THE NATURE AND DETERMINANTS OF THE WEALTH PORTFOLIOS OF SALARIED MIDDLE AND UPPER INCOME EMPLOYEES IN KENYA

JULIUS MONZI MUIA

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DECLARATION

I declare that this thesis is my original work and has not been submitted for the award of a degree in this or any other University.

9th October 2012

Julius Monzi Muia
PhD Candidate
Reg. No.: D/80/P/7780/2002
School of Business, University of Nairobi

This thesis has been submitted for examination with our approval as University supervisors.

10/10/2012

Dr Julius M. Malombe

11-10-2012

Prof. Nzele D. Nzomo

11/10/2012

Prof. Ganesh P. Pokhariyal

DEDICATION

Firstly, I dedicate this work to my father, Paul M. Kimii and my late mother, Hellen K. Muia for they nurtured me and challenged me to explore my potential.

Secondly, I dedicate this work to my parents in law, Mrs Naomi N. Kimeu and the late Julius K. Muasya who have been strong pillars for my family and a source of constant support.

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ABSTRACT

Personal wealth as denoted by accumulated net assets is a key ingredient of a people's standards of living. This is because wealth facilitates consumption, especially in old age, cushions people against adversities such as illness and unemployment as well as, enables further wealth creation through access to bank credit. The assets that comprise wealth include cash and bank balances, properties, shares in cooperatives and listed companies, life assurance policies, accrued pension benefits, corporate bonds, and treasury bills and bonds.

Whereas modern portfolio theory (MPT) suggests that investors should aim to maximize their wealth and hold diversified portfolios, life-cycle hypothesis (LCH) maintains that people should target a smooth consumption path in their lifespan, respectively. Yet, empirical evidence from developed countries shows that personal wealth portfolios consist of few assets, are inadequate to support retirement consumption and are very dissimilar with respect to holders' personal attributes. The lack of knowledge on the diversification, adequacy and determinants of personal wealth portfolios in developing countries makes it difficult to appreciate, and formulate appropriate policies for enhancing the wealth holdings of the citizens for improved standards of living. This study is designed to address this research gap.

The study examines the sizes and composition of the wealth portfolios of employees in order to: a) establish whether they are diversified; b) ascertain the wealth adequacy; c) find out which personal attributes are key determinants of the portfolios; and d) develop descriptive wealth holding models. A composite conceptual framework integrating the theoretical models of LCH, MPT and Sociological Approach was developed and used in this study. The above informed the use of a deductive research design that guided the development of suitable research hypotheses which were tested using empirical data to realize the study objectives. The target population for the study comprised all the salaried middle and upper income employees in Kenya. In this survey, questionnaires were administered on a random sample of 1,067 salaried middle and upper income employees drawn from a stratified random sample of large institutions. A response rate of 75% was achieved. Data collected on personal wealth levels and personal attributes was analysed and tested for independence and correlation using statistical tests such as Analysis of Variance, Pearson product-moment coefficient, and Multiple regression analysis, among others.

The study establishes that the sampled employees hold under–diversified wealth portfolios. Firstly, they do not hold equal proportions of all the asset types in the market as stipulated under naïve diversification (Carnner, Mankiw & Weil, 1997; DeMiguel, Garlappi & Uppa, 2009). The wealth portfolios are dominated by cash and property with mean proportions of 57% and 36%, respectively. They are also simple; the mean number of assets held is three with the top three assets accounting for 87% of the wealth values. Secondly, the mean shareholding of equity investors is three listed companies against a recommended minimum of 11 listed firms. These findings contradict theory but are in line with empirical evidence from documented personal wealth studies in developed countries.

In common with other studies, this research finds that the sampled employees may not have adequate wealth to meet their consumption needs while in retirement. This is based on the findings that the mean proportion of the employees' estimated retirement income to current employment income, also referred to as the replacement rate, is 43%. This rate is significantly lower than the recommended minimum of 70%.

The study establishes that the quantitative personal attributes that are the main determinants of wealth size are employees' income, age, proportion of risky assets held, inherited wealth and savings rate. Also, the main categorical determinants are income classification, job seniority, cultural background and education. Other findings are that the quantitative attributes that are the main determinants of wealth composition as measured by the proportion of risky assets held are: wealth size and employees' income. The main categorical determinants of wealth composition are similar to those for wealth size. Whereas the commonality of the determinants noted above implies that the concepts of wealth size and composition are closely related, the results further show that wealth determinants have a closer relationship with wealth size than its composition. Overall, these findings largely conform to theory and corroborate evidence from prior studies.

Multiple regression analysis and multiple discriminant analysis are used to develop descriptive models to depict the relationships between various personal attributes on the one hand, and the monetary size, as well as the level of employees' wealth holdings, on the other. Further analysis shows that life cycle factors have a closer relationship with wealth portfolios when compared to MPT and Sociological factors.

It is recommended that employees should target high wealth and diversified portfolios. In this pursuit, employees can rely on the descriptive predictive models to plan their investments. Professional advisors, who are consulted by most employees, can play a key role in this. Also, the government can help by formulating and implementing policies to widen the scope of available investment choices, avail more data on asset returns, simplify and improve the investment process as well as cultivate a culture of objective investments among employees.

With respect to the wealth portfolios of employees in a developing country, the study has contributed to net knowledge by demonstrating the challenge of diversification, showing quantitatively the inadequacy of wealth, and isolating the key personal attributes that policy makers should target to improve employees' welfare. The findings also suggest that personal wealth portfolios in developing countries can be studied scientifically and objectively, thus calling for wealth surveys and researches. Majority of the research gaps are thus addressed.

Conflicting evidence to the prescription of MPT that wealth maximizing investors should hold diversified portfolios suggests the need for further work to establish what informs the composition of wealth portfolios, especially noting that simple portfolios are associated with little wealth and that over 87% of the employees indicated that they aim to maximize returns when investing. On account of simple and undiversified portfolios, employees may be unable to accumulate adequate wealth to support them in retirement, thus worsening the dependency burden. Further studies could also examine the role of investment advisors in influencing employees' risk-taking behaviour, their investment plans and hence their wealth holdings. Also, a similar study can be designed to examine the wealth portfolios of informal sector employees, who comprise about 68 per cent of total employees in Kenya (GoK, 2009b).

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Abbreviations and Acronyms

ANOVA	Analysis of Variance
BHPS	British Household Panel Study
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
COTU	Central Organization of Trade Unions
CPI	Consumer Price Index
DCF	Discounted Cash Flow
EPISTEL	Economic, Political, Informatics, Social, Technological, Environmental and Legal
ERS	Economic Recovery Strategy
EVS	German Socioeconomic Panel (Wealth Survey)
FKE	Federation of Kenya Employers
FRS	Financial Research Survey (in UK)
FRSS	Family Resources Survey (in UK)
GDP	Gross Domestic Product
GoK	Government of Kenya
GTZ	Deutsche Geselleschaft Technische Zusammenarbeit
HILDA	Household, Income and Labour Dynamics in Australia
HRS	Health and Retirement Study (A Wealth Survey in USA)
ILFS	Integrated Labour Force Survey (in Kenya)
INSEE	French National Institute for Statistics and Economic Studies
KIHBS	Kenya Integrated Household Budget Survey
KLIPS	Korean Labour Income Panel Study
KMO	Kaiser-Meyer-Olkin Measure
KNBS	Kenya National Bureau of Statistics
LCH	Life-Cycle Hypothesis
MSA	Measure of Sampling Adequacy
MPT	Modern Portfolio Theory
MDA	Multiple Discriminant Analysis
NSE	Nairobi Stock Exchange
PEPs	Personal Equity Plans
RBA	Retirement Benefits Authority

SA	Sociological Approach
SACCOs	Savings and Credit Cooperative Societies
SAPs	Structural Adjustment Programmes
SCF	Survey of Consumer Finances (A wealth Survey in U.S.)
Shs	Kenya Shillings, the currency of Kenya
SHIW	Survey of Income and Expenditures (in Italy)
TIAA-CREF	Teachers Insurance and Annuity Association-College Retirement Equites Fund
UHBS	Urban Household Budget Survey (in Kenya)
UNDP	United Nations Development Programme
UK	United Kingdom
USA.	United States of America
US$	United States Dollar

CHAPTER ONE

INTRODUCTION

1.1 *Background of the Study*

The acquisition of more wealth is a common goal of most nations, communities, households and individuals. This is largely because wealth is a key enabler of consumption (Engen, Gale & Ucello, 2004) as explained by Keister (2007) who opines that '...Wealth is among the most fundamental indicators of well-being because it is relatively enduring and related in some way to most other measurements of achievement' (p.1). Consequently, personal wealth has recently been the subject of considerable interest among academicians, policymakers and practitioners. Most of the documented studies on personal wealth have tended to use macro-level approaches (Banca d'Italia, 2007) to examine its distribution in terms of the structure and inequalities in the assets held by diverse groups within and across countries. The studies show that personal wealth is unevenly distributed and tends to be more concentrated than income among the rich and by region (Torche & Spilerman, 2007).

Among developed countries, a new frontier on wealth holding emerged recently due to widespread financial reforms, investment product innovations, availability of wealth data and advances in analytical techniques (Guiso, Haliassos & Jappelli, 2002). This has led researchers on personal wealth to adopt micro-level approaches that employ modern principles of personal finance to examine, prescribe and describe investment processes and their asset holding outcomes. The focus of such studies has been how families and individuals obtain, budget, save and spend monetary resources over time, taking into account various financial risks and future life components. Studies by Browning and Crossley, (2000), Munnnell, Webb and Delorme (2006), among others, report that these private resources, also referred to as personal wealth portfolios, are usually inadequate and vastly dissimilar among comparable households and individuals.

The theoretical constructs and empirical evidence from the micro-level studies referred to above provide useful bases for carrying out similar research on personal wealth portfolios in developing countries where related research has focused on poverty rather than wealth. Also, the design of such research can benefit immensely from lessons learned from wealth studies in developed countries. An understanding of the salient features of the progress in discourses on personal wealth, as highlighted below, can also inform these investigations.

The publication by Adam Smith titled *The Wealth of Nations,* marking the start of classical economics (Smith, 1776), is often cited as the earliest substantive discourse on wealth. Informed by this publication, economics was re-orientated away from analyzing rulers' personal possessions in feudal systems and directed to examining asset class-based interests. Henceforth, the wealth of a nation was represented by yearly national income comprising rent to landlords, interest to capital, and wages to labour. In these groundbreaking works, Adam Smith further opined that religion is a key determinant of wealth and economic development.

The next wave of interest in wealth occurred much later during the great depression of the 1930s, when high unemployment and low production signaled the failure of classical economists' premise that economies generally tend towards equilibrium and full employment (Keynes, 1936). According to Galeotti and Karakostas (2010), this ushered in neoclassical economics that was based on the assumptions of *rational preferences, maximizing income-constrained utility, and efficient market hypothesis.* After holding ground for half a century, these foundations were shaken by new knowledge from analyses of survey data and experiments showing that peoples' behaviour systematically deviates from the predictions of traditional finance and neoclassical economic theory (Kahneman & Tversky, 1979). The findings inspired researchers to incorporate psychology into wealth models, thereby giving birth to behavioural finance and behavioural economics.

In view of the lessons from historical evidence, the review of literature in Chapter two of this thesis begins in earnest from the second half of the 20th Century. Some of the defining features of this period with respect to personal wealth are that: (i) it marked the start of sustained searches for objective ways of studying personal wealth; (ii) survey data on households' and individuals' incomes, wealth and expenditure was made publicly and widely available; and finally, (iii) the use of new analytical tools enabled innovative and extended study designs. This was also a transition period from industrial to knowledge economy.

1.2 Conceptual Basis of Personal Wealth Portfolios

This Section discusses briefly the conceptual bases of personal wealth generation and the holders. Personal wealth is the object while wealth holders are the subjects.

1.2.1 *Underlying Concepts of Personal Wealth*

Conceptually, wealth is closely tied to the usefulness of the asset held and the precursor variables of income, consumption, saving and investment. This flows from the central theme

of most consumption functions which suggest that people divide their consumption between the present and the future based on estimates of their needs in the long run. Crossley and Pendakur (2002) provide a useful customisation of this analogy by employing Canadian expenditure data to show that wages usually determine earnings which are the bases of income that in turn enables consumption and finally leads to material well-being. From this model, the most critical elements in the study of personal wealth portfolios emerge to be income, savings, investments and wealth itself. These concepts are amplified below.

The outputs of the Crossley-Pendakur model find wide support in literature where for instance, the Kenya National Bureau of Statistics (KNBS) concurs that 'consumption is a more satisfactory measure of well-being for both theoretical and practical reasons', (GoK, 2007a) p.23. Additionally, the flow process of the Crossley-Pendakur model clearly shows that investment activity is necessary for wealth creation. This aspect is supported by recent studies that suggest that the financial behaviours of households and individuals are hierarchical. One such study was by Hilgert and Hogarth (2003) who examined Survey of Consumer Finances (SCF) data in USA to explore the connection between financial knowledge and household behaviour. The researchers reported a continuum of application of financial management whereby over 75% of the households practiced cash-flow management; 58% carried out credit management; 50% were additionally able to save, while only 46% were able to make investments for wealth creation.

Personal wealth is often denoted as the market value of a person's net assets (Badu, Daniels & Salandro, 1999; Bodie & Crane, 1997; Davies, Sandstorm, Shorrocks & Wolf, 2007; Johnson & Tanner, 1999; King & Dicks-Mireaux, 1982; Weicher, 1997). These studies do not however, attempt to ascertain whether the asset prices are supported by the neoclassical theories of the efficient market hypothesis, a phenomenon that has been the subject of wide debate by the proponents of behavioural finance (Thaler, 1999). Whereas it is agreed that net assets is the residual amount after deducting personal debts such as loans, mortgages, credit card liabilities and advances from the gross value of personal assets, there is lack of concurrence on the definition of the asset types that depict the nature of wealth. As discussed in Chapter Two, the diversity of assets held and the relative proportions are critically important because assets are not homogenous in unit size and income earning streams.

Scholars have advanced other definitions of wealth that are discussed herein for completeness. Using a neoclassical approach, Robinson (1956) defines wealth as the

command over goods and services; a definition that is not preferred due to the inability to quantify command. Another definition is offered by Tracy and Schneider (2001) who opine that wealth is associated with wealth accumulation which occurs when there is a long-lasting increase in assets such that savings exceed dissavings. Other scholars (Carsberg, 1974; Gibson & Scobie, 2003) adopt an opportunity cost and discounted cash flow (DCF) approach and define wealth as the present sum that an individual would exchange for all cash flows that will be available for future consumption without a sense of loss or gain. Thus, the DCF approach equates wealth to the present value of future earnings. Because of the difficulties in estimating the amounts and timing of future cash flows as well as lack of agreement on a suitable discount factor, the DCF approach is seldom used in wealth valuations.

Tracy and Schneider (2001) define income as the flow of resources to a consumption unit in a given period. Thus, employee earnings are measured in terms of disposable income that Hyman (1992) defines as income obtained by individuals after deducting personal taxes and other non-tax payments to government. Papatheodorou (1998) corroborates this and argues that household pre-tax income comprises incomes from labour, entrepreneurship, property, agriculture, social security and others such as alimonies, gifts, remittances and imputed rent. This view is supported by government records whereby the Kenya Integrated Household Budget Survey (KIHBS) identifies the three main sources of household income in Kenya as salary and wages, business income and agricultural income (GoK, 2007a).

According to Juster, Smith and Stafford (1999), savings may be defined as the algebraic sum of new money put into assets plus net repayments of debt obligation. However, at a personal level, this definition is rarely used. Other researchers (Claus & Scobie, 2002; Tracy & Schneider, 2001) apply the *stock* concept and define savings as an increase in net wealth over a given period after adjustment for capital gains, losses and net transfers. The same researchers follow the reasoning by Keynes (1936) that income not consumed is saved and adopt the more commonly used *flow* concept to define savings as the direct reports by respondents of either the saving itself or the difference between current disposable income and consumption expenditure. In this case, savings are expressed as a percentage of income. Loayza, Schmidt-Hebbel and Serven (2000a) emphasize the centrality of savings in the wealth accumulation process and state that they drive investments. This is underscored in leading textbooks (Friedman & Hahn, 1996; Reilley & Brown, 2000) and reinforced by Ameriks, Caplin and Leahy (2003) who find from their review of Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF) data that households

with a propensity to plan tend to achieve higher savings and have more wealth.

The fourth concept that requires clarification within the wealth paradigm is investments. In this regard, an important insight is provided by Carsberg (1974) who observes that the most essential feature of investment is that it involves the commitment of resources that could be used for current consumption, results in benefits at a future date and both outlays and expected benefits do not always coincide. This view is supported by Reilley and Brown (2000) who define investment as 'the current commitment of money for a period of time to derive future payments that will compensate the investor for the time the funds are committed, expected inflation and uncertainty of future payments' (p. 99). The import of the above with respect to this study is that the investment activity of employees is a key process in informing their wealth portfolios.

1.2.2 *Households versus Individuals as Unit of Wealth Analysis.*

At the micro level, wealth is held by individuals or households which GoK (2003a) defines as a group of persons residing in the same compound, answerable to the same head and pooling and sharing resources for common provisions. A related concept is family which refers to all persons residing in the same dwelling and are related by blood, marriage or adoption, (Chen and Dunn, 1996; Modigliani & Jappelli, 2003). In this study, households and family are used interchangeably as is the case with most personal wealth studies.

In common with most social, microeconomic and public sector models, personal wealth studies are often designed using the household as the unit of analysis. However, recent observations indicate that this approach suffers from a number of challenges that are discussed below. Further details of the differences between households and individuals as units of analysis are outlined in Appendix 1 of this study.

Firstly, households have a definitional problem and are not always stable: they tend to be amorphous and can denote one individual or family members or an unrelated group of people. In this regard, Chen and Dunn (1996) point out that the composition, size and structure of households vary widely between and within society and over time. Secondly, and of more concern, is how to resolve the conceptual issue of the decision-making process and preferences of households. Whereas the neoclassical model treats a household as a single decision-making agent with unitary preferences, the more recent collective model recognises the role of negotiations, bargaining and conflict in the allocation of household resources, and

calls for the specific investigation and understanding of the process of intra-household distribution of resources and tasks. The third issue relates to outcomes wherein researchers argue that households are intermediaries between policies/programmes and targeted individuals. For this reason, analyses based on households are not preferred.

The foregoing establishes a case for a study of wealth portfolios based on individuals rather than households. This is based on the principal reasons that individuals are the primary economic units; possess an unambiguous conceptual definition; have clearer decision-making mechanisms and are usually the targets of policy. Moreover, recent upsurges in urbanization, commercialization and rapid industrialisation have given rise to a large number of employees, who comprise a special group of individuals as explained below.

1.2.3 *Employees in the Context of Wealth Holding.*

Employees are a widespread global phenomenon mainly due to specialization and division of labour, the creation of large-scale enterprises following the second industrial revolution between 1870 and 1930, and the subsequent rise of the service economy. Also, recent advances in technology and gains of economic development have led to massive automation of primary production which has replaced most unskilled workers. An important outcome of the above is the creation of a large and critical mass of a human resource cadre comprising office and factory workers, administrators and executives, who are paid salaries for their services. This group of service providers is known as salaried employees.

For the purposes of the current study, salary is important because it comprises the largest part of an employee's income (GoK, 2002) for consumption expenditure and savings. Whilst savings form part of an employee's wealth portfolio and may be used to fund investment, the potential stream of earnings from future salary is uniquely important, especially in environments of low saving and borrowing constraints in that such savings can be used to leverage on credit finance for wealth creation.

1.2.4 *Key Observations Based on the Conceptual Review*

The foregoing conceptual review brings to fore a number of justifications for studying the wealth portfolios of employees. Firstly, literature indicates that personal wealth helps to even out consumption by insulating holders against adverse events such as illness, unemployment and age (Davies et al., 2007). Thus, Engen, Gale and Ucello (2004) argue that wealth is a key enabler of consumption especially in retirement in that before retirement, consumption may

be financed by employment earnings, accumulated assets, or inheritances received, whereas when in retirement, personal consumption is usually financed by assets accumulated earlier and annuity income from social security and pensions.

The second justification for studying personal wealth is offered by Gutter, Fox and Montalto (1999) who opine that wealth increases the ability of households to deal with financial shocks of disability or death of a key income earner. This view is supported by Hilgert and Horgarth (2003) in their observation that wealth bestows to a household a level of financial security that enables it to contribute to thriving communities and thereby foster community economic development. Personal wealth, therefore, yields positive behavioural outcomes that improve the well-being of the holder and wider society.

On the supply side, it is important to note that recent deregulations and financial liberalization have provided consumers and investors with a wide variety of consumption and complex investment choices. When these choices are combined with the emergence of the equity culture, the result is that planning for consumption and investments has become a relatively complex activity (Poterba, 2001a). This is heightened by the 2007/2008 global financial crisis that has led to massive erosion of asset prices and substantial decline in investors' wealth. All these underscore the need to understand personal wealth portfolios.

Resting on the family life cycle, the current trend of an ageing population alongside reduced government support for private consumption has also put into focus the need to examine personal saving behaviour and understand people's wealth portfolios (DeVaney & Chiremba, 2005; Leigh, 2006). Also, this issue has assumed more significance on the realisation of the failed traditional view that retirement income can be fully conceptualised as a *three-legged stool* comprising *state social security system*, *employer pensions*, and *private savings*. Consequently, the researchers call for the *fourth* and *fifth leg* to support retirement income for sustenance of consumption and standard of living at the pre-retirement level.

Regarding adequacy of retirement income, an issue that has received wide attention recently is whether the large number of people on the verge of retiring will have enough resources to live on comfortably in their retirement. In the USA, for instance, the older baby boomers who were born between 1946 and 1954 have already retired; the younger baby boomers born between 1955 and 1964 are next in line (U.S. Department of Labour, 2005). The concern over the financial needs of longer living citizens gives rise to the *fourth leg* that refers to

earnings generated from personal investments. This therefore implies a need to understand personal wealth portfolios which generate these investment earnings.

Finally, studies in traditional societies in Africa and Asia suggest the existence of a *fifth leg* to support retirement income in the form of *bride wealth* and *dowry*. Hoogeveen (2000) and Maitra (2007) in their examination of the role of *bride wealth* as a source of retirement income find evidence to suggest that it (bride wealth) may play an important role in providing such income to rural folk. Nonetheless, this form of wealth lies outside the scope of the current study that focuses on salaried employees; a group that is unlikely to derive sizable income from rural crop farming and animal husbandry, and would most probably be working in the urban formal sector.

