
<td><strong>Sacrifices:</strong></td>
</tr>
<tr>
<td>1. Unreliable service after paying your bills promptly</td>
</tr>
<tr>
<td>2. Foregoing other household needs and making water payment a first priority</td>
</tr>
<tr>
<td>3. Difficult to remain consistent</td>
</tr>
</tbody>
</table>

However, there are also indirect benefits that emerged across all groups. Many customers believed that when they pay their water bills promptly the utility will be in position to cover operational costs, and most importantly, utility staff will have the necessary facilities, equipment and motivation to serve them better. This demonstrates customer awareness of the importance of paying for water in time, and perhaps a major shift in attitudes towards paying for water.

### Paying promptly— Barriers and facilitators

In addition to assessing attitudes towards paying water bills promptly, we also inquired into the factors or circumstances that might facilitate or make it difficult for customers to engage in the behaviour. Boxes 2 and 4 show what most customers believe to be the main facilitators and barriers respectively. With the exception of the factors related to tariffs and whether or not a customer has a regular paying job, all the other top five barriers and facilitating factors that emerged relate to service issues that are within the full control of the water utility.

<table>
<thead>
<tr>
<th>Box 2. Facilitating factors/circumstances</th>
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</thead>
<tbody>
<tr>
<td>1. Reduction in tariffs</td>
</tr>
<tr>
<td>2. Reliability of supply</td>
</tr>
<tr>
<td>3. Bills delivered in time</td>
</tr>
<tr>
<td>4. Having a paying regular job</td>
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<tr>
<td>5. Threat of disconnection</td>
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<tr>
<td>6. Selling water to neighbours</td>
</tr>
<tr>
<td>7. Reminder visits/radio announcements</td>
</tr>
<tr>
<td>8. Budgeting</td>
</tr>
<tr>
<td>9. Regular promotions/discounts to promote prompt payments</td>
</tr>
<tr>
<td>10. Quick responses to repair requests</td>
</tr>
<tr>
<td>11. Good water quality</td>
</tr>
<tr>
<td>12. Good customer care</td>
</tr>
<tr>
<td>13. Flexibility and choice in payment options</td>
</tr>
<tr>
<td>14. Presence of reconnection fees</td>
</tr>
</tbody>
</table>

However, when asked what they considered to be the main factors preventing customers from paying their water bills promptly, the responses of utility managers differed significantly from what the customers perceived as the main barriers (see Box 3). In particular, all the 10 managers interviewed pointed to the low-incomes as the main barrier to paying water bills promptly, in contrast to their customers who pointed mainly to service delivery issues related to reliability, poor customer service, poor billing systems and delivery, faulty meters, etc.

Therefore, what motivates a customer to settle an outstanding water bill seems to relate mainly to the overall quality of the service provided. This has implications for water utilities and their regulators in terms of policy, operations, and incentive mechanisms for promoting prompt and regular payment of water bills. Basing on the qualitative insights obtained in this study, the next section briefly looks at policy and managerial actions that can be implemented in the short to medium term to encourage prompt payments in the present context.

<table>
<thead>
<tr>
<th>Box 3. Utility Manager's perceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do you consider to be the main factors preventing customers in your service area from paying their bills promptly?</td>
</tr>
<tr>
<td>1. Low incomes</td>
</tr>
<tr>
<td>2. Customers not used to paying for water</td>
</tr>
<tr>
<td>3. Political interference</td>
</tr>
<tr>
<td>4. Intermittent supply</td>
</tr>
<tr>
<td>5. Low production</td>
</tr>
<tr>
<td>6. Water quality problems</td>
</tr>
<tr>
<td>7. High water consumption leading to high bills</td>
</tr>
</tbody>
</table>

### Encouraging prompt and regular payments

The first step in seeking to respond to problems involving irregular or delayed payments is to determine precisely why customers might not pay their bills. We attempted to gain
insight into some of the reasons with a view of making some recommendations in the context of small town water services in Uganda. Obviously, it is difficult to make sound proposals for action considering the myriad of factors that emerged. However, by isolating those issues that are within the full control of a water utility, it is possible to identify strategies that can be implemented at the micro level to promote prompt and regular payment of water bills by customers.

Firstly, in the current context, ensuring reliability of supply – i.e. consistency and adequacy of supply as per the promised service level - seems to be the single most important action that managers can take to promote prompt bill payment. In the long term, this may require additional investment to increase production levels in areas such as Ibanda and Nkokonjeru, where there is a substantial supply deficit. Secondly, managers need to work on improving customer relations through appropriate and timely communications in case of service failure, quick response to customer complaints, payment reminder notices/visits, and generally improving the quality of service pertaining to the interaction process between customers and the organisational elements like staff and the service environment.

Thirdly, there is need to improve billing systems and procedures - ensuring minimal errors in billing, timely delivery of bills to customers and providing flexibility and choice in payment options. In line with this, utilities need to segment customers into categories based on how quickly they react to water bills. This would enable managers to design targeted strategies for debt management and recovery. For instance, those considered to be high risk would be flagged for personal follow-up immediately a payment is missed, and a reminder letter and vulnerable customers, who are struggling to pay, can be offered additional help and advice. Adopting such a proactive customer-centric strategy has potential not only to transform revenue collection but also to increase customer satisfaction. Small urban water utilities need to take advantage of their relatively small number of customers by adopting a customised approach to debt management and recovery.

Fourthly, incentive mechanisms in the form of discounts or vouchers for prompt and regular payment could be explored; perhaps for a limited period of time. These could be designed to incentivise payment by customers who have found it difficult to pay their water bills, rather than reward those who can afford to pay.

Fifthly, although the disconnection strategy seems to be working well in the current context as a facilitator for prompt payment, it appears that in some instances this strategy is being implemented indiscriminately without due consideration to the particular circumstances of customers. For instance, it would be particularly inappropriate to disconnect customers who are facing short-term payment difficulties resulting from non-permanent situations such as incurring extraordinary medical bills, school fees, etc. These circumstances do not warrant the disconnection of service. Nor would the disconnection of service in these circumstances protect the utility against any future loss of revenue. Instead, it has the potential to affect customer relations and hence satisfaction levels, which might be damaging in the long term. The key message is that utility managers should adopt a customised approach when dealing with customers in arrears.

At the macro level, the key lesson for policy makers is to appreciate that cost recovery through water customer payments is affected by so many factors and so many different aspects of project design and operation. There is strong evidence in Uganda and elsewhere (Komives and Prokopy, 2000) that many urban water projects begin without fully acknowledging the importance of these factors. When cost recovery is viewed as the need to collect enough revenues from users to cover the cost of installed systems, the challenge of getting people to pay becomes apparent. Although there may be strategies that can be adopted at the operational level (such as those discussed above) to promote payments, we contend that there are also long-term policy issues that need to be addressed, particularly those relating to tariff structures, technology and service level choices. Getting customers to cover the cost of services provided is a well established approach to improving cost recovery. However, utilities and their regulators need to realise that changing the cost or the characteristics of those services can also contribute to improving cost recovery (Komives and Prokopy, 2000).

