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DETERMINANTS OF WILLINGNESS TO PAY FOR AIDS LEVY BY CIVIL SERVANTS: A CASE OF GWERU DISTRICT

Submitted

By

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SUPERVISOR'S APPROVAL FORM

The undersigned certifies to the supervision of Kahombe Tanaka's dissertation entitled Determinants of willingness to pay for AIDS levy by civil servants: A case o Gweru District

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CHAPTER 1 ....

CHAPTER 2 ....

CHAPTER 3 ....

CHAPTER 4 ....

CHAPTER 5 ....

DATE ....

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DECLARATION FORM

I Kahombe Tanaka R112146Z do hereby declare that this research represents my own work and has never been previously submitted for a degree at Midlands State University and any other University.

....

Student's signature   Date

DISCLAIMER

The content in this study is purely for academic purposes and from the author. The supervisor is not subjected to this paper and the content does not necessarily represent the University's view.

DEDICATION

I dedicate this dissertation to my family especially my beloved mother.

ACKNOWLEDGEMENT

ABSTRACT

The primary objective of this study was to establish the determinants of willingness to pay for AIDS levy by civil servants in Gweru District. A sample of 328 civil servants in Gweru was surveyed by the researcher using two-stage cluster sampling technique. Civil servants were first grouped according to their Ministries representing clusters and then a simple random sampling was employed from each cluster to collect data. The researcher employed the theory of contingency valuation method because it is a straight forward technique used by many researchers to elicit willingness to pay. The contingent valuation method also ascertain key factors influencing an individual willingness to pay hence found suitable for establishing the determinants of willingness to pay for AIDS levy by civil servants in Gweru. Primary data collected through the use of questionnaires was regressed using the probit model regression method. The results showed that civil servants were willing to pay on average US $7.67of their monthly income that is 1.8% according to appendix 8 which is less than 3% they are currently paying. From the regression results income, gender, level of education, number of people employed in a household all were statistically positive significant determinants and gender was a negative significant determinant of willingness to pay for AIDS levy by civil servants in Gweru District. From the findings there is need for the government to reduce the AIDS levy percentage downwards to improve the welfare of those who earn an income below the poverty datum line, those with low level of education and households with only one employed member mostly older men. Future studies should consider the formally employed citizens in the private sector as they were left out in this study, and adopt the significant new variable number of people employed in a household used in this study as a determinant of willingness to pay.

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AIDS	Acquired Immune Deficiency Syndrome
CEO	Chief Executive Officer
ESTP	Emergence Short Term Plan
HIV	Human Immune Virus
ISSP	International Social Survey Programme
LR	Likelihood Ratio
MoHCW	Ministry of Health and Child Welfare
NAC	National AIDS Council
NSSA	National Social Security Authority
SAFAIDS	Southern African HIV/AIDS Information Dissemination Service
UNESCO	United Nations Education, Scientific and Cultural Organisation
USAID	United States Agency for International Development
WTP	Willingness To Pay
ZIMSTAT	Zimbabwe Statistical Agency

CHAPTER ONE

INTRODUCTION

1.0 Introduction of the study

HIV/AIDS is one of the most serious challenges faced by Zimbabwe since independence. At least 3000 Zimbabweans died because of AIDS related illness every week in the late 1990's and early 2000's (National Aids Council of Zimbabwe 2011 report). Berwick and Martin (1996) showed that the HIV/AIDS death rate can be reduced through strong health policies, proper care and active prevention strategies. They said that "this would not be possible without access to antiretroviral drugs". This study objective is to ascertain the attributes that can be used to understand willingness to pay for AIDS levy by civil servants in Gweru. The levy was introduced by the government of Zimbabwe in 1999 and is a 3% deduction from taxable income of formally employed people. This study will review existing literature and empirics to further understand factors that demonstrate determinants for willingness to pay for HIV programmes and add to the existing literatures by introducing a new variable which was overlooked. The research is going to adapt an econometric model to be used to model the findings of the study.

1.1 Background of the study

Before the AIDS levy was introduced in Zimbabwe, the first reported case of HIV/AIDS epidemic was in 1985. Since then the epidemic has impacted the social, cultural and environment of the country negatively. A number of plans, strategies and policies have been developed and implemented by the government of Zimbabwe through the Ministry of Health and Child Welfare (MoHCW) and relevant stakeholders. In response to the crisis according to Southern Africa HIV/AIDS information Dissemination Service (SAfAIDS) report (2003) the government of Zimbabwe advocated for complete screening of donated blood and blood products in 1985 as an initial move HIV/AIDS. Following 1985 in 1987 the Zimbabwean government established the National AIDS Coordination Programme responsible for drafting and implementing inclusive policies and strategies on HIV/AIDS. This was complemented by a one year Emergency Short Term Plan (ESTP) that same year aimed at creating public awareness and at training health personnel in different aspects of prevention and control of the epidemic (MoHCW and National AIDS Council 2004). In 1992 the Zimbabwe AIDS

Network was formed as an umbrella body for HIV/AIDS related services and address HIV related stigma (MoHCW and National AIDS Council 2004). Between 1995 and 1997 the highest HIV prevalence of 36% was reported in Zimbabwe which led the MoHCW to embark on a broad based and multilevel consultative process from 1997-1999 (MoHCW and National AIDS Council 2010-2012). This led to the development of the National AIDS Policy and the creation of the National AIDS Council (NAC) of Zimbabwe in 1999 enacted through the act of parliament. According to the National AIDS Council of Zimbabwe Act (Act No.16 of 1999) (Chapter 15:14) NAC's responsibilities are to guarantee development strategies to combat, control and ameliorate the effects of HIV/AIDS pandemic and promote and co-ordinate the implementation of such strategies. Also to mobilise and administer resources in support of national response to HIV/AIDS, to promote the provision of facilities to treat and care for people infected with the diseases and support and co-ordinate research into the HIV/AIDS and ensure successful dissemination and implementation of the results of such studies.

According to The National AIDS Council of Zimbabwe report (2003) in 1999 the government declared the HIV pandemic as a national crisis and introduced the AIDS levy through the act of Parliament in which all employed persons in Zimbabwe are levied 3% of their taxable incomes. The levy came into place when the nation was facing challenges in securing foreign aid to mitigate the HIV/AIDS diseases. It has shown as a resourceful approach to ensure sustainability and reducing foreign aid dependency as it contributes quarter of the money used to buy antiretroviral drugs whilst the rest is financed by international donors (Sidibe 2012). Everyone formally employed pays the levy whether HIV positive or not. The levy became effective in January 2000. The graph below shows statistics of revenue collected since the multicurrency regime 2009 to 2013.
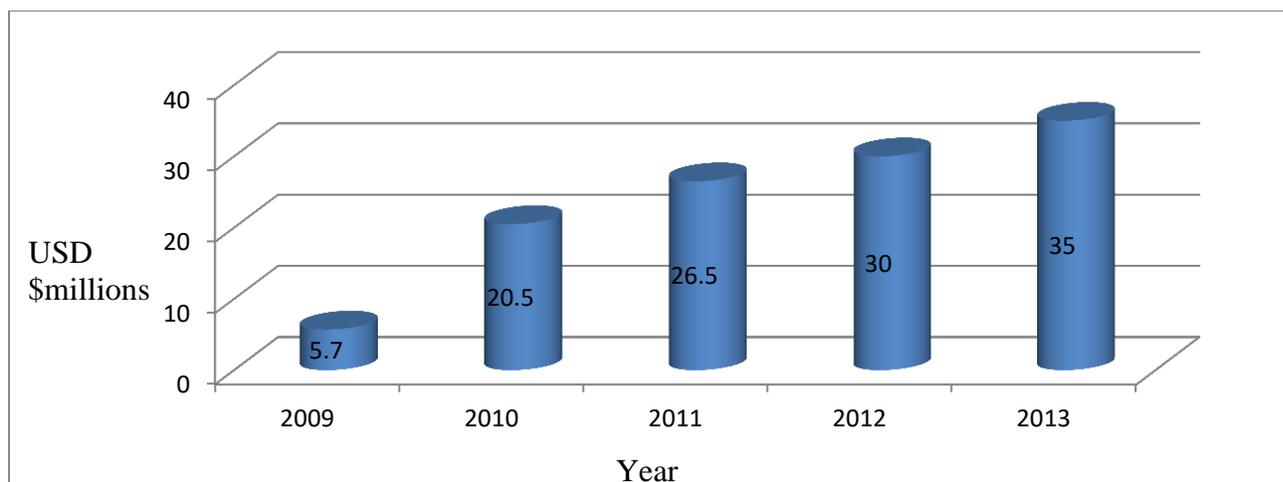
Figure 1: Revenue collected from AIDS levy (2009-2013)

Sources: National AIDS Council of Zimbabwe (2013)

The figure above shows revenue collected after the multicurrency system was introduced because the revenue collected from the AIDS levy from 2000 to 2008 cannot be meaningfully expressed as they were distorted by the 2007-2008 hyper inflation environment. However according to Dr Magure the CEO of NAC in news paper article in February 2012 an average of US $5,7million was generated by the AIDS levy between 1999 and 2006, the low revenue accumulation was due to the poor economic performance of the nation. The government admitted the levy was essentially in non existence in 2007 and 2008 due to the hyper inflation according to the Zimbabwe National HIV and AIDS Strategic Plan 2011-2015. From the figure above there has been an upward trend in the revenue collected by National AIDS Council from the AIDS levy since the multicurrency was introduced. The low revenue collected in 2009 was due to the transition from the Zimbabwean dollar to the US dollar, poor tax remittances and low economic growth. However a significant improvement in the revenue collected was noted in 2010 as it increased from US $5.7million from the previous year to US $20.5 million brought about by economic stability, growth which created jobs lost during the economic meltdown period and improved tax remittances. The revenue collected continued to increase showing an upward trend to 35million in 2013 (National AIDS Council of Zimbabwe 2013 report). After the levy is collected half of it is supposed to go directly into buying drugs and equipment relevant for HIV and AIDS and the other half to administrative costs of NAC and other prevention strategies like raising awareness (NAC of Zimbabwe report 2003).