With respect to personal wealth portfolios, a recapitulation of the four concepts of wealth, income, savings and investments as well as employees helps to provide a possible direction for the current study. Firstly, an analysis based on the inter-temporal consumption-saving choice decision of the investor emerges as key for the study. This reasoning suggests a key role for the life-cycle hypothesis (LCH) as proposed by Modigliani and Blumberg (1954), where age is deemed as the most important factor in informing personal incomes, savings, consumption, and hence wealth. Secondly, a further analysis is required that is premised on assessing investors' allocation of resources among alternative assets in the investment process in order to maximize wealth. This reasoning suggests the need to apply modern portfolio theory (MPT) as proposed by Markowitz (1952). Another aspect that emerges is the need to recognize the uniqueness of investors and how this impacts income generation, and saving and investing processes in varying environmental conditions. This dimension alludes to psycho-social issues and suggests the need to consider some of the underlying behavioural aspects that could inform the holders' wealth portfolios.

1.3 *Perspectives of Personal Wealth Portfolios*

The key milestones in the historical development of thought and knowledge on personal wealth portfolios are discussed below. This is done through a brief review of the underlying theoretical frameworks and the environment in which wealth is built and held.

1.3.1 *A Contextual View of Studies of Personal Wealth Portfolios*

A common feature of developed countries is the good standards of living enjoyed by its citizens on account of high levels of incomes, consumption and wealth holding. This is

supported by a system that delivers low unemployment rates, high education levels, functioning institutions and stable politics. Such countries embrace high technology in information, communication and production to reduce transaction costs and enable various production processes to flourish. Among others, these features create environments that are supportive to investments and creation of substantial personal wealth. This contrasts sharply with the situation in low income developing countries as shown in Appendix 2.

A large proportion of the innovative approaches to the study of personal wealth portfolios was evidently originated in the USA, thereafter spreading to other developed countries. According to Torche and Spilerman (2007), recent literature on personal wealth portfolios in these countries is centered on three aspects. The first are descriptive studies of wealth holding; the second are investigations into the determinants of household wealth accumulation and parental motives in making wealth transfers, while the third is the effect of household wealth on various outcome measures. Some key elements in these studies are the circumstances and the underlying theories that are applied in the study of personal wealth.

Literature reviewed shows that the earliest micro-level studies on personal wealth were informed by theories on aggregate consumption, savings and investments that are traced to mid 20th Century. Thus, Keynes (1936) proposed the Keynesian theory to explain the behaviour and determinants of consumption and suggested that consumption expenditure is a stable function of current disposable income and that savings depend wholly on income. Building on this theory, the *relative income hypothesis* of Duesenberry (1949) suggested that people are concerned about relative and not absolute consumption. A significant re-orientation was later provided by the LCH of Modigliani and Blumberg (1954), which emphasized the role played by age in determining consumption and wealth holding. This new thinking was amplified by the *permanent income hypothesis* of Friedman (1957) which suggested that the real determinant of consumption and savings is lifetime rather than transitory income. Among these three, the LCH has gained wider acceptance and has been used extensively to study the size and composition of personal wealth with respect to age.

Contemporaneously, researchers who were focusing their attention on asset-pricing in the USA had set out to prescribe how investors should structure their investments on the basis of existing neoclassical frameworks to achieve optimal wealth portfolios. Research in this area climaxed in the formulation of the *modern portfolio theory* (MPT) by Markowitz (1952) which has thereafter been used widely by economists and finance scholars to study personal

wealth portfolios with emphasis on how investors optimise the return and risk relationships of their asset portfolio by diversifying their investments. The prescription from a theoretical and investment advisors' perspective is that the portfolios of wealth maximising investors should be fully diversified. This said, discussions in Chapter Two surprisingly show that empirical evidence is not consistent with theory.

According to Guiso et al. (2002), personal wealth studies in developed countries have received a big boost from the institutional changes that occurred in the later part of the 20th Century. Firstly, the privatizations of state corporations and accompanying institutional reforms resulted in a large increase in the supply of investment options. Secondly, public data on personal wealth from national balance sheets, estate records, income tax returns, and national wealth surveys provided useful inputs for wider and more comprehensive empirical tests. Thirdly, the liberalization of financial and capital markets, the removal of barriers to trade, as well as the increase in product offerings such as hedge funds and derivatives, resulted in widened investor choices and made investing a demanding and important activity that requires an objective professional approach. Some key outcomes of all these changes are that personal wealth portfolios have recently become larger in monetary value, wider in the range of assets held, and more complex in design and management (Poterba, 2001a).

From a family life-cycle perspective, the ageing population in developed countries has significant implications on the adequacy of personal wealth as a source of income to support consumption in retirement. The commonly used measure for the adequacy of personal wealth is the replacement rate, which Munnell et al. (2006) define as the percentage of a person's income in retirement to the pre-retirement income. Owing to its increasing importance and relevance, most recent studies on personal wealth have extended their scope to examine this emerging concept of replacement rate.

Technological advancements in computing have had their impact on personal wealth studies as well. Thus, dating back to the 1970s, research using empirical data on personal wealth has employed newly-developed and more advanced analytical methods. In this regard, logit, tobit and probit regressions and multivariate analyses have been applied widely to reformulate existing wealth portfolio models and expand the underlying theories with a view to improving their efficacy.

Lastly, some key concerns arising from personal wealth studies require special mention.

These include findings that: (i) during their working life, people do not save enough for their consumption needs in retirement (Mitchell & Moore, 1997), (ii) similar households appear to reach retirement with very different wealth levels (Browning & Crossley, 2000); (iii) in contrast with expectations of rational investment theory, Banks and Smith (2000), King and Leape (1987), Georgarakos (2002) and others find that personal wealth portfolios tend to be simple and undiversified. The import of the deviation of these findings from convention, coupled with portfolio diversity, invokes the need for convergence of disciplines in the examination of wealth portfolios. Consequently, a number of researchers in the 21st Century have argued for the adoption of a multidisciplinary approach to understand personal wealth.

Developing countries, including formerly communist countries in transition, portray a distinct scarcity of information on personal wealth. Some features that may have profound impact on personal wealth are discussed hereunder using the EPISTEL framework of environmental, political, informatics, sociological, technological, economic and legal systems.

The demand side of wealth creation is characterized by low incomes, high poverty levels, little education, and limited financial knowledge among majority of the people who either live in rural areas or are mainly engaged in the informal sector. This has a negative impact on saving, investments and wealth holding. The supply side of wealth creation comprises unstable politics, weak financial systems, immature institutions and considerable inflation with a six year annual average to 2009 of 10% per CBK (2010). When coupled with uncertainties, these factors tend to dampen wealth holdings. Another possible impediment to wealth holding that arises from underdeveloped trading systems is asset scarcity (Torche & Spilerman, 2007). This situation is compounded by the fact that trading in shares is not common, while real estate may also not be widely held due to lack of suitable indices and investment trusts. It can therefore be inferred that investments and large wealth portfolios would be constrained by these unsupportive demand and supply conditions.

The other key issue is the absence of studies on personal wealth in developing countries. This is partly explained by the unfavorable investment environment noted above, and the lack of reliable personal wealth data (Davies & Shorrocks, 2000, Gurieve & Rachinsky, 2006). According to Torche and Spilerman (2007), the few studies on wealth portfolios in developing countries tend to associate personal wealth with productive resources such as educational attainment and social capital; a definition which conceptually contrasts sharply with that for developed countries where assets refer only to material items. Consequently,

personal wealth studies in developing countries are scanty and are usually geared towards the measurement of wealth and its effects, rather than understanding the nature and determinants of the wealth portfolios. This is a significant research gap.

In Kenya, the investment climate is adversely affected by unstable politics on account of a nascent multi-party democracy and a non-cohesive multi-ethnic and multi-religious community. Other challenges to investments include asset scarcity, lack of financial sophistication, low literacy, underdeveloped institutions and inadequate regulatory framework, double-digit interest spreads, as well as a weak economic base of investors due to low income levels. The drag caused by low earnings is aggravated by an age dependency rate of 77% (GoK, 2008a). Given this situation, which is typical of a low income developing country, a study of personal wealth portfolios in Kenya is expected to yield net knowledge.

1.3.2 *Wealth Portfolios of Employees in Kenya*

The evolution of personal wealth portfolios in Kenya is closely tied to the country's development experience. Some key elements that have informed government policy and shaped the country's institutional arrangements, commerce and the conduct of persons include the colonization of Kenya in 1895; the attainment of independence in 1963; and Kenya's Sessional Paper no. 10 of 1965 on African Socialism and its Application to Planning. Others are the Structural Adjustment Programmes (SAPs) in early 1980s; Session Paper no. 1 of 1986 on Economic Management for Renewed Growth; the Economic Recovery Strategy (ERS) for Employment and Wealth Creation of 2003; and the Kenya Vision 2030, the country's current long term development plan.

1.3.2.1 Evolution of personal wealth portfolios in Kenya

Using Kenya's political and economic performance as a basis of periodisation, researchers (M'Amanja & Morrissey, 2005; Mwega & Ndung'u, 2002; Ndulu & O'connell, 2000) identify four major periods: (i) pre-independence period to 1963, (ii) post independence period of improving economic performance from 1964 to 1974, (iii) a relative poor performance period from 1975 to 2002, and (iv) a recovery period from 2003. This periodicity is anchored on socio-economic development that informs the personal wealth portfolios and the wealth accumulation process in Kenya. In this study, four major phases in the evolution of personal wealth portfolios in Kenya were identified. These include: (i) race-based land, livestock and crop wealth holding between 1895 and 1967; (ii) monetisation of wealth holdings from 1968 to 1986; (iii) diverse and broad forms of wealth holdings from

1987 to 1997; and (iv) capital and marketable forms of wealth holdings from 1998 to present.

During the colonial period, the Kenyan economy was structured to produce agricultural raw materials for the British industries through few large-scale white-owned farms and many small-holder crop farming by Africans, observes Nasibi, (1992). Whereas the white farmers were wealthy and operated within the small and limited formal economy, the Africans were poor and concentrated in the non-cash economy. The financial system lacked monetary independence, there was little modern commerce and industry, and hence negligible formal employment. For this reason, personal wealth for the largely rural African population was held in the form of communal land, farm animals and agricultural produce. Thus, in the period to 1966, when the Central Bank of Kenya (CBK) was set up, the typical wealth portfolios may be described as *race-based land and livestock and crop wealth holding.*

In line with Sessional Paper no. 10 of 1965, the newly-independent nation adopted a government-led development paradigm with three major policy thrusts (Kimenyi, 2007). The first was to encourage the redistribution of large agricultural estates to small holders and with supporting farmers' cooperative societies to purchase land from White settlers, market the produce and provide farm inputs and credits (Mwega & Ndung'u, 2002). The second thrust involved wide government controls whose epitome was a high level of industrial protection to encourage local production for export. The third was the encouragement of savings and capital accumulation. This resulted in heavy investments by the government in the financial sector such as the setting up of the Central Bank of Kenya in 1966, and the establishment of several commercial banks and development finance institutions.

The policies adopted in the late 1960s were largely successful and enabled the economy to undergo a structural transformation resulting in remarkable growth in industry and agriculture, reports IFC and Central Bank of Kenya (1984). Expansion of cash crop farming and primary processing of agricultural produce also enabled more Africans to participate in the cash economy leading to increased employment of salaried employees and a rise in urban population. The financial sector responded with the growth of a wide banking network, farmer-based agricultural marketing cooperatives, workers' Savings and Credit Co-operative Societies (SACCOs) and insurance companies. These developments ushered in new types of personal assets in the form of bank accounts; savings in SACCOs and some life assurance policies. In the twenty years to 1984, SACCOs increased from 2 to 1,038 while commercial bank deposits and wage employees doubled in the same period, GoK (1985). Thus the period

between 1967 and 1986 was characterized by *monetization of wealth holdings.*

The third phase in the evolution of personal wealth portfolios was between 1987 and 1997 when liberalisation led to privatization of several state companies, share floatation as well as introduction of enabling institutional reforms in the banking sector, stock exchange, insurance and pensions. Between 1975 and 1979, the country experienced a large balance of payments problem, while exports and private investments fell due to a combination of high oil prices, world inflationary pressures and a failure of the country's import substitution strategy. Development agencies responded by suggesting policy reforms between 1980 and 1990 that were tied to aid conditionalities under the Structural Adjustment Programmes (SAPs). These reforms were aimed at influencing resource allocations through market forces and downsizing government, thus leading to liberalization of the financial markets, deregulation of external trade, freeing up of controls on foreign exchange and capital account, free movement of goods in the domestic market as well as decontrol of domestic prices (Ndung'u, 2000). Regrettably, Kimenyi (2007) points out that these policy reforms failed to bring about the anticipated growth and instead led to high inflation, increases in poverty rates, and unequal distribution of incomes.

Some of the major institutional reforms during this period were the enactment of the Insurance Act, 1987, the establishment of the Capital Markets Authority (CMA) in 1989, relaxation of permitted ownership of local companies, and the conversion of the then Nairobi Stock Exchange into a company in 1991. These reforms moved in tandem with government privatisation programmes of state enterprises, starting with the sale of its 20% stake in Kenya Commercial Bank in 1988. Consequently, trading in shares and bonds in the stock exchange increased. Thus, listed shares, bonds and life assurance policies, emerged as significant new forms of personal investments. Additionally, the enactment of the Retirement Benefits Act (1997) brought order in the pensions sector, leading to an increase in members, pension contributions and retirement assets. The period 1987 to 1997 was thus characterized by *diverse and broad forms of wealth holdings.*

The institutional reforms of the 1990s increased the availability and tradability of shares, treasury bonds and property, thus leading to the fourth phase in the evolution of personal wealth. Furthermore, the ERS (GoK, 2003b) spelt out specific modernization efforts, including lower interest rates, prudent control over government expenditure, public service reform, especially through performance contracting and strategic planning which provided

further impetus. Its more ambitious successor, the Vision 2030, has a longer time span and builds on these solid foundations. Vision 2030 is expected to lift Kenyan citizens to higher standards of living, through improved prosperity, based on high incomes and wealth.

A key beneficiary of recent policy thrusts was the recovery of the property sector leading to a boom in urban residential houses due to wider availability of term loans at lower costs as well as government policy in support of housing. The result is wider ownership of urban houses by employees through bank and SACCO loans such that the contribution of housing ownership and dwellings to GDP rose from 7% in 1984 to 23% in 2007. Also, the introduction of electronic trading in shares in 2006 and successes of initial public offers further popularized investment in listed shares by individuals. Consequently, the wealth portfolios of salaried employees are likely to include urban housing, listed shares, and retirement assets, which are hereby called *capital and marketable wealth portfolios*. Useful data on these wealth portfolios are provided by reports in GoK (2003b) and household surveys (GoK, 2007a; GoK, 2007b) as well as sector portfolio positions as shown below.

Table 1.1: Composition of the Asset Portfolios of the Pension Sector in Kenya

	December 2010 Per cent of total value	June 2011 Per cent of total value	Mean %
Government Securities	32	33	33
Quoted Equities	29	26	27
Immovable Properties	18	18	18
Guaranteed funds	7	9	8
Corporate Bonds	5	4	4
Fixed Deposits	4	4	4
Cash	2	1	1
Offshore	3	4	4
Unquoted Equities	1	1	1
Total	100	100	100

Source: *Retirement Benefits Authority (2012)*

Table 1.1 shows that the pension sector asset portfolios are dominated by government securities and quoted equities; accounting for 60% of the investments. Additionally, the Retirement Benefits Authority (2012) shows that the National Social Security Funds (NSSF)

accounts for two-thirds of the assets, while the 17 registered funds make up the remaining one-third. These assets amounted to Shs471 billion in June 2011 and were 18% of the GDP.

Table 1.2: Composition of the Asset Portfolios of Unit Trusts in Kenya

	September 2009 Per cent of total value	September 2010 Per cent of total value	Mean %
Cash and Demand Deposits	11	7	9
Fixed Deposits	18	26	22
Treasury bills and bonds	17	18	17
Corporate bonds	10	2	6
Commercial paper	0	7	4
Quoted Equities	38	39	38
Other Unit trusts	3	0	2
Offshore investments	3	1	2
Total	100	100	100

***Source**: Capital Markets Authority, Quarterly Statistical Bulletin*

Totaling Shs25 billion in September 2010, the asset portfolios of Unit Trusts in Kenya were dominated by quoted equities and cash/bank deposits; all of which accounted for two thirds of the assets. As expected, the pension sector and collective investment schemes have nil holdings in SACCOs, which are specifically for individuals. To some extent, the asset portfolios of institutional investors provide useful stylized facts on the components of personal wealth portfolios in Kenya. However, the portfolio mix may not be typical for an individual investor who is not a professional wealth manager.

1.3.2.2 Employees in Kenya

In Kenya, employees form an economically significant group. For instance, GoK (1998) shows that employees supported about one–third of all the country's households. Comprising about 5% of the Kenya's population in 2008, their employment income accounted for about one-third of the country's Gross Domestic Product (GDP). Also, other publications (CBK, 2009) show that salaries and wages paid by the exchequer comprised about one-third of recurrent expenditure in 2008/09. A useful insight is given by the Report of 1998/99 Integrated Labour Force Survey (ILFS) where GoK (2003a) classified employed persons in Kenya into two. The first category are those in paid employment, while the second group are

those in self-employment (i) who are either at work for profit or family gain in cash or in kind, and (ii) those with an enterprise but not at work.

Kenya's Statistical Abstract of 2009, (GoK, 2009a) shows that employees' salaries in Kenya are low. The highest earners at more than Shs30,000 per month were 3.6% of the total while 18% earned between Shs25,000 and 29,999, and 21% earned between Shs20,000 and 24,999. The majority, 58%, earned below Shs20,000 monthly, and may be unable to save for investments from their salaries. Consequently, a study of the wealth portfolios of all employees may be conceptually flawed. This called for selecting employees for this study on the basis of an objective criterion. The answer to this question is provided by literature on social stratification that suggests that the most common classification is a hierarchical class-based partitioning. In this case, the analysis by Warner, Meeker and Eells (1949) of American society into upper, middle and lower class using social anthropology offers the best taxonomy. Literature shows that this classification is commonly deemed to be properly reflected by people's incomes, wealth and occupation.

In order to maintain consistency with government reports, the current study used the classification developed by KNBS based on the 1993/94 Urban Household Budget Survey (UHBS) that was used to compute the Consumer Price Index (CPI) in 1997 (GoK, 2002). The CPI computation which simultaneously employed household expenditures and incomes data applied the commonly-used basis of lower, middle and upper income classification of households. The report concluded that 'the analysis showed that there were very few households in the upper income group and so the middle and upper income were combined' (Ibid p. 41). Consequently, the survey grouped urban households into two: lower income and middle/upper income. The middle/upper income had a lower cutoff point of a gross monthly income of Shs10,000 and accounted for 20% of urban households, while the lower income group made up the balance of 80% of the households.

A subsequent and related study by KNBS using the KIHBS 2005/06 data (GOK, 2007b) provides new insights. Using this data, an accompanying report concludes that "...in the 2005/06 survey, the income groups in Nairobi comprised households with the following monthly income: lower income group, below Shs23,670; middle income group, between Shs23,671 and Shs120,000; and the upper income group above Shs120,000" GoK, 2008b, p8). This grouping yielded the following proportions: lower income households were 72.1%; middle income households comprised 24.1%, while upper income households were 3.8%.

Thus, the combined total for middle and upper income households was 27.9%. This income classification has been adopted as the national basis for both households and individuals in Kenya, and at the time of carrying out this study, this classification was still in force as reported in *Business Daily* (4th March, 2010, p. 1,4) per Appendix 3.

While the above categorization was for Nairobi households only, it provides the closest income-based classification of employees in Kenya. This basis is particularly useful because the KNBS annual salary data does not contain sufficient detail: all employees earning Shs30,000 and above are lumped together. Furthermore, it is instructive that Kenya's Ministry of Labour, the Federation of Kenya Employers (FKE) and the Central Organisation of Trade Unions (COTU) have adopted the KNBS household income-based classification for employees as well. For these reasons, this study adopted the KNBS-based income classification which is regarded as the official position of the Government of Kenya.

The analogy described above enabled the researcher to select middle and upper income employees as the targets for this study; a sizeable group with reasonable income to save and invest. Furthermore, the 1993/94 nation-wide survey indicated that middle/upper income households comprised about 20% of the urban population, whilst the 2005/06 study showed that they comprise 27.9 % of the Nairobi urban households. On these premises, the subjects of this study were about one-quarter of the population of salaried employees, and therefore, were expected to yield important lessons to inform research, practice and policy.

Other reports provide further support for using salaries as the basis of classification in this study. The survey of 4,800 families in all urban areas in 1993/94, (GoK, 2002) showed that employment income is the largest source of income. Cash salary accounted for 73.4%, employment income in kind 3.8%, business income 18.8%, while property and transfer income accounted for 4%. Similarly, GoK (1998) reports that for the urban non-poor, who are surrogates for middle and upper income employees, employment earnings accounted for 79% of household income, whereas business income was 14%. This trend is reflected in Republic of Kenya (2006) which concludes that 'on average, combined allowances in the public service account for about 28.6% of average monetary compensation, and salaries for 71.4%' (p. 14). Such evidence supported locating this study on salaried middle and upper income employees in Kenya.

1.3.2.3 Stylized facts about employees' wealth portfolios in Kenya

The foregoing yields some key facts on the wealth portfolios of employees in Kenya that can be broadly generalized as discussed below. However, in the absence of empirical personal wealth studies in Kenya, these stylized facts are drawn largely from macro-level evidence.

Following financial sector reforms and liberalization in the 1990s, financial wealth which comprises bank accounts, life assurance policies, pension scheme assets, equities, bonds, and cooperative shares are nontrivial wealth components. However, capital market wealth that includes quoted equities and corporate bonds is held by few employees and comprises a small proportion of their wealth portfolios because significant public issues of shares and bonds, as well as electronic trading are a very recent phenomenon in Kenya. Cooperative shares are widely held by employees primarily as saving and collateral instruments.

Salaried middle and upper income employees, who have the benefit of substantial employment income and considerable literacy, are inclined to have complex wealth portfolios whose objectivity and sophistication are constrained by asset scarcity and lack of market return data on all assets. The earnings data on cooperative shares and property are, for instance, not publicly available. These stylized facts beg the question of portfolio diversification.

A point of concern though is the reported low replacement and pension participation rates in Kenya wherein *The East African*, January 8, 2007 quotes an unpublished World Bank study indicating that retired Kenyan workers are likely to face abject poverty because the pensions paid are too low compared with their consumption needs. It adds that the monthly pension benefit for three-quarters and one–half of retired civil servants is less than 16% and 8% of their pre-retirement salaries, respectively. Also, Retirement Benefits Authority (2006) reports that pension receipts in the private sector are about 20% of members' pre-retirement incomes and that only 15% of employees are members of pension schemes. This is corroborated by GoK (2007a) which reports that only 11.6% of urban households receive pension incomes.

The combination of several emergent asset types and young institutional structures in a liberalized market engenders considerable portfolio heterogeneity among employees. The extent of this variability, the earnings potential of these wealth portfolios, and the underlying functional relationships with the wealth determinants, are not known.