**Conclusion**

This paper has provided some insight into the motivations of water utility customers when it comes to paying their water bills promptly. Through an exploratory research in five small urban utilities in Uganda, we found evidence of a positive attitude towards regular and prompt paying of water bills among utility customers. However, what motivates a customer to settle an outstanding water bill seems to relate mainly to the overall quality of the service provided by the utility. Contrary to the usual explanation that low-income levels (typical of small urban centres in many developing countries) are responsible for the low cost recovery levels, we found evidence that supports the view that poor service quality (i.e. unreliable supply, low service levels, poor customer relations, poor billing and collection systems, etc) is

### Box 4. Barriers to paying bills promptly

1. Poor customer care/complaints not addressed in time
2. Incorrect bills and mistakes in reading meters
3. Unreliable service
4. Faulty meters
5. High water tariffs
6. Lack of money
7. Irregular income (especially during dry season)
8. Unexpected circumstances such as death or illness
9. Poor water quality
10. Failure to understand the bill
11. Presence of alternative water sources
12. Lack of control over household finances
13. Misappropriation of funds by authorities
14. Ignorance about government water policy
a key consideration for customer decision-making when it comes to paying water bills regularly and promptly. This has implication for small urban water utilities and their regulators in Uganda and elsewhere. In particular, cost recovery strategies that rely heavily on revenues from customers are unlikely to succeed if aspects relating to the service itself (such as service quality, reliability, operational costs/tariffs etc) are not addressed appropriately at both the micro and macro levels.

References

Notes
1. Tariff setting for small towns water services is currently being done by the Ministry of Water, Lands and Environment
2. A key objective of our current research on bill payment behaviour is to determine, using a suitable theoretical framework, the factors that significantly contribute to variations in prompt bill payment behaviour.

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Type of Paper: Journal Paper


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Marketing urban water services: information needs for water utility managers in developing countries

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Abstract A decade ago the 'Dublin Principles' shifted global thinking towards treating water as an economic good. The concern was that overly supply-driven approaches had been financially unsustainable, and therefore failed to reduce the service gap. Accompanying this conceptual shift has been a wider move towards focusing on the customer's needs and preferences and their willingness to pay, and applying marketing techniques to meet those needs in a financially sustainable manner. Although regarded as a positive move, its success is heavily dependent on how well water utilities understand their customers. This paper examines existing literature on the determinants of customer willingness to use and pay for improved water services in developing countries. The contribution of past research to our understanding of the behaviour of customers, with regard to service level choice and payment for services, is critically analysed. Based on this analysis, we develop and discuss a generic model of a water consumer's decision-making process. The model serves two purposes. First, it consolidates past research into a coherent framework to facilitate implementation of the marketing approach. Second, we use the model to identify critical customer information that water utility managers need to know in order to be customer-focused.

Keywords Customer; developing countries; marketing; urban water services

Introduction
As a result of urbanisation and rapid population growth, urban water utilities in developing countries face enormous challenges in meeting the water needs of urban dwellers. The twin objectives of closing the coverage/service gap while achieving financial sustainability is a key concern for many water utilities and municipalities. However, most utilities continue to use the conventional supply-driven approach to water provision, which has not been successful in meeting the water needs of the growing populations (Njiru and Sansom, 2003). Indeed, many water utilities and municipalities fail to serve as many as 50 to 80 percent of the people living in their urban areas (Sansom et al., 2004). The unserved people often rely on water vendors, to whom they pay high prices, or use alternative water sources of questionable quality. In addition, utilities in low-income countries face considerable difficulties in recovering the much needed revenue from among those customers connected to their networks.

In recent years, a growing number of sector professionals (e.g. Njiru, 2002; Nickson and Franceys, 2003; Njiru and Sansom, 2003; Sansom et al., 2004) have pointed out that a marketing approach to water services delivery has the potential to improve coverage and financial sustainability in low-income countries. This approach is seen as an effective way for water service providers to be customer-focused and therefore demand responsive. Indeed, a marketing approach to urban water services delivery is consistent with the new public managerialism paradigm that is currently guiding internal reforms for public water utilities in developing countries (Nickson and Franceys, 2003; World Bank, 2004).
However, while a marketing approach seems much more relevant to the service problems at hand than the conventional supply-driven approaches, the degree to which its implementation will succeed is heavily dependent on how well water utilities understand the consumer. Marketing functions within the business realm are heavily dependent on the knowledge of consumer behaviour (Loudon and Dell Bitta, 1993). This is attributed in part to the desire of business firms to obtain a competitive advantage by basing marketing decisions on information about the factors that determine the customers' preferences among products or services and their willingness to pay.

In this paper, we examine existing literature on the determinants of customer willingness to use and pay for improved water services. Basing on the literature, we develop and discuss a generic model of a water consumer's decision-making process as regards service level choice and paying for services. The model attempts to consolidate past research into a coherent framework to guide water utilities in developing and implementing customer-oriented service improvements. In particular, it enables utilities to identify critical customer information on which to base strategies for increasing uptake of service options and promoting positive bill payment behaviour.

The urban water supply market in developing countries

Urban water utilities in developing countries operate in an environment where both their existing and potential customers have access to alternative water sources and service providers. Case studies carried out in Africa and South Asia have revealed a dynamic water market, supported by socially complex networks of access and distribution (Whittington et al., 1988; Collignon and Vezina, 2000). Across a typical town or city, residents use private water vendors, individual household on-selling/buying, family and institutional boreholes, hand-dug wells, streams, rainwater and springs to supplement, replace or substitute direct utility water. Although these alternative supplies are often unregulated, unreliable and costly, a big proportion of urban dwellers use them regularly either through necessity or choice. Indeed, these sources of water supply attract reasonably loyal customers, and therefore, could be said to represent a certain degree of competition to conventional water utilities. Whether this level of competition is sufficient to drive urban water utilities into new larger markets (such as informal settlements) is yet to be resolved. Nonetheless, utilities do have a social responsibility to provide sustainable clean water services to all urban residents at an equitable price. In addition, recent institutional reforms also require that urban water utilities ensure increased cost recovery in order to enhance service sustainability. In light of the mounting social and commercial pressures, water utilities in developing countries are being argued to change their business approach from being supply-driven to engendering customer focus (Kayaga et al., 2004).

Being customer-focused implies that utility services are organised and directed towards the demands and desires of the customer. To achieve this, a water utility would have to execute a management process involving: (1) investigating customer demand for different service options; (2) identifying groups of consumers whose requirements could be better satisfied; (3) developing reliable service options to meet changing demands; (4) pricing the service at a level which the market will bear and which will meet the financial objectives of the utility; and (5) promoting the service so that a desired unit or revenue volume of demand is achieved (Sansom et al., 2004). Such a process is considered key to improving utility performance. However, its success relies heavily on accurate knowledge of the customer. Further, in order to apply marketing tools and techniques, such as market segmentation, service differentiation and appropriate pricing, water utility managers need to develop a comprehensive profile of both their existing and potential customers. In the following sections, we review existing literature on the determinants of customer
decisions to use and pay for improved water services, and develop a framework that puts consumer behaviour at the centre of a water utility's efforts to improve performance.

Studies on domestic water demand behaviour in low-income countries

Understanding domestic water demand behaviour in low-income countries has been a top priority for many international financing agencies since the end of the 1980-1990 International Water and Sanitation Decade. In particular, research has focused on understanding the determinants of household demand for services and their willingness to pay. Some of the studies are briefly reviewed as follows, and their contribution to our understanding of the behaviour of water consumers in low-income countries is assessed.

Factors affecting service level choice

Most urban dwellers in developing countries have a choice between obtaining a private connection and using other options such as public water kiosks, shared connection, water vendors, and public wells/boreholes. A few studies have investigated the factors that influence this decision. Many of the studies are conceptually based on the assumption that water consumers (either individually or as part of a household unit) use an implicit economic cost-benefit framework to guide their decisions. For instance, a study carried out in Ukunda, a small market town in Kenya (Mu and Whittington, 1990) reported a significant influence by two economic factors: the price of water and connection time. Other studies, focusing on household decisions to connect to piped water systems, have revealed that in addition to socio-economic factors such as income, gender and education levels, tariffs and connection fees negatively affect the likelihood of households to connect to public piped water systems (Altaf et al., 1993; Singh et al., 1993; McPhail, 1994).