According to the HIV and AIDS Epidemic in Zimbabwe 2004 report Zimbabwe has achieved the sharpest decline in the HIV/AIDS prevalence rate in Southern Africa. The figure below shows the statistics of HIV/AIDS prevalence and deaths in Zimbabwe from 1997 to 2010.
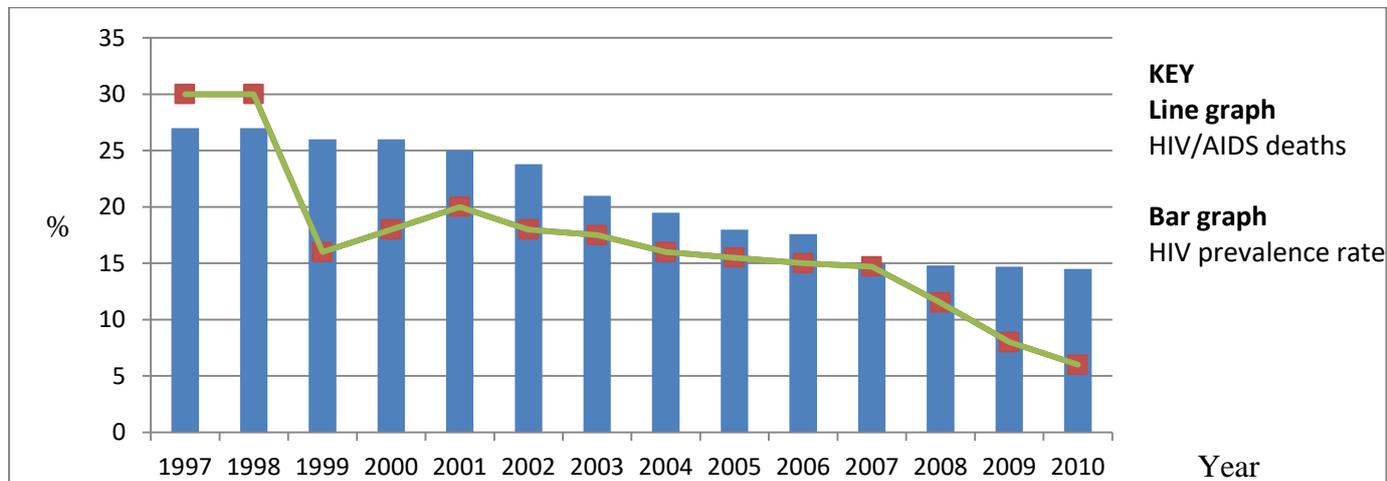
Figure 2: HIV/AIDS prevalence rate and HIV/AIDS deaths in percentages (1997-2010)

Source: MoHCW HIV Estimates 2011

From the figure above there have been a decline trend in the HIV/AIDS prevalence and deaths in Zimbabwe from 1997 to 2010. There was a sharp decline in HIV/AIDS deaths from 1998 to 1999 because the nation had declared the epidemic as a crisis and more effort and resources were put into eradicating it. A rise from 1999 to 2000 was due to the fact that foreign donors who offered aid in fighting the pandemic had left the country. Also after the introduction of the AIDS levy there has been a significant decline in the prevalence and deaths of the epidemic due to the increased availability of drugs and treatment through internal resource mobilisation to help with the donor community. However even when the AIDS levy collected revenue was low during the economic crisis and was not even collected from 2007 and 2008 the HIV/AIDS prevalence and deaths continued to decrease in Zimbabwe. This shows that the AIDS levy is not the main reason for the decline but other reasons like high literacy rate above 90% (UNESCO Institute of statistics 2012), which have made it easy to raise awareness of the diseases.

The decline has been attributed to prevention measures for example use of condoms by people. This is shown by the increased sales of protector plus a strong brand of condoms in Zimbabwe. According to USAIDS report 2013 in 2000 9,2million condoms were sold and the number has increased to approximately 70million in 2008. The increase in condom sales

attributed to the sharp decline from 2007 to 2010. In 2012 roughly 90million male condoms were distributed (USAID 2013). This has led to people practising safe sex hence the decline in the prevalence rate and the deaths of HIV epidemic in Zimbabwe. Also since there is a decline in the prevalence rate there is now need to revisit the AIDS levy percentage and revise it upwards or downwards as the reduction of the prevalence rate results in decline of ARV drugs needed hence the need to revise the revenue collected towards the epidemic.

The reduction of HIV/AIDS deaths has also led to an increase in the life expectancy in Zimbabwe as shown by the figure below which shows life expectancy statistics since the AIDS levy was introduced and the nation declared HIV epidemic as national crisis from 2000-2012
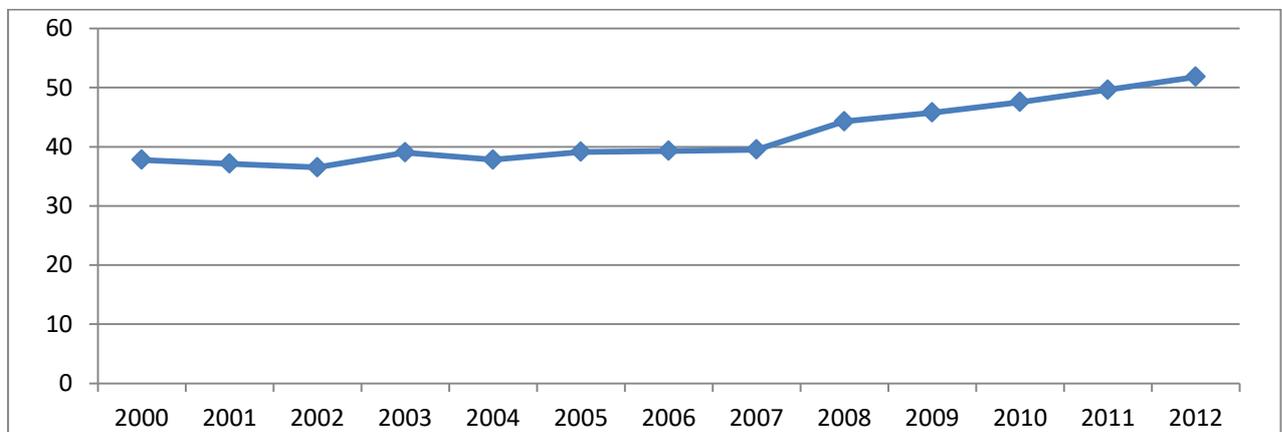
Figure 3: Life expectancy at birth (2000-2012)

Source: ZIMSTAT report 2012

The figure above shows the life expectancy of the citizens of Zimbabwe. The life expectancy has increased from 2000 from 37.78 years to 51.82 years in 2012 (ZIMSTAT report 2012). The increase in the number of years has shown an increasing trend since 2000 because of the reduction in the HIV/AIDS deaths in Zimbabwe since 2000.

Zimbabweans pay 3.5% of their salary towards National Social Security Authority (NSSA) and Pay As You Earn which is at least 20% of taxable income above US$250 tax free threshold according to Dr Chimedza the Deputy Minister of MoHCW in an article in Herald on 5 December 2013. The levy on the other hand can be considered to be a burden as it further reduces formally employed people's income.

According to the (ZIMSTAT) Poverty, Income, Consumption and Expenditure Survey 2011-2012 over 60% of Zimbabweans are living in poverty, many employed are earning way below the poverty datum line pegged at 511 US dollars and that 76.8 percent of employed persons in Zimbabwe earn gross monthly primary income of less than 350 US dollars while 4.3 percent earn above 800 US dollars. The bulk of these people are civil servants who earn below the poverty datum line pegged at US $511 for an average of five (Tshuma 2013). (http// Allafrica.com accessed on 7 August 2014 19:00) the lowest paid civil servant who is in grade B1-B5 which include office orderlies takes home US $375, grade D1-D5 which were mostly teachers, nurses and members of the uniformed forces and most office workers gets an income of US $500 per month and where deputy directors and chief accountants occupy which is gradeE1- E5 earn US $623. This reason leads the researcher to carry out a study on what percentage the civil servants are willing to pay for the AIDS levy as it is one of the factors affecting their income hence the need for it to be revised since the prevalence rate of HIV is going down as shown by figure 2. The study focuses on civil servants as they constitute the one third of 850 000 formally employed people in Zimbabwe according to http//www.dailynew.co.zw, who earn a salary which is above the tax bracket since the lowest paid worker in government earns US $375 than the private sector where someone can earn as low as US $150 a month. Also the reason that if the government is to take quick action on the AIDS levy it has to be the voice of its employees which will be highly considered than that from the private sector. Also to the fact that much of the civil servants earn an income below the poverty datum line hence it will be interesting to hear their perception on the AIDS levy.

1.2 Statement of the problem

According to figure 2 the prevalence rate and HIV/AIDS deaths has reduced over time even when the levy was not collected yet the revenue collected towards the epidemic through the AIDS levy continues to increase each year according to figure 1. This raises a question of whether the same percentage of the AIDS levy should continue to be deducted from formally employed citizens to which a lot of them earn below the Poverty Datum Line in this case civil servants. Or should it be revised downwards or upwards since it met its target of reducing the HIV epidemic?

1.3 Objectives of the study

The main objective of the study is to obtain in-depth information from civil servants in Gweru on what determines their willingness to pay for the AIDS levy put in place by the government in 1999 and if they are willing to pay more, less or the same percentage. From this main objective comes with it the following secondary objectives the study wishes to clarify:

- Establish the percentage civil servants are willing to pay for the AIDS levy.
- Assessing the civil servants satisfaction with the AIDS levy through their willingness to pay.
- To acertain the main determinants of civil servants willingness to pay for the AIDS levy
- To be able to give policy recommendations.

1.4 Hypothesis

Willingness to pay for AIDS levy is determined positively by income, gender, number of people employed in a family, level of education, experience of HIV/AIDS, religion, marital status and negatively influenced by age.

1.5 Significance of the study

Hsu *et al* (2008) who carried out a study in Canada on willingness to pay for a higher gasoline tax and Dumn (2012) who studied willingness to pay for a plastic bag tax in Utah State among other researchers paid particular attention to household size as a determinant towards households in their studies. The researcher has decided to give particular importance to the number of employed people in a household rather than household size alone. The inclusion of this variable will result in a new dimension of thought in studies of willingness to pay for HIV/AIDS related strategies such as AIDS levy and other studies.