1.4 *The Research Problem*

The search for sufficient personal wealth to enable and sustain consumption at levels that can sustain acceptable standards of living is a goal that is pursued by most individuals, households and governments. This calls for high growth in net assets by through strategic and objective goal–oriented personal investments to leverage finite resources. For this to happen, investors not only require an enabling environment but also need to appreciate the size, optimality and the earnings potential of their wealth portfolios. In addition, the ability of investors to enhance their wealth is helped if they understood how their personal attributes influence their wealth. In Kenya though, there is little appreciation of the nature, composition, size and diversity of the wealth held by salaried employees. Besides, the determinants of personal wealth have not been empirically studied. This inopportune situation may partly be explained by past development orientation towards poverty reduction which resulted in numerous poverty surveys and studies and negligible evidence–based information on wealth for use by investors, advisors and policymakers.

Based on the foregoing, three main research issues emerge that this study addresses. The first relates to the structure of employees' personal wealth portfolios, the second concerns the wealth adequacy, while the third addresses the functional relationships between employees' wealth portfolios and their personal attributes.

In order to grow personal wealth, MPT recommends that wealth maximizing investors should hold fully diversified portfolios whose mix should approximate the market portfolio. Despite the attractiveness of this strategy studies from developed countries indicate that personal wealth portfolios tend to be simple and undiversified. Unfortunately, such portfolios constrain wealth growth; a situation that could be worse in a low-income developing country, like Kenya due to an unfavourable environment and scanty asset data. The foregoing implies a need to examine the composition of the wealth portfolios of salaried middle and upper income employees in Kenya and ascertain whether they are diversified.

The lack of studies on personal wealth makes it difficult to ascertain the adequacy of the wealth held by employees to support their consumption needs while in retirement. This is of major concern because studies in developed countries indicate that employees who are about to retire do not have adequate wealth. In Kenya, high dependency rates, low replacements rates for households and poor pension participation rates compound this issue further.

The pursuit of enhanced wealth portfolios is hampered by little documentation on the functional relationships between personal wealth and its key determinants. The absence of such knowledge puts investors at a disadvantage in their efforts to structure superior wealth portfolios that are anchored on best practice. Likewise, policymakers and practitioners are unable to assist investors in this course. The need to understand the determinants of wealth portfolios is further accentuated by unsupportive personal and environmental features that are peculiar to developing countries. Some of these include: inadequate official data on assets, a narrow scope of investment options, minimal personal wealth accumulation culture, extended family dependency systems, and low incomes.

1.5 *Research Questions*

Analyses of the issues pertaining to the research problem entailed inquiring into the following five key questions: (i) Are the wealth portfolios of salaried middle and upper income employees in Kenya diversified? (ii) How adequate are the wealth portfolios of salaried middle and upper income employees in Kenya? (iii) What personal socio-economic attributes and characteristics potentially explain the monetary size of the wealth portfolios of salaried middle and upper income employees in Kenya? (iv) What personal socio-economic attributes and characteristics potentially explain the composition of the wealth portfolios of salaried middle and upper income employees in Kenya? (v) What models can be developed to explain the net wealth portfolios of salaried middle and upper income employees in Kenya?

Answers to these questions were enriched with information that was gathered on the role of borrowings and external factors in influencing the wealth portfolios of salaried employees. Five research objectives were formulated as shown below to answer these research questions.

1.6 *Research Objectives*

Regarding salaried middle and upper income employees in Kenya, the five study objectives were to:

i. Establish the composition in asset types and percentage of the wealth portfolios of employees, and therefore, whether the wealth portfolios are diversified;
ii. Ascertain whether the wealth portfolios of employees can generate adequate income for the employees to rely on during retirement;
iii. Establish which personal attributes explain the absolute sizes in monetary values of employees' wealth portfolios;

iv. Establish which personal attributes explain the composition of employees' wealth portfolios; and

v. Develop models to explain the net wealth portfolios of employees.

This study examined primary data that was gathered from responses by a sample of employees in Kenya. The sample elements comprised randomly selected public and private sector salaried middle and upper income earners. The field work for this study was carried out between March and September 2010.

1.7 *Importance of the Study*

This Section discusses the perceived importance of the study by highlighting the usefulness of the results for policy formulation, research, personal financial planning and business.

The study was expected to yield new knowledge on the wealth portfolios of employees in a low-income developing country. By focusing on wealth at the micro level, this positive-oriented discourse is a paradigm shift from previous wellness surveys and studies in Kenya that have concentrated on the poverty and its determinants.

The study was carried out in a low income developing country, where personal savings and investments are significantly challenged by low resource endowment, un-supporting investment channels and unfavourable investment conditions such as high inflation, opaque systems, and few investment choices. By using employees as the unit of analysis, the current study focuses on the basic economic unit which is normally the target of policy. In this respect, the study was designed to help in extending the frontiers of knowledge especially noting that previous wellness surveys and studies in Kenya targeted households only.

The study was designed to provide useful new knowledge on the nature, composition and size of the wealth portfolios of employees as well as new insights into the wealth determinants thereof. By shedding new light on the levels and patterns of wealth holdings amongst middle and upper income employees in Kenya, the study will yield invaluable information that can be used as input in policy designs to improve the standards of living of this group and others who depend on it. Besides, evidence on the adequacy of wealth will present a new set of data for policymakers, academicians and practitioners to engage with this matter on the grounding of an empirically-proven framework.

Finally, employees can also use the results of this study to re-evaluate their financial positions and review their financial plans with a view to improving the funding of their consumption needs while in retirement. Employers can use the models developed in this study to design remuneration packages and training programmes that enable their employees to improve their levels of savings, quality of investment plans and their wealth holdings.

1.8 *Organisation of the Thesis*

Chapter One discusses briefly the concept and context of personal wealth to identify the research problem and delineate the research questions and objectives. The principal theories that inform the main concepts, as well as the historical development of thought on personal wealth, are examined in Chapter Two. This Chapter integrates a review of empirical studies on personal wealth holdings to identify research gaps and develop a conceptual model for the study. To achieve the study objectives and respond to the research gaps identified, five research hypotheses are formulated and later tested. The model developed in this Chapter is later used to design and develop the research methodology in Chapter Three.

Chapter Four provides results of the analysis of the sample characteristics, while Chapter Five gives results of hypotheses testing and uses various mathematical techniques to model and profile wealth portfolios. Finally, Chapter Six provides a summary of the major findings of the study in relation to each of the research objectives. The implications of these findings to theory, practice and policy, as well as attendant recommendations, are discussed further. The Chapter closes by highlighting the study's limitations and delimitation, while proposing areas for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 *Introduction*

This Chapter reviews theoretical and empirical literature on personal wealth. A brief survey of relevant history is considered in Section 2.2, while Section 2.3 is devoted to a review of relevant theoretical literature. Section 2.4 examines related empirical literature. It starts with a survey of evidence on the nature and composition of personal wealth portfolios and later examines evidence from wealth studies premised on LCH, MPT and Sociological Approach (SA). Based on literature reviewed and with a view to answering the study's research questions, Sections 2.5 and 2.6 discuss the identified research gaps and consider a conceptual framework for application in this study, respectively. The Chapter closes with Section 2.7 that outlines the research hypotheses for testing to satisfy the study objectives in Section 1.6.

2.2 *Survey of Relevant History*

Bodie and Crane (1997) observe that prior to 1960, investing, as opposed to merely putting money in a savings account was governed by the *casino view* whereby investing and asset pricing were regarded as speculative affairs; the preserve of the rich. However, this view had come under attack earlier on from Williams (1938) who showed that the prices of financial assets reflect an *intrinsic value* that can be measured by the discounted stream of future income. This led to the growth of a new line of research on how investors should optimally allocate their savings between competing investments and how assets should be priced. A related thrust that was going on in parallel in the USA and UK was examining the relationships that existed between aggregate consumption, incomes and wealth. The postulates that emerged from these investigations and inquiries were later subjected to tests using empirical data on wealth holdings from surveys of personal consumption and wealth. For this reason, substantial inquiry into personal wealth is often traced to mid 20th Century.

Tracking theory, the 1962 Survey of Financial Characteristics of Consumers in the USA is cited as the first large-scale survey of personal wealth holdings. This was improved later by the 1983 U.S. SCF; a model which is widely used currently in developed countries. Important insight into the availability of wealth data is provided by Aron and Prinsloo (2006) who, in their attempt to produce comprehensive estimates of household balance sheets in South Africa observe that, whereas survey data and wealth studies styled in the manner of

SCF are now available in many developed countries, this is not the case in developing countries which suffer notable paucity of data. Similarly, Torche and Spilerman (2007) identify two important and relevant characteristics of personal wealth study. Firstly, that empirical evidence on wealth portfolios is a recent phenomenon, mainly from the turn of the 20th Century. Secondly, such evidence is only available in developed countries using survey data that is obtained from national panel and cross-sectional surveys, and to a small extent, from employee retirement accounts and personal income tax records.

2.3 *Review of Theoretical Literature*

This Section considers the theoretical literature that informs the study of personal wealth portfolios at the general and specific level. Specific literature that is reviewed is on LCH, MPT and SA. The Section closes with a recap of the most recent situation.

2.3.1 *Approaches to Personal Wealth Studies*

In a comprehensive review of literature, Robinson (2000) reports that four main neoclassical frameworks are applied in personal finance studies. These are *utility maximisation, goal-directed financial planning, life-cycle hypothesis and modern portfolio theory.*

The *utility maximisation framework* has its roots in philosophy and is the oldest and most common. It holds that people seek to maximise satisfaction subject to constraints. Despite its appeal, the framework suffers the drawbacks of a marked difficulty in measuring utility, inability to assure rationality in investing, and the challenge of inefficient and incomplete markets. The *goal-directed financial planning* assumes that people set goals of wealth attainment over a given time frame where the major inputs are human capital, a chosen level of consumption, and investments held. Researchers (Barret & Reardon, 2000; Kennickell, Starr-McCluerr & Sunden, 1996; Lusardi, 2001) find fault with this approach on grounds that people, especially the uneducated, rarely articulate their goals. However, this framework is seldom used because it is unrepresentative of the real life situation by ignoring probability estimates of various outcomes. The third neoclassical framework is the LCH which emphasizes that wealth is a function of age. Lastly, the MPT seeks to prescribe the assets a wealth maximising investor should hold subject to the constraints of the riskiness of the assets. The LCH and MPT are discussed in further detail in Subsections 2.3.2 and 2.3.3.

A common feature of these four neoclassical frameworks is that they are normative in design and tend to prescribe how households and individuals should make their investment

decisions. Robinson and McGoun (1998) and Robinson (2000) opine that on a stand-alone basis, these frameworks are conceptually faulty because they do not consider how the environment impacts personal wealth. This view is upheld by Campell (2006) who notes that evidence suggests that households and individuals make investment decisions that are hard to reconcile with advice from financial planners and standard neoclassical investment models such as MPT. These facts motivate the researcher to suggest the adoption of a dual conceptual approach that combines normative prescriptive frameworks with positive models that describe the asset choices held by households and individuals. This leads Campell to propose the use of behavioural finance theory in the study of personal wealth portfolios.

A partial cure of the problem posed by the inadequacy of the neoclassical frameworks is offered by the emergent *sociological approach* that posits that cultural values, beliefs, traditions and regulations dictate investment activity. For instance, whereas the ownership of land or cattle may have high premium in some societies, the receiving of interest income may be regarded as a taboo by others. Similarly, Badu et al. (1999) argue that a cultural fear of being in debt may inhibit certain groups from seeking mortgages or taking student loans while households from subgroups that are risk averse in their asset and liability choices are unlikely to invest in high-return assets, leading them to accumulate a lower amount of wealth.

Literature reviewed shows that the SA has received little attention among scholars in the study of personal wealth. This leads Keisler and Moller (2000) to criticize fellow sociologists for not studying wealth and its sociological determinants. The researchers complain that sociologists have been too pre-occupied in studying inequalities by equating personal income to well-being. Furthermore, Robinson (2000) argues that the SA may not find wide application due to problems in quantifying the variables and the impracticability of assigning functional relationships to represent different environments. It is however encouraging to note that proponents of behavioural finance are now advocating for the inclusion of sociology and psychology in the study of investment behaviour and wealth portfolios in view of the challenges posed by the widely-observed phenomena of irrationality in financial decisions and investments. Recent studies by sociologists who examine the relationship between personal wealth accumulation and wealth holding with culture and religion provide a welcome front to locate further inquiries in this field of study.

To surmount the inadequacies of traditional frameworks, Robinson and McGoun (1998) propose a broader perspective that enables personal financial management to be sensitive to

the dictates of religion, take cognizance of personal anxieties, and serve as a form of entertainment. Chieffe and Rakes (1999) take the challenge further and propose the use of an integrated model for financial planning. In the same vein, Robinson (2000) calls for adopting an inclusive conceptual framework that embraces all the separate frameworks. Combining the arguments raised above with the call for an interdisciplinary approach to personal finance by Schuchardt et al. (2007) persuaded this researcher to anchor the current study on the fields of economics, finance and sociology. This required a conceptual design that combines the *life-cycle hypothesis*, the *modern portfolio theory* and the *sociological approach*. By virtue of its design, the composite approach offers a rich and robust conceptual footing for improved results. The three selected frameworks are discussed in the subsections that follow.

2.3.2 *The Life-Cycle Hypothesis (LCH)*

The concepts of personal saving, consumption and wealth accumulation over the life cycle of households and individuals are often studied in the light of the *life-cycle hypothesis* (Bodie & Crane, 1997; Gibson & Scobie, 2003; Headey, Marks & Wooden, 2004; Modigliani et al., 2003; Sabelhaus & Pence, 1999; Shorrocks, 1975). This is confirmed by Daynan, Skinner and Zeldes (2002) who model U.S. savings under uncertainty and proclaim that 'as the workhorse of consumption and saving research for the past four decades, the life-cycle model has proved flexible and useful for examining a variety of questions' (p. 274).

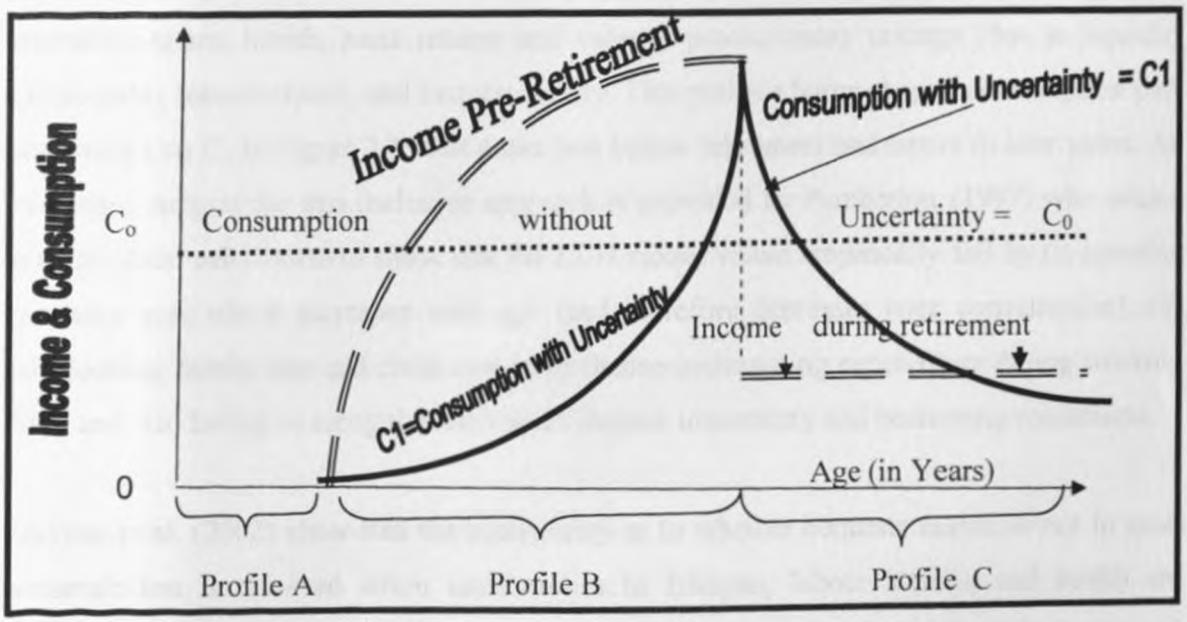
With its strong base in neoclassical economic theory, the LCH is hailed as the earliest and most comprehensive theoretical and empirical model that shows how earnings, consumption, savings and wealth change during a person's life. Its central building block is the inter-temporal trade-off between consumption and saving that is premised on interest rates and rational behaviour. A key contention of the LCH is that consumption needs, earnings and risk tolerance are fundamentally affected by peoples' finite lives. This framework models consumers' behaviour as that of maximising their discounted lifetime expected utility such that the consumption flows and wealth stocks at each point depend on their permanent income (say, anticipated lifetime resources and preference parameters). The framework is attractive and reconciles well with sociologists' life-cycle patterns by portraying where average persons are likely to find themselves at any time in their life cycle.

Resting on the assumption of perfect markets and certainty of life spans, incomes and consumption, the static or basic model of Modigliani and Blumberg (1954) provides the cornerstone for the LCH. The model assumes that people care about their own lives only as

opposed to their dynasties. Thus, their concave utility functions lead them to desire a level path of consumption in which their forward-looking savings behaviour means that their main motivation to save is to accumulate wealth to support consumption at the habitual standard of living in retirement. This reasoning suggests that people borrow before their working life, save while working, and dissave when in retirement. The arrangement enables an individual to plan to consume the same amount in real discounted terms each year. Real consumption is deemed to be a proportion of expected real wealth, while wealth is the sum of initial net assets at planning stage, current income and expected (discounted) future income.

Researching in the UK, Lydall (1955) offers support for the LCH and opines that incomes should rise from youth to middle age and peak just before retirement, while savings should follow an irregular path and reach the summit later in life. Later, the LCH *of saving* (Ando & Modigliani, 1963) reinforces this basic model by showing from empirical data that savings follow a hump shape to age as well. Accordingly, wealth should be an integration of a person's rate of savings and level of inheritances. Modigliani (1986) follows this through and concludes that wealth should be hump shaped with respect to age, and that people attempt to smooth the marginal utility of consumption over their lifetime as shown in Figure 2.1 below.

Figure 2.1: Income and Consumption in the Basic Life-Cycle Model



Source: Adapted from Mitchell and Moore (1997), Figure I.B.1

A far-seeing retiree, under certainty and perfect market conditions, would set the lifetime consumption at C_o and accumulate wealth in lifespan profile B when employment income

exceeds consumption. In Profile C, the person draws down on wealth when consumption exceeds employment earnings. This implies a hump shape of savings and wealth with respect to age and a flat consumption path. Using this framework, supporters of the LCH conclude that the most important determinant of a person's wealth is age. Accordingly, the early years, in profile A, are associated with negative savings through financial support from parents and relatives; the middle age, profile B, is characterised by high income from employment, high savings and substantial wealth accumulation, while negative savings during retirement lead to wealth decummulation. This said, the efficacy of this model in explaining wealth portfolios is weakened when the assumptions of certainty and perfect markets are relaxed.

A partial solution to the simplification of the basic model is provided by Barro (1974) and Becker (1974) who propose the altruistic LCH. The researchers recognise the widely observed cases of inter-vivo gifts (within the same generation), inheritances, and bequests. This remodeled version is based on the premise that households care about their descendants and therefore build and exhaust estates and inheritances to smooth their dynastys' consumption paths over many generations. Later studies in support of the altruistic behaviour among households are reported by Cox and Jimenez (1990) and Park (2001).

Further improvements to the LCH model are made by Deaton (1992) and Browning and Lusardi (1996) who relax some of its assumptions and allow for uncertainty (of earnings, mortality, tastes, health, asset returns and values), precautionary savings (due to liquidity constraints), leisure choice, and bequest motive. This yields a hump-shaped consumption path following line C_1 in Figure 2.1, that peaks just before retirement and tapers in later years. An important support for this inclusive approach is provided by Pemberton (1997) who uses a mathematical calculation to show that the LCH model would empirically fail by (i) ignoring mortality risk which increases with age (and therefore depresses later consumption), (ii) overlooking family size and child care costs (hence understating expenditure during working life), and (iii) failing to recognize the role of income uncertainty and borrowing constraints.

Daynan et al. (2002) show that the controversy as to whether bequests matter or not in asset accumulation is resolved when uncertainties in lifespan, labour income and health are allowed. Thus, analysis of personal wealth holdings in developing countries is better served by the *altruistic* LCH for the reason that considerable heterogeneity in income encourages substantial wealth transfers from wealthier people and higher income earners to the less fortunate. The *altruistic* LCH is also attractive in these countries on account of poor health

facilities, inadequate social security frameworks, substantial market imperfections and considerable uncertainty that is operationalised by Goh and Downing (2002) by the rate of unemployment and inflation. These aspects are further reinforced by a general lack of knowledge about the future, and limitations in peoples' cognitive and analytical skills.

According to basic LCH, age is the principal determinant of personal wealth. When the assumptions are relaxed, inheritances emerge as important determinants. Recent studies also show that psychological and social factors exert substantial influence on personal wealth portfolios. In the absence of a coherent theory on these influences, this researcher recognises the important role of these attributes by exploring the challenges to the LCH and thereby adopting a positive research framework in this study that incorporates sociological attributes.

The intuitive appeal of the LCH framework notwithstanding, and in spite of a number of modifications, it has faced a number of criticisms. Chang (1993), Browning and Lusardi (1996), and Chen, Hanna and Montalto (1998) point out that the framework is fatally weakened by the fact that people are unable to borrow freely. Besides, the portfolio one holds tends to affect savings significantly since a household that chooses a portfolio with higher earnings will have more resources available over its lifetime for saving and will also enjoy more utility. Unfortunately, higher return portfolios expose the holders to more uncertainty in their consumption, an aspect which the LCH is not able to deal within in its original construction since it treats uncertainty and portfolio risk as exogenous. Kennickell, Starr-McCluer & Sunden (1996) and Lusardi (2001) downplay the effect of age and disagree that people plan consumption and savings considering their lifetime resources, that they are forward looking, anticipate the inevitable decline in income at retirement, and have an ultimate aim of maximising lifetime utility. The researchers conclude that people are unable to define optimal savings, determine consumption plans and set desired personal wealth levels because of uncertainty in income and wealth and the lack of problem-solving skills.

The appeal of the LCH model has also been weakened by a number of contradictions in the form of puzzles that have also been noted. The major ones include continued saving in retirement (Borsch-Supan, 2001; Harvorsen, 2003; Poterba, 1994); sharp falls in consumption in retirement (Bernheim, Skinner & Weinberg, 2001; Miniaci, Monfardini & Weber, 2003); the inability of the LCH to explain portfolio choice (Cochrane, 1997; Hugget, 1996; Kocherlakota, 1996); or inequality in wealth (Hugget, 1996). Empirical evidence contradicting the LCH on account of bequest savings (Barro, 1974; Becker, 1974; Kotlikoff

& Summers, 1981; Laitner, 2001; Park, 2001) and the need to relax the assumptions (Browning & Lusardi, 1996; Deaton, 1992; Dynan et al., 2002) has led researchers to modify the model and search for other determinants of personal wealth. To cap it, Lusardi and Mitchell (2006) find a critical fault in the conceptual design of the LCH where in their rebuttal argument, they cite inability of people to understand present discount values, differentiate between nominal and real amounts, project future earnings, retirement incomes (from pensions and social security), and their retirement age and survival probabilities. The researchers conclude that the strict requirements for the success of the LCH are inherently complex, very demanding and indeed unachievable.