Similarly, a recent study in three Kenyan cities of Nairobi, Mombasa and Kakamega (Gulyani et al., 2005) found that consumer's decisions to connect are significantly influenced by only three factors: (1) current unit cost of water; (2) current per capita use; and (3) time spent daily in collecting water. According to this study, a household is more likely to maintain its current water supply status, the lower the unit cost it bears for water, the lower its per capita water use level, or the longer the time it spends daily collecting water (Gulyani et al., 2005).

In contrast, other studies have reported a lesser role of economic factors (price, quantity and time) in service-level choice decisions. Asthana's (1997) study in the city of Bhopal in Central India showed that the decision to connect to a public water supply system was strongly influenced by household expectations or experiences of alternative sources. A similar study (Whittington et al., 2002) in five municipalities in Kathmandu valley, Nepal found that household preference for improved services was influenced not only by socioeconomic/demographic factors and the existing water situation, but also by their perceptions of water quality and public policy. Furthermore, a study carried out in rural parts of the Philippines showed that households value an in-house piped water supply highly relative to other characteristics of their homes (North and Griffin, 1993).

On the whole, results from the above studies appear to suggest that economic and service factors (such as price, reliability, quality and quantity), rather than socio-economic/demographic factors (such as income, gender, and education) explain much of the variation in household decision-making. It is also evident that internal psychological factors such as beliefs/perceptions, expectations and attitudes towards improved services and utility policy have an influence on customer decision-making, although their role has not been fully explored in the research reports reviewed.
Paying for water services

Predicting consumer behaviour regarding payment for water services has been a subject of intense research in the past two decades. Several studies (e.g. Katko, 1990; Whittington et al., 1990; World Bank Water Demand Research Team, 1993; Mani et al., 1997) have been conducted in various low-income countries to establish factors that influence WTP for water services. In the context of urban water services, the set of influencing factors as revealed by past research can be broadly categorised into: (1) factors within the full control of the water service provider organisation, e.g. service level, service quality and reliability, reputation of service provider, policy environment, and transparency of financial management; (2) factors within the partial control of the service provider, e.g. perceived benefits, opportunity cost of time, water for production; and (3) factors beyond the control of the service provider, e.g. characteristics of alternative sources, income levels and myriad other socio-economic/cultural factors. WTP studies are now widely considered as forming part of an improved planning methodology for water supply in developing countries. This is because they provide a basis for distinguishing financially viable projects from those that are destined for failure. However, as experience in several low-income countries suggests, cost recovery is still a major problem even for those projects with good initial financial models.

Consequently, the research community is now interested in providing a deeper understanding of the factors responsible for translating the consumer's self-reported WTP into actual payment behaviour. For instance, Kayaga et al. (2004) attempted to establish the influence of customer perceptions of utility services on bill payment behaviour using empirical data from Uganda. Their findings showed that customer perceptions of service quality, service value and corporate image were strong predictors of customer satisfaction, which in turn, significantly predicted favourable consumer attitudes towards paying water bills or customer loyalty (Kayaga et al., 2004). In an attempt to predict actual bill payment behaviour (measured as mean bill payment period), the influence of various attitudinal variables (i.e. service value perceptions, corporate image, customer satisfaction and, customer loyalty) was modelled. With the exception of customer loyalty, all other variables did not have a significant influence on mean bill payment period (Kayaga et al., 2004). Moreover, the size of the variation in mean bill payment period explained by the regression model was quite small (7 per cent), hence suggesting the presence of other potential influences on bill payment behaviour. Therefore, although the existing literature makes a strong contribution to our understanding of the factors influencing WTP for improved water services, little research has focused on explaining variations in actual payment behaviour. Water utility managers facing difficulties in recovering bills from their existing customers would greatly benefit from a greater understanding of the factors that influence the payment behaviour of their customers.

The water consumer's decision-making process

From the above review, it is apparent that domestic water demand behaviour in low-income countries has received only limited research attention. Paradoxically, the demand responsive/marketing approach advocated for by many sector professionals as the way forward for improving the financial sustainability of water services in low-income countries requires that service providers have a deeper understanding of the behaviour of their existing and potential customers. Consumer decision-making is one aspect of consumer behaviour that market-oriented water utilities should strive to understand. In this section, we develop and discuss a generic model of a water consumer's decision-making process as regards service level choice and paying for services. The model, presented in Figure 1, is designed to consolidate the existing literature reviewed above into a coherent
framework to facilitate implementation of the demand-responsive/marketing approach. It does not presume to provide an exhaustive picture of the complexities of consumer decision-making. Rather, it is developed to synthesise and coordinate relevant concepts into a significant whole.

Theoretical perspective

Theories of consumer decision-making vary, depending on one’s assumption about the nature of humankind. The two dominant perspectives found in the literature include (Schiffman and Kanuk, 1997): (1) the economic perspective; and (2) the cognitive perspective. The economic perspective characterises a consumer as a rational decision-maker; aware of all available alternatives and capable of correctly ranking each alternative in terms of its benefits and costs in order to identify the one best alternative. This perspective dominates most of the earlier research on domestic water demand behaviour in developing countries. However, consumer researchers have often criticised this view as unrealistic because consumers rarely have all of the information, or sufficiently accurate information, or even an adequate degree of involvement or motivation, to make the so-called perfect decision (Schiffman and Kanuk, 1997). In the water sector, the major weakness of the economic perspective is that it takes a narrow view of water demand behaviour, explaining it only in terms of price, quantity and time. The cognitive perspective, on the other hand, portrays the consumer as a thinking problem solver (Schiffman and Kanuk, 1997), who seeks not to make a perfect decision, but a satisfactory one. It focuses on the processes by which consumers seek and evaluate information about alternatives. Within the context of the cognitive model, consumers are viewed as information processors. Information processing leads to the formation of preferences and, ultimately, to satisfactory decisions.
The generic model shown in Figure 1 is developed to reflect the cognitive consumer. The model has three sets of variables: input variables, process variables, and output variables. The input component draws on external influences that serve as sources of information. The process component is concerned with how potential customers make decisions about whether to connect or not, and how existing customers make decisions about whether to sustain bill payment or not. Internal psychological influences on the decision-making process include beliefs, perceptions and attitudes towards the specific behaviour. The output phase of the model concerns the post-decision activities of the consumer, i.e. whether the consumer continues to use the service level option chosen, and sustains payment for it.

**Input component**

In this model, input components exert external influence on the decision-making process by acting as external sources of information. From previous research (e.g. Mu and Whittington, 1990; Altaf et al., 1993; Singh et al., 1993; Asthana, 1997; Whittington et al., 2002; Gulyani et al., 2005), we can identify two types of input. The first type is the service characteristics, i.e. price (tariffs and connection fees), water quality and quantity, reliability of supply and customer service. These factors represent the external influence on behaviour that is within the full control of the water utility. The second external input to the decision-making process is the socio-economic/cultural environment. Several case studies from developing countries have revealed myriad socio-economic and cultural factors that influence consumer willingness to use or pay for a particular service, e.g. gender, education, income levels, and tenure status (World Bank Water Demand Research Team, 1993; Kayaga et al., 2003).