 Previous studies done in Zimbabwe like Tsodzo (2007) who studied the challenges of the HIV and AIDS among informal settlements in Hatcliff extension Harare concentrated much on what causes HIV and challenges of the HIV pandemic, how to reduce the epidemic without specifying what happens if the pandemic does reduce. So this study will show what measures should be taken if the HIV pandemic reduces in Zimbabwe

Mufuka and Tauya (2013) studied new fallacies about the HIV/AIDS in Zimbabwe concentrated on new ways to reduce the HIV pandemic and how to finance the fight towards the epidemic. They did not look at people's willingness to contribute towards the fight and also what happens if the HIV pandemic declines. So this study will add to the literature in Zimbabwe done on HIV/AIDS pandemic as it attempts to fill the gap left by other studies by taking into consideration people's perception on what they are willing to forgo towards the eradication of HIV and what determines their willingness to pay towards the fight of the epidemic. So this study is going to help the government of Zimbabwe to know what their workers opinion on AIDS levy is and how it is affecting their welfare, for the government to revise the AIDS levy percentage deducted from civil servant.

The study is important to the nation as civil servants have value to the nation because they are the one's responsible for carrying out government objectives which are the nations plans for it to develop and if not properly catered for they may not perform well resulting in the nation not meeting its objective and remain an undeveloped country.

1.6 Organisation of the rest of the study

Presentation of the rest of the study is as follows: Chapter two reviews relevant theoretical and empirical literature of the study is presented in chapter two. Chapter three provides the methodology of the study containing model specification, variable justification, diagnostic tests, data type and source as well as sample size. Results presentation and analysis will be presented in chapter four which will also provide the basis to reject or accept the null hypothesis. Chapter five is the final chapter of the paper where recommendations and conclusion of the study are offered.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides the theoretical aspect of the research and empirical evidence of past studies done by other scholars. Theories of determinants of willingness to pay will be reviewed in theoretical review. Empirical evidence in this chapter provides the practical applicability of the research and aspects of the theory to note if the researcher is conforming to prior researchers and theory.

2.1 Theoretical review

Under theoretical review this paper is going to show methods employed in measuring willingness to pay, which according to Donald (2000) is a cost benefit analysis in which the inputs and output are converted into quantitative terms based on utility. Also the researcher is going to show which one he is going to employ in his study. The methods which are going to be described are contingent valuation, revealed preference, hedonic approach and choice modelling as method used to measure willingness to pay.

2.1.1Contingent Valuation method

Contingent valuation method is straight forward which is mainly used by many researchers studying willingness to pay by people or consumers. It is a survey based economic technique for evaluating non-market goods and services Bootman *et al* (1998). It allows researchers to ask people about choices that they may make or may not make in real life situations. The contingent valuation method seeks to ascertain the value placed on a discrete policy change by an individual according to Virjee K (2003). The method is used to measure the economic benefits of a programme and to ascertain the key factors influencing an individual's payment for the proposed programme (Tours 2003). Survey techniques that may be used in a contingent valuation method include open-ended questions and closed-ended questions to elicit the willingness to pay. However although the hypothetical nature which is defined as its strength it is also considered to be it weakness as hypothetical bias is potentially a problem in markets where respondents understand the market good and service in question (Mushunje

2012). Contingent valuation among its advantages captures the total economic values which are use and non-use values whereas other techniques may only provide estimates of the direct or indirect use value.

2.1.2 Revealed preference

According to Walley, Haycox and Boland (2004) revealed preference approach refers to benefits of an intervention based on findings of subjective choices of individuals such as obtaining low and high risk. It is mainly used in labour and environmental economics in studies where wage premiums are offered to incentivize workers to accept more risk jobs. This method uses the assumption that employees are familiar with risk they take in the workplace and this is shown by additional wages they receive; therefore it is also called the compensation- wage approach (United States Department of Agriculture, 2009). Revealed preference enables the study of preferences which can be directly observed. Preference can be incidental based on activities generated to avoid them. The compensation differential approach assumes that employees are willing to accept exposure to a certain point of job-related risk in return for a certain level of compensation (United States Department of Agriculture, 2009). Its main advantage on measuring willingness to pay is based on real market data rather than hypothetical data although it is rarely applied. Willingness to pay is measured by revealed preference through market data and experiments through laboratory experiments, filed experiments and auctions (Garcia 2005). However this theory is not relevant to the current study using the compensation wage approach.

Grossman (1972) used revealed preference approach to value health with his household health production model. An extension of the model was done by Crooper (1981) who extended it to health outcomes affected by pollution. The household has a choice over market goods which affect health and the household optimises its utility function with respect to these goods subject to an independent level of pollution, a budget constrain and market prices. Willingness to pay is the decrease in expenditures required to attain a certain level of health made possible by a reduction in the negative externality (Crooper (1981). Among its weaknesses a revealed preference survey will often collect only one data point elicitation question which is how much are you willing to pay for a good or service? In this study using the context of household health production model the theory may be relevant to establish

willingness to pay for the levy as one is to be asked how much are you willing to pay for the levy?

2.1.3 Hedonic approach

The hedonic approach extends the health production through the observation which is often only specific characteristics of goods or services contributing to health, with other attributes serving as functions. The final price on goods or services will reflect the desirability of all its characteristics (Cookson 2003). Is also a revealed preference method which uses a substitute market for placing value on health services. The method can also be used to estimate the premium placed on health services and use information of the risk premium to value people willingness to pay to avoid health hazards in their lives. It is used to estimate economic benefits and costs. Its basic principle is that the price of a good or service is related to it characteristics for example the price of a car reflects its comfort, style, luxury and fuel economy. Therefore we can value the individual characteristics of a good or service by looking at how much they are willing to pay when the determinants is changed. In other words willingness to pay can be elicited through determinants of a service or good.

2.1.4 Choice modelling.

It is also known as conjoint analysis and according to Breidert, Hahnsler and Reuttere (2006) "choice modelling is a stated preference method offering hypothetical changes to respondent and using indirect choice behaviour to estimate the willingness to pay and welfare policy change". For instance the person in the survey is given a set of choice situation encompassing a number of alternatives including the characteristics that describe them for example the quality of the service the cost of the service and future characteristics. A number of alternatives are presented to the respondent where he/she is required to specify the alternative which is preferred most within the set due to this fact substitutes must be necessary. This method presents further theoretical benefits because of the structuring of choice sets as composed of alternatives, therefore if alternatives are considered to be composed of characteristics that can be influenced by the researcher, willingness to pay composed with various levels of those attributes in policy can be estimated (Virjee 2003). Each attribute in the experiment is also described by a number of levels such as low costs and high costs, which are combined using different packages of the goods or services which individuals then compare in surveys. The output from discrete choice model can be used to improve

understanding of the determinants of people's choice including estimates of different determinants for a specific service, estimate of the marginal rate of substitution that people are willing to make between attributes provide an indirect measurement of willingness to pay (Virjee 2003).

2.2 Empirical review

Brouwer *et al* (2008) carried out a study on air travel passengers willingness to pay a tax on top of their current price ticket to offset their carbon dioxide emissions. The study was carried out in Amsterdam at Schipol airport and focused on air transport passengers. A sample of 400 passengers was interviewed randomly. They used the interval regression model and found that place of residence, air travel awareness, household income, travel distance, traveller's perception of their responsibility for climate change and effectiveness of the proposed carbon tax had a significant positive relationship with willingness to pay. They concluded that willingness to pay was significantly influenced by household income and the intensity of the good for which travellers are asked to pay.

Hsu *et al* (2008) studied willingness to pay higher gasoline taxes in Canada. Gasoline tax was 5 cents a litre of gasoline. Variables they used were age, level of education, gender, transport information like vehicle ownership and type and income. They used the ordered probit model. They found income, gender and level of education to be positive determinant of willingness to pay for a higher gasoline tax though income was suggested to be the strong determinant. Gender had a positive influence on willingness to pay as women were more likely to support the gasoline tax increase. Hersch and Vicusi (2006) in their study, their results showed a negative relationship between age and willingness to pay for a higher gasoline prices. Their results were in contrast to that of Hsu *et al* (2008) as they concluded that to a lesser extent income levels determines willingness to pay higher gasoline tax but that education is the main determinant.

Achtnicht (2012) carried out a study on willingness to pay a carbon tax to reduce carbon dioxide emission in Germany. Survey among potential car buyers in Germany was carried out where a sample of 600 people was interviewed across different regions of the country. Achtnicht (2012) used the logit model to estimate his results. Willingness to pay for the carbon tax was log-normally distributed. The researcher found that there was a negative

relationship between willingness to pay and age as younger individuals had a high significant willingness to pay. There existed a gender difference as women were more willing to pay more than men which was the same result Hsu *et al* (2008) found in their study. This result was the same as of those of Hersch and Vicusi (2006) in relation to the negative relationship between age and willingness to pay.

Dumn (2012) carried out a study in Utah State on willingness to pay for a tax of US $0.15 for using a plastic grocery bag or whether to switch to using reusable bags that could be purchased at a grocery shop. Dumn (2012) employed the probit model. An online survey was done and contingent valuation method was used to elicit willingness to pay as the initial tax bid started from US $0.05 to US $0.35. Bid values were chosen from a deviation of minus and plus US $0.15. Tax bid was found to have a negative impact on willingness to pay as the higher the tax the less likely the consumer is willing to pay. Dumn (2012) observed a significant positive relationship between income and willingness to pay which confirms with the results of Brouwer *et al* (2008). Dumn (2012) found that middle age people are more likely to pay the tax than older people postulating a negative relationship. This observation was the same as that of Hersch and Vicusi (2006). Household size was found to have a negative influence on willingness to pay suggesting that as the household size increase people will be less likely willing to pay the tax, as lager household size signifies more plastic bags therefore a tax on consumer would pose a larger expense.