In defense of the LCH, a number of researchers contend that recent applications and extensions of the framework have resulted in rapid developments of social security and positive effects on private savings. The researchers also credit the LCH for the recent switch from capital and income taxes to the more equitable consumption taxes on account of variations in dates of retirement. Perhaps, the saving grace is offered by Kotkliff and Summers (1981) who argue that although the LCH may not apply to populations in the margin such as the biggest savers and the lowest earners, it certainly is appropriate to the vast majority of people. Indeed, in ordinary life it is recognised that a person's income has a direct and profound impact on the composition and size of wealth held. People with higher income are able to accumulate wealth since they have a greater capacity to save, invest and take risk. Juster et al. (1999) provide a middle ground by declaring that differences in wealth holdings are due to varying savings rates and different ex-post rates of returns on those savings.

In conclusion, it is fair to state that the LCH has the tenets of a sound framework to examine personal wealth portfolios. However, it is also clear that on a stand-alone basis, the LCH is unlikely to provide a sufficient conceptual base for examining the nature and determinants of personal wealth portfolios. This calls for an examination of other complementary frameworks.

2.3.3 *The Modern Portfolio Theory (MPT)*

Also known as the risk management framework, the MPT is traced back to works on decision-making under uncertainty where Daniel Bernaulli, in his seminal paper of 1738, introduced the concepts of marginal utility and maximization of expected return (to increase wealth and minimise risk), Frederickson (1971). More seeds were sowed to MPT by Bachelier (1900) in his proposition that stock prices behave randomly and that it is difficult to

foretell and beat the market. Markowitz (1952), regarded as the father of the MPT, provided the breakthrough, in the seminal paper on *portfolio selection* that transformed investments theory by combining utility with risk to formulate the MPT. The researcher used wealth to proxy utility and measured it by the asset returns while the measure for risk was the volatility of returns. By providing the first link between investors' preference for higher wealth and the risk associated with such gain, this milestone event revolutionized the study of personal wealth.

A major contribution by Markowitz was the mean-variance single-period model which theorised and showed that using a bundle of wealth, an investor ought to construct a fully diversified portfolio. Premised on neoclassical economics, MPT is based on the thesis that people are wealth maximisers: given an amount of wealth they prefer the highest return for any given level of its variability (Francis & Archer, 1979; Markowitz, 1952). However, the constraint of limited resources implies that investors face choice dilemmas because assets are dissimilar in liquidity, lumpiness and size. Other differences relate to timing and riskiness of earnings as well as the relationships between asset prices and key economic variables such as interest rates and inflation. In the final analysis, the MPT model, in its normative orientation suggests that rational investors ought to hold an optimal portfolio of uncorrelated asset classes to earn the maximum returns with the least amount of volatility. Thus, the wealth portfolios of households and individuals should be fully diversified in order to satisfy the holders' assumed desire to maximize earnings from their investments.

According to the proponents of MPT, its conceptual appeal is that it uses a simple model to identify, evaluate, control, finance and monitor personal wealth accumulation. Besides, risk management is even more important in the arena of personal wealth because unlike businesses, people have a finite life and cannot diversify their human and physical capital in the way investors in companies can. Yaxuan (2007) singles out the background risk that people face because of the non-tradable idiosyncratic labour income, illiquid housing wealth, and un-tradable entrepreneurship. Somehow, the MPT tends to blend well with LCH in that the protection of human and physical capital are the key concerns at early stages in life, while the protection and preservation of financial wealth becomes more important with age.

As a tool for the study of personal wealth, the weaknesses of MPT are linked to its strengths. Firstly, Harry Markowitz's MPT prescribed how individuals should structure their financial asset portfolios assuming that they make decisions 'myopically' in a static one-time horizon.

Besides, capital markets are assumed to be perfect and complete, with complete certainty and no transaction costs. Unfortunately, these conditions are rare in real life.

Tobin (1958) provides a partial solution by showing how an individual investor should divide his funds between a safe liquid and riskless asset (cash or treasury bills), and a risky asset (bond or shares) on the basis of his degree of risk aversion. Under the *mutual fund theorem*, Tobin argues that all investors should hold an identical portfolio of risky assets such that the allocation of wealth across different risky assets does not depend on the investor's risk preference. Drawing on insight by Markowitz (1959) that share prices are likely to co-move with the market, Sharpe (1963) simplifies the difficulty of computing covariances of a large number of shares. In the *simplified model for portfolio analysis*, Sharpe assumes a linear relationship between security returns and a market index, and derives a measure of a security's risk (β) as the covariance between its returns and that of the market.

Further improvements to MPT are made by Mossin (1969) and Samuelson (1969) who integrate MPT with lifecycle models using a multi-period model to address the shortcoming of the investment horizon. This model handles longer periods that mimic lifetime planning of consumption and investment to demonstrate that an investor can optimise the consumption stream over many periods and that the optimal asset allocation does not depend on the investment horizon, hence short-term and long-term investors should hold identical portfolios. But this assumes that investors have constant relative risk aversion, all assets are tradable at no cost and investors face the same investment opportunities over time. In reality though, investment horizons matter a great deal while markets are neither perfect nor complete. For instance, human capital asset is not tradable, while shares and housing are only tradable at significant costs. Besides, returns are never stable and vary widely over time.

Smith (1971) and Chen, Jen and Zionts (1971) try to solve the problem of imperfect markets by recognising the existence of significant transaction costs and employing dynamic programming to generate multi-period models. Furthermore, Merton (1969, 1971) overcomes the investment horizon problem by developing the continuous-time model of optimal consumption and portfolio choice of financial assets. This improved model is made more realistic by Bodie, Merton and Samuelson (1992) who add a third choice variable, the amount of work people choose to do. In this blending of the LCH and the MPT, the researchers employ the life-cycle model with continuous consumption decisions and trading in risky financial assets to theorise how labour flexibility which denotes the period that people choose

to be employed, affects consumption, saving and portfolio investment in their life cycle. Results from the continuous-time model suggest that the fraction of an individual's financial wealth that is optimally invested in shares should decline with age under three cases.

The first case is the *human capital argument* which states that because earnings by employees are less risky than shares, then the proportion of human capital in an individual's total wealth should decline with age. Therefore, younger peoples' total wealth should be dominated by safer human capital which implies that such people should hold a large share of risky assets (shares) in their financial wealth in order to get *sufficient risk* in the wealth.

Conventionally, it is rational for the young to prefer shares because they have greater *labour flexibility* in their labour/leisure decisions. Thus according to the law of large numbers, younger employees who have a longer time horizon should invest a large portion of their wealth in shares because the long-run average of their portfolio returns will have a lower variance than the average return for the older employees with shorter horizons. Younger people are therefore likely to recoup any loses from stock market downturns and are likely to have a continuing flow of labour income until retirement. Thus, human capital is crucial in explaining investments, labour and the consumption behaviour of rational investors.

The third case is the *investment horizon argument* in which Jagannath and Kocherlochota (1996), Balduzi and Lynch (1999) and Lynch and Balduzzi (2000) argue that the share of wealth invested in shares should have a hump shape to age. They claim that younger people have longer time horizons and should allocate a large fraction of their wealth in shares than a short-term investor, because asset allocations are a function of the non-tradable human wealth. Young people have a long stream of future income which shortens with age, leading to a fall in the value of their human capital. Under this premise, investors ought to shift the risk composition of their financial wealth in order to offset the decline in their human capital.

More recently, Ucello (2000) argues that there should be a strong case for a positive correlation between salary and the wealth allocation to shares. The logic is that higher salaries translate into more human capital, which is either riskless or dominated by idiosyncratic risk that is only weakly correlated with stock returns except for fund managers and stock option beneficiaries. Therefore, the relatively safe investment in human capital is rationally combined with a higher investment in stock. The researcher also points out that a higher salary is a good proxy for education and financial sophistication. Finally, Arrondel and

Lefebvre (2001) round all these arguments up and posit that young, educated, highly-qualified employees and non-salaried workers have high labour-supply flexibility and should have a higher proportion of their wealth invested in shares. Faig (2002) agrees and theorises that households with large human capital and a safe job should hold less long-term bonds.

The efficacy of total volatility as a measure of risk was questioned by the architects of MPT (Markowitz, 1959; Sharpe, 1964) who acknowledge that the mean variance measure of the volatility of expected returns may lead to unsatisfactory results. To address this problem, other measures of risk that distinguish between bad and good variability of expected returns have been suggested in what is now referred to as post-modern portfolio theory (Rom & Ferguson, 1993). The successful application of these refinements requires complete and accurate asset return data, ability of investors to formulate expectations, and the desire to minimize returns. Unfortunately, these conditions are seldom met in practice.

Numerous tests on means, standard deviations and variances of asset return data and actual wealth holdings show that optimal Markowitz diversification is difficult to achieve. The Markowitz model, for instance, requires estimates of the expected returns above the risk free rate as well as the variance-covariance matrix of returns. However, Merton (1980) argues that good estimates of expected excess returns require very long time series of data, while other studies (Green & Hollifield, 1992; Jagannathan & Ma, 2003) have shown that the variance-covariance matrix may not be stable. This has given rise to proposals for easier-to-measure asset holdings, the most common of which is naïve diversification, which applies the 1/n (where n is the number of assets in the portfolio) heuristic approach in asset allocation as a general rule to approximate economic theory (DeMiguel, Garlappi and Uppal, 2009).

Also, critics of the MPT have faulted it for the fact that its assumptions do not always hold. For instance, investor choices are affected by tax rates, laws and regulations, whilst asset trading involves transaction costs. Considerable doubt by psychologists and behavioural economists as to whether the assumptions of the efficient market hypothesis are supported conceptually and empirically also contribute to further weakening of the MPT (Lo, 2004). Specifically, Butler (1995) notes that property markets are less efficient than share and bond markets. Furthermore, a more fundamental criticism is that the MPT tends to deal mainly with financial assets. This is a serious design fault that Blake (2003) highlights using UK data to show that between 1948 and 1994 the share of financial assets in personal wealth was a mere 4.4% compared to housing at 6.8% and human capital at 76.5%.

The foregoing suggests that a study of personal wealth whose conceptual framework ignores housing and human capital may be inadequate. Consequently, this researcher opines that a good personal wealth study must look behind the portfolio structure and examine factors that proxy human capital, because these have a profound impact on the generation, storage and consumption of wealth. This view is supported by Faig (2002) who observes that applying MPT on the rich asset data from surveys provides invaluable insights into the determinants of portfolio choice. Faig calls for complex models that address the richer opportunities and necessities facing investors by including realistic treatment of human capital, business wealth and the effects of transaction costs, borrowing constraints, and investment opportunities that vary over time.

The foregoing review of the MPT indicates that this framework continues to receive advancements in its theoretical formulations in an attempt to approximate reality in investments. Firstly, the wealth held by an individual is expected to be a function of the investor's preferences (attitude to risk) and the returns available. Because returns are exogenous and asset-specific, they tend to moderate the size of wealth for investors in the same environment. Secondly, in order to minimise risk and maximize returns, investors are expected to hold a wide range of assets, whereby their preferences would dictate the combinations of the assets held. Thirdly, the proportion of shares to total wealth is expected to be highest among the young, according to the *human capital argument* and theories of *labour flexibility and investment horizon*. Fourthly, the proportion of shares to total wealth should be higher for those with higher incomes who are likely to be more educated. Finally, the impact of human capital, the existence of incomplete and imperfect markets, as well as significant trading costs, suggest the need to compliment MPT with other theories of investment behaviour in order to describe rather than prescribe personal wealth portfolios.

2.3.4 *The Sociological Approach (SA) to Personal Wealth Study*

The criticisms advanced against the LCH and the MPT opened the door for researchers on personal wealth to embrace other fields of study to seek explanations on the determinants of personal wealth portfolios, especially to reconcile with empirical data. Consequently, the attempt to describe rather than prescribe how personal investments are made provided a fertile ground to apply behavioural finance and sociology in the study of personal wealth portfolios.

Much earlier, Smith (1776) appears to have been one of the first scholars to comment on the

impact of religion on wealth. In the widely quoted text, the author portrayed participation in religion as a rational device for individuals to enhance the value of their human capital, wealth and incomes. A century later, Max Weber, the famous German political economist and sociologist and founder of the modern study of sociology and public administration, provided the next solid discussion linking religion to economic performance (Weber, 1958). In the classic argument of *protestant ethic thesis*, the scholar postulated that the protestant reformation and protestant work ethic must have triggered the advent of modern capitalism. The result was economic growth and development in protestant societies that outpaced the catholic societies. The writer singled out the observed association between Protestantism and the development of the commercial spirit through the rational pursuit of economic gain.

Olsen (1998) advocates for the adoption of behavioural finance in the study of personal wealth portfolios on the premise that it enables researchers to challenge the fundamental assumptions of economics and finance by offering a more empirically complete view of financial behaviour. The researcher makes this conclusion after faulting traditional finance models that are based on neoclassical economics on their low descriptive and predictive power when compared with empirical findings. The main contention of Olsen is that traditional economics and finance tend to ignore the role of culture, religion and other psycho-social aspects as a possible explanation of the wealth portfolios that people hold.

Further influence of culture on wealth portfolios is cited by Weber and Hsee (1998). They propose the *cushion hypothesis* which holds that people from collectivist societies may be more apt to engage in financial risk because they enjoy a *societal cushion* that helps to protect them from downside risk. Iannaccone (1998) continues the debate on the influence of religion on personal wealth in a global survey of the economics of religion and helps to operationalise the concept of religion by defining it to mean any shared set of beliefs, activities and institutions premised upon supernatural forces.

In a study on the impact of religion on wealth in the USA, Keister (2003) notes that religious affiliations can affect wealth accumulation directly by shaping peoples' values and attitudes towards wealth accumulation and providing networks and contacts that facilitate wealth accumulation. The researcher also cites an indirect effect through fertility, childbearing and education which in turn impact wealth. This is supported by Noland (2003) who argues that some religions may focus adherents on diligent, efficient economic activity, thrift and non-ostentatious accumulation of wealth, while those centered on Puritanism exhort their

members to pursue piety and shun wealth accumulation. This is supported by Barro and Mcleary (2003) who provide a comprehensive discussion on the relationship between wealth and cultural factors in their publication *Religion and Economic Growth.* The researchers opine that culture influences economic outcomes since it affects personal traits such as honesty, thrift, savings, work ethic and openness to strangers.

The foregoing is a brief outline of the development of the theoretical concepts regarding the hypothesized causal relationship between culture and religion on the one hand, and wealth on the other. As noted, more impetus to this line of reasoning has been provided by the advent of behavioural finance and behaviourial economics. With respect to this study, the main lessons to draw from this review are that the SA is gaining popularity in the pursuit of understanding the nature and determinants of personal wealth portfolios.

2.3.5 *Recent Theoretical Perspectives on the Study of Personal Wealth Portfolios*

Recent advances in the theoretical frameworks that are employed to study personal wealth portfolios have been informed by the dual desire to reconcile existing conceptual frameworks with findings from empirical data using higher computational power and the need to address the continued challenge to the anchoring neoclassical models. It is noteworthy that these advances and modifications point towards a possible convergence and a tendency to coalesce around proposals for an integrated approach as discussed below.

Among recent studies that yield results with significant academic interest are the findings by Shefrin and Thaler (1988) from cross-sectional tests on empirical data that evidence does not support the LCH. To resolve the contradiction, the researchers build on studies by psychologists and social scientists on bounded rationality and impatience, and incorporate these principles into the LCH model to conclude that the basic LCH fails because it ignores the key behavioural aspects of self-control, mental accounting and framing. The researchers propose an enriched model, the *behavioural life-cycle hypothesis* (BLCH) based on the notion that people treat components of their wealth as non-fungibles by dividing it into three mental accounts: current income, current assets (wealth) and future income. The researchers show that the temptation among people to spend is highest for current income and least for future income. Graham and Isaac (2002) carry out a further review of the BLCH approach and emphasize that by fragmenting an individual into two people, a *far-sighted planner* and the pathologically *myopic doer,* the LCH introduces issues of agency in the individual, which the model is unable to handle. The observations noted above have added further impetus to

the call for integrated approaches to wealth studies.

Studies on the theoretical framework of investments and wealth management theory have offered some suggestions for the next frontier beyond modern portfolio theory. For instance, Campell and Viciera (2002) emphasize the need for extensions to this framework in dynamic strategic asset allocations. Also, Merton (2003) calls for an integrated approach to recognise the risk of human capital and the complexity of choosing among many alternative choices while ensuring that the investments will generate sufficient income for longer life during retirement. A more recent insight is offered by Ambachtsheer (2005) who suggests that the next two frontiers in investment theory are likely to be extensions hinging on information theory and principal-agent theory. The researcher justifies these suggestions on the observed prevalence of information asymmetry and the increased role of financial advisors. With these extensions, he calls for the development of an integrative investment theory.

Similarly, researchers on personal wealth using the sociological framework appear to suggest the adoption of an integrated approach. In this regard, Oslen (1998) argues for the mainstreaming of behavioural finance and economics to enable the theoretical frameworks to reflect findings from empirical data. More recently, Yao, Gutter and Hanna (2005), from their examination of empirical SCF data of different cultures in the USA propose an integrated model for studying wealth portfolio allocations as described in Section 2.6 below.

2.4 *Review of Empirical Evidence from Studies on Personal Wealth Portfolios*

This Section examines empirical literature on personal wealth portfolios. It starts with a general review of evidence on the composition, size and adequacy of personal wealth portfolios. This is followed by a review of the design and findings from some selected personal wealth studies to ascertain support for the candidate theoretical framework, and also identify documented determinants of personal wealth portfolios. The closing subsection examines evidence on the role played by savings on the investment process and by implication the potential impact on personal wealth portfolios.

2.4.1 *Studies on the Nature and Composition of Personal Wealth Portfolios*

In this subsection, the types of assets that constitute personal wealth portfolios, as well as the relative proportions of assets, are examined. This is augmented by a review of the diversification features and sizes of personal wealth portfolios.

2.4.1.1 Components of personal wealth portfolios

Early works on personal investments under the MPT were mainly devoted to financial asset portfolios that comprised cash, treasury bills, treasury bonds and shares (Francis & Archer, 1979). However, researchers have in the recent past widened their scope to include human capital, housing and entrepreneurship (Pelizzon & Weber, 2006). This category of non-financial wealth is also referred to as illiquid assets on account of the significant trading costs. Partly because of transferability and measurement problems, there are relatively few studies that examine the components of human capital and entrepreneurship in wealth portfolios. This is evident in the design of selected major personal wealth surveys as shown in Table 2.1 below.

Table 2.1: Components of Personal Wealth Portfolios based on Country Surveys

Components in Wealth	**Some Country Wealth Surveys**				
	SCF (USA)	**FRSS (UK)**	**EVS (Germany)**	**SHIW (Italy)**	**HILDA (Australia)**
Bank Deposits	✓	✓	✓	✓	✓
Bills and Bonds	✓	✓	✓	✓	✓
Shares + Mutual funds	✓	✓	✓	✓	✓
Life assurance policies	✓	✓	✓	✓	✓
Pensions wealth/Unfunded Superanuation Fund	✓	✓	No	✓	✓
IRA Balances-U.S. only	✓	✓	No	No	✓
Vehicles	✓	No	No	No	✓
Housing/Property	✓	✓	✓	✓	✓
Farm/Business assets	✓	✓	No	✓	✓
Collectibles and Durables	✓	No	No	✓	✓
Less: Debts	✓	✓	✓	✓	✓

Source: Derived from published country surveys (Juster et al., 1999 for SCF in USA; Banks & Smith, 2000 for FRSS in UK; Borsch-Supan & Eymann, 2000 for EVS in Germany; Guiso & Jappelli, 2000 for SHIW in Italy and Headey et al., 2004 for HILDA in Australia.)

The evidence in Table 2.1 was obtained for developed countries where personal wealth surveys have been carried out at the national level for a considerable period and received substantial refinements. The list includes the SCF survey in the USA, Family Resources survey (FRSS) in the UK, Germany Socioeconomic Panel (EVS), Survey of Income and Expenditures (SHIW) in Italy, and Household, Income and Labour Dynamics in Australia. Analysis of these surveys shows that both SCF and HILDA are the most inclusive in the wealth asset baskets. In contrast, the EVS of Germany has the least wealth components and noticeably excludes pension wealth, tax balances, vehicles, farm and business assets as well

as collectibles and durables. This evidence suggests lack of concurrence on the universal components of wealth portfolios; they vary from country to country.

Combining evidence from these wealth surveys with appropriate consideration of the Kenyan environment and taking care to use variables for wealth measurement that are internationally comparable, yielded the components that were included in this study of employee wealth in Kenya. These components were determined to comprise *cash and bank balances, treasury bills and bonds, shares in listed companies, life assurance policies and pension scheme benefits, shares in SACCOs, and property (housing).* Specific exclusions were vehicles, durables, private businesses and human capital. With respect to Kenya, one may argue that, whereas durables and private businesses are not easily valued, vehicles are rarely regarded as forms of wealth.

Reflecting on the magnitude of some of these assets in the Kenyan economy helps to shed some light on their relative importance. Recent national data indicates that deposits by SACCOs amount to Shs120 billion, the sum assured for life assurance policies is valued at Shs180 billion, while pension and provident funds assets amount to about Shs270 billion.

2.4.1.2 Composition of personal wealth portfolios

A useful guide for measuring the composition of wealth is provided by Banks and Smith (2000) in their study of individual wealth portfolios is the UK. Five methods of measuring wealth are identified in this study to include: i) the proportions in value of risky assets in the wealth portfolio; ii) the proportions in value of each asset in the total wealth portfolio; iii) the ownership rate of an asset; iv) the number of different assets held; and (v) the conditional asset share. Literature shows that the most popular methods are those based on the proportions of assets held. Whereas the ownership rate is computed as the fraction of people who own a given asset within a target population, the conditional asset share assesses the proportion of the market value of a given asset to the net assets held given that the holder owns the asset in question.

A review of literature shows a functional link between the indicators of wealth composition and the underlying conceptual frameworks. Thus MPT prescribes that investors should hold diversified portfolio such that the asset returns have low correlation with one another. This notion blends well with the LCH which posits that the fraction of financial wealth invested in listed shares should fall with one's age and rise with employment income and education.

Empirical evidence on the proportions and asset ownership rates provides useful information.