**Process component**

The process component is concerned with how consumers make decisions. To understand this process, water utilities must consider the influence of psychological factors such as beliefs/perceptions and attitudes. Regrettably, previous research has not adequately investigated these influences. Psychological factors represent the internal influences that affect consumer-decision making processes (Schiffman and Kanuk, 1997). In the case of service level choice, the three basic stages that potential customers go through in order to reach a decision about which level of service to use are represented in the model as: (1) problem recognition – which is usually the periodic lack of adequate water; (2) information search, e.g. asking neighbours where they obtain a reliable source and the costs involved; and (3) evaluation of alternatives – which may involve use of one or two alternatives over a short period of time before making the final decision. Similarly, in the case of existing customers, the decision to sustain bill payment is represented in the model as a three-stage process, i.e. (1) evaluation of benefits and sacrifices of sustaining payments; (2) assessment of service value; and (3) satisfaction judgements or comparison of service expectations and performance. As depicted in the model, the psychological field acts as an internal source of information, i.e. held beliefs/perceptions and attitudes towards the behaviour. For instance, the decision to acquire a private connection can be internally influenced by: (1) beliefs about the likely outcomes (e.g. benefits and costs) of having a private connection and the evaluation of those outcomes (i.e. whether they consider them desirable or not); (2) perceptions of social pressure (from friends, family and community) to connect; (3) perceptions of how easy or difficult it is to acquire a private connection; and (4) beliefs about the presence of factors that may facilitate or make it difficult to acquire a private connection. Similarly, in the case of existing customers, the decision to sustain bill payments can be internally influenced by the corresponding beliefs/perceptions
relating to benefits and costs, social pressure, and presence of impediments and facilitating factors.

Output component
The output phase of the model concerns the decision outcome and post-decision activities of the consumer. For instance, in the case of service level choice, evaluation of alternatives may yield one or two preferred options, and the decision is made to go for one or both. In the case of two options (e.g. public tap stand and vendor-delivered water), the consumer's ongoing behaviour may be to stay with one option as the primary source and retain the other as a supplementary source. Customer experiences with the chosen service provide the feedback route to the process component of the model. Experience in this case acts as an additional internal source of information for subsequent decisions. Further, in the case of existing customers, satisfaction with the service offering is expected to translate into an increased desire to sustain the service through continuous and prompt bill payments (Kayaga et al., 2004).

Getting to know the customer: information needs for water utility managers
The conceptual model of consumer behaviour discussed above enables us to identify critical customer information that water utility managers need to know in order to successfully implement the demand-responsive/marketing approach. To understand the customer in a comprehensive manner, particularly if a utility is to increase service coverage and maximise customer satisfaction, the information required is grouped into the following three categories, based on the degree of control a utility has over the issues revealed.

Category 1: The perceptions of existing and potential customers with regard to:
• the water supply services provided by the utility in terms of key service characteristics such as quality, quantity, collection time, frequency, reliability, and supply pressure
• the utility's water charges, and billing arrangements
• the utility's customer services in general, in terms of dealing with requests and responding to complaints
• the ease or difficulty of acquiring connections and paying water bills
This information reveals critical service issues that are important to customers. These issues relate to service characteristics and therefore are within the full control of the water utility. In order to influence consumer decision-making and behaviour, utility managers need to know which service attributes have a significant influence on the decision making process. This would facilitate the design of cost-effective intervention strategies for increasing service coverage and promoting bill payment.

Category 2: The beliefs of existing and potential customers with regard to:
• the benefits and costs (including time and effort) of acquiring, using and paying for utility water services
• the relative advantages and disadvantages of water services provided by competitors, such as water vendors and community-based groups
• overall satisfaction with utility water services
This category of information taps into the consumer's psychological field, and therefore utilities have only partial control of the issues revealed. However, this information provides important clues for service improvement, as well as enabling the utility to design effective promotional strategies. For instance, understanding the benefits consumers expect from an improved service and the factors that influence their behaviour patterns would be an important input in the design or development of services that consumers will
readily appreciate. With such knowledge, the water utility would be able to develop service options that meet the needs of different consumers. Additionally, by addressing the benefits consumers expect from a service, water utilities could potentially increase consumer's willingness to pay services.

Category 3: Socio-economic Information

This category concerns information on (1) the socio-economic characteristics (such as gender and education levels) of existing and potential customers; and (2) their geo-demographic characteristics such as type of dwellings, type of employment and income level. Previous research has shown these to have a significant influence on willingness to use and to pay for improved water services (World Bank Water Demand Research Team, 1993; Kayaga et al., 2003). In terms of designing behavioural change strategies, socio-economic issues are beyond the control of the water utility. However, such information helps in providing a detailed profile of the various customer groups in the service area, allowing the development of well-targeted utility services and promotion strategies that address the preferences and needs of each group. In addition, geo-demographic characteristics can be used to draw market segments for a water service area, thus allowing utilities to deliver differentiated service levels at different prices for the benefit of all consumers and the utility.

Conclusion

Mounting social and commercial pressures on urban water utilities and municipalities in developing countries have forced a rethink of the traditional supply-driven approaches to a more demand-responsive approach using marketing-type techniques. Such a shift inescapably requires utility managers to have a deeper understanding of the customer, and the factors that determine their preferences and behaviour. This paper has examined existing literature on the subject. Findings from several case studies carried out in the developing world have been combined into a unified framework to explain customer choice decisions with regard to service levels and payment for improved services. It is hoped that this framework will serve two purposes. First, it enables utility managers to easily identify the critical inputs to customer decision-making and design intervention strategies aimed at increasing service coverage and promoting bill payment. To enable water utilities to understand their customers in a comprehensive manner, we have identified and discussed critical information needs for water utility managers. Secondly, the model discussed in this paper provides a useful conceptual basis to guide future research on domestic water demand behaviour in developing countries. In particular, the role of internal psychological factors in influencing behaviour is a subject for investigation.

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Introduction

Water services provision in low-income countries has become an important area of concern and research within the global sustainable-development agenda. The global interest in potable water-supply issues in the developing world is captured in the Millennium Development Goals of the United Nations member states (United Nations 2000). A key target of these goals is to halve the number of people without sustainable access to safe drinking water and basic sanitation by the year 2015. To achieve this target, the World Health Organization and the United Nations Children’s Fund (WHO and UNICEF 2000) estimate that more than one billion people in the developing world will need to gain access to improved water services within the next 10 years. This estimate is based on the assumption that services for those who are already served will be sustained. However, recent studies have revealed that huge constraints still affect the sustainability of water supply services. These constraints include funding limitations, insufficient cost recovery, and inadequate operation and maintenance (WHO and UNICEF 2000). These challenges are greater in the fast-growing small urban areas of low-income countries where the highest population growth rates today are reported (United Nations 2002; Satterthwaite and Tacoli 2003).

This article focuses on the problems and issues regarding water services management in small towns of low-income and developing countries. The article has three primary objectives. First, the authors show that whereas management systems for water service delivery in both rural and large urban areas are fast becoming accepted as norms, service provision in small-town settlements faces special challenges that may require rethinking conventional approaches. Second, the authors critically evaluate recent practices and efforts aimed at addressing the special challenges that water service providers face in small-town settlements. Third, drawing on the rapidly growing body of applied research and policy analysis directed specifically at small-town water supply, the authors identify an integrated set of reform considerations to guide policymakers and urban-planning professionals involved in water supply issues in developing countries.