Bachus *et al* (2013) carried out a study on the public acceptability of the Environmental Tax Reforms. A sample size of 1308 people was surveyed. Bachus *et al* (2013) used the ordinary least square regression model. Variable which were used were age, gender, having a relationship, number of children, being religious, years of schooling, income, material expectations realized, environmental awareness and willingness to pay taxes as the independent variable. Years of schooling, income and material expectation were found to have a significant positive relationship with willingness to pay taxes. Bachus *et al* (2013) concluded that educational level was found to be more influential in one's willingness to pay for the Environmental Tax Reforms. The strong emphasis of educational level was the same as that found by Hersch and Vicusi (2006).

Salvatore *et al* (2012) carried the same study as that of Bachus *et al* (2013) in Italy. Using ordered logit model his conclusion that educational level has strong positive impact on

willingness to pay for an environmental tax reform was the same to that of Bachus *et al* (2013). Salvatore *et al* (2012) in contrast with Bachus *et al* (2013) found that age, income and parenthood were insignificant determinants of willingness to pay for an environmental tax and females had low willingness to pay than males. They also concluded that personal beliefs were a positive significant determinant of willingness to pay. Alm and Torgler (2006) who carried out a research on cultural differences and Tax Morales in United States and in Europe his results confirms to that of Salvatore *et al* (2012) on the variable personal beliefs. They found out that religion and willingness to pay taxes have a positive relationship as they found that higher rates of church attendances result in a greater willingness to pay for taxes.

Kollmann and Reichl (2013) carried out a study in Austria to analyse how political trust influences the acceptance of environmental taxes. They used survey data of 45 000 individuals in 32 countries collected in the ISSP Environment 3 survey. He used the logit model and found out that trust level in government, level of education and marital status have a positive relationship with willingness to pay for environmental taxes. They also found that a negative relationship between willingness to pay and age existed. Harring and Jagers (2013) in his study of the public acceptance of the carbon dioxide tax in Sweden concluded that trust has significant positive impact on willingness to pay for a tax. The result is the same as that of by Kollmann and Reichl (2013).

Tours (2003) investigated the willingness to pay for free HIV vaccination programme for one year in Thailand. A 600 sample unit survey was conducted in the capital city Bangkok using the contingency valuation method to elicit willingness to pay. Tax payers where asked how much they would be willing to pay or the one year programme from their yearly income tax payment ranging from TBH 500, 1500, 2000, 3500, 5000 to 6000. The probit mode was employed to estimate the following variables which are rate of the tax payment, personal monthly income, age, gender, marital status, occupation, and education level, HIV/AIDS awareness, knowledge and experience of the respondent with the disease, beneficiary or a non-beneficiary of the scheme and vaccine effectiveness. Tours (2003) found out that age had a significant negative impact on willingness to pay because the old in Thailand are more likely to pay less than the young. Rate of the tax payment, income, and gender had significant positive influence on willingness to pay. Tours (2003) findings showed that people were willing to pay TBH 2,050 if the vaccine was 70% effective and TBH 1,746 if the vaccine was 30% effective.

Hanny and Wachs (2007) who carried out a study on factors influencing support for local transportation sales tax measures in California used the voting data and census demographic data for three transportation sales tax elections. They employed the ordinary least squares regression and found that voters who lived near the transportation project and higher incomes were positive significant variable in determining the support of the tax.

2.3 Conclusion

The theoretical review showed methods used to measure willingness to pay and the contingent valuation is the most used method to elicit willingness to pay. The empirical evidence reviewed that willingness to pay is determined by several factors mainly demographic factors such as income, level of education and age as shown in the discussion above. The theories explained were supported by the empirical evidence. The next chapter provides the methodology of the study.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter's main purpose is to provide the model going to be used in the research through model specification. It presents the variables which are going to be used in the model and their justification in the study. Diagnostic tests to be carried out in the next chapter are also specified in this chapter and the data type used as well as sample size. This chapter sets as precedence for the next chapter.

3.1 Model specification

The research is going to adapt a probit model used by de Tours (2003). The researcher is going to remove certain variable which are HIV/AIDS knowledge and awareness because the people already has knowledge and is quite aware of HIV/AIDS shown by the decline of the HIV prevalence rate in Zimbabwe hence these variables are insignificant to this study. Rate of tax payment is also another variable the researcher is to remove as the study already is focusing on a levy which is also perceived as tax hence. Vaccine effectiveness is an irrelevant variable in this study as it does not focus on vaccines, but is focusing on a levy hence it is insignificant to the study and last to be removed is occupation as the researcher is going to use the income of the civil servants to determine which position they occupy. Then the researcher is to add certain explanatory variables which are important to the study such as religion which is significant to the study as it is an important integral in African society's perceptions and number of employed people in a family which is a new dimension to the study. The model is an adaptation of the Tours (2003) model and is specified as:

$$\Pr(WTP) = \beta_0 + \beta_1 Y + \beta_2 G + \beta_3 A + \beta_4 MS + \beta_5 R + \beta_6 ED + \beta_7 NPE + \beta_8 HE + \varepsilon$$

WTP is willingness to pay for AIDS levy and is the dependant variable. It is going to be treated as binary variable. However from the questionnaire in data collection it is going to be presented as continuous variable where the respondent is going to be asked how much he is willing to pay for the AIDS levy. After obtaining the amount, when entering the data, the amount will be calculated against the income of the respondent to establish if the percentage

is less than or more than 3%. If it is more than 3% a 1 would be assigned and if it is less than 3% then a 0 would be assigned.

β_0 is a constant and β_1 up to β_8 are the coefficient of explanatory variables.

Independent variables are presented in the table below:

Y	is individual income per month and is a to be treated as continuous variable where one is asked how much he/she earns per month in US dollars.
G	is gender which a dummy variable were 1 is assigned if one is male and a 0 if female.
A	is biological age which is a continuous variable. The respondent is going to be asked how old he/she is?
MS	is marital status is dummy variable in which 1 is going to be assigned if is married and 0 if otherwise.
R	is religion this is a dummy variable where the respondent is going to be presented with a number of religions which he is to pick which one he belongs to. 1 is going to be assigned to Christians and 0 if otherwise
EDU	is level of education and is going to be treated as continuous variable. The respondent is going to be asked how many years he/she spent at school. 7years at school means he only attained primary level and 11-13 years shows the respondent reached secondary level.
NPE	is number of people employed in a family is a continuous variable where the respondents are to be asked how many employed people are there in their current household?
HE	is Experience of HIV/AIDS is going to be treated as a dummy variable the respondent is to be asked whether he knows someone with HIV/AIDS. A 1 if he knows someone with HIV and 0 if otherwise.
ε	is the error term.

3.2 Variable justification

3.2.1 Individual income per month (Y)

Those with high income are more willing to pay than those with lower suggested by Hsu *et al* (2008) and Dunn (2012). Therefore as one's income increases his willingness to pay also increases. Due to this reason a positive coefficient sign is expected in the results of this research by the student.

3.2.2 Gender (G)

Hsu *et al* (2008) and Achnicht (2012) suggested that women were more willing to pay than men because women bear less expenditure and responsibilities than men. Due to this gender differences the researcher in his results expects a positive coefficient sign on gender.

3.2.3 Age (A)

Hersch and Vicusi (2006) suggested that older people have significant lower willingness to pay than young people because older people believe that they would not benefit from the taxes in the long run. Achtnicht (2012) and Tours (2003) agreed that younger people are more willing to pay than older people as they believe that they will benefit in the future. Therefore as one grows older the willingness to pay reduces hence a negative coefficient sign on age is expected by the researcher in his results.

3.2.4 Marital status (MS)

Married people are more willing to pay than single people suggested by (Kollmann and Reichl 2013) because married people share the financial burden therefore have a higher disposable income than single people. Hence as people move from being single to being married their willingness to pay increases. Therefore the researcher expects a positive coefficient sign on marital status signifying a positive impact of marital status on willingness to pay.

3.2.5 Religion (R)

Alma and Torgler (2006) said that higher rate of church attendance being a proxy of religion showed a greater willingness to pay and Bachus *et al* (2013) agreed with them. This is because Christians believing in helping people in need and doing well for the less fortunate. Therefore as one move from being a non Christian to being a Christian his or her willingness

to pay increases hence the researcher expects religion to have a positive impact on willingness to pay and expects a positive coefficient sign in his results.

3.2.6 Level of Education (ED)

Those with higher level of education are more willing to pay than those with lower education suggested by (Hersch and Vicusi 2006), Salvatore et al (2012), Hsu et al (2008), Kollmann and Reichl (2013) and Bachus et al (2013). This is due to the fact that as one attains more education his income increases hence his willingness to pay also increases. Due to this reason the researcher expects a positive coefficient sign on level of education.

3.2.7 Number of employed people in a household (NPE)

An individual who belong to a household with many employed people would be willing to pay than that one who is the only employed person in his household (Pastrapa 2009). This due to the fact that as the number of employed people increase the expenses in that households will be share hence more willing to pay. A positive coefficient sign is expected in the writer's results.

3.2.8 Experience of HIV/AIDS (HE)

Tours (2003) suggest that if one has experience of HIV/AIDS for example if he knows someone with HIV and is benefiting from the levy he will be more willing to pay than one who does not have experience of HIV he will consider it a waste of money hence will be less willing to pay willingness to pay. Therefore the researcher expects a positive relationship in his results.

3.2.9 Disturbance term (ε)

It is modelled as a random variable or the error term. It captures all other factors excluded from the model which can also affect willingness to pay.

3.3 Diagnostic tests

Since the researcher is using primary data there is need to carry out some relevant diagnostic tests which are multicollinearity, heteroscedasticity and model specification tests to obtain relevant and significant results from the study.