Table 2.2: Composition of Personal Wealth Portfolios from Selected Country Surveys

	Australia	Germany	UK	USA	S. Korea
Real estate %	76	51	56	53	50
Cash %	12	23	21	27	
Shares %	9	11	17	14	25
Bonds %	None	11	1	4	

Source: Derived from published country surveys (Tan & Voss, 2000 in Australia; Tracy & Schneider, 2001 for SCF in USA; Banks & Smith, 2000 for FRSS in UK; Borsch-Supan & Eymann, 2000 for EVS in Germany; and Cho, 2005 for Korean Labour Income Panel Study)

Table 2.2 above shows that in developed countries, the largest component in household wealth is real estate, also referred to as housing. Besides, house ownership rates and the share of housing in household wealth have been increasing (Arrondel & Lefebvre, 2001; deRoon, Eichholtz & Koedjk, 2002; Mitchell & Moore, 1997; Pelizzon & Weber, 2006). These studies also show that cash is the most widely-held asset second to housing in proportion, while shares and bonds are the least. These results are not likely to be replicated in Kenya because the context is different. Developed countries enjoy a favorable investment environment such as wide availability of assets, stable and low inflation, developed financial markets, and higher investor incomes, while the situation in developing countries, Kenya included, is the converse. This suggests a research gap that this study sought to address.

Asset scarcity requires special attention when discussing the composition of personal wealth in developing countries. In their review of personal wealth profiles in Latin America, Torche and Spilerman (2007) use two parameters to measure this aspect. The first measure is the share of household income from investments (rent, dividends, interest and profits) in total income, while the second is the proportion of households receiving income from investments. Citing the effect of high concentration of assets among the elite and low asset holding and human capacity among the majority, the researchers report significant asset scarcity in Latin America. They find that households that received incomes from rent were about 3.3% in Paraguay and 9.8% in Colombia, while those receiving dividend incomes ranged from 0.1% in Brazil and Mexico to 0.7% in Bolivia. Similar asset scarcity would be expected in Kenya on account of underdeveloped financial and property markets.

In Africa, Aryeetey and Udry (1997) examine data from the Ghana Living Standards Survey

to ascertain the country's personal wealth ownership patterns and report that only 5% of the value of household portfolios in urban areas is held in the form of financial assets. The comparative figure is about 40% in the U.S. Asset scarcity is also reported in Kenya in the 2005/06 survey which showed that only 28.6% of urban households receive income from interest, dividends and rentals (GoK, 2007a). In addition, these property incomes are small with an average of Shs 26,701 per year.

In the case of Kenya where the financial and capital markets are relatively underdeveloped, there is a high likelihood that the fraction of cash in employees' portfolios is likely to be higher than that reported by studies in developed countries. Likewise, financial wealth is also likely to comprise a small share of employees' total wealth.

2.4.1.3 Are personal wealth portfolios diversified?

This subsection discusses diversification at two levels; for asset components and at securities level. According to MPT, an earnings maximizing investor should target efficient diversification by having an asset allocation that is similar to the market portfolio in the number of assets held and weight. Such holding is said to be an efficient portfolio because it eliminates the unique risk of each specific security, also called unsystematic risk. An efficient portfolio therefore has only the un-diversifiable market-related risk that is also called systematic risk. However, because of the widely-reported challenge of applying the optimal Markowitz diversification (DeMiguel et al., 2009), this study examined empirical evidence on naïve diversification, in which investors are deemed to choose assets randomly using equal allocations to achieve diversification. This is also referred to as the 1/n heuristic rule, where "n" is the number of assets in the portfolio. Consequently, at the wealth components level, diversification was examined based on the number and proportions in the wealth portfolio of the asset types and classes held, while at the securities level, diversification was depicted by the number of companies' shares that the investor holds.

Back in the fourth century, Rabbi Isaac bar Apha is quoted to have provided what is considered the earliest rule in asset allocation for naïve diversification: 'One should always divide his wealth into three parts: a third in land, a third in merchandise, and a third ready in hand', (DeMiguel et al., 2009, p. 1915). Similar to this advice, recent studies suggest that to achieve naïve diversification at the wealth component level, investors should spread their investments into 'thirds' such that one third is in cash, treasury bills and bonds; another third in property; and the last third in shares. Evidence in support of this is provided by Carnner,

Mankiw and Weil (1997) who report that leading investment advisors in the USA recommend that conservative individuals should invest in the "thirds". Watson (2003) of The Wharton School advises employees to have a similar asset allocation in order to achieve wealth diversification. Corroborating support is provided by empirical findings from a study in USA by deRoon et al. (2002) who report that the best diversification benefits from housing investment are achieved when 30% of the portfolio is in housing.

Another application of the 1/n heuristic rule for naïve diversification is the number of securities measure which is anchored on how unsystematic risk, which relates to a specific company, decreases with increased holdings of different shares. The first of such studies was conducted by Evans and Archer (1968) who modeled risk in terms of the standard deviation of the portfolios' returns and concluded that for a randomly-selected equally-weighted portfolio, there is very little risk reduction beyond eight to ten securities. The total number of shares approach is also used by Blume, Crocket and Friend (1974) and Vissing-Jorgensen (1999) to measure portfolio diversification with acceptable results. Similarly, Reilley and Brown (2000) report that for randomly selected shares, about 90% of the maximum benefit from diversification was derived from portfolios of 12 to 18 shares. Lastly, a study by Goetzamnn and Kumar (2007) using data for trades and monthly portfolio positions of 62,387 retail stock investors in the USA to test the efficacy of the total number of securities approach offers useful insights. The study results show that the diversification parameters of the total securities approximate the variance-base measures with positive moderate correlations. The foregoing justifies applying the eleven (11) securities benchmark hereafter.

Literature on personal wealth indicates that despite the advantages associated with diversification, most investors hold under-diversified and non-efficient portfolios. Georgarakos (2002) captures this aspect aptly in an analysis of cross-sectional household wealth data in FRSS of UK to ascertain the personal wealth portfolio choice. The researcher reports that '...In contrast to the predictions of theoretical models [such as Capital Asset Pricing Model (CAPM)], the analysis of micro data suggests that most of the households do not include any risky asset in their portfolios and that the diversification across and within different risk asset categories is limited and even so, for the very wealthy' (p. 7).

The *diversification puzzle* cited above has been explained variously in wealth studies. In the USA, King and Leape (1987) use ratio analysis to examine the level of diversification based on the 1978 Survey of Consumer Finance Decision Survey of households' wealth data. The

researchers report incomplete portfolios that are explained by information costs. These findings are later supported by Haliassos and Bertaut (1995) who apply econometric analysis on 1983 SCF data to examine why over 75% of USA households did not hold shares. The study shows that low participation rate in shares is due to costs of entry/participation, low education and cultural practices. Related findings by Paxson (1990) using the 1992 SCF data show that low diversification is due to borrowing constraints on the part of the investor.

Further insight into the diversification puzzle is provided by recent studies. For instance, Banks and Smith (2000) examine UK Financial Research Survey (FRS) and aggregate data in the period 1980 to 1995 to study the portfolios of individuals. In this study, the researchers employ a three-way asset categorization for risk classification as follows: *completely safe assets* comprise savings, deposits and fixed return, national saving products; *partially safe assets* include mutual funds and investment trusts; while *risky assets* consist of shares, bonds and business assets. Using ratio analysis, they find that 90% of the people prefer to hold completely safe assets; that 50% of the households hold completely safe assets only; 8.6% hold all the three classes of assets; while those owning any two classes of assets were 31.9% They also report that 73.4% of the sampled population did not own any equities. For those with financial wealth, the values of shares comprised only 21.6%, while that for bonds was only 8.8%.

The conclusions by Banks and Smith (2000) are supported by evidence from the review of a different database, the UK FRSS data, by Geogarakos (2002). The researcher examines the households' portfolio discrete choices of ownership of risky financial assets using probit regression analysis, and reports that only few households among the poorer decide to include risky forms of financial wealth in their portfolio. The study reports that the important determinants of wealth composition are the level of wealth, income, education and investment in housing.

Various wealth studies in the USA report widespread under-diversification in shares held. One such case is the extensive study by Statman (1987) which reports that 34% of investors hold one security; 50% own up to two; and only 11% hold more than ten. Also, Lusardi (2001) reviews the 1992 Health and Retirement Study (HRS) data in the USA and finds evidence to suggest that the composition of household portfolios is rather naïve. The study shows that about one-third of households had all their financial wealth in one asset, while about 15% did not hold financial wealth. As further evidence of poorly structured portfolios,

about half of the respondents did not hold any of the assets which had recorded high returns in the recent past such as real estate, business, bonds and equities.

Polkovnichenko (2003) uses household survey data for the period 1983 to 1998 in the USA to examine the extent of diversification of the equity portfolios of households using ratio analysis. The researcher reports that four out of five of all equity-owning households were investing in one to five companies; about 90% in fewer than ten, and that one-third of their financial wealth was tied in one company. Financial ignorance and the hope of receiving an extraordinary gain, a phenomenon known as 'prospect preferences', are advanced as the possible reasons. These findings are supported by the study by Goetzmann and Kumar (2004) of 40,000 investors in large discount brokerage houses in the USA which reports that the mean and median number of shares in a portfolio was four and three, respectively. The same study shows that younger investors and those in low income and non-professional categories hold the least diversified equity portfolios. More recently, Statman (2004) reviews literature on diversification of equity portfolios and adds a twist to the diversification puzzle; that investors tend to concentrate their portfolios in large capitalization stock or in one location.

Little is documented on asset holdings of households and individuals in Africa. According to Aryeetey and Udry (1997), this is partly due to the lack of relevant household surveys on consumption, incomes and personal wealth. In their review of Ghana Living Standards Survey, the researchers find that financial assets account for only 5 percent of the value of household portfolios in urban areas. Low diversification is also reported in Korea, an emerging economy, where analysis of Korean Labour Income Panel Study (KLIPS) data by Cho (2005) finds that most households hold one or two financial assets in either rent or time deposit. Thus, the sketchy available evidence shows that the value of formal sector financial assets in developing countries is low, and that these assets are a relatively small component of personal wealth.

Whether investors carefully plan their investments and subscribe to utility theories of earnings maximisation or not, can be gleaned by answering the question: Do households and individuals go out to seek financial advice when making investment decisions? Kennickell et al. (1996) set out to answer this question and analyse responses from a nationally representative data set of 4,000 households in the USA from the 1983 SCF data. Using multivariate analysis, they find that 45% of the respondents sought financial advice with 57% getting advice from friends and relatives while only one quarter sought advice from

professionals (bankers, brokers, accountants, lawyers, tax advisors, etc).

2.4.1.4 Size of personal wealth portfolios

The size of personal wealth portfolios is often discussed in the light of its absolute monetary value and in relative terms, that is, the income it can generate compared to the holder's financial requirements. The second aspect has more conceptual appeal and, resting in the realm of retirement planning, deals with the normative issue of the level of income one should have while in retirement. This is commonly referred to as the 'replacement rate' which is computed as ratio of a person's income needed to finance desired retirement consumption divided by the annual pre-retirement income. In their examination of household data in USA to describe and evaluate patterns in retirement asset accumulation using descriptive statistics, Mitchell and Moore (1997) declare that the replacement rate is indeed a 'spiritual descendant of LCH'. The researchers further state that efforts to compute retirees' target replacement rates from empirical data have in the past yielded a wide range of estimates depending on what is included in the computations and the data set used. Consequently, experts' opinion on the appropriate replacement rate is seemingly divided.

The Financial Engines, a popular source of retirement investing advice in the USA, notes that many financial planners estimate that retirees need about 70% of their pre-retirement income to maintain their standard of living, (Bodie, 2001). Merrill Lynch recommends about 65 to 70% of pre-retirement income. This is also corroborated by Au, Mitchell and Phillips (2005) who propose a figure of 75% from their review of HRS data in the USA, and Munnell et al. (2006) who suggest a rate of 73% from their review of 1983 to 2004 SCF data. However, Wharton's Pensions Research Council advocates a 100% rate to cater for inflation and longevity risk. In Kenya, no similar research has been done and therefore, there is no country benchmark. However, a replacement rate of 100% may be more appropriate for Kenya on account of the country's undeveloped social security, high dependency rates and inflation, as well as the need to provide for financial support to the extended family. This discussion yields a research gap regarding the need to determine the desirable replacement rate in Kenya, whose results would be useful to the pensions sector.

Literature reviewed shows varying evidence suggesting that the wealth held by employees tends to be inadequate for their consumption needs during retirement. Among a number of similar studies Mitchell and Moore (1997) report that the median American on the verge of retirement has too little wealth to support a comfortable life in retirement. This leads

Browning and Crossley (2000) to restate a confounding paradox in the USA which may be equally applicable anywhere else that: 'apparently, similar households appear to reach retirement with very different wealth levels and many more arrive at retirement with little or no wealth at all' (p. 28).

Similar sentiments are echoed by Munnell et al. (2006) from their study of SCF 1983–2004 data to estimate the share of working-age households who are at risk of being unable to maintain their pre-retirement standards of living after retirement. The researchers report that about 43 % of households are at risk of having inadequate retirement income, and that most of the working-age population saves virtually nothing outside of their employer-sponsored pension plans.

The predicament of inadequate wealth that seems to face many people who are approaching retirement is captured by a retirement consulting firm, The Hartford Financial Services Group (2007), in its survey in USA, Europe and Asia. The Company commissioned an independent research agency, Opinauri, who polled 6,500 consumers aged 45 years and older, and reported that across the globe, baby boomers who are readying themselves for retirement are facing a crisis of *confidence* over how to prepare for retirement and where to turn to for help. The survey reports that most people who realize that they have inadequate resources are planning to work longer into their retirement. The poll results reinforce the role of culture in influencing investments through personal preferences. High risk aversion rates are reported for people in South Korea (79%), Japan (69 %) and Germany (71 %), while those who are less risk averse are in the UK (59 %) and the USA (41 %).

The empirical evidence examined above is mainly from developed countries, which limits its relevance to Kenya. This brings out a clear research gap: the need to collect primary data on personal wealth portfolios and examine it to ascertain the absolute levels and adequacy of the wealth portfolios. However, some important lessons that are relevant to the current study are worth mentioning. Firstly, the wealth portfolios of employees are likely to be low, both in absolute terms and relative to what is required to support their consumption needs while in retirement. Thus, a low replacement rate is expected. This may be partly due to lack of retirement planning, leading to low savings and investments. Furthermore, a high level of heterogeneity in the composition and levels of employees' wealth portfolios is also expected.

2.4.2 *Design of Personal Wealth Studies and the Determinants of Personal Wealth Portfolios*

This subsection considers findings from empirical research on the design of studies and determinants of personal wealth portfolio on the premises of the LCH, MPT and the SA. A separate review is made on the role of savings in influencing personal wealth portfolios.

2.4.2.1 Empirical evidence from personal wealth studies based on the life-cycle hypothesis

One of the earliest studies that empirically tested the propositions of the LCH that personal wealth is an increasing function of age until retirement was by Shorrocks (1975). Using longitudinal data from the UK Inland Revenue on individuals' estate taxes from 1912 to 1971 to plot wealth against age, Shorrocks found evidence in support of the LCH. The findings are challenged by King and Dicks-Mireaux (1982) on the grounds that the study was on individuals rather than households; it excluded people who die without wealth and omitted assets that vanish after death such as human capital, pension and annuity rights. Besides, the profile of one's assets at the time of death may not be representative of their wealth in the normal course of life. Nevertheless, these results suggest that age is an important determinant of the monetary value of a person's wealth portfolio.

Using 1983 and 1986 SCF data, Gale and Scholz (1994) study the effect of transfers on wealth accumulation in the USA. Their findings in support of the altruistic LCH show that: one-third of wealth transfers occur within generations, intended transfers account for 20% of USA wealth, while bequests take up a further 31%. The results of this study suggest that inheritances are key determinants of personal wealth portfolios.

The role of gender differences in investing and risk-taking on personal wealth was clearly documented by Bajtelsmit and Bernasek (1996) based on a ratio analysis of questionnaires sent to clients of a large USA brokerage firm. The study showed that after age and income, gender was the third most important determinant of investor style. Women emerged as more conservative investors compared to men. In a related study, Ghokale, Kotlikoff, and Sabelhaus (1996) examined USA wealth data between 1960 and 1990 for age groups 20 to 89 years and found evidence to suggest that consumption by men exceeded that of women and that the pension and human wealth of men in the age group 65 to 85 years exceeded that of women significantly. These findings suggest that age, income and gender are likely to have significant correlation with personal wealth holding, where for instance, men would be

expected to have more wealth than women, other things equal.

In the USA, Yoo (1994) examines SCF data to ascertain how investors' portfolio of wealth in risky assets is affected by age. A regression of the portfolio composition on the respondent's age reveals that age is a significant factor in determining the portfolio composition. Thus, the percentage of investors seeking to maximise return on investments diminishes as the age of the household increases, while the fraction of individuals seeking to safeguard capital increases with age. Contrary to theory, the study found that during the working life, households tend to progressively increase their holding of shares, while the fraction of cash and cash equivalents diminishes. The researcher identifies a research gap in these results and suggests further work be done to identify a satisfactory model of investors' behaviour by focusing on factors that are not linearly related to age. The results, however, imply that older employees should have a higher proportion of their wealth in shares and less in cash and reinforces the fact that age is a key determinant of a person's wealth portfolio.

Banks and Smith (2000) employ the LCH framework on both FRSS and aggregate data from 1980 to 1995 to study the portfolios of UK individuals and their evolution. Using probit models, they find that non-tax payers have a lower probability of holding tax-free investments. The likelihood of holding shares is found to rise from age 30 at the rate of 1% for every 3 years until age 65 when it falls. The most educated are found to hold 7% of their wealth in shares while the wealthiest 5% have more concentration of shares. These findings lead the researchers to conclude that: 'the concentration in risky assets increases further in the wealth distribution, although in the top quartile, risky assets are more likely to be held in the form of investment, trusts, unit trusts and Personal Equity Plans (PEPs) as opposed to direct holdings in stocks' (p. 25). The results suggest that employee age, income and education have a positive correlation with the size and diversity of employee wealth portfolios.

Analysis of household portfolios in Germany in the 1980s and 1990s is done by Borsch-Supan and Eymann (2000) using two sources of micro-level data (EVS and Spiegel-Verlag survey "Soll und Haben") alongside macro data from German Socio-economic Panel (GSOEP) under the LCH framework. The researchers apply probit models and multivariate analysis to investigate investors' willingness to hold risky assets. They report high ownership rates of domestic bonds and life assurance contracts, but low holdings of shares and real estate. The willingness to hold shares is found to increase with age, wealth, education and financial knowledge, while persons who actively seek information from diverse banks were

more likely to hold diversified portfolios, whereas persons relying on the advice of family and friends or their own bank were more likely to have clearly safe assets only. Thus, with respect to the current study, older, wealthier and more educated employees are expected to have a higher proportion of shares in their wealth portfolio, while those who seek professional advice would have more diversified portfolios.

The controversy on the importance of life cycle and bequest saving with regard to wealth accumulation is tackled by Dynan et al. (2002) when they use a two-period model in which households have an altruistic bequest motive. They examine the 1998 SCF data, with lifespan uncertainty and no bequests, and report that savings among the younger people (30–60 years) are 10%, and negative, at -11.3%, for older people. When uncertainty of life and a bequest motive are introduced, saving among the younger climbs to 15% compared to 0.6% for older people. Another indication that bequests are important is that the bequest reason for saving was cited by 12% of the sample compared to 30% who quoted emergency/illness, while 45% singled out retirement. The findings suggest that inheritances are important determinants of the size of personal wealth holding.

In what is said to be the first study of its kind in Japan, Iwaisako (2003) examines the role of age-pattern relationships in shares and housing portfolios using aggregate data from the Bank of Japan Flow of Funds Accounts and survey data from the Central Council of Savings Promotions together with Nikkei Radar data drawn mainly from Tokyo Metropolitan area and the surrounding Prefectures. Applying regression and probit analyses, the researcher's findings contradict theory by reporting an increasing proportion of shares in wealth with age peaking at mid fifties, and that the percentage of the population owning shares increases with age. The same pattern is also reported with respect to housing and wealth, inclusive of housing. The researcher reports that house ownership has a significant positive impact on stock market participation and the proportion of financial wealth held in shares. The results of this study should however be treated with caution because the Nikkei Radar data may be inappropriate because it is cross sectional rather than from a panel. It may also comprise younger people in Tokyo and therefore unrepresentative. This said, the study results suggest that older employees are expected to have a higher proportion of shares and housing in their wealth portfolios since age is found to influence the wealth portfolio mix.

2.4.2.2 Empirical evidence on personal wealth studies based on the modern portfolio theory

Cohn, Lewellen, Lease, and Schlarbaum (1975) attempt to reconcile theory with practice by investigating the effect of wealth holding on the proportions of individual assets allocated to risky assets. Using data obtained from 972 respondents to a mail questionnaire survey among customers of a nation-wide US retail brokerage firm, the researchers cite evidence to support theory: a strong pattern of decreasing relative risk aversion was found. Thus, as wealth increases, a higher proportion is committed by the holder to risky assets. The findings suggest that wealthier employees are expected to hold a higher proportion of equity in their wealth portfolio; thus, wealth size influences wealth portfolios.

The propositions of MPT find further application on the relationship between an investor's risk tolerance and the level of wealth holding where McInish, Ramaswami and Srivastava (1993) investigate the link between risk aversion and two aspects of well-being: net worth and incomes. Using data from 3,000 households selected randomly across the USA the study results confirm theory where labour income is found to be inversely related to risk aversion while wealth level is found to affect wealth holding through the portfolio structure due to decreasing relative risk aversion. More fundamentally, the researchers find evidence to show that risk tolerant investors tend to have more wealth. This leads them to concur with observations made by professional investment managers that most people who manage their own retirement funds make wrong investments by selecting too conservative portfolios that have low returns. The import of these findings is that risk-averse employees are likely to have lower levels of wealth and less diversified wealth portfolios. Thus, personal preferences are found to be important determinants of personal wealth.

Spurred by an observed increase in house ownership, high share of housing in wealth, substantial returns to real estate where Ibbotson and Siegel (1984) report an annual return of 8.3% between 1947 and 1982 in the USA, and the fact that housing wealth was excluded from the original MPT, researchers (Goetzmann & Ibbotson, 1990; Kallberg, Liu & Greig, 1996) apply MPT to ascertain the effect of housing on portfolio choice. Additional evidence from several series of historical U.S.A. asset return data show that returns to real estate have low variability and are weakly correlated to those for financial assets. These findings suggest that housing wealth offers diversification benefits. Whilst there is concurrence that an efficient portfolio ought to include housing, consensus is lacking on the ideal fraction. Whereas Goetzmann and Ibbotson (1990) recommend a 50% housing share to wealth, Kallberg et al. suggest 10 to 20%. The important lesson here is that the inclusion of housing

asset is conditional to a diversified wealth portfolio.

Bodie and Crane (1997) survey participants drawn randomly from TIAA-CREF records in the USA to examine how individual holding of shares is influenced by wealth from a MPT framework. Applying quartile analysis to the data obtained from questionnaires, the researchers find that in the lowest net worth quartile, the average proportion of non-retirement assets held in cash was 57%, while in the highest net worth quartile, this fell to 25%. The study confirms the age/wealth profile: younger employees have lower net wealth than older ones, yielding a positive correlation coefficient of 0.346 between age and net worth. In the same study, the fraction of shares held in financial assets is found to decline by 0.6% with each additional year of age. These results suggest that age is an important determinant of the composition and size of employee wealth portfolio.