Small Towns: Definition, Characteristics, and Significance

In many low-income and some middle-income countries, between one-quarter and one-half of the total population live in settlements with between 2,000 and 20,000 inhabitants (International Institute for Environment and Development 2003). In some countries, most or all these settlements may be classified as urban; in others, most or all may be classified as rural. This is rather explicable because most such settlements indeed have a mix of rural and urban characteristics. Within the water sector, the term small town is increasingly being used to refer to such settlements in developing countries (Wood 2000; Njiru and Sansom 2002; Satterthwaite and Tacoli 2003).

Small towns lie somewhere on the continuum between rural and urban. Although the criteria for defining rural and urban vary from country to country, population size threshold is the most commonly used. Table 1 shows a disaggregated “rural-urban” spectrum for selected countries following an analysis of their censuses. In Botswana for example, 50.2% of the country’s population is classified as urban, but only 19.2% live in urban areas of more than 50,000 people. This sample data indicates that most of the urban population in developing countries do not live in big cities but instead live in smaller centers (mostly market towns and administrative centers). Small towns seem to be found predominantly at the lower end of the urban spectrum. However, because of country variations in population thresholds used, a universal population-based definition of small towns is difficult to resolve.

In terms of water service delivery, a definition is required that identifies the niche for small-town water services in comparison with rural and urban services. Participants in the March 2000 small-town water and sanitation electronic conference proposed a definition that distinguishes small towns from villages on the basis of the economies of scale offered by piped water systems and that distinguishes urban centers from small towns on the basis of the financial viability of being managed by conventional urban utilities:

Small towns are settlements that are sufficiently large and dense to benefit from the economies of scale offered by piped systems, but too small and dispersed to be efficiently managed by a conventional urban water utility. They require formal management arrangements, a legal basis for ownership and management, and the ability to expand to meet growing demand for water. Small towns usually have populations between 5,000 and 50,000 but can be larger or smaller. (Water and Sanitation Program 2000, p. 3)

The preceding definition clearly follows an integrated approach, encompassing population size, technology, and management issues. It generally suffices as a working definition for enhancing discussion on management options. However, no
agreement yet exists on what constitutes a "conventional" urban water utility, since different management models currently exist in developing countries and are being used with varying levels of performance (Njiru and Sansom 2002). No evidence therefore supports the premise that a "conventional urban water utility" cannot efficiently manage water services in small towns. In view of this premise, a legitimate question arises: What is the niche for small-town water services provision in comparison with rural and urban services? What is so special about these settlements?

Rather than attempt to offer another absolute definition of small towns, the authors provide an understanding of small towns of developing countries by looking at their common characteristics and determining how they affect water-services delivery. Typically, small-town settlements in low-income countries are characterized by a core trading center and relatively scattered settlements around the commercial zone or core, which tends to be densely populated. The core is a center of commercial establishments and generally exhibits urban characteristics. The fringe, on the other hand, tends to be more rural in nature, with mainly residential houses that are widely spaced from one another compared with the core. The main sources of income for populations in these areas are small-scale trade, followed by peasant farming and a few agro-based industries. Small towns attract people from rural areas and are diverse, dynamic, and constantly evolving environments (Moriarty et al. 2002). The presence of institutions—such as schools, health centers and administrative centers—is a significant phenomenon that adds to their prominence in boosting overall population and water demand.

Several authors have identified the role of small towns in regional and rural development (e.g., Adahlemo 1984; Kammeier and Swan 1984; Rondinelli 1984; Wong and Saigo 1984; Hardoy and Sarthweite 1986; Satterthwaite and Tacoli 2003). Although available empirical evidence varies greatly, small urban centers in many developing countries have been found to: (1) act as centers of demand and as markets for agricultural produce from surrounding rural areas; (2) act as centers for the production and distribution of goods and services to their rural areas; (3) act as centers for growth and consolidation of nonfarm activities and employment through the development of small and medium-size enterprises; and (4) attract rural migrants from surrounding regions through demand for nonfarm labor and decreasing migration pressure on some larger urban centers (Satterthwaite and Tacoli 2003). As they fulfill the above roles, small towns in developing countries are believed to host an estimated one billion people (Bank Netherlands Water Partnership 2002), but the level of access to such basic services as safe water remains unacceptably low.

Challenges of Water-Service Delivery in Small Towns

Small towns face special challenges in providing water services. First, their transient nature requires a flexible approach to planning, implementing, and operation. This approach does not rely on a single technical or management model but makes use of a dynamic and flexible mix in which different supply options are provided for different consumer groups and stages of town development. Second, small towns suffer from such structural disadvantages as diseconomies of scale, a lower qualified human resources base, lower per capita incomes, lower population densities, and little organizational capacity. Another structural disadvantage is the mix of rural and urban characteristics, which makes it difficult to exclusively use rural or urban approaches to service delivery. The financial and professional resources of small towns are too limited to match urban systems and technologies, and they cannot employ rural solutions because they cannot adequately serve the population. They usually do not have many big commercial and industrial consumers that generate financial resources to supplement revenues from residential consumers. For instance, evidence from Uganda shows that even the small towns in medium enterprises that are usually assumed to be capable of subsidizing households actually prefer such lower service options as standpipes, which offer limited scope for cross-subsidization (Davis et al. 2001). From a cost-benefit perspective, the problem of small-town water supply is one of large capital requirements against limited scale of economies and low ability of consumers to pay for services.

Third, small towns face the problem of falling somewhere between the two dominant management paradigms of the water sector. They are too small to attract the large private utilities that are increasingly taking over running large towns and city services, but they are too large and lack the cohesion for community management approaches (as practiced in rural areas) to be appropriate. Indeed, some studies challenge the suitability of community management models in small towns (Doe 2003; Doe and Sohail

Table 1. Sample Data on the Proportion of People Living in the Rural-Urban Spectrum of Selected Countries

<table>
<thead>
<tr>
<th>Country (date of census)</th>
<th>% Rural areas</th>
<th>Proportion of population in urban areas of different sizes</th>
<th>% Urban areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh (1990)</td>
<td>80.2</td>
<td>2.9 2.5 2.7 1.0 1.3 1.9 5.9 19.8</td>
<td></td>
</tr>
<tr>
<td>Sri Lanka (2000)</td>
<td>84.4</td>
<td>2.2 2.9 4.8 1.1 3.4 0.0 0.0 15.6</td>
<td></td>
</tr>
<tr>
<td>Botswana (2000)</td>
<td>49.8</td>
<td>8.8 22.8 19.2 0.0 0.0 0.0 0.0 50.2</td>
<td></td>
</tr>
<tr>
<td>Cameroon (2000)</td>
<td>51.0</td>
<td>0.9 4.2 12.9 7.5 4.3 0.0 0.0 49.0</td>
<td></td>
</tr>
<tr>
<td>Guinea (1996)</td>
<td>71.2</td>
<td>1.7 4.8 6.3 0.0 15.3 0.0 0.0 28.8</td>
<td></td>
</tr>
<tr>
<td>Kenya (1999)</td>
<td>64.1</td>
<td>1.6 3.0 5.2 2.5 3.1 10.0 0.0 35.9</td>
<td></td>
</tr>
<tr>
<td>Malawi (1999)</td>
<td>86.7</td>
<td>1.4 1.0 1.5 9.5 0.0 0.0 0.0 13.3</td>
<td></td>
</tr>
<tr>
<td>Uganda (2002)</td>
<td>88.0</td>
<td>1.6 2.8 2.6 0.0 4.9 0.0 0.0 12.0</td>
<td></td>
</tr>
<tr>
<td>Zambia (2000)</td>
<td>64.9</td>
<td>1.4 3.3 9.2 7.5 11.0 0.0 0.0 35.1</td>
<td></td>
</tr>
<tr>
<td>Mauritania (2000)</td>
<td>42.3</td>
<td>8.1 16.2 2.9 0.0 22.3 0.0 0.0 57.7</td>
<td></td>
</tr>
</tbody>
</table>

Countries comparisons may not be valid because of differences in how urban populations are defined.