3.3.1 Multicollinearity

It is the existence of more than one exact linear relationship among some or all explanatory variables in a regression model Gujarati (2004). The test is credited to Frisch (1960) as the founder. It presence is detected by partial correlation or using the correlation matrix. The researcher is going to use the correlation matrix to test for the presence of multicollinearity. The hypothesis is that if the correlation in the correlation matrix between variables exceeds 0.8 we do not reject the null hypothesis and conclude that there is multicollinearity. However if the correlation is below 0.8 we reject the null hypothesis against the alternative that there is no multicollineraity between the explanatory variables. Gujarati (2004)

3.3.2 Heteroscedasticity

According to Gujarati (2004) heteroscedasticity occurs when the error variance is time variant. The presence of heteroscedasticity is detected using the Breush-Pagan-Godfrey test. If heteroscedasticity is present OLS estimators remain unbiased and consistent but they will be inefficient. Therefore heteroscedasticity needs to be corrected. There are two approaches used to correct for heterocsedasticity which are the Method of weighted least squares which is applied if variance is known and White heteroscedasticity-consistent variance and standard errors when variance is unknown. The null hypothesis states that there is no heteroscedasticty and the alternative hypothesis states that there is heteroscedasticity. Using the Breusch-Pagan tests for heteroscedasticity if P-value obtained is less than 0.05 or X^2cal $> X^2$ we reject the null hypothesis and accept the alternative hypothesis concluding that heteroscedasticity is present. However if the P-value obtained is greater than 0.05 we do not reject the null hypothesis and conclude that the model is heteroscedasticity free (Gujarati 2004).

3.3.3 Model specification test

Model specification test is used to see whether the model being used is correctly specified such as there is no missing variable or the inclusion of an irrelevant variable (Gujarati 2004). Using the Ramsey RESET test the hypothesis of such a test is such that the null hypothesis states that the model is correctly specified and the alternative hypothesis states that the model is not correctly specified. We reject the null hypothesis if the p-value is less than 0.05 and accept the alternative hypothesis and conclude that the model is not correctly specified. On

the other hand if the p-value from the Ramsey RESET test is greater than 0.05 we do not reject the null hypothesis and conclude that the model is correctly specified.

3.4 Data type

The study is going to use primary data. The researcher is going to use primary data due to its advantage of being unbiased and data is collected direct from the civil servants under study as they directly give their opinion and perception pertaining what determines their willingness to pay for AIDS levy and what percentage are they willing to pay. However primary data has its own disadvantages as it is tiresome and time consuming as the data has to be collected and analysed.

3.4.1 Sample size

The sample under study are civil servants in Gweru District. The sample to be surveyed is 328 civil servants using the Krejcie and Morgan (1970) table for determining sample size from a given population in this case number of civil servants in Gweru which is 2713 according to the Public Service Commission of Gweru District. To collect data from the sample the researcher employed cluster sampling technique. Cluster sampling was employed if it is not possible to obtain a complete list of members of a population the researcher desires to study but can obtain a list of the clusters (Babbie 2011). The researcher was not able to obtain the list of civil servants in Gweru therefore he chose to use cluster sampling as it is the suitable technique to use in such a situation suggested by Babbie, (2011). Through cluster sampling the population of the civil servants was divided into groups which are called clusters in this case they will be grouped according to their Ministries and a simple random sampling procedure is used.

There are two types of cluster sampling which are, one and two stage cluster sample. One stage cluster sample includes all the members from a chosen cluster in the final sample for example all the members in a particular Ministry are included in the final sample. Two stage cluster sampling is when the researcher identifies the population to be sampled and group it into cluster. The researcher then only selects certain respondents from each cluster for example from the population of civil servants they are then grouped into Ministries and then a random sample are then used to certain individuals in that Ministry not the whole Ministry. The researcher is going to use two stage cluster sampling in collecting data. Cluster sampling

has an advantage in that it is cheap, quick and easy to employ since resources are allocated to a few randomly selected rather than the whole population of civil servants. Also it has a large sample size than using simple random sampling because of using a sample from multiple clusters. However it is the least of the representative of the populace from the types of probabilities samples since it is frequent for persons within a cluster to have the related characteristics leading to over or under presented of certain attributes.

3.5 Conclusion

The model to be used was specified in this chapter, the variable included in the model were justified, their expected signs and how they are going to be measured. The diagnostic tests to be carried out in the study were outlined, the data to be used was also outlined in this chapter. This chapter serves to be the basis of the next chapter which is chapter four.

CHAPTER FOUR

RESULTS PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter presents results of the determinants of willingness to pay for AIDS levy and analyse the estimated results. Results in this chapter are estimated using an econometric software STATA 11.2 using primary data collected from civil servants in Gweru District. Results of the diagnostic tests and regression results are going to be presented in this chapter.

4.1 Diagnostic tests results

4.1.1 Multicolinearity tests results

Table 4.1: Correlation matrix

	Income	Gender	ED	MS	Age	Religion	NPE	HE
Income	1.0000							
Gender	0.0060	1.0000						
ED	0.6165	-0.0292	1.0000					
MS	0.1562	-0.1874	0.1746	1.0000				
Age	0.1847	-0.0686	0.2117	0.4679	1.0000			
Religion	0.0720	-0.0341	0.0320	-0.0550	-0.0609	1.0000		
NPE	0.3085	-0.1550	0.3530	0.1316	0.1377	0.0673	1.0000	
HE	0.1294	-0.1028	0.1129	0.0439	-.00006	0.6393	0.1694	1.000

Refer to appendix 3 for full results

As discussed in chapter 3 multicolinearity is tested using the correlation matrix. From the table above on the diagonal is the correlation between the variable itself and off the diagonal is the pair-wise which is the correlation between and variable and another variable. From the hypothesis in chapter 3 we reject the null hypothesis and accept the alternative hypothesis since there is no correlation which exceeds 0.8 between the variables and conclude that there is no multicolinearity. Then we use the do nothing approach (Gujarati 2004)

4.1.2 Heteroscedasticity tests results

Table 4.2: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Chi2(1)	0.70
p-value	0.4039

Refer to appendix 4 for full results

Heteroscedasticity is tested using the Breusch-Pagan test. From chapter 3 we reject the null hypothesis that there is no heteroscedasticity against the alternative that heteroscedasticity is present when the p-value is less than 0.05. From the table above the p-value is greater than 0.05 therefore we do not reject the null hypothesis and conclude that the model is free from heteroscedasticity. A do nothing approach from Gujarati, (2004) is used.

4.1.3 Model specification tests results.

Table 4.3: Ramsey RESET test using the powers of the fitted values of wtp

F(3, 317)	0.49
p-value	0.6892

Refer to appendix 5 for full results

Ramsey RESET test is used to test the null hypothesis that a model is correctly specified against the alternative that the model is not correctly specified so it is used to test for model specification. In chapter 3 the null hypothesis is rejected if the p-value is less than 0.05. From the table above the p-value is greater than 0.05 hence we conclude that the model is correctly specified therefore we do not reject the null hypothesis.

4.2 Results presentation.

 The probit regression model has estimated the following results between the dependant variable and the explanatory variable.

Table 4.4: Estimated results using the probit regression model

VARIABLE	COEFFICIENT	STD ERROR	Z-STATISTIC	P-VALUE
Y	0.029555	0.001473	2.01	0.045
G	0.6005406	0.2182481	2.75	0.006
ED	0.1720602	0.0503794	3.42	0.001
MS	0.3645035	0.2551042	1.43	0.153
Age	-0.0366366	0.0146386	- 2.50	0.012
R	-0.0066108	1.168609	-0.01	0.995
NPE	0.8251908	0.1259068	6.55	0.000
HE	1.682664	1.101996	1.53	0.127
Constant	-6.805713	1.193092	-5.70	0.000

Refer to appendix 6 for full data

Number of observations   =   328

LR chi^2(8)   =   145.27

Prob > chi^2 =   0.0000

Pseudo R^2 =   0.3449

Log likelihood   =   -137.94363

From the model in chapter 3 the results are specified as follows:

$$\Pr(\text{wtp}) = -6.805713 + 0.029555\,\mathbf{Y} + 0.6005406\,\mathbf{G} - 0.0366366\,\mathbf{A} + 0.3645035\,\mathbf{MS}$$
$$- 0.0066108\,\mathbf{R} + 0.1720602\,\mathbf{ED} + 0.8251908\,\mathbf{NPE} + 1.682664\,\mathbf{HE} + \boldsymbol{\varepsilon}$$

4.3 Results interpretation

4.3.1 Likelihood Ratio test

Present the likelihood of the specified model. It tests the null hypothesis that entire slope coefficient simultaneously equates to zero against the alternative that the entire slope coefficient does not equate to zero (Gujarati 2004). From the results above the Likelihood Ratio (LR) statistic is 145.27 with a p-value of 0.0000 which is less than 0.05 therefore we

reject the null hypothesis and accept the alternative hypothesis which states that the entire slope coefficient does not simultaneously equate to zero. From the results above the model converged and iterations stopped at a level where the log likelihood was -137.94363.

4.3.2 Pseudo R^2

McFadden pseudo R^2 tests the predictive potential of the model. It is of limited value to the binary models such as the probit model used in this study (Gujarati 2004). Its value should be between 0 and 1 and in most cases ranges from 0.2 to 0.6 and from the above results it is 0.33449.

4.3.3 Prob > chi^2

According to Gujarati 2004 it measures the significance of the study. The null hypothesis states that the model is not significant with the alternative hypothesis stating that the model is significant. We reject the null hypothesis because the p-value is less than 0.05 and accept the hypothesis that the model is significant.

4.3.4 Individual income per month (Y)

From the table 4 above according to the survey income is a significant variable in determining willingness to pay for AIDS levy and indicates a positive relationship with willingness to pay. This is because it has a positive coefficient 0.029555 as expected in chapter three and is statistical significance since it has a p-value less than 0.05 which is 0.045. This postulates that when income increases the willingness to pay for the AIDS levy by civil servants increases as well. The results corroborates with that of Hsu *et al* (2008) and Dumn (2012).

4.3.5 Gender (G)

Table 4 above shows that gender is statistically significant as it has a p-value less than 0.05 which is 0.006. Gender has positive coefficient as expected in chapter three which is 0.06005406 suggesting a positive relationship with willingness to pay for AIDS levy. This result confirms to that of Tours (2003) and Hsu *et al* (2008) who also found gender to have a positive influence on gender. Form the survey it has shown that women are more willing to pay than women also suggested by Tours (2003).