In a comprehensive study of 1992 HRS panel data of US households, Mitchell and Moore (1997) test empirically whether wealth is associated with potentially explanatory factors such as education, marital status and household total income. The results show that wealth levels strongly increase with education, where the median married couple had three and eight times the financial wealth of the single male and single female household respectively. The report shows that the share of wealth held in housing falls with education from 70% for those not attained high school grade, to 40% for holders of advanced degrees. This may be explained by the fact that housing tends to dominate other forms of wealth for people with low education. The implication of these findings is that education, marital status and income are important determinants of the composition and size of personal wealth portfolios.

The wealth effect of personal preference through risk aversion is also examined by Sunden and Surette (1998) in their study of 1992 and 1995 SCF data using a multinomial logit model. The researchers operationalise attitude to risk and measure it by self-reported willingness to exchange risk for return. Whereas absolute risk aversion is measured as the monetary value of one's portfolio invested in risky assets, relative risk aversion refers to the proportion of risky assets in the investor's wealth. The evidence suggests that risk-averse households invest more conservatively than those willing to exchange above-average risks for higher returns.

The interplay of gender and marital status in determining whether investors choose 'mostly shares' or otherwise, was investigated by Jianakoplos and Bernasek (1998) using the SCF 1989 data sample. The researchers regressed the percentage holding of risky financial assets

on total financial wealth assets to explanatory variables such as age, income, gender, marital status, race and number of children. Thus, measuring relative risk aversion by the above coefficient of the wealth variable, single women were found to be more risk averse in their asset holdings than single men or married couples. In the same study, the researchers report that participants' self-reported investment risk tolerance provides further evidence that women perceive themselves to be less inclined to risk-taking than men. These results suggest that risk-averse employees should have a lower level of wealth: thus personal preferences are important determinants of the size of personal wealth portfolios.

In the USA, King and Leape (1998) examine the Survey of Consumer Financial Decisions data drawn from a stratified sample of 6,010 households to study the allocation of wealth among assets. Not surprising, they find a prevalence of incomplete portfolios where 9% of the people own bank accounts only, 50% own shares, and only 10% own all three: cash, shares and property. The researchers argue that transaction costs force optimal portfolios to contain few assets, hence the reason for incomplete portfolios. Acknowledging the realities and constraints imposed on investors by imperfect markets, the researchers conclude that portfolio choice in such markets depends on (i) income and wealth to finance transaction and information costs, and (ii) financial information that is proxied by age, education and parent's wealth composition. In the case of Kenya, where the financial markets are not well developed, employees are likely to hold narrow wealth portfolios on account of the moderating influence of the external environment.

Arrondel and Mason (2002) analyse the French National Institute for Statistics and Economic Studies (INSEE) survey and aggregate data to ascertain the portfolio choice of French households. The researchers build on the works of King and Leape (1998) and consider sources of future exogenous risk such as health, family risks (marital status and family size), and income risk (sector of employment, previous unemployment record and whether one is an employee or self-employed). Using quartiles and probit regressions, they report that the proportion of financial assets increases in household wealth; that the ownership of shares displays a hump-shaped age profile; and that education has a positive correlation with the proportion of shares in wealth. The research design in this study is particularly relevant because it combined the LCH and the SA in its conceptual framework, although it did not include MPT. This yields an imputation that wealth, age and education should be important determinants of the composition of the wealth portfolios of employees.

Using the 2002 Household survey data, Gibson and Scobie (2003) explore the key factors that explain the differences in net non-human capital among households in New Zealand. Decile analyses and third-order polynomial regressions show a marked hump shape of wealth to age with a peak at 55 to 65 years. They apply probit models on the portion of risky assets held to proxy risk-aversion and find that risk-averse households invest more conservatively. The researchers also report that consumption, pension and human wealth of men usually exceeds that of women since the latter tend to have lower recurring income and live longer. A moderately weak correlation of 0.33 between wealth and income is reported, while other important wealth determinants are found to be years of secondary schooling, the number of children, and family health. Also, inheritances are found to have a major effect on wealth in that only one-third of wealth accumulated is consumed and that the expectations by a person to receive US$ 10,000 in inheritances enables such people to have US$ 24,000 more wealth than others. These findings suggest that key determinants of the size and composition of employee wealth include: age, gender, risk aversion, income, education, and inheritances.

2.4.2.3 Empirical evidence from personal wealth studies based on the Sociological Approach

This subsection examines the results of empirical studies employing the SA on the nature and determinants of personal wealth portfolios. This being a relatively new approach in the study of personal wealth portfolios, most of the studies are very recent.

In their US study, Badu et al. (1999) apply canonical correlation analysis on the 1992 SCF data to examine the influence of culture, as depicted by ethnicity, on the asset and liability combinations of blacks and whites. They find that black households have lower mean assets and liabilities compared to white households. These findings reinforce the conclusions by Brimmer (1991), also in the USA, that culture has a significant influence on wealth from their findings that whereas black households tend to prefer liquidity and concentrate more on investment property, white households tend to prefer financial assets and concentrate their investments in single family dwellings. Applying these findings to Kenya suggests that employees' culture as proxied by ethnicity and religion is likely to impact the composition and size of their wealth portfolios.

Ucello (2000) studies the asset allocation behaviour by investor characteristics and spousal actions based on 410(k) data in the SCF file. Using probit models, Ucello finds that married women with non-working husbands invest more conservatively than those whose husbands

work. The study also reveals that allocations to shares are higher for employees with more job security and longer service: employees who have worked in the same company for 16 to 20 years hold on average 62% in shares, compared to 31% for those with 5 years working period. For Kenya, these results suggest that public service employees, who have more job security and are longer serving, should have a higher proportion of their wealth in shares. Therefore job type is a determinant of the composition of employee wealth portfolios.

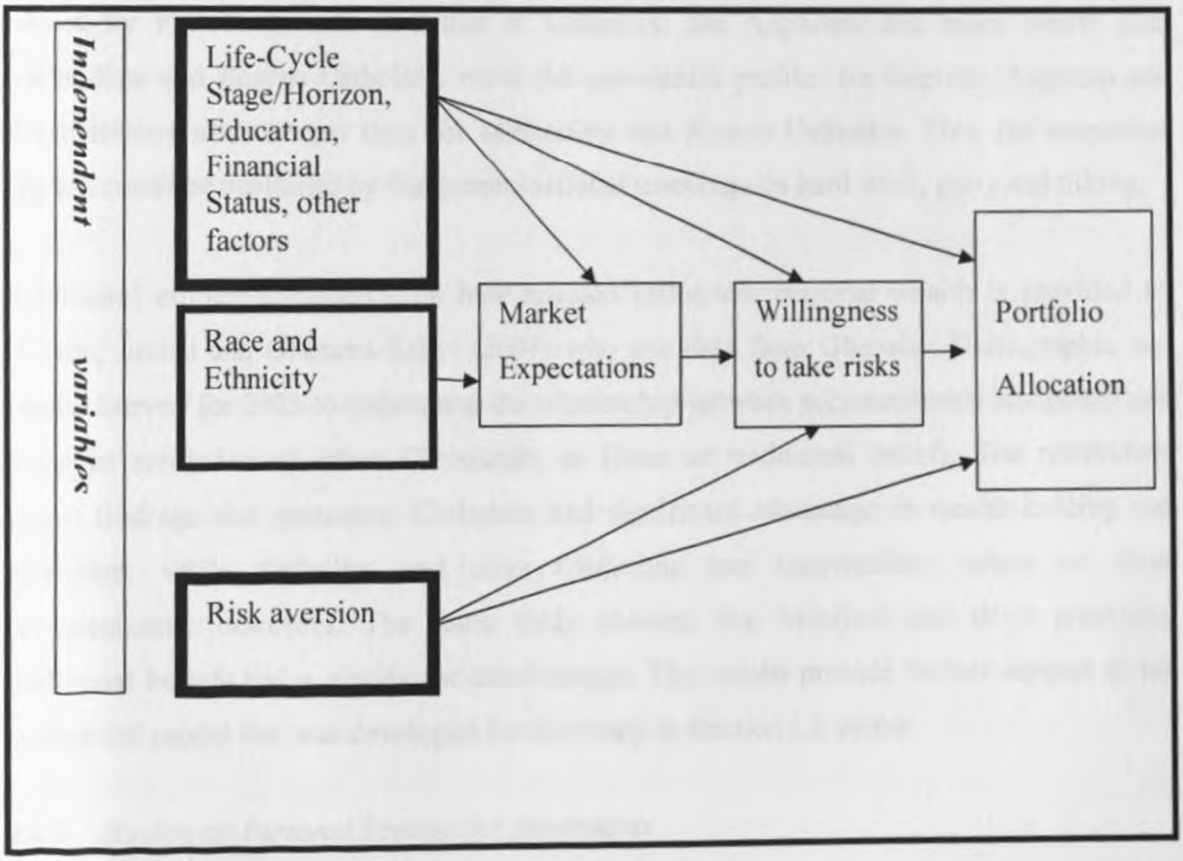
The interaction between culture and personal wealth is examined by Fan and Xiao (2003) who compared the risk preference attitudes and behaviour between a sample of 470 Chinese workers from Guangzhou city and 2,671 Americans using the 1998 SCF data. The researchers report that Chinese people were more risk tolerant than Americans in their financial decisions. The Chinese were also found to have a higher risk preference attitude as measured by the categorical variable of willingness to take risks as well as a higher share ownership rate. This is also interpreted as a measure of financial risk-taking behaviour.

But these findings are criticized in a recent study titled, "Does Finance have a Cultural Dimension?", by Hens and Wang (2007), who argue that the results seem to contradict existing stereotypes, and suggests that the phenomena could be explained by the Cushion hypothesis proposed by Weber and Hsee (1998): thus people from collectivist societies may be apt to engage in more financial risk because they have a societal cushion that will protect them from downside risk. This conclusion is non-trivial since it implies that culture has a profound effect on risk preference and hence the choice of assets and debt in an investor's portfolio. Because of the extended family system in Kenya and the tendency towards collectivism, employees in Kenya would be expected to be risk tolerant and therefore hold riskier portfolios, with a high proportion of shares. However, this may be constrained by asset scarcity due to undeveloped capital markets, low education and lack of financial advice.

The interplay of culture and religion on wealth and how family processes in childhood shape adult well-being are also examined by Keister (2005) using a nationally-representative sample of 12,686 young adults aged 14 to 22 years in the USA. The researcher finds that people from conservative protestant families as depicted by Assemblies of God, Baptist and Pentecostal, are asset poorer than Roman Catholic and Jews. This is on account of low educational attainment, early marriage, high fertility, low adult occupational attainment, and limited income. The findings lead the researcher to hypothesise that the religious teachings of sacrificial giving and the discouragement of accumulation, diminish their wealth.

Surprised by reported widening of large differences between the net wealth of blacks and whites, where the mean wealth of white households in 2001 was reported to be 4.2 times that of blacks in the USA, Yao et al. (2005) examine six waves of SCF data from 1983 to 2001. The study was designed to ascertain the underlying determinants of willingness to take financial risk which in turn affects portfolio allocations, say portfolio mix. The researchers develop an updated model of the underlying determinants and suggest the framework reproduced in Figure 2.2 below.

Figure 2.2: Conceptual Relationships between Race/Ethnicity and Portfolio Allocation



Source: Adapted from Yao, et al. (2005), p55, Figure 1

The above conceptual model is appealing to the current study because the researchers identified the three basic determinants of portfolio allocation to be life-cycle factors, sociological factors and risk-taking behavour, as shown in the boxes outlined in bold lines. In its core, the model intuitively combines the LCH, MPT and SA conceptual frameworks. In this proposed model, the independent variables are grouped into three: culture (race and ethnicity), risk aversion and others (life-cycle stages, education, financial status), while market expectations and willingness to take risks are intervening variables. Portfolio

allocation (wealth composition), is the dependent variable. With a few modifications to this model, this researcher is able to derive inferences that underlie the design of the current study as shown in Figure 2.3 on page 66. A final point is made that the SA clearly establishes the central place of culture and religion in influencing personal wealth portfolios.

Drawing on inspiration from Weber (1958), Di Matteo (2007) analyses 3,476 records of the 1892 to 1902 probate decedent residents of Ontario for evidence of the impact of religion on the level of wealth and rate of wealth accumulation. After controlling for age, birthplace, occupation, gender and urbanization, the researcher finds evidence to suggest that religion and denomination have significant effect on wealth. They report that the level of wealth owned by Protestants exceeded that of Catholics; the Anglicans had more wealth than Methodists and Roman Catholics, while the age-wealth profiles for Baptists, Anglican and Presbyterians were steeper than for Methodists and Roman Catholics. This, the researcher argues, could be explained by the denominational teachings on hard work, piety and tithing.

Additional empirical evidence on how religion influences personal wealth is provided by Heaton, James and Oheneba-Sakyi (2007) who use data from Ghanaian Demographic and Health Survey for 2003 to understand the relationship between socioeconomic attainment and religious affiliation of either Christianity or Islam or traditional beliefs. The researchers report findings that protestant Christians had significant advantage in wealth holding and education, while Catholics and other Christians had intermediate values on these socioeconomic outcomes. The same study showed that Muslims and those practicing traditional beliefs had a significant disadvantage. The results provide further support to the conceptual model that was developed for this study in Section 2.6 below.

2.4.3 *Studies on Personal Savings for Investments*

The tri-annual SCF surveys and the HRS panel data provide important information on household savings and wealth in the USA. In these surveys, and nearly all wealth studies, savings are depicted by the self-reported portion of income that is saved by the respondents. Bernheim (1996) examines SCF data using ratios to ascertain the determinants of savings and reports that savings are an increasing function of financial and economic literacy. Following this, Kennickell, Starr-McCluer and Sunden (1997) apply ratio analysis on the 1989, 1992 and 1995 SCF data to ascertain the recent changes in US wealth and saving patterns and report that about one-quarter of households in the USA do not save.

Similar findings of low savings rates are reported by Mitchell et al. (1997) using descriptive statistics to describe and evaluate patterns in retirement asset accumulation based on the 1992 HRS households' panel data. They find three reasons to explain the low saving rates, namely: low incomes; lack of self-control, which is caused by peoples' desire for immediate consumption; and inability to plan for savings because of uncertainties regarding life expectancy, high inflation rates, low interest rates, labour income taxes, and low asset returns. The latter two reasons have a conceptual appeal for the current study because they imply a role for behavioural finance in examining savings and their effect on wealth portfolios.

The lack of planning for savings is further corroborated by Yakoboski and Dickemper (1997) who apply regression analysis to examine data from the 1997 Retirement Confidence Survey on the retirement planning and saving behaviour of American workers. The study reveals that only one third of current workers in the USA have tried to determine how much they need to save to fund a comfortable retirement, while 37% have given little or no thought to their retirement. Given these findings it is expected that employees who plan for savings in Kenya are likely to be a small number in relative terms.

In a widely-quoted study, 'Explaining why so many people do not save', Lusardi (2001) uses HRS data in the U.S. to examine savings in older families whose heads were born between 1931 and 1941. Using regression analysis, they find that 30 percent of the households do not save, a situation which the researcher attributes to the complexity of the planning process: individuals learn to plan from older siblings and the experiences of their parents. The study identifies a link between savings and household wealth where the researchers report that households whose head does not plan have lower wealth holdings and save less than those who make retirement plans. However, the results are not conclusive about the determinants of planning and savings. This implies a research gap.

In the UK, Guariglia (1998) uses panel data of 10,000 individuals in the British Household Panel Study (BHPS) 1991 to 1996 to examine peoples' saving behaviour. A tobit analysis on the data shows that labour income variability significantly affects savings whereby majority of savings are informed by the precautionary motive rather than investments. Further evidence on the relationship between incomes and savings is provided by Butelmann and Gallego (2000) in their review of the 1988 and 1996–97 Household Budget Survey of Chile. Using Analysis of Variance (ANOVA), they report a positive correlation between saving rate and income level, as well as the household's education level, which they argue is a better

proxy for permanent income. These results reinforce the key role of savings in a study of the determinants of personal wealth portfolios.

Recently, Munnell et al. (2006) reviewed a nationally representative sample of 4,500 households in the U.S. 2004 SCF data to evaluate households' saving patterns. The researchers reported low savings where most of the working-age population save virtually nothing outside their employer-sponsored pension plan. This suggests that employees are likely to have low saving rates.

Further explanation for low savings rates is provided by evidence on the reasons which motivate people to save. From their review of 1995 SCF data, Kennickell and Starr-McCluer (1997) tabulate the percentage of American households who cite different reasons for saving: precautionary motive (33%), retirement (24%), education (11%), major purchase (8%), investment (4%), buy a home (6%), family (3%) and other reasons (6%). It is instructive from these results that a remarkably low percentage of households cite savings for investments. The import of these findings is that employee savings in Kenya are expected to be low with much less going into investments.

Empirical evidence on savings for investments by employees in Kenya is scarce partly due to the absence of relevant survey data. Notwithstanding this challenge, useful insights are provided by evidence from household surveys and broad macro-economic data. The first insight is provided by the 1998/99 Integrated Labour Force Survey (1998/99 ILFS) that used data from the third welfare monitoring study (WMSIII) of 1997 to examine the incidence of poverty among employees (GoK, 2003a). The survey reports an urban saving rate of 13%. These findings are somewhat corroborated by data from Kenya's annual economic surveys that reveal a national gross savings rate averaging 13.1% between 2003 and 2008. This national average should be read with caution though, and may be unrepresentative of employee savings rates on account of countrywide averaging.

Lastly, the wealth holdings and saving rates of employees in Kenya can also be imputed from the fraction of households that receive income from savings, interest and investments. This evidence is obtained from the KIHBS 2005/06 survey of 13,430 households that was designed to collect data on certain socio-economic aspects of the Kenyan population (GoK, 2007a). The study reports that 28.6% of urban households receive interest, dividend, and rental income from their investments, albeit at an annual average of Shs 26,701.

An indirectly related issue is the low utilisation of loans in Kenya. Evidence in this regard is provided by the KIHBS 2005/06 survey which shows that only 29% of urban households seek credit. Of those who sought credit, 38% obtained it from neighbours/friends while 19.3% obtained it from SACCOs. The report also shows that only 27.2% of the households who take credit use it for investments: 2.5% to buy land, 2.2% to purchase agricultural inputs, 13.7% for other business inputs, and finally 8.8% for purchase/construction of dwelling. These statistics imply that only 8% of all urban households seek credit for investments. This low utilization of credit to finance investment may perhaps be explained by the phenomenon of wide interest spread coupled with potentially low financial knowledge and challenges of access to credit.

The evidence cited above suggests that personal savings rates are low and that few people save for investments. In developed countries, the main reason for this appears to be lack of planning, while for developing countries, the reasons may include adverse external factors such as wide interest spread, undeveloped financial markets, high inflation rate, as well as personal attributes such as low incomes, altruistic behaviour and lack of financial planning. In Kenya for instance, the combination of low savings rates and little use of credit due to borrowing constraints and lack of financial sophistication are likely to be a precursor to poor investments. On these premises, this researcher opines that the composition and size of the wealth portfolios of employees in Kenya is likely to be impacted substantially by their savings. Consequently, the current study of the wealth portfolios of employees in Kenya is designed to include savings in its conceptual design as shown in the model that is proposed and discussed in Section 2.6 below.

2.5 Synopsis and Research Gaps Identified

The review in Sections 2.1 to 2.4 above shows that the most common conceptual frameworks that have been used to study personal wealth are the LCH and MPT. Sociologists have also carried out a number of studies in this area, mostly from the latter part of the 20th Century.

Evidence from studies premised on the LCH emphasize the processes of wealth accumulation/deccumulation and largely confirm the basic proposition that during one's working life, wealth is an increasing function of age as income rises and savings are made to finance investments. Contradictory empirical evidence and criticism leading to relaxation of the basic LCH assumptions yields the altruistic model which is supported by empirical data to show that bequests influence personal wealth portfolios. When the certainty assumptions of

the LCH are relaxed, research shows that wealth is influenced by other personal attribute besides age and inheritances, while external factors also count. The centrality of income, savings and investments in influencing personal wealth is confirmed. From a welfare perspective, the key concern is whether employees accumulate enough wealth to rely on the investment earnings in their retirement. This raises the question of wealth adequacy.

Whereas the MPT prescribes diversified portfolios, personal wealth portfolios are found to be simple, narrow, incomplete and under-diversified with low shareholding and high portions of wealth in cash and housing. This is explained by general uncertainty that is characterised by the risk of losing a job, inflation, mortality, health and dependency combined with imperfect capital markets and investor irrationality. The studies also suggest a positive relationship between wealth and incomes, inheritances, the level of an investor's education and financial knowledge, job seniority, length of years in employment, and wealth. Risk-averse investors tend to have lower wealth than their converse. Failure to seek professional advice in making investment decisions is cited as a possible reason for sub-optimal and inefficient portfolios. These undiversified portfolios in turn constrain the growth of investors' wealth. This invokes the need to examine the diversification of the wealth portfolios of employees.

Studies by sociologists show that culture and religion have a significant influence on the composition and size of personal wealth portfolios. The most commonly used proxies for culture are race, ethnicity and place of origin, also called personal background.

Literature reviewed shows that the commonly used analytical methods in personal wealth studies include Analysis of Variance (ANOVA), multiple-, probit-, and tobit regression, multivariate and canonical correlations. Whereas the components, composition and absolute size of wealth portfolios are the dependent variables, the independent variables are age, income, preferences, marital status, education, source of financial advice, gender, inheritance, the number of children, wealth, culture and religion. These wealth portfolios are moderated by non-personal environmental factors that include taxes, inflation, investment options, advice, prices, and other external factors.

Personal wealth is measured by the market value of net assets. The assets include cash, treasury bills, bonds, shares, cooperative shares, property, life assurance and pension policies, but exclude human capital, business wealth and durables. The size of wealth is usually assessed relative to the holder's consumption needs while in retirement; the replacement rate.

Empirical evidence from studies in developed countries shows that the wealth portfolios of most people cannot generate earnings to match the recommended minimum replacement rate of 70% of their pre-retirement income. This is partly because most of them do not plan their savings and investments to fund their retirement consumption. Consequently, majority reach retirement with inadequate wealth to support the same standard of living.

The three major research gaps that emerge with respect to the conceptual framework of studies on personal wealth include the conceptual model, location and study subjects. These are discussed below in turn.

Firstly, the conceptual design of personal wealth studies takes for granted some critical aspects that have a large impact on wealth. The studies, which are mostly done in developed countries, assume wide availability of investments, reasonable ability of employees to save, existence of affordable credit, and easy access to return data for all major assets. In a low-income and developing country like Kenya, personal investments are likely to be impacted negatively by asset scarcity, low savings, and shortage of credit, which lead to limited investment options. This calls for a study on personal wealth that has an extended research design to examine the role played by savings on wealth holdings. The absence of sufficient return data for all major asset types for use by investors makes the investment complicated.