Data sources: (United Nations 2003; Brinkhoff 2005).
The traditional approach to water-service delivery in small towns was through centralized regional or national providers. This approach was primarily intended to counter the structural disadvantages of small-town settlements. Because most small towns have neither major industrial and commercial clients nor a sufficiently large consumer group that can generate enough income to maintain a viable financial and human resource base, centralized management provided an opportunity for sharing service delivery functions and possible economies of scale. However, national or regional service providers in developing countries have rarely been able to provide efficient and sustainable services, largely because they lacked local accountability, had few incentives to serve dispersed small towns across the country or region, and were constrained in their operations by bureaucracy and politics (Pilgrim et al. 2004).

Over the previous few decades, the concept of decentralization has become an increasingly familiar premise in public services provision and has been embraced by governments of many developing countries. The principal driver for decentralizing responsibility for water-service provision is the belief that lower levels of government (or community groups) are better placed to respond to local conditions and consumer preferences and that consumers are more willing to pay for and sustain services that respond to their demands (Briscoe and Garn 1995; Litvack and Seddon 1999). Other drivers relate to increased participation and accountability on the part of local governments. These arguments are based on the following assumptions:

- Local decision makers have access to better information on local circumstances than central authorities, and they use this information to tailor services to local needs and preferences;
- Consumers provide input to local decision-making processes and hold local decision makers accountable for their actions;
- Administrative autonomy creates space for learning, innovation, community participation, and adaptation of services to local circumstances.

Each of the preceding assumptions appears to lead us to a specific benefit of decentralization: the potential to address the challenge posed by the transient nature of small towns. This challenge requires flexibility and adaptability in planning, implementing, and operating water services. However, most of the preceding assumptions are open to question, especially in the context of developing countries. Although local authorities have the advantage of access to information on local needs, they may be disadvantaged by a lack of professional capacity to interpret it. Mechanisms for enabling consumers to express their wants and preferences may be ineffective—and the institutional capacity and incentives for local decision makers to respond may be weak. A 2001 study of decentralization and public service delivery in Uganda and the Philippines (Azfar et al. 2001) highlights some of the reasons that the expected benefits of decentralization fail to materialize:

- Local governments have limited authority and are unable to adjust services even when they perceive local demands;
- Citizen influence at the local level is hampered by limited information on the responsibilities and performance of local government;
- Local governments are generally weak.

Similarly, Litvack et al. (1998) highlights the institutional determinants of successful decentralization of service provision, pointing out that much of the literature on the subject assumes the existence of institutions that are very weak in developing countries. Other authors (Prud'homme 1995; Asthana 2003) have pointed out the shortcomings of decentralization, including its effects on equity and efficiency.

However, none of the preceding arguments constitute a rejection of the value of decentralization. Instead, they highlight the extensive range of institutional preconditions necessary to make decentralized service provision successful. Indeed, as a result of the decentralization policy, different management models for small-town water services have emerged, although in some countries larger utilities still centrally manage groups of small towns. Some of the management options currently in use include the following (Water and Sanitation Program 2000; Moriarty et al. 2002; Njiru and Sansom 2002; Pilgrim et al. 2004):

- Community water user Associations (WUA);
- Ring-fenced municipal water departments (MWD);
- Autonomous water boards (WB);
- Small-scale private water companies; and
- Community water companies.

Field experience has shown that each of the preceding management options has its own niche, and that no universally accepted option exists for managing water services in small towns. For this reason, the authors avoid a classic strength—weakness analysis of each option and instead concentrate on highlighting some institutional issues that are central to promoting the sustainability of water-service delivery in small-town settlements, regardless of the management model that is in place.

Key Reform Issues for Water Services Management in Small Towns

In this section, the authors identify key reform issues on the basis of the growing body of applied research and policy analysis directed specifically at small-town water supply in developing countries (e.g., Bank Netherlands Water Partnership 2002; Moriarty et al. 2002; Njiru and Sansom 2002; Pilgrim et al. 2004). The consensus emerging from these studies is that a wide variety of local management initiatives have yielded positive results and offer grounds for learning. The main challenge therefore is one of guiding and supporting the evolution of these initiatives and improving the institutional environment in which they operate. On the basis of various case studies (mainly from Sub-Saharan Africa), an initial understanding of the ingredients of success in small-town water-services management has emerged, namely, financial and management autonomy, transparency and accountability, professional support, competition, demand responsiveness, and incentives for expansion (Bank Netherlands Water Partnership 2002). Consequently, many developing countries are pursuing management reforms that incorporate these ingredients. However, in the absence of a sound and supportive institutional
foundation, management reforms alone are likely to be ineffective in realizing sustained improvements.

To provide guidance regarding the relevant institutional issues, a framework for reform is presented in Fig. 1 and discussed in the following subsections. This framework does not focus on management issues in isolation; it instead looks at the wider institutional environment involving legal and policy issues, as well as regulation aspects. In this discussion, we refer to factors analyzed under this framework as institutional ingredients of success, where success, in this context, is indicated by good-quality affordable services that are sustainable and accessible to all inhabitants of a small town. The word ingredients is used to emphasize the potential synergetic impact of the mixture of different factors.

Policy Ingredients

Small towns should be recognized as a distinct subsector within national water-policy frameworks. National policies on small-town water supply should specifically address the following key issues. First, the transition to decentralized water-service delivery should be accompanied by policies that explicitly address the special challenges to be expected. Local-level capacity should be enhanced through a program of capacity building and technical assistance that forms an integral part of the decentralization process. Additionally, decentralization must be accompanied by delegation of authority for small towns to act, including authority to raise revenues to finance operations.

Second, policies should promote broad-based participation in service delivery through partnership building. It is widely held that user participation is a fundamental element of most sustainable rural water programs (Esman and Uphoff 1984; Oakley 1991; Nayyar 1995). However, in small towns with a mix of rural and urban characteristics, participation needs to be more broad-based, involving users, the private sector, nongovernmental organizations (NGOs), and community-based organizations. Policies that recognize the role of broad-based participation through partnerships and that define strategies for actual involvement can be useful ingredients for sustainable delivery of urban services (Sohail et al. 2005).

Legal Ingredients

Existing legal frameworks (national and local) should create an enabling environment to underpin management, policy, and regulatory functions for sustainable service provision. Explicit definition of ownership status and responsibilities for operation and regulation is necessary. In line with the decentralization policy, local authorities should be allowed to choose from the various approaches to manage their systems. Legal conditions and processes should be clearly defined for the implementation of any chosen management arrangements. In addition, enabling laws are needed to legitimize the role of local factors (small water enterprises, community-based organizations), and NGOs.

Regulatory Ingredients

The relationship between service providers (public, community, or private) and consumers needs to be regulated. With decentralized service providers, local regulation may make the best use of local knowledge. However, technical and management capacity is often uneven at the lowest levels of government. Regulatory frameworks need to establish an appropriate distribution of roles between national and local authorities, making greater use of contracts and legislation as regulation instruments. Contracts for operations strengthen good management by increasing autonomy, transparency, and accountability (through clearly defined roles and responsibilities). Well-crafted contracts offer incentives for good performance, such as performance-based remuneration, rewards, and bonuses, as well as penalties and sanctions. Contracts therefore can be an effective regulation tool for achieving social objectives established by towns, such as service to all at affordable rates.