4.3.6 Age (A)

Age influences willingness to pay in a negative manner since table 4 shows that it has negative coefficient sign as expected in chapter three. It s coefficient is -0.0366366 and is a significant variable in determining willingness to pay for AIDS levy by civil servants in Gweru. This suggests that as one grows older his/her willingness to pay decreases showing that young people are more willing to pay the AIDS levy than the older confirming to the findings of Hersch and Vicusi (2006), Achtnicht (2012) and Tours (2003) in their findings in the empirical review in chapter two.

4.3.7 Marital Status (MS)

There is a positive relationship between marital status and willingness to pay for AIDS levy by civil servants in Gweru shown by a positive coefficient sign of 0.3645035. The relationship is also the same to that of Kollmann and Reichl (2013). The positive sign is as expected in chapter three. However marital status as shown by table 4 is an insignificant variable in determining willingness to pay for AIDS levy by civil servants in Gweru as its p-value 0.153 is greater than 0.05. Being insignificant contradicts to the results of Kollmann and Reichl (2013) who found it to be significant in his study. The results postulated that married people are willing to pay than those who are not married.

4.3.8 Religion (R)

From the table above religion has a negative coefficient sign which the researcher was not expecting to get in his results. The coefficient is -0.0066108 postulating controversial negative relationship with willingness to pay for AIDS levy which is the opposite of that found by Alma and Torgler (2006) and Bachus *et al* who found a positive relationship between willingness to pay and religion. The difference is between the way the variable was measured as Alma and Torgler (2006) used church attendance as measure of religion and this current study gave options of different religions and the variable was made a dummy variable. Also religion from table 4 is found to be an insignificant variable in determining willingness to pay as its p-value of 0.0995 is greater than 0.05.

4.3.9 Level of Education (ED)

Level of education is statistically significant as table 4 shows that its p-value 0.001 is less than 0.05. It possesses a positive coefficient sign as expected in chapter three by the

researcher of 0.1720602. Level of education has a high coefficient than income, gender and age. The positive coefficient suggests that as one becomes more educated he/she's willingness to pay for the AIDS levy also increases confirming to the studies by Hersch and Vicusi (2006), Hsu *et al* (2008), Kollmann and Reichl (2013) and Bachus *et al* (2013) who also had the same result in their studies.

4.3.10 Number of Employed people in a household (NPE)

Number of employed people in a household is a new variable to the study and from table 4 it is statistically significant in determining willingness to pay for AIDS by civil servants in Gweru as shown by its p-value of 0.000 which is less than 0.05. Also it has a positive coefficient sign expected by the researcher in chapter three which is 0.8251908 which is high than any other positive significant variable which determines the willingness to pay for AIDS by civil servants in Gweru. This postulates that in a household where a number of individuals are employed their willingness to pay is higher than in a household where only one person goes to work using the law of large numbers.

4.3.11 Experience of HIV/ AIDS (HE)

Experience of HIV/AIDS is statistically insignificant in determining willingness to pay AIDS levy by civil servants since its p-value 0.127 is larger than 0.05. This means that whether someone knows someone with HIV or not does not influence willingness to pay. The variable though has a positive coefficient as expected in chapter three which is 1.682664. The insignificant positive relationship confirms to that found by Tours (2003) in his study reviewed in chapter two.

4.4 Marginal effects

Marginal effects give a quantitative change to variables interpretations to significant variables from the probit estimation results. The table below shows the marginal effects results constructed from appendix 7.

Table 4.5: Marginal effects after probit

VARIBLE	DY/DX	STD ERROR	Z-STATISTIC	P-VALUE
Income	0.0009791	0.00049	2.01	0.045
Gender	0.1739846	0.05529	3.15	0.002
ED	0.0569973	0.0166	3.43	0.001
MS	0.1131648	0.07283	1.55	0.120
Age	-0.0121364	0.00483	-2.51	0.012
Religion	-0.0021939	0.3885	-0.01	0.995
NPE	0.2733559	0.04507	6.07	0.000
HE	0.3080101	0.06574	4.69	0.000

Refer to appendix 7 for more detail

4.4.1 Individual income (Y)

From the table above it is found that on average a dollar increase in income increases one's probability of willingness to pay for the AIDS levy by 0.009791.

4.4.2 Gender (G)

The results shows that gender is a dummy variable so an additional male, such as from 0 being female to 1 being male increases the probability of willingness to pay for AIDS levy 17.39846 percent.

4.4.3 Level of education (ED)

From the table above an additional year to the level of education increases the probability of one's willingness to pay for AIDS levy by 5.69973 percent.

4.4.4 Age (A)

An additional year to one's age reduces the probability of willingness to pay by 1.21364 percent from the table above.

4.4.5 Number of people employed in a household (NPE)

From table 5above an additional employed member in a household increases the probability of willingness to pay for AIDS levy by 27.33559 percent.

4.5 Conclusion.

The probit regression results showed that five variable were statistically significant in determining willingness to pay for AIDS levy which are individual income, gender, level of education, number of employed people in a household which all have a positive influence on willingness to pay and age which has a negative impact on willingness to pay for AIDS levy. The next chapter looks at policy recommendations and conclusions.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.0 Introduction

This chapter is the last chapter of the research paper where a summary of the determinants for willingness to pay for AIDS levy is presented from the findings of the whole study, policy recommendations are given and a conclusion of the determinants for willingness to pay for AIDS levy is given. In this chapter suggestions for future studies towards AIDS levy will also be offered. This chapter shows whether objectives of the study were met, the significance of the study is justified and most importantly whether the problem in chapter one is answered.

5.1 Summary of the study

This research shows the determinants for willingness to pay for AIDS levy by civil servants in Gweru district. From the theoretical literature presented in chapter two the study used the contingency valuation to elicit willingness to pay. The research employed the probit model in estimating the results collected from a sample size of 328 using cluster sampling technique. Results in chapter four showed that individual income, gender, marital status, number of employed people in a household, level of education and experience of HIV/AIDS are positive determinants of willingness to pay for AIDS levy by civil servants in Gweru district. However religion and age both have a negative influence on willingness to pay for AIDS levy by civil servants in Gweru district. Form the findings in chapter four probit regression results in appendix 6 only five variables were statistically significant in determining willingness to pay for AIDS levy by civil servants and the majority of the civil servants were willing to pay less than the 3% they are already paying. From the findings in appendix 8 it shows that civil servants are willing to pay US $7.67 on average which is 1.8% from their monthly income. The civil servants signified that they are not satisfied with the AIDS levy as the majority were willing to pay less. And from the results in chapter four from appendix 6 level of education is the main statistical significant determinant of willingness to pay.

5.2 Conclusion

From the research findings there are only five variables which are statistically significant in determining willingness to pay for AIDS levy by civil servants in Gweru district. These variables are individual income per month, gender, age, number of employed people in a household and level of education. Level of education having a high coefficient than all significant variables showing that willingness to pay for AIDS levy is strongly determined by the level of education. The majority of the civil servants are willing to pay less than the 3% they are currently paying for the AIDS levy as the majority perceived the disease as a self imposed disease hence one should bear the consequences of his/her own actions. From the study more males are willing to pay for the levy than female. Those with higher income are more willing to pay than those with lower income with the average income being US $420 per month. The study showed that young people are more willing to pay than the older people with the average age being 34 years among the civil servants in Gweru. The average level of educational years spent at school among the civil servants in Gweru was found to be 15years and the findings showed that those with high levels of education were more willing to pay than those with lower levels of education. Concluding that civil servants are determined to pay US $7.67 on average (1.8%) which is less than the 3% they are currently paying.

5.3 Policy recommendations

From the basis of the study findings there is need for the government to revise the AIDS levy downwards which will be a relief to the civil servants who are earning below the Poverty Datum Line, those with low level of education and those households with only one employed member mostly older men to improve their welfare and living standards.

The government should also find a way to share the burden to the whole nation rather than only formally employed people hence the should find a way for the informally employed people in a household, and also due to the fact that most of the young people, men or women in Zimbabwe are informally employed to pay for the AIDS levy from their monthly income. This will in turn reduce the percentage deduction due to the wide tax base.

The National AIDS Council should be more transparent with how it handles the AIDS levy collections to a point of giving monthly updates of the collection and how it was used and its achievements to the public at large rather to the MoHCW like it does since the public are important stakeholders of the levy.

5.4 Suggestions for future study

The study only focused on the determinants of willingness to pay for AIDS levy civil servants in Gweru from the formally employed people in Zimbabwe. Future researchers should take into account the other group of formally employed people in the private sector, those in parastatals and municipalities. They should also carry out studies in other provinces and cities in Zimbabwe.

Future studies should also use the variable of number of people employed in a household in their studies of willingness to pay as it was proved to be a significant determinant in willingness to pay.

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APPENDICES

Appendix 1: Questionnaire

MIDLANDS STATE UNIVERSITY

L am Kahombe Tanaka (R112146Z) a final year student at Midlands State University, studying for a B.com Hon Degree in Economics. In partial fulfilment of the programme l m required to conduct a dissertation on a topic of my choice. L am researching on **The Determinants of willingness to pay for AIDS levy by civil servants: A case of Gweru.** AIDS levy is a 3% deduction from salaries of formally employed citizens who earn above the tax bracket and was introduced in 1999 to fund for treatment and drugs for HIV related diseases. This questionnaire is completely anonymous and confidential. L will be extremely grateful and would appreciate your time in completing this questioner.

TICK OR COMPLETE AS APPROPRIATE

1. How much are you willing to pay for the AIDS levy?…………………………………

2. What is your monthly income?………………………….

3. Your gender: 1 ☐ Male   2 ☐ Female

4. How many years have you spent at school to attain your current educational level?……………………..

5. Indicate your marital status: 1 ☐ married   2 ☐ single   3 ☐ divorced

                                4 ☐ separated   5 ☐ widowed

6. Mention age ……………. years

7. What is your religion: 1 ☐ christianity   2 ☐ muslim

                                 3 ☐ african tradition   4 ☐ no religion.

8. How many people are employed in your household?...………………….

9. Do you have a relative or know anyone who is HIV positive: 1 ☐ yes 2 ☐ no

Please make sure that you check that all spaces have been filled and you have completely answered the questioner. Thank you very much for completing this questionnaire your cooperation and time is very much appreciated.