Secondly, the majority of analytical models that are used in personal wealth studies are based on either the LCH or the MPT, whose main focus is the patterns of wealth accumulation/deccumulation and the way investments are made, respectively. More recently, sociologists' studies on personal wealth have been designed to examine the influence of socio-cultural factors on wealth portfolios. But such studies tend to limit themselves mainly to the role of culture and religion in influencing wealth portfolios, while ignoring the propositions of finance and economic theory. The resulting research gap is that these studies do not use an integrated conceptual framework for an inclusive consideration of the key underlying research variables. This is considered in further detail in Section 2.6 below.

The third research gap is that most studies on personal wealth have been carried out on households in developed countries where the environment and the personal attributes of the investors are different from those in low income and developing countries. With respect to Kenya, investments and personal wealth holdings are likely to be hampered by an unfavourable investment climate that is characterised by asset scarcity, inflation, high interest

rates, unstable politics, inadequate data and information, underdeveloped institutions, high dependency rates, unemployment and low incomes. For instance, there are no known studies that empirically examine employee savings rates, and the size and determinants of the wealth portfolios of households and employees. Survey data is also not available on employees' savings rates for investments and the wealth portfolios they hold. On the other hand, there are a number of national poverty surveys and reports as well as several research papers, on the incidence, levels and the alleviation of poverty. The absence of data, reports and studies on employee wealth portfolios in Kenya heightened the need for the current study.

This study addressed the issues and the conceptual research gaps identified above by using an integrated approach to propose a composite model that was used to examine patterns of wealth holding; the modes of investment and the socio-cultural factors that inform the composition, size and diversity of the wealth portfolios of salaried employees in Kenya. The study also used the 'replacement rate' parameter to assess the adequacy of the wealth held by salaried employees to support their consumption needs while in retirement.

2.6 A Conceptual Model for the Determinants of Personal Wealth Portfolios

This section discusses the theoretical framework that offers a suitable conceptual foundation for identifying the relationships that exist among the key variables for this study. The discussion is informed by literature reviewed above that has shown the need for an integrated model for the study of personal wealth portfolios. The study's dependent, independent, intervening and moderating variables are briefly outlined below and depicted in Figure 2.3.

2.6.1 Dependent Variable

The variable of primary interest which this study seeks to explain and predict its variability is employees' wealth portfolios. In order to achieve the above, the concept of wealth portfolios is depicted by five indicators: the asset types held, asset ownership rate, monetary value, wealth composition and potential earnings rate. In this study therefore, the personal wealth portfolios of employees comprise the dependent or criterion variable.

2.6.2 Independent Variables

Literature reviewed shows that the wealth portfolios of employees are influenced either positively or negatively by their personal attributes, which for the purposes of this study are the independent or predictor variables. It also shows that the concept of personal attributes is

operationalised differently based on the underlying theory. Thus, the LCH and MPT lay emphasis on the role of a person's age and personal preferences, respectively while the Sociological approach singles out the importance of the attributes of culture and religion.

2.6.3 Intervening Variables

The effects of the independent variables on wealth portfolios are manifested midway through intervening variables such as personal rates of savings, the outlay and choice of investments, as well as consumption levels. On account of their functional relationship with the personal attributes, the intervening variables are critical in understanding personal wealth portfolios.

2.6.4 Moderating Variables

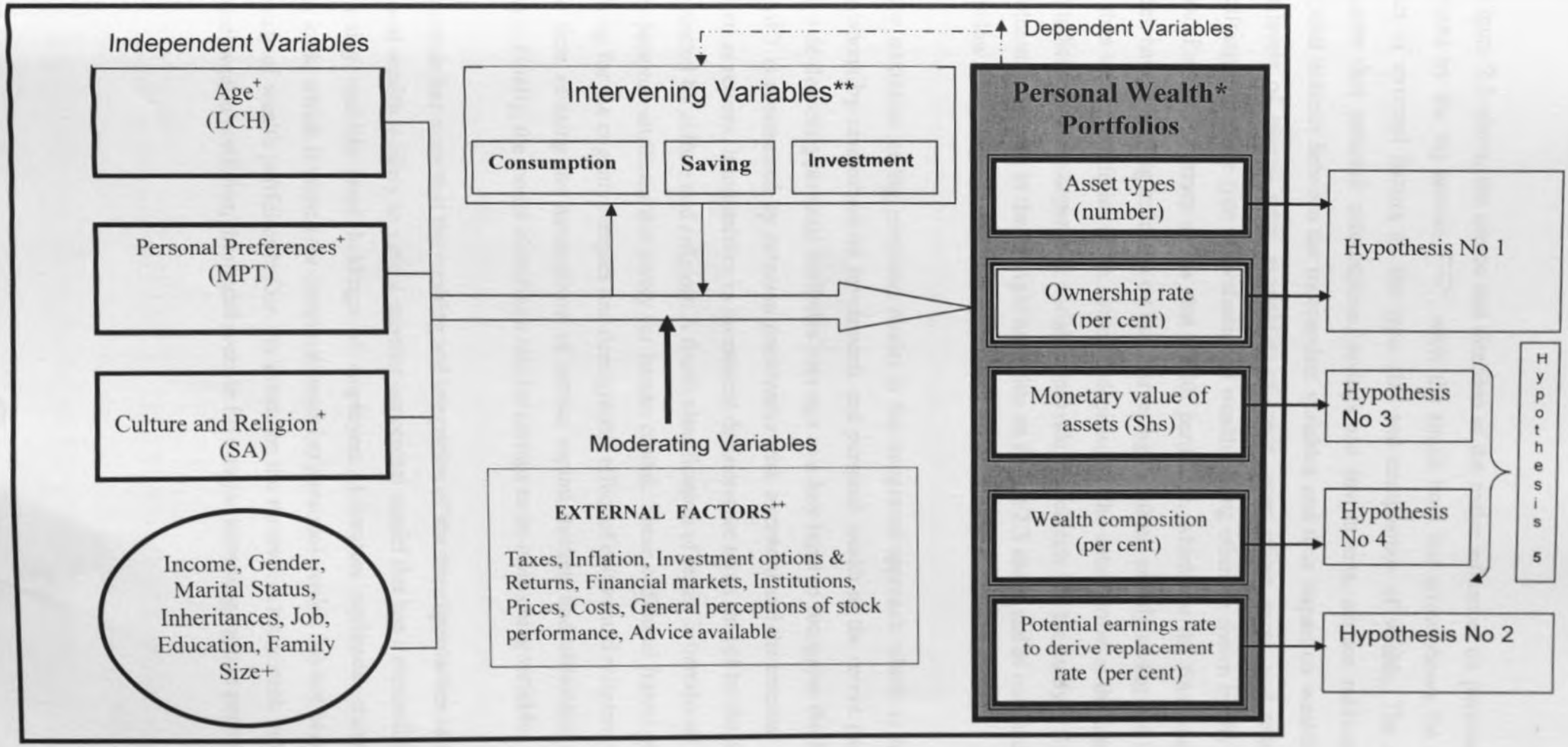
The environment, which is denoted as external factors in this study, has strong contingency effect on the personal attributes of employees and how these influence their wealth portfolios. For the reason of their modifying effect on wealth, external factors are regarded as moderating variables and include the type of financial institutions, investment options and returns, markets, sources of finance, regulations, inflation, taxes, costs etc.

2.6.5 The Model

Cognizant of the above, the proposed conceptual model hypothesizes that employees' wealth portfolios are influenced mainly by their personal attributes. This is supported by MPT, LCH and Sociological approach to personal wealth study. The researcher finds encouragement on the central role of personal attributes from the wealth equation by Gibson and Scobie (2003) based on a study of wealth holding in New Zealand showing that personal wealth is a function of human capital, which encompasses personal attributes.

Enhancing and modifying the model by Yao et al. (2005) in Figure 2.2 above enabled this writer to propose a conceptual framework of the assumed relationships between the research variables in the current study in Figure 2.3 below. This proposed conceptual model is titled, 'Relationships of the Determinants of Personal Wealth', as shown overleaf.

2.3: Relationships of the Determinants of Personal Wealth



Source: Researcher's Own Conceptualisation (2010)

Key: + Independent variable; * Dependent variable; ** Intervening variable; ++ Moderating variable

In Figure 2.3 above, the source and direction of the major influences on personal wealth is depicted by the big arrows '⇨', while the single bold line arrow shows the moderating effect of external factors on the type, size and composition of wealth. The model also suggests that personal consumption, savings and investments, surface midway and in a temporal manner between the independent variables and their impact on wealth portfolios. The levels of interest rates, availability of credit, asset prices, taxes, and returns have a modifying impact the type and valuation of wealth among others as shown by the heavy bold arrow. Finally, literature shows that wealth portfolios, which are the final output in this model, have a looping influence on the intervening variables, namely saving and investments and then wealth portfolios again, which is depicted by the dotted arrow at the top. Using the five indicators these dependent variables provide the objects for the study's five research hypotheses as shown in the far right hand side on Figure 2.3 above and as outlined in Section 2.7 below.

A key attraction of the proposed model is the integrated approach which is in line with suggestions by researchers on investments and personal wealth in the recent past. The left hand side depicting personal attributes uses *age* as a key input to recognise the LCH, while the MPT is represented by *personal preferences* (risk aversion) and the external factor item marked as returns. Irrationalities in investment decisions are taken care of by the SA which is represented by *culture* and *religion*. A fourth classification of inputs is introduced to cater for other personal attributes that proxy for human capital. These additional inputs emerge after allowing for the cognitive impact and demographic effect of *culture* and *religion*, while at the same time relaxing the assumptions of perfect capital markets and certainties of life and income. Finally, the model identifies a role for savings as an intervening variable.

This researcher avers that the meshing and integration of the three approaches in the study of personal wealth is likely to yield a superior conceptual model that has a reasonable chance of explaining real-life asset holdings of employees. Literature reviewed shows that this framework, which is named *the composite model of personal wealth*, has not been applied in the study of wealth portfolios before. By extending the theoretical framework in the study of personal wealth portfolios, the model seeks to fill a major knowledge gap in personal finance.

2.7 Research Hypotheses

Five research hypotheses were formulated to answer the research questions and thereby satisfy the five research objectives stated in Section 1.6. These hypotheses are shown below.

H1 The wealth portfolios of salaried middle and upper income employees in Kenya are diversified.

$H1_a$ The wealth portfolios of salaried middle and upper income employees in Kenya are not diversified.

H2 The estimated income that can be generated from the wealth portfolios of salaried middle and upper income employees in Kenya is adequate for their consumption needs during retirement.

$H2_a$ The estimated income that can be generated from the wealth portfolios of salaried middle and upper income employees in Kenya is not adequate for their consumption needs during retirement.

H3 The personal attributes of salaried middle and upper income employees in Kenya have no significant relationship with the absolute sizes of their wealth portfolios.

$H3_a$ The personal attributes of salaried middle and upper income employees in Kenya have significant relationship with the absolute sizes of their wealth portfolios.

H4 The personal attributes of salaried middle and upper income employees in Kenya have no significant relationship with the composition of their wealth portfolios.

$H4_a$ The personal attributes of salaried middle and upper income employees in Kenya have a significant relationship with the composition of their wealth portfolios.

H5 The personal attributes of salaried middle and upper income employees cannot be used to model the sizes and determinants of their personal wealth portfolios.

$H5_a$ The personal attributes of salaried middle and upper income employees can be used to model the sizes and determinants of their personal wealth portfolios.

Each hypothesis was supported by detailed and testable sub-hypotheses that are summarized in Appendix 4. An outline that links all the research questions and objectives to the research sub-hypotheses through the five hypotheses is shown in Table 2.3 below.

Table 2.3: A Relational Scheme of Research Objectives, Hypotheses and Questionnaire

Research question	Research objective	Research hypothesis	Research sub-hypothesis	Questionnaire question number
i	i.	H1	1.1 to 1.2	24, 25, 27, 14 to 16
ii	ii.	H2	3.1 and 3.2	24 to 26
iii	iii.	H3	3.1 to 3.21	1 to 13, 17 to 20, 21, 24 to 27
iv	iv.	H4	4.1 to 4.19	1 to 13, 17 to 20, 21, 24 to 27
v	v.	H5	5.1 and 5.2	Various data

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 *Introduction*

This Chapter discusses how the researcher employed the conceptual framework developed in Section 2.6 above to inform the research methodology for this study. Insights drawn from epistemology and review of research paradigms enabled the identification of a suitable research design and selection of appropriate data collection procedures. Determination of the sample size and identification of the sampling elements was informed by theory, empirical evidence, and the character of the target population to ensure that the study results can be scientifically justified within reasonable resources. Suitable measurement criteria and methods of operationalisation of all the research variables were identified and described to facilitate data collection and analysis of the wealth portfolios of salaried middle and upper income employees in Kenya. The philosophical basis for this research is explained below.

3.2 *Philosophy of the Research*

The current study was motivated by the search for knowledge, as is the case with most researches (Kothari, 2004). This necessitated carrying out enquiry and investigation (Collis & Hussey, 2003; Sekaran, 2003) in a scientific and systematic search for pertinent information of an empirical nature (Bless, Higson-Smith & Kagee, 2006) to know and understand reality. Informed by the need for rigour, the study was guided by proposals by Krauss (2005) to ensure that issues of ontology, epistemology and methodology are properly addressed. Whereas ontology refers to the philosophy of reality, epistemology addresses how we come to know that reality, while methodology identifies the specific practices used to attain knowledge of it.

Several methods of acquiring knowledge have been suggested. Nachmias and Frankfort-Nachmias (1992) describe four modes of acquiring new knowledge that include the scientific approach, the authoritarian mode, the mystical mode, and the rationalistic mode. Bryman and Bell (2003) advocate for the empiricism concept to denote a general approach to the study of reality. Under this concept, only knowledge gained through empirical experience and the senses is acceptable. Therefore, ideas must be subjected to empirical testing before they can be considered knowledge. A continuum framework is suggested by Cooper and Schindler (2006) who argue that sources of knowledge range from untested opinions to highly systematic modes of thinking, and posing opinions.

The current study's objectives suggest that objectivity, observations and tests on empirical data are central in this research. Therefore, the study uses empiricism to build knowledge by testing scientific propositions on the nature and determinants of employee's wealth portfolios in Kenya. This approach is supported by a positivistic methodology as described below.

3.3 *Research Design*

For most researches in social science, it is rarely possible to examine the entire population of interest, and often difficult to carry out a laboratory experiment. This reality informed the adoption of a survey research methodology. Being of the explanatory type, the study relied on an in-depth review of literature to distil the most recent conceptual frameworks regarding the nature of personal wealth portfolios and the causal relationships with certain personal attributes. A deductive research design was adopted in which the findings from the review of literature were used to generate research questions, objectives and hypotheses for testing the body of knowledge in order to fill the identified research gaps. A quantitative methodology was employed to collect primary data from the sampled respondents. Higher order scales were used to take advantage of powerful methods of statistical analysis and tests. The research was designed to minimize the alpha and beta errors, while achieving a high power.

Primary data for this study was derived from the demographics and the self-declared wealth of the sampling units, the individual employees in the target population. A complete register of salaried middle and upper income employees was, however, not available from which the sampling units could be drawn. This posed an imitable yet solvable challenge that drawing a sample from a frame that does not include all the sampling elements introduces the possibility of a coverage error that may affect the generalisability of the study results.

The researcher sought to overcome the problem of an incomplete sampling frame by selecting a proportionate stratified random sample of employees based on Statistical Abstract 2009. This was the most recent Kenya government report that had relevant data for this study. The Statistical Abstract identified mutually exclusive logical strata of the macro data of all the employees in 2008 by industry type and income groups in a nine-by-nine matrix. The researcher considers this yearly government report to be a reliable base for primary sampling. The choice of the primary sampling units which was by industry types as listed in the Statistical Abstract was informed by the intuition that industry type is likely to influence employee wealth holding a lot more than physical location, which is the commonly used basis for area probability sampling in published national wealth studies in other countries.

3.4 *Population of the Study*

The target population in this study comprised all the salaried middle and upper income employees in Kenya at the time of data collection in mid 2010. According to Statistical Abstract 2009, employees include those engaged in the production of public services in central government, state corporations, local government, East African Development Bank and National Examination Council.

The estimate of the range of earnings for the target group was obtained by adopting the lower limit of monthly income of Shs 23,670 in KIHBS 2005/06 for middle income households as reported in GoK (2008c) and multiplying it by the annual average increase in earnings of all employees in Kenya thereafter. The economic surveys (GoK, 2008a; GoK, 2009b) show that the annual average wage increases were 10.8% and 8.4% for the two years. Applying these factors yielded a lower limit of employment earnings of Shs 27,917, which was rounded up to Shs 28,000 per month for the purposes of this study. The wage employees in Kenya in 2008 totaled 1,943,456 per (GoK, 2009a), whereby those in the lower income group comprised 89.2%, while the middle and upper income group was 10.8% and accounted for an estimated 49.6% of the total employment earnings of employees. The highest paid group, according to the Statistical Abstract, had monthly earnings of Shs 30,000 and above, which comprised 69,548 employees, say 3.6% of the total. For this reason, it was not feasible to compute from the national statistics, separate totals for middle and upper income employees. Subsequently, responses on income levels were used to classify them into either middle income or upper income employees. This post-ante division of the respondents by the two income groups enabled further analysis of their wealth holdings separately.

The definition of an *employee* for the purposes of this study was provided by the Kenya government in the Statistical Abstract (GoK, 2009a):

> 'An employee is any person who is employed for pay such as casual, part-time workers, directors, and partners on a service contract but excludes self-employed persons, family workers who do not receive payment, informal sector employees in small-scale agriculture and pastoralist activities' (p. 241).

This study followed the clear definition adopted by the Statistical Abstract and excluded self-employed persons, unpaid family workers and informal sector employees in small-scale agriculture and pastoralist activities. In the opinion of this researcher, leaving out this group of employees in this study was justified because their earnings tend to be too low to enable

them to save and make reasonable investments. Besides, it was felt that the excluded group was also likely to be un-banked and characterised by low financial knowledge, which in turn suggests that they were likely to engage in limited investment activities that may be of insignificant consequence in economic terms.

3.5 *Sampling Frame*

The private sector sample of employees was drawn from those earning a minimum gross employment income of Shs28,000 per month. In the public sector, the classification of salaried middle and upper income employees was derived from the Republic of Kenya (2006) report which analysed all the employees from job group "A" to "V" in numbers and average monthly basic salary (excluding benefits). The upper cut-off for lower income employees was determined to be at job group F, where the average basic pay was Shs 12,497. When this amount is grossed-up (to take into account benefits) by the ratio of basic pay to gross pay of 71.4%, the result is estimated gross employment earnings of Shs 17,502. The next cadre was job group G with an average basic pay of Shs 17,211 which yielded grossed-up monthly earnings of Shs24,105. Based on these workings, middle and upper income public sector employees were determined to comprise officers in job groups G and above. Indeed, the resulting classification was supported by existing functional categories in the public sector where *support staffs* are designated as job groups G to J; *technical staffs* are job groups K to N; *senior managers* are job groups P to R, and *policy makers* are job groups S to V.

The earning limits indicated above were then applied on the employment figures in Statistical Abstract 2009 to generate the estimated numbers of employees by income classification. The detailed analysis in Appendix 5 yielded the summary in Table 3.1 below.

Table 3.1: Distribution of Employees between Income Groups in Kenya, 2008

	Number of Employees	Percentage of Employees	Average Monthly Income Per Employee Shs	Total Monthly Wages Shs Billion
Lower income	1,734,532	89.2	16,398	28.4
Middle and upper income	208,924	10.8	152,728	31.9
Total Wage employees	**1,943,456**	**100**	**31,054**	**60.3**

Source: Derived from Appendix 5.

From Appendix 5 and Table 3.1 above, the total number of salaried middle and upper income employees in 2008, which was the target population for this study, was estimated to be 208,924, that is, 10.8% of all wage employees in Kenya. The computed monthly average

earnings of Shs 152,728 per person, suggest that many of these were likely to be urban-based, could afford to save from their employment income for investment, and therefore hold some wealth. In order to achieve population validity, the accessible population comprised all employees who were resident in Kenya at the time of data collection.

3.6 *Sample Design*

This Section discusses how the sample size for this study was determined. It also explains how the participating institutions and sample elements were selected taking into consideration the need for validity in the test results.

3.6.1 *Sample Size*

At the conceptual level, the determination of sample size is usually driven by the desire to obtain a representative sample that achieves precision but does not result in the waste of time and resources for a minimal gain. Precision in this case is defined as the extent to which the study estimates the target population parameters. At a practical level, a key consideration in determining the sample size was the fact that the target population was expected to be highly dissimilar with respect to the personal attributes and wealth holding. Another factor that influenced the identification of the sample size was the desire to ensure that the conclusions from the study could be scientifically supported.

The requirements listed above demand a high power (1-β), which is defined as the probability that a statistical significance test will reject the stated hypothesis or the ability of a statistical test to detect an effect, given that the effect actually exists. This requires that "β" or type II error is minimized, which is also defined as the probability of concluding that a relation does not exist when it does in fact exist. Another critical factor in the determination of sample size was the alpha level, called type I error; the probability that a relationship that is found to exist does not actually exist. An alpha level of 5% was used in line with similar researches on wealth (Kennickell, 2000; Mitchell & Moore, 1997; Arrondel & Mason, 2002). Since the population variance with respect to the dependent variable was unknown, and because wealth was measured by a continuous variable, the sample size estimate followed the recommendations by Cochran (1977), Bartlett, Kortlik and Higgins (2001) and Sekaran (2003) in the form shown below: (for a population that is above 10,000).

$$n_o = \frac{(Z_{\alpha/2})^2 * (p)(q)}{(d)^2}$$

$$n_o = \frac{(1.96)^2 * (0.5)(0.5)}{(0.03)^2} = 1,067$$

$\mathbf{n_o}$ is the calculated sample size;

"z" is the value for the selected alpha level of 2.5% in each tail, resulting in **z** =1.96; The alpha level is the level of risk that the researcher is willing to accept the true margin of error exceeds the acceptable margin of error;

"p" is the proportion/probability of success; **"q"** is proportion/probability of failure. Since the variance is not known and we do not want to be biased, we assign both a 50/50 chance. **(p)*(q)** is the estimate of variance to obtain the highest variance and a high sample size;

"d" is the acceptable margin of error, that is the error the researcher is willing to accept for the population proportions being estimated. A 3% margin of error is recommended for continuous data in line with Bartlett et al. (2001).

The calculated sample of 1,067 represented about 0.14% of the target population. This sample size was considered adequate for the current study on account of the systematic and scientific manner in which it was computed.

3.6.2 *Sample Selection*

This subsection discusses the method that was used to select the sampling institutions and outlines the process followed in selecting sampling elements within the selected institutions. The stratification approach that was used in this study drew from that applied by Borsch-Supan and Essig (2003) in Germany, who used household quotas in proportion to the 2000 micro-census on the basis of age, earnings type and household size. In Kenya, a similar approach was also used in the KIHBS 2005/06 study per GoK (2007a).