Furthermore, regulation frameworks should incorporate mechanisms for open communication and consultations with users and customers. Regular external auditing and benchmarking are examples of such mechanisms, which underpin management through increased transparency. User consultations on issues such as service levels and tariff setting can improve cost-recovery. Open communication and consultation also offer opportunity to users to express demand, hence underpinning demand responsiveness.

Management Ingredients

In addition to the preceding, participants at the June 2002 Addis Ababa conference on water supply and sanitation for small towns and multivillage schemes identified financial and managerial autonomy, transparency, and accountability, as well as professional support, as key ingredients for the success of the management and operation function of service delivery (Bank Netherlands Water Partnership 2002). Recent research drawing on case studies in Uganda, Ghana, and Tanzania identified commercial and customer orientation as additional ingredients (Njiri and Sansom 2002).

Financial and management autonomy is likely to lead to operational decisions that are based on what is best to provide good quality and affordable water to expanding communities, as well as to ensure that revenues are not diverted to other uses. System managers should be able to hire and fire staff, set attractive salaries, offer performance incentives, disconnect both public and pri-
vate nonpayers, and be able and free to reinvest revenues into system improvement and expansion.

Management: transparency and accountability are critical to gain and maintain the trust of users and investors. They are founded on clear roles and responsibilities, independent audit and monitoring, disclosure of information, and consultation with consumers. Since water service provision is a monopoly, transparency and accountability arrangements are particularly important. Contracts between the corporate oversight body (e.g., the water board) and private operators can improve transparency and accountability and eliminate the potential conflict of interest that may exist when a water board supervises its own staff. Contracts also act as a means of introducing incentives for good performance.

Furthermore, it is important that system managers do not underestimate the professional skills required to successfully manage water-supply facilities. Although system managers and their staff can perform routine operations, experienced professionals are needed to formulate and guide efficiency improvement programs and to handle the technical and financial aspects of system expansion. Because of the small revenues, it is difficult for small towns to have these professionals in-house. System managers who recognize the need for professional support and prepare long-term training and capacity building plans are most likely to improve efficiency and effectiveness.

Ingredient Interlinkages

It is apparent from Fig. 1 that the four institutional ingredients for success are interrelated. Legal ingredients empower policy ingredients. For instance, clearly defined legal provisions for broad-based participation are more likely to lead to or empower a policy that defines, legitimizes, and encourages partnerships with local private sector, NGOs, and community-based organizations; Legal provisions defining responsibility and authority to local governments with regard to ownership, operations, and oversight are likely to reinforce the decentralization policy. As far as small towns are concerned, national laws and local government bylaws should aim to establish and enforce rules that foster fair and sustainable relationships among local actors. Taken together, legal, and policy ingredients underpin management and regulation ingredients. It is evident that management ingredients are under direct influence from policy, legal, and regulation ingredients. From a reform perspective, this implies that reform efforts concentrated entirely on system management and operational aspects of water services delivery without addressing the policy, legal, and regulation preconditions are likely to be less effective and hence unsustainable.

Conclusions

This article has examined the problems and issues regarding water services management in small towns of low-income or developing countries. The article indicates that within the urban spectrum of most low-income countries, small town settlements have fundamental structural differences and unique characteristics that may render conventional approaches to service provision inapplicable. These unique characteristics present special challenges for water infrastructure planning and management. A synthesis of these challenges has been discussed, and the decentralization policy embraced by many developing country governments as a response to these challenges was critically reviewed. In general, decentralization has potential to address many of the challenges, but it requires an extensive range of institutional preconditions to be successful. The authors contend that reform efforts in small towns should be directed toward improving the institutional framework under which local management initiatives operate. To reinforce this position, a framework for reform is discussed; capturing some of the interrelated institutional issues relevant to small towns in low-income countries. The authors conclude that efficient and effective management of services in small towns is likely to be achieved and sustained under a supportive policy, with a legal and regulatory environment. From a reform perspective, this implies that reform efforts concentrated entirely on system management and operational aspects of water services delivery without addressing the policy, legal, and regulation preconditions are likely to be less effective and hence unsustainable.

References


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Maximizing the ‘value’ of improved water services in small towns

J Mugabi and C Njiru, UK

This paper examines the value concept drawing on literature from consumer behaviour and services marketing disciplines. The relevance of the concept to water services management, particularly in small towns is highlighted. Consistent with other services or goods, the authors contend that value perceptions play a crucial role in consumer decision-making as regards improved water service use. To influence consumer decisions to utilise improved water services such as piped water, and the willingness to sustain the services, service providers should put more emphasis on maximising consumer perceived value of the service offering. The authors propose a wide range of value maximisation strategies. It is also suggested that water sector practitioners and researchers pay more attention to consumer behaviour studies so as to promote a consumer-centred approach to water service delivery.

Introduction

Recent years have seen dramatic shifts in the attention given to small town water supply and sanitation services. During the 1980-90 decade most effort was concentrated on rural areas. But during the 90s it became clear that the majority of the underserved were actually living in urban areas, either in large conurbations or in small towns. In response to this imbalance, many developing country governments supported by their development partners have made considerable investments in piped water supply infrastructure in small towns over the last decade. The current trend however is that funding for recurring operation and maintenance expenditures and expansion costs is becoming a major concern as more systems come on-stream and the central government subsidy burden increases. Today, the main problems for small town water services are two-fold: the low utilisation levels of the new or rehabilitated piped water systems and the inability of system managers to recover costs related to providing the improved service. In Uganda’s small towns for instance, system utilisation levels can be as low as 10 percent of design capacity, bill collection efficiency as low as 50 percent, and in some towns operation costs exceed revenues by up to 25 percent (Carl Bro Group, 2003). In Lao PDR, small town water system utilisation levels can be as low as 44 percent (WSP, 2002). The low income levels commonly found in small towns of developing countries is usually given as the explanation for this state of affairs.

However, it is important to note that small towns that install full service piped water systems for the first time face several other constraints. First, consumers supplied with water from existing point sources (e.g. private or communal wells) may be reluctant to abandon them and pay for an unproven service, especially if the quality of the existing source is acceptable. Secondly, low income consumers and immigrants from surrounding rural areas previously supplied by wells or standpipes, are not accustomed to pay for water and may be reluctant to pay connection fees and tariffs. Thirdly, people may give priority to other needs in allocating their limited resources and not support water and sanitation investments. The benefits of a piped water system may be clear to its planners and local authorities but they may not be apparent to the consumers. Indeed, a consumer’s evaluation of the new service offering is likely to be in terms of a comparison of what they expect to benefit and what they are expected to pay or sacrifice. This is where the concept of ‘value’ comes into play. The value that consumers attach to improved water services, and how this affects subsequent behavioural intentions, is an area that has received little attention in terms of research in the water sector.

In this paper, the authors draw on an exploratory literature review to show why it may be beneficial for small town water utilities to maximise the consumer perceived value of improved water services. The authors suggest alternative value maximising strategies relevant to small town water services, and conclude the paper by highlighting future research directions.