Appendix 2 Data set

obs	wtp amount	wtp	income	gender	ed	ms	Age	religion	npe	he
1	0.19	0	300	0	13	1	31	1	2	1
2	3	0	300	0	13	0	52	1	1	1
3	15	1	450	1	16	1	35	1	3	1
4	1	0	300	1	11	1	30	1	1	0
5	15	1	500	1	11	1	29	1	1	1
6	15	1	400	1	16	0	32	1	5	1
7	5	0	250	1	15	0	31	1	1	0
8	20	1	520	1	16	1	30	1	6	1
9	20	1	520	1	16	1	33	1	2	1
10	5	0	350	1	13	1	35	1	2	1
11	3	0	300	1	14	1	47	0	1	0
12	15	1	450	1	17	1	33	1	2	1
13	5	0	270	1	11	0	27	1	1	0
14	2	0	340	1	14	1	30	1	2	1
15	15	1	400	1	16	0	28	1	1	1
16	5	0	400	1	16	1	45	1	2	0
17	12	1	400	1	16	0	24	1	4	1
18	15	1	450	1	17	1	34	1	5	1
19	5	0	500	1	16	1	32	1	2	1
20	3	0	400	1	17	1	32	1	1	1
21	2	0	450	1	17	1	25	1	1	1
22	20	1	560	1	16	0	25	1	3	1
23	3	0	400	0	13	1	50	1	1	1
24	5	0	485	0	16	1	26	1	2	1
25	10	0	466	0	17	1	29	1	1	1
26	2.5	0	400	0	17	1	30	1	2	1
27	20	1	600	0	20	1	45	1	2	1
28	5	0	519	0	18	1	40	1	2	1
29	0.5	0	300	1	11	0	22	1	1	0

30	5	0	380	1	13	1	36	0	1	0
31	3	0	450	1	18	1	35	0	1	0
32	2	0	450	1	17	0	27	1	2	1
33	15	1	440	1	18	1	30	1	2	1
34	20	1	520	1	16	1	36	1	2	1
35	12	1	400	1	17	0	23	1	5	1
36	1	0	300	1	13	1	35	1	1	1
37	15	1	400	1	11	1	27	1	2	1
38	12	1	400	1	20	1	44	1	2	1
39	15	1	450	1	17	1	28	1	2	1
40	15	1	500	1	16	1	30	1	2	1
41	25	1	700	1	18	1	39	1	2	1
42	15	1	400	1	17	1	32	1	2	1
43	15	1	400	1	17	1	30	1	2	1
44	12	1	400	1	16	0	45	1	1	1
45	3	0	350	1	13	1	47	1	2	1
46	12	1	350	1	11	1	44	1	1	1
47	12	1	350	1	13	0	25	1	3	1
48	15	1	500	1	16	1	35	1	2	1
49	3	0	350	1	11	1	35	1	1	1
50	2	0	350	1	11	1	26	1	1	0
51	20	1	519	1	17	1	35	1	3	1
52	20	0	516	1	13	1	35	1	2	1
53	1	0	350	1	13	1	26	1	2	1
54	1	0	350	1	11	1	36	1	1	0
55	3	0	350	1	13	1	28	0	1	1
56	5	0	364	1	11	1	29	1	2	1
57	5	0	333	1	15	1	48	1	7	1
58	2	0	450	1	17	0	32	1	1	1
59	5	0	500	1	14	1	26	1	1	1
60	5	0	445	1	17	1	39	1	2	1
61	5	0	500	1	11	1	35	1	1	1

62	5	0	500	1	11	1	54	1	1	1
63	15	1	500	1	16	0	30	1	2	1
64	15	1	500	1	13	1	29	1	2	1
65	15	1	500	1	15	0	24	1	5	1
66	15	0	500	1	16	1	29	1	1	0
67	5	0	400	1	13	0	28	1	1	1
68	3	0	350	1	11	0	25	1	1	1
69	25	1	700	1	18	1	54	1	4	1
70	1	0	300	1	11	0	26	1	1	1
71	10	0	550	1	17	1	30	1	2	1
72	1	0	350	1	11	1	40	0	2	0
73	5	0	450	1	13	1	35	1	1	1
74	10	0	500	1	13	1	27	1	1	1
75	5	0	350	1	11	0	24	1	1	1
76	20	0	620	1	20	1	42	1	2	1
77	10	0	420	1	16	1	32	0	2	0
78	6	0	380	1	14	1	35	1	2	1
79	15	0	700	1	20	1	50	1	2	1
80	1	0	350	1	13	1	42	1	1	1
81	5	0	450	1	15	1	54	1	2	1
82	5	0	500	1	17	1	48	1	2	1
83	3	0	350	1	13	1	40	1	1	1
84	1	0	300	1	11	0	30	1	1	1
85	2	0	400	1	13	0	28	1	1	1
86	15	1	450	1	15	1	27	1	2	1
87	1	0	350	1	13	0	30	1	1	1
88	15	1	420	1	15	0	25	1	5	1
89	12	1	400	1	16	0	29	1	3	1
90	15	1	500	1	17	1	41	1	2	1
91	1	0	360	1	16	0	24	1	1	0
92	20	1	600	1	18	1	53	1	4	1
93	15	1	440	1	13	0	26	1	1	1

84	20	1	520	1	17	1	33	1	2	1
95	12	1	380	1	13	1	36	1	2	1
96	12	1	400	1	13	1	37	1	2	1
97	1	0	300	1	11	0	27	1	1	1
98	15	1	450	1	13	0	26	1	3	1
99	20	1	460	1	13	1	28	1	2	1
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103	2	0	450	1	16	0	27	1	1	1
104	1	0	350	1	13	1	39	1	2	1
105	2	0	400	1	17	1	31	1	2	1
106	12	1	380	1	16	1	38	1	2	1
107	25	1	700	1	20	1	51	0	3	0
108	1	1	290	1	11	1	37	1	2	1
109	15	1	400	1	14	1	33	1	2	1
110	10	0	350	1	13	1	36	1	2	1
111	12	1	390	1	14	1	34	1	2	1
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113	12	1	380	0	16	1	49	1	3	1
114	5	0	350	0	13	1	41	1	2	1
115	5	0	350	0	13	1	48	1	2	1
116	2	0	300	0	13	1	42	1	2	1
117	15	1	400	0	16	1	32	1	2	1
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120	15	1	480	0	17	1	27	1	2	1
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123	3	0	400	0	16	1	40	1	2	1
124	15	1	480	0	15	1	31	1	2	1
125	15	1	440	0	16	0	27	1	1	1

126	15	1	450	0	16	1	32	1	2	1
127	15	1	470	0	17	1	38	1	2	1
128	15	1	420	0	16	1	33	1	2	1
129	15	1	450	0	17	1	37	1	3	1
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132	15	1	440	0	16	0	26	1	4	1
133	15	1	470	0	17	1	31	1	2	1
134	10	0	420	0	17	0	25	1	3	1
135	15	1	490	0	17	1	32	1	2	1
136	5	0	400	0	16	1	26	1	2	1
137	1	0	300	0	13	1	43	1	2	1
138	3	0	350	0	13	1	27	1	2	1
139	1	0	310	0	13	1	42	0	2	0
140	3	0	400	0	14	1	28	0	2	0
141	5	0	400	0	15	1	25	1	2	1
142	10	0	500	0	13	1	29	1	2	1
143	1	0	400	0	14	1	36	1	2	1
144	3	0	480	0	17	1	30	1	2	1
145	5	0	470	0	17	1	40	1	2	1
146	1	0	300	0	11	1	26	1	2	1
147	2	0	420	0	15	1	41	1	2	1
148	2	0	460	0	16	1	27	1	2	1
149	5	0	450	0	16	1	39	1	2	1
150	2	0	410	0	13	1	41	1	2	1
151	3	0	430	1	13	1	38	1	2	1
152	3	0	400	1	13	1	29	1	2	1
153	15	1	500	1	13	0	24	1	4	1
154	25	1	700	1	22	1	45	1	3	1
155	15	1	450	1	13	1	41	1	2	1
156	12	1	400	1	16	0	25	1	1	1
157	12	1	400	1	13	1	36	1	2	1

158	2	0	320	1	13	1	38	1	1	1
159	3	0	390	1	14	1	36	1	1	1
160	1	0	330	1	14	1	35	1	1	1
161	12	1	380	1	14	1	36	1	2	1
162	5	0	340	1	13	0	25	1	1	1
163	15	1	370	1	16	1	41	1	2	1
164	1	0	350	1	13	0	26	1	1	1
165	12	1	360	1	13	1	40	1	2	1
166	12	1	360	1	13	1	27	1	2	1
167	1	0	350	1	13	1	44	1	1	1
168	12	1	370	1	13	1	37	1	2	1
169	2	0	340	1	13	0	30	1	1	1
170	3	0	380	1	16	1	48	1	1	1
171	1	0	330	1	13	1	52	1	1	1
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173	1	0	320	1	13	1	51	1	1	1
174	5	0	390	1	13	0	44	1	1	1
175	3	0	310	1	13	1	50	1	1	1
176	5	0	400	1	13	1	43	0	1	0
177	1	0	300	1	11	1	49	1	2	1
178	15	1	410	1	13	0	26	1	3	1
179	20	1	519	1	16	1	48	1	2	1
180	15	0	500	1	13	1	54	1	1	1
181	20	1	530	1	17	1	35	1	2	1
182	20	1	520	1	17	1	46	1	2	1
183	10	0	510	1	17	1	44	1	1	1
184	10	0	500	1	13	0	30	1	1	1
185	5	0	450	1	13	1	43	1	1	1
186	3	0	490	1	16	1	31	1	1	1
187	3	0	480	1	16	0	25	1	1	1
188	1	0	450	1	16	1	32	1	2	1
189	2	0	400	1	13	0	26	1	1	1

190	5	0	450	1	16	1	33	1	1	1
191	3	0	440	1	17	0	27	1	1	1
192	3	0	400	1	13	1	34	1	2	1
193	1	0	320	1	13	0	28	1	1	1
194	5	0	420	1	13	1	35	1	1	1
195	1	0	330	1	13	1	29	1	1	1
196	5	0	410	1	16	0	26	1	1	1
197	1	0	340	1	13	0	30	1	1	0
198	5	0	400	1	13	0	26	1	1	1
199	2	0	350	1	13	1	31	1	2	1
200	3	0	450	1	16	1	38	1	1	1
201	5	0	500	1	17	1	36	1	1	1
202	2	0	350	1	13	0	32	1	1	1
203	3	0	400	1	17	1	37	1	2	1
204	5	0	450	1	17	1	33	1	1	1
205	1	0	350	1	13	1	38	1	1	1
206	15	1	420	1	17	1	34	1	2	1
207	1	0	400	1	13	1	39	1	1	1
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210	20	1	520	1	17	1	45	1	2	1
211	2	0	380	1	13	0	24	0	1	0
212	2	0	400	1	13	1	40	1	1	1
213	5	0	450	1	15	0	26	1	1	1
214	15	1	460	1	16	1	29	1	1	1
215	2	0	350	1	13	1	27	1	1	1
216	25	1	700	1	22	1	52	1	3	1
217	25	1	650	1	20	1	40	1	2	1
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219	3	0	350	1	13	0	29	1	1	1
220	12	1	400	1	16	1	44	1	2	1
221	2	0	380	1	16	1	30	1	1	1

222	3	0	410	1	16	1	36	1	1	1
223	2	0	400	1	17	1	31	1	1	0
224	1	0	400	1	13	1	35	1	1	1
225	1	0	380	1	13	1	32	0	2	0
226	1	0	350	1	13	1	47	1	1	1
227	1	0	350	1	13	1	33	1	1	1
228	2	0	380	1	15	1	48	1	2	1
229	15	1	400	1	16	1	34	1	2	1
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232	5	0	500	0	13	0	28	1	2	1
233	15	1	500	0	17	1	36	1	2	1
234	10	0	500	0	11	1	31	1	2	1
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240	15	1	480	1	17	1	50	1	4	1
241	15	1	420	1	17	1	27	1	1	1
242	15	1	460	1	17	1	49	1	3	1
243	15	1	450	1	16	1	28	1	2	1
244	3	0	410	1	13	1	48	1	1	1
245	5	0	430	1	13	0	25	1	1	1
246	1	0	400	1	13	1	47	1	2	1
247	10	0	500	1	11	0	23	1	1	1
248	5	0	410	1	13	0	24	1	1	1
249	3	0	430	1	13	0	29	1	1	1
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251	2	0	400	1	13	0	30	1	1	1
252	3	0	480	1	14	0	26	1	1	0
253	2	0	440	1	13	1	34	1	1	0

254	2	0	450	1	16	0	27	1	1	1
255	10	0	470	1	17	1	49	1	2	1
256	3	0	420	1	16	0	28	1	1	1
257	5	0	450	1	16	1	48	0	1	0
258	5	0	500	1	11	0	32	1	1	0
259	5	0	450	1	13	1	47	1	1	0
260	3	0	440	1	14	1	28	1	1	1
261	5	0	470	1	16	0	24	1	1	1
262	3	0	420	1	13	1	29	1	1	1
263	5	0	490	1	17	1	46	1	2	1
264	15	1	400	1	16	1	30	1	2	1
265	0.5	0	300	1	11	0	33	1	1	1
266	1.5	0	350	0	13	1	31	1	2	1
267	3	0	400	0	13	1	24	1	2	1
268	1	0	350	0	13	1	32	1	2	1
269	2	0	390	0	13	1	44	1	2	1
270	1	0	330	0	14	1	33	1	2	1
271	3	0	380	1	13	1	43	1	1	0
272	2	0	340	1	13	0	34	1	1	1
273	2.5	0	350	1	13	1	42	1	1	1
274	15	1	500	1	17	1	35	1	2	1
275	25	1	700	1	20	1	43	1	3	1
276	20	1	600	1	18	1	36	1	2	1
277	5	0	400	1	13	1	40	1	1	1
278	12	1	400	1	16	1	37	1	2	1
279	1	0	300	1	11	1	39	1	1	1
280	2	0	350	1	13	1	38	1	1	1
281	1	0	350	1	11	0	29	1	1	1
282	12	1	400	1	13	1	41	1	2	1
283	0.5	0	320	1	13	0	31	1	1	1
284	12	1	390	1	16	0	26	1	3	1
285	1	0	330	1	13	0	26	0	1	0

286	15	1	380	1	13	1	33	1	2	1
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288	15	1	370	1	16	1	36	1	2	1
289	2	0	350	1	13	0	30	1	1	1
290	5	0	360	1	13	1	45	1	2	1
291	5	0	360	1	16	1	31	1	1	1
292	5	0	350	1	15	0	24	1	1	1
293	1	0	370	1	16	1	32	1	1	1
294	15	1	400	1	17	1	29	1	2	1
295	2	0	380	1	13	0	27	1	1	1
296	5	0	450	1	13	1	39	1	2	1
297	3	0	380	1	13	1	31	1	1	1
298	1	0	320	1	14	1	38	1	2	1
299	1	0	390	1	13	1	32	1	1	1
300	3	0	310	1	13	1	37	0	1	0
301	1.5	0	400	1	13	1	33	1	2	1
302	2	0	400	1	13	1	36	1	2	1
303	1.5	0	500	1	13	1	34	1	1	1
304	15	1	500	1	16	1	35	1	2	1
305	2	0	450	1	13	0	28	1	1	1
306	5	0	400	1	13	1	35	1	2	1
307	3	0	500	0	11	1	29	1	2	1
308	2	0	350	0	11	1	26	1	2	1
309	5	0	400	0	13	1	32	1	2	1
310	5	0	460	0	13	1	28	1	2	1
311	5	0	480	1	16	0	31	1	1	1
312	1	0	270	1	11	0	27	1	1	1
313	5	0	450	0	13	1	32	1	2	1
314	3	0	350	1	13	1	37	1	1	1
315	5	0	460	1	13	1	33	1	1	1
316	5	0	400	1	17	1	34	1	1	1
317	3	0	450	1	17	0	30	1	1	1

318	1	0	300	1	11	0	29	1	1	1
319	2	0	440	0	16	1	35	1	2	1
320	2	0	413	0	16	1	30	1	2	1
321	1	0	400	1	13	1	36	1	2	1
322	5	0	500	1	13	0	24	1	1	1
323	5	0	500	1	17	1	37	1	1	1
324	2	0	450	1	13	1	28	1	1	1
325	1	0	370	0	13	1	25	1	2	1
326	5	1	400	0	16	1	29	1	2	1
327	0.5	0	300	0	11	1	26	1	2	1
328	3	0	500	0	11	1	30	1	2	1

Appendix 3

```
. corr income gender ed ms age religion npe he
(obs=328)
```

	income	gender	ed	ms	age	religion	npe
income	1.0000						
gender	0.0060	1.0000					
ed	0.6165	-0.0292	1.0000				
ms	0.1562	-0.1874	0.1746	1.0000			
age	0.1847	0.0686	0.2117	0.4679	1.0000		
religion	0.0720	-0.0341	0.0320	-0.0550	-0.0609	1.0000	
npe	0.3085	-0.1550	0.3530	0.1316	0.1377	0.0673	1.0000
he	0.1294	-0.1028	0.1129	0.0439	-0.0006	0.6393	0.1694

	he
he	1.0000

Appendix 4

```
. hettest
```

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of wtp

        chi2(1)     =     0.70
        Prob > chi2 =   0.4039
```

Appendix 5

```
. ovtest
```

```
Ramsey RESET test using powers of the fitted values of wtp
        Ho:  model has no omitted variables
                F(3, 317) =      0.49
                  Prob > F =      0.6892
```

50

Appendix 6

```
. probit wtp income gender ed ms age religion npe he, nolog
```

```
Probit regression                              Number of obs   =        328
                                               LR chi2(8)      =     145.27
                                               Prob > chi2     =     0.0000
Log likelihood = -137.94363                    Pseudo R2       =     0.3449
```

wtp	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
income	.0029555	.001473	2.01	0.045	.0000685	.0058426
gender	.6005406	.2182481	2.75	0.006	.1727823	1.028299
ed	.1720602	.0503794	3.42	0.001	.0733183	.2708021
ms	.3645035	.2551042	1.43	0.153	-.1354915	.8644985
age	-.0366366	.0146386	-2.50	0.012	-.0653276	-.0079455
religion	-.0066108	1.168609	-0.01	0.995	-2.297043	2.283821
npe	.8251908	.1259068	6.55	0.000	.578418	1.071964
he	1.682664	1.101996	1.53	0.127	-.4772086	3.842537
_cons	-6.805713	1.193092	-5.70	0.000	-9.14413	-4.467296

Appendix 7

```
. mfx
```

```
Marginal effects after probit
      y  = Pr(wtp) (predict)
         =   .27101161
```

variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
income	.0009791	.00049	2.01	0.045	.000023	.001935	420.402
gender*	.1739846	.05529	3.15	0.002	.065615	.282354	.804878
ed	.0569973	.0166	3.43	0.001	.024465	.08953	14.5244
ms*	.1131648	.07283	1.55	0.120	-.029579	.255909	.759146
age	-.0121364	.00483	-2.51	0.012	-.021602	-.00267	34.4512
religion*	-.0021939	.3885	-0.01	0.995	-.763641	.759253	.954268
npe	.2733559	.04507	6.07	0.000	.185029	.361683	1.7378
he*	.3080101	.06574	4.69	0.000	.179164	.436856	.908537

```
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

Appendix 8

```
. sum wtp income gender ed ms age religion npe he
```

Variable	Obs	Mean	Std. Dev.	Min	Max
wtp	328	7.672835	6.585857	.19	25
income	328	420.4024	80.39914	250	700
gender	328	.804878	.3969	0	1
ed	328	14.52439	2.225653	11	22
ms	328	.7591463	.428255	0	1
age	328	34.45122	7.732773	22	64
religion	328	.9542683	.2092218	0	1
npe	328	1.737805	.8838531	1	7
he	328	.9085366	.2887074	0	1