The ‘value’ concept

The value concept is old and endemic to consumer behaviour and exists only to a limited extent in the marketing literature. There is a myriad of competing definitions of value in the marketing and consumer behaviour literature, but the early conceptual proposal made by Zeithaml (1988 p.14) - “a consumer’s overall assessment of the utility of a product based on perceptions of what is received for what is given” - is the most universally accepted definition of
perceived value. This definition suggests treating value as a trade-off between the relevant ‘give’ and ‘gets’. In what is regarded as an extension of this conceptualisation to the pricing literature, Monroe (1991) defines perceived value as the ratio between perceived benefits (the ‘gets’) and perceived sacrifice (the ‘gives’). For a piped water service, quality, reliability, time-saving and convenience can be identified as the salient ‘gets’ or benefits while the sacrifice (or ‘gives’) made to acquire and sustain the service can be identified as connection fees, water tariffs, time and effort expended in receiving and understanding bills, forwarding complaints in case of service failure, and making journeys to pay for bills. The services marketing literature also considers other sacrifices such as the risk assumption (e.g. physical, financial, performance, social and psychological risks) associated with a particular service (Cronin et al., 1997).

A review of exiting literature on consumer value provides insights as to why the value concept may be crucial to the water services sector. First, the value concept can explain different areas of consumer behaviour: product/service choice (Zeithaml, 1988), purchase intention (Dodds and Monroe, 1985) and repeat purchasing (Cronin et al., 2000). Secondly, value will often be related to customer loyalty in the marketing literature (Bolton et al., 2000) and more recently in the urban water services management (Kayaga, 2002). In the context of water services in small towns, where there are often numerous water sources and providers (e.g. vendors), consumers are likely to integrate their perception of what they benefit and what they must sacrifice (in the short and long term) in order arrive at a decision whether or not to use a particular water source or service provider. The obvious challenge for water utility managers in small towns is to determine how best to present the information used by consumers in this decision process so as to motivate them to choose and sustain the utility water service. In the next sections we examine the factors that influence consumer decision-making in the context of connecting to and sustaining a new piped water service, and outline ways in which water utility managers in small towns can potentially influence consumer decision making by increasing consumer perceived value.

Consumer’s intentions to connect to piped water services

Consumer willingness to pay is increasingly being accepted as a key indicator of demand that helps guide investment decisions urban water supply. However, many systems in small towns remain underutilised even after 3 to 5 years in operation. Indeed, there is a tendency for planners to assume that the benefits of a piped water supply are apparent to everyone and that the service will be utilised quickly. Consumers do not always perceive the benefits of a service offering uniformly (Zeithaml, 1988). Similarly, although cost factors have been shown to be an important predictor of demand (World Bank Water Demand Research Team, 1993), consumers do not always go for the lowest cost option. In an effort to enhance our understanding of the relative importance of perceived benefits and sacrifices in predicting consumer behavioural intentions to connect to piped water services, the value construct is presented as a crucial factor.

Influencing the decision to connect: Value creation

The authors' proposition is that a consumer's decision to connect to the water service will be determined to a large extent by the value the consumer attaches to the service. Therefore, to influence the decision to connect, managers need to create or increase consumer perceived value. Given that value is a trade-off between benefits and sacrifices, increasing value will involve either increasing benefits or reducing sacrifices. Before making the decision to connect, the consumer would have to first convince him/herself in two ways: that there are huge benefits associated with this service or that the sacrifices are low compared to the benefits to be gained.

Water utility managers in small towns may be able to influence consumer decision-making in the following ways:

- Educate consumers about the benefits to be gained from the service such as quality, health benefits, time-savings and convenience. Successful education campaigns will require an understanding of the dominant personal values.

![Figure 1. A model of consumer intentions to connect to the water service](image-url)
at play in the community since an extended sensitisation programme will have to be designed that also targets various influences on the formation of benefits/sacrifice expectations

• Involve consumers in the whole process of establishing the service. The sense of ownership or belonging that results may be perceived as an added benefit

• Ensure good quality construction to reduce perceived risks of non-performance and increase consumer confidence in the reality of benefits to be gained

• Reduce sacrifice by streamlining and simplifying connection procedures, implement flexible system of paying connection fees (such as spreading connection fee over long periods through a surcharge on tariffs), and ensure transparency and accountability in all dealings with the consumer.

Consumer’s intention to sustain the service

Although small town water utilities may be able to experience reasonable growth in new connections by influencing consumer decision to connect, they face challenges in maintaining long-term profitable relationships with consumers. In some cases, as new consumers get connected, an almost equal number of already existing consumers get disconnected, thus creating a backlog of uncollected bills and non-performing capital equipment. This raises the question: how can water utility managers through their service offering influence consumer’s intention or willingness to sustain the service? While there may be various factors (both external and internal to the service provider) that can influence consumer’s intentions to sustain the water service, value is again proposed as having a dominant role, either directly or indirectly through customer satisfaction with the service. Figure 2 shows a model of consumer’s intentions to sustain the service.

In figure 2, the authors also suggest that service benefits such as quality, reliability, and convenience can influence consumer intentions to sustain the service either directly or indirectly through value and satisfaction. This influence comes from the fulfilment of benefit expectations as perceived by the consumer before the decision to connect was made. It is important to note that for a water service, service quality does not only refer to the technical or core quality but it also includes the quality of the relational or interaction process between the service provider and the consumer.

The effect of perceived value on intentions to sustain

It is reasonable to anticipate that value will have a direct influence on the intention to sustain the service. Consumers who value their water service are expected to have a higher willingness to sustain it. Value can also influence intentions indirectly through the construct of satisfaction. Achieving customer satisfaction is usually the primary goal for most water service providers, but many utility managers often assume that improving core quality is the only way to achieve it. As shown in figure 2 and the preceding reviews, it is likely that consumers will often assess the water service in terms of both benefits and sacrifices. This assessment is translated into a ‘value tag’. It is this tag that service providers should be most concerned about.

Influencing the decision to sustain: Maximising value

Although there may be other external factors (such as inappropriate tariff regimes) that affect the decision to sustain the service, the authors contend that most of the factors that influence this decision or willingness are within the control of the service provider organisation. Again, maximising value by increasing benefits or reducing sacrifices is suggested as one way in which service providers can maintain long-term mutually beneficial relationships with consumers.

Specifically, service providers may be able to influence consumer willingness to sustain water services in the following ways:

• Reduce consumer’s monetary sacrifice by increasing efficiency in water production, distribution and other management and administration costs

• Increase the perceived benefits obtainable from the end product by increasing the physical-chemical and biological quality of the water, increasing service continuity and reliability.

• Increase perceived benefits by increasing the quality of service pertaining to the interaction process between consumers and the organisational elements like staff and the service environment.

• Reduce the sacrifice consumers make through difficulties experienced in getting complaints addressed, efforts in getting incorrect bills corrected, inconveniences experienced in payment procedures and processes.

Figure 2. A model of consumer intentions to sustain the water service
Conclusions and Implications of this Paper

This paper has examined the value concept drawing on literature from consumer behaviour and services marketing disciplines. The relevance of the concept to water services management, particularly in small towns has been highlighted. Consistent with other services and goods, the authors contend that value perceptions play a crucial role in consumer decision-making as regards improved water service use. Therefore, water utility managers should aim to maximise consumer perceived value rather than continuing to only maximise perceived benefits without adequate attention being paid to consumer perceived sacrifices. To influence consumer decisions to utilise improved water services such as piped water and willingness to sustain the services, service providers should consider a wide range of value maximisation strategies. As the quest to provide sustainable water services to millions of unserved people continues, it is suggested that water sector practitioners and researchers pay more attention to consumer behaviour studies to promote a consumer-centred approach to water service delivery. The authors are currently undertaking a field test of the proposed models in Uganda, and hope to share further insights.

References


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