As indicated above, the required sample of 1,067 employees was selected from nine industry categories based on the proportions of the estimated number of middle and upper income employees that were computed from Statistical Abstract 2009 as shown in Appendix 6. The estimated number of employees in the income bracket of interest, the relative proportions and therefore proportionate sample sizes are summarized in Table 3.2 below.

Table 3.2: Distribution of Wage Employment by Industry in Kenya, 2008

Industry	Estimated Middle and Upper income Employees	As Per cent of Total	Computed Proportional Sample Size: Number of Employees
1. Agriculture and forestry	13,878	6.6	71
2. Mining and quarrying	510	0.2	2
3. Manufacturing	33,175	15.9	170
4. Electricity and water	2,747	1.3	14
5. Construction	7,096	3.4	36
6. Trade, restaurants and hotels	36,984	17.7	189
7. Transport and communications	23,111	11.1	118
8. Finance, Insurance, real estate and business services	22,367	10.7	114
9. Community, social and personal services/public sector	69,056	33.1	353
Total	**208,924**	**100.0**	**1,067**

Source: Statistical Abstract, GoK (2009a), for wage employee numbers pp. 270-271

The sector establishments were used to identify a sub-sample of institutions from which to select the respondents. For the eight industry groups in the private sector, the researcher relied on the national institutions membership lists of the Federation of Kenya Employers (FKE) and Kenya Bankers Association to generate the top 20 establishments by number of employees in each industry (Appendix 7). Using national membership lists guaranteed that the sample was distributed in the whole country. From these lists, three establishments were selected by simple random sampling in each industry to yield the list of sampled establishments. A proportionate sample of employees was then assigned to each selected establishment based on the number of employees to add up to the required industry sample size. The sampling choice of larger establishments was preferred because these are likely to have a sizeable number of salaried middle and upper income employees and possess an institutional culture that would be representative of the practice in that industry.

The ninth industry category that is designated as *Community, social and personal/public sector services* in the Statistical Abstract mainly comprises government services and is also referred to as the public sector. According to Economic Survey 2009, the categories of institutions and their relative share of employee earnings were as follows: central government 23%; Teachers Service Commission 34%; parastatals 21%; local government 9%, and majority control by public sector 13%. Since the employees in these institutions are all public servants who are subject to similar personnel policies, the sample for this study was drawn from one representative body, the central government.

For reasons of potential inaccessibility of sampling units, the following ministries were left out: Office of the President; Office of the Prime Minister; Office of the Vice President and Ministry of Home Affairs; Ministry of State for Defense and Ministry of State for Provincial Administration and Internal Security. On this basis, information provided by the Ministry of Public Service as at July 2009 was used to itemise the government ministries that could be sampled as shown in Appendix 8. It was assumed that the sampling bias arising from the exclusion of some ministries would not invalidate the study findings for the reasons that the conditions and terms of service in government are uniform. This approach was also supported by the guidelines issued by the European Social Survey (2004) which permit the exclusion of inaccessible people in military and prison barracks. From the list of ministries, a random sample of three was selected to yield a sub-sample of ministries for the stratified sample.

The 24 sampled establishments in the private sector and the 3 randomly selected government ministries were approached to seek permission to carry out the survey. Following the granting of permission, the researcher visited the selected institutions in the company of a research assistant to identify the sampling elements on which to administer the questionnaires. The contacts in the selected institutions helped to determine the simple random sample of employees to be interviewed from their personnel records that had the sampling frame. Whereas most of these records were arranged by employment number, some were in the alphabetical order of employee names. The eligible public service employees were those from job group G whose records are kept separate from their juniors, while those from the private sector comprised those earning a gross salary in excess of Shs28,000 per month. In this case, employees who would finally turn out to be middle income earners had the same chance of being selected as upper income earners. Institutions that refused to participate were substituted with others that were randomly selected within the same industry.

3.7 *Data Collection*

The review of literature in Chapter Two concluded with an outline of the hypothesised variables that are of research interest in this study. This information further enabled the identification and description of relevant independent, intervening, moderating and dependent variables. This sub-section discusses how data was collected to obtain measurements for the variables that are considered necessary to test the sub-hypotheses and hence the hypotheses.

3.7.1 *Data on Moderating Variables*

In this study, moderating variables were identified to include: investment options, asset earnings, inflation, financial markets, institutions, prices, costs, taxes, general perceptions of stock performance, and advice available. Because these variables are the same within Kenya and are likely to impact on all the employees in more or less the same way, the researcher did not investigate their effect on employees' wealth portfolios. For this reason, these variables were not measured. This approach was informed by literature reviewed that indicated that these factors are only factored in and their effect on wealth portfolios evaluated when comparing wealth portfolios in different countries.

3.7.2 *Data on Independent, Intervening and Dependent Variables*

This study used primary data comprising personal attributes and wealth portfolios that was obtained from sampled employees using questionnaires (see Appendix 9).The questionnaire consisted of quantitative questions mainly where categorical answers were sought. Additionally, qualitative questions were asked in line with Yoo (1994) who used open-ended questions to obtain responses on what other considerations individuals make in their choice of investments. Combinations of nominal, ordinal, interval and ratio scales were used to enrich the data in line with Kennickell (2000). Instrument reliability and the clarity of the questionnaire were pre-tested through face to face interviews on a pilot sample of 10 employees. Lessons learned from the pilot test were used to modify the questionnaires with respect to: the length, wording, question sequencing and choices for bands of incomes and wealth values. The questionnaires were pre-coded to facilitate data preparation and entry. Further details pertaining to the three-part questionnaires are discussed below.

Part A of the questionnaire sought information about respondents' personal attributes: a nominal scale was used to measure the variables of gender, marital status, job type, culture and religion while an ordinal scale was applied to measure job seniority and level of education. An interval scale was employed for age while a ratio scale was used for family size and length of service.

Part B obtained details of respondents' investment style with respect to how employees make decisions regarding where and how to invest. Information on the respondents' risk-taking behaviour was also gathered in this segment. A specific question was designed to seek information on whether the maximization of earnings is a key consideration by employees

when making investments.

The last portion of the questionnaire was **Part C**. Respondents were requested to provide data on their personal income and wealth portfolios. The sources of personal income were split between employment and others, while a quantitative measure was achieved by employing an interval scale that required respondents to choose from ranges of monetary values. Wealth was also broken into asset components and measured in monetary terms within bands. Information on the disposal of monthly income was sought in this Section to ascertain the proportion of income that is saved and invested.

Taking cognizance of a borrowing constraint potential, and with a view to enriching the study, respondents were asked to indicate the extent to which they used borrowed funds to finance their investments. Further information was also sought from the respondents regarding their opinions on the influence of external factors on their investments.

3.7.3 *Field Work*

After selecting the sampled establishments in each industry, contact was made through a telephone call. Once permission to collect data was granted, a date was agreed on when to visit the institution and deliver the letter of introduction from the University (see Appendix 10) and explain further the objectives of the survey and the modalities of sample selection and questionnaire administration. At the appointed time, the researcher visited the establishment, agreed on the sample size, and delivered the questionnaires with a covering note requesting the sampled employees to participate in the research (see Appendix 11) and provide the information required for this study.

To improve the speed of data collection and supplement the researcher's data collection efforts, four research assistants were engaged. Before commencing data collection, the research assistants were put through training on the rationale of the study, how to ensure accurate data is collected, techniques to minimise non-response, and ascertaining that data collected could be relied on. The training process was also accompanied by dry run interviews and filling up of the sample questionnaires to clarify areas of potential doubt. The administration of the questionnaires combined a "drop and pick" and face-to-face interviews depending on the method agreed upon with the institution. This approach was aimed at achieving a faster completion of the data collection phase. A monitoring and evaluation process for the conduct and progress of the field work was carried out through fortnightly

meetings between the researcher and the assistants and by telephone. During the fortnightly meetings, the record of questionnaires issued to selected institutions and the responses received were updated to gauge the progress of the fieldwork process.

To achieve high response rates, the administering of the questionnaires was carefully done as explained below. Firstly, the questionnaires were redesigned after the pilot test. Secondly, establishments that were selected to participate in the survey were contacted on telephone first, and permission to carry out the interviews sought. This was found to be helpful in securing cooperation from the institutions as opposed to mailing out questionnaires blindly. Thirdly, sampled employees were assured of secrecy and anonymity and given further comfort that the study was strictly for academic purposes, that together with their employer, they had been selected through a random process and that the sample being surveyed was considerably large. Finally, in line with recommendations by Arrondel and Masson (2002), respondents were asked to select from bands of years of service, income, age and wealth, rather than provide point estimates which are harder to estimate and rather intrusive. Other useful strategies in this respect included selection of appropriate times for interviews and interviewer training. The questionnaires were also not pre-numbered.

3.7.4 *Data Quality Control*

Considerable data quality control to ensure validity and reliability is required in a study of this nature for three reasons: it was the first wealth research survey in Kenya; it used primary data; and finally, this treatment is in line with the practice for similar studies. Whereas validity refers to how well the measurement instrument, in this case the questionnaire, measures the concept it is supposed to assess, reliability applies to the consistency and stability of the instrument in measuring that concept (Sekaran, 2003). The treatment of data quality issues in this study such as validity, missing data, non-response and reliability are discussed in the subsections that follow.

3.7.4.1 Validity

External validity, the extent to which the study results can be generalized to the target population (Cooper & Schindler, 2006; Sekaran, 2003), was enhanced by carrying out a brief review of the socio-economic environment in Kenya during the study period. This entailed the examination of reliable macro data from publications by the Kenya National Bureau of Statistics (KNBS), CBK, Nairobi Stock Exchange (NSE) and available local studies that were relevant to personal wealth. With regard to the survey of employees, a safeguard to external

validity was achieved by using recent data for 2008 as the basis of designing a stratified random sample. This design was expected to yield an efficient and representative sample.

The extent of confidence in the causal effects between employee personal attributes and their wealth portfolios, also called internal validity, was partly guaranteed by grounding the questionnaire on a sound conceptual framework. To achieve this, the questionnaire was enriched with knowledge gained from review of empirical data in previous wealth studies and feedback from the pilot test. This was enhanced by the use of both non-metric and metric scales that permitted the collection of more comprehensive data. More safeguards were sought through reasonableness checks, including investigation of means, standard deviations and comparisons of results with studies conducted in other countries. Finally, most of the threats to internal validity were overcome by using trained interviewers to obtain employee responses during the same period in more or less similar circumstances.

3.7.4.2 Missing data and non-response

Researchers on personal wealth (Kennickell et al., 1997; Montalto & Sung, 1996) contend that survey data typically contains a fair amount of missing and incomplete information, which unless addressed could be a major source of non sampling error. Whereas unit non-response occurs when selected sample units fail to participate completely or refuse to cooperate, item non-response arises when respondents do not provide useful answers to particular questions.

Unit response rate was measured by dividing the number of respondents (complete and partial interviews) by the number of eligible subjects in the sample. Specifically, unit non-response was deemed to arise when selected employees refused to participate fully or did not provide answers to at least 25% of the questions, in line with Sekaran (2003), or failed to answer questions on the key variables comprising wealth holding, income, age and gender. Literature reviewed indicates that a unit response rate above 75% is desirable and a measure of good practice (Bailey, 1987; Fowler, 2002). This is also supported by guidelines issued by research associations that require the same minimum rate to be targeted (AAOPR, 2000; European Social Survey, 2004).

Ethical issues were addressed by using trained assistants, designing and wording questionnaires correctly, and observing good practice. Informed consent was also verbally obtained and respondents assured of secrecy on their identities. To reduce incidences of

omissions and the potential bias that this could cause, data collectors were required to edit the data before handing in the questionnaires. Additionally, all the returned questionnaires were subjected to further edit to pick out unit and item non-responses and isolate logical errors. Open-ended questions were given specific attention to ensure that coding was done properly.

3.7.4.3 Reliability

Personal wealth studies show that using cross-sectional data to estimate mean and median wealth age profiles especially in the life-cycle concept, is full of pitfalls due to cohort effects (Attanasio & Hoynes, 2000 in USA; Guiso & Jappelli, 2000 in Italy; Mitchell & Moore, 1997 in USA and Shorrocks, 1975 in UK). The cohort effect is aptly explained by Modigliani and Jappelli (2003) to mean that older people usually come from earlier cohorts and the fact that different cohorts tend to have dissimilar experiences and resources. This implies that a cross-sectional study may suffer from the problem of reliability because of the composition of different cohorts. A mitigation of this potential shortcoming was the employment of a relatively large sample (1,067) and the use of stratified random sampling.

3.7.5 *Summary of Data Sources*

The data that was deemed necessary for the purpose of testing the research hypotheses spelt out in Chapter Two of this report were identified individually and distinctly to achieve clarity and avoid ambiguity. In addition, the sources of each type of data were scrutinized and properly ascertained. These key elements are summarized in Appendix 12.

3.8 *Measurement of the Research Variables*

Using the framework of theory, concepts and empirical evidence, seven hypotheses were formulated in Chapter One. In order to generate measurable variables, the concepts that inform and underlie the major hypotheses were broken down further into appropriate sub-hypotheses as indicated in Appendix 4. This subsection explains the measurements of the variables that are used in the sub-hypotheses to enable hypothesis testing using primary data. A matrix of the operationalisation of all the variables is summarized in Appendix 13.

3.8.1 *Measurement of Dependent Variable*

Wealth is the main dependent variable in this study wherein five key attributes were identified for measurement. These were (i) the nature of wealth, (ii) net wealth, (iii) diversification; (iv) portfolio riskiness, and (v) wealth adequacy. The wealth variable was

initially measured using nine methods as explained below.

The endeavour to obtain information on employee wealth portfolios took cognizance of the concern raised by Barrett and Reardon (2000) regarding problems of getting accurate data which are associated with recall, especially where income and wealth are small, varied, and documentation is lacking. In the current study, the opportunity to choose from a range of asset values rather than a point estimate was exploited to mitigate non-response. This was informed by the approach that was employed in the UK by Banks and Smith (2000) who examined survey data on individuals' wealth that had been collected in bands. Additionally, the researchers used midpoints of the bands and imputed values for the top and lowest coded individuals to estimate their wealth holdings. Related support was also found in Borsch-Supan and Essig (2003) who report that by asking German respondents to indicate their income and wealth within bands rather than in discrete amounts, response rates improved from one-quarter to one-third. A similar approach is also recommended by Campell (2006). The current study followed the practice noted above and used the midpoint value to denote the typical value for wealth in each band. In line with literature reviewed, respondents were asked to supply their estimates of the monetary value of each wealth component.

The bands that were used to measure wealth in this study were computed as multiples of employee incomes. Ten wealth bands were used, the lowest at an upper limit of Shs249,999, which was about ten month's equivalent of the lower limit of the monthly earnings for the middle income employees as used in this study. A band width of Shs250,000 was assumed such that the top wealth group started at Shs2,500,000. This method was designed in line with literature reviewed to yield sufficient information on asset holding and wealth valuation since the wealth indicators were broken down by asset types.

Net of personal loans, the principal components of wealth were taken to include cash and bank accounts, cooperative shares, value of pension scheme assets and life assurance policies, treasury bills and bonds, shares in listed companies, and property (houses and buildings). To explore employees' thoughts of their other holdings, respondents were asked to indicate the values of other assets such as business, farm animals, farm land, foreign investments and motor vehicles. The combination of ranges for the values of assets and the types of assets resulted in a 10-by-14 matrix that was deemed easy to administer and un-demanding for the respondents to complete (See Appendix 9: Question 24 to 26). Primary data for testing employee wealth portfolios was gathered using this matrix.

The types of assets and the composition in terms of the number of different types held, as well as the asset classes, provided the first, second and third measure of wealth. Informed by recent practice (Banks & Smith, 2000; Borsch-Supan & Eymann, 2000), the fourth measure was the ownership rate which was defined as the percentage of employees holding a given asset or an asset class. The fifth measure was value-based; the respondent's self-declared monetary value of each asset. After aggregating this data using the midpoints, these scores yielded the estimated value of the wealth portfolio for each employee, which was the sixth measure. The estimated market value of each employee's wealth was determined net of the reported value of debt. This was augmented by a closely related aspect; the relative share of each asset held, and more specifically, the fraction of risky assets (shares and property) in the wealth portfolio. A related measure was the proportion of each asset type and class in the wealth portfolio. These were taken as additional measures of wealth. Further use of these metrics to measure the diversification and adequacy of wealth is discussed below.

Diversification was measured by the proportions of the asset type and classes in the gross wealth portfolio, and for equity portfolios, the number of companies in which shares were held. Also, the ownership rate of the risky assets was used to complement these three measurements. Thus, under-diversification was associated with holding of few assets and asset types and asset classes as well as having portfolios that were distinctly different from the equal holdings that an investor is expected to hold to achieve naïve diversification.

Finally, another measure of wealth was its adequacy in supporting life-cycle consumption in retirement. Following Bodie (2001), Au et al. (2005) and Munnel (2006), wealth adequacy was measured in the first instance by a computed replacement rate for employees in the age group of 45 years and above. A typical asset return rate was applied on the aggregate gross wealth values of each candidate employee to estimate the annual earnings from investments. In the absence of published country data on domestic equity and housing returns, this researcher used the composite returns of all pension scheme assets in Kenya as the surrogate. This figure was obtained from the survey by Alexander Forbes Financial Services (2009), which showed five-year weighted average annual earnings from 2006 to 2009 of 11.9%. The use of a composite rate has strong merit because it provides an independently determined return for a basket of personal assets. However, the rate is likely to be overstated compared to earnings of wealth portfolios of individual employees, which are usually overweight in low-return cash, compared to more professionally designed portfolios of pension schemes. Finally, the estimated asset earnings were expressed as a percentage of current income from

employment to derive a 'replacement rate'. The computed rate described above was also compared to a self-declared target 'replacement rate' that was obtained from the questionnaire responses by sampled employees.

Some of the metrics derived from the measurements of wealth yielded independent variables for this study. Firstly, the proportion of risky assets in the wealth portfolio for each employee was used as a measure of risk-taking behavior, also called portfolio riskiness. After ranking respondents in order of the proportion of risky assets in gross wealth, the resulting variable that measured risk perception was in turn used as an independent variable. Likewise, the calculated value of wealth of each employee was used as an independent variable for tests where wealth composition was the dependent variable. This approach was informed by empirical findings (Arrondel et al., 2002; Cohen et al., 1975) that the proportions of financial wealth and risky assets increase with higher holdings of personal wealth.

3.8.2 *Measurement of Independent Variables*

3.8.2.1 Employment income

Income was operationalised by self-reported monthly gross wages, comprising all earnings from employment in line with the definition in Chapter One. A justification for using these figures is offered by GoK (1998), where the poverty report shows that for the urban non-poor, employment earnings accounted for 80% of household income. The Statistical Abstract 2009 (GoK, 2009a), which is a reliable source of income data for employees in Kenya, identifies two income groups among the salaried middle and upper income employees with class intervals of employment earnings of Shs 5,000 per month. The lowest paid group earns between Shs 25,000 and Shs 29,999, while the other earns Shs 30,000 and above. The same interval was adopted to create 15 classes: the lowest starting from a monthly income of Shs 28,000 and the highest was stated to be 'Shs 158,000 and above'.

3.8.2.2 Age

Majority of wealth studies that were reviewed in this study singled out age as the most important determinant for wealth and measured it in intervals of four years from 20 years to 70+. Such studies include analysis of US National Survey data by Yoo (1994), a study of German households by Borsch-Supan and Eymann (2000), and a survey of saving rates in Norway by Harvorsen (2003). The measurements of age using class intervals in this study were informed by these researches. Specifically, the choice of class intervals was based on

the KIHBS study and other studies in Kenya. Consequently, the researcher adopted a class interval of four years and ten classes as follows: up to 25 years, 25 to 29, 30 to 34, 35 to 39, 40 to 44, 45 to 49, 50 to 54, 55 to 59, 60 to 64, then 65+. Respondents were asked to indicate their age in years by ticking from bands. Control for life-cycle effects was achieved through variables such as number of children, gender and marital status.

3.8.2.3 Gender

Gender was measured using a dichotomous variable, where sampled employees were asked to indicate whether they were either male or female. This is in line with practice and conforms to common groupings of natural persons.

3.8.2.4 Risk- taking behaviour

Risk-taking behaviour among the respondents was disaggregated and measured using three approaches: risk perception, risk preference and attitude to risk.

Risk perception was measured using the quantitative inference that draws from economic theory. The relative risk aversion of each sampled employee was calculated as the proportional holding of the self-reported value of risky assets (equity, housing and buildings) in the entire wealth portfolio following Blume and Friend (1975) and Schooley and Worden (1996). To operationalise this aspect, the survey results were analysed into quartiles based on the relative proportion of the risky assets in the wealth portfolio: the top quartile was ranked as "risk takers", followed by "least risk averse", then "risk averse" and finally, the lowest quartile was tagged as "very risk averse". Whilst this method has sometimes been vilified on the basis that some people may not own risky assets due to low income and wealth, the researcher derived comfort from earlier findings that self-reported risk aversion accurately reflects the observed riskiness of the household portfolio allocation from review of 1989 SCF data (Ibid p.12). Consequently, the proportion of risky assets in the wealth portfolio, as computed and set out in the four classes stated above, was adopted as an independent variable. The same measurement of risk-taking behaviour was also used by Sunden and Surette (1998) in their study of 1992 and 1995 SCF data where they operationalised relative risk aversion by the proportion of risky assets in the investor's wealth.

Risk-taking behaviour in the subjective form relied on direct answers by respondents to questions that sought to ascertain both their risk preference and perceived attitude to risk and risk preference. Measurements for these two attributes were based on (i) a psychology-

leaning approach that focuses on the behavioural aspect of an individual's risk preference using the standard lottery question (Bajtelsmit, 1999; Dohmen, Falk, Huffman, Sunde, Schupp & Wagner, 2005; Venter, 2006) and (ii) respondents' self-reported willingness to exchange risk for return (Bajelsmit & Bernasek, 1996; Gibson & Scobie, 2003; Jianakoplos & Bernasek, 1998). The approach that was adopted in this study was derived from Dohmen et al. (2005). Thus, risk attitude was measured using employee's willingness to take risks in a continuum, whereby 10 indicated "fully prepared to take risks" and 0 denoted "complete unwillingness to take risks". Similarly, risk preference was measured using the standard lottery question where employees were asked to indicate their willingness to invest in a hypothetical lottery with explicit stakes and probabilities as shown in Appendix 9, Question 17 & 18.

The investment styles of employees with regard to the motive of maximizing or not maximizing earnings was operationalised by the source of investment advice. Those seeking to maximize earnings were expected to rely on professional investment advice. The second part of operationalisation was the self-declared choice of investment using a Likert scale.

3.8.2.5 Job

The concept of job was operationalised by three variables: industry type, seniority and length of employment service. These variables were measured in the manner described below.

Preliminary investigations of reported employment earnings data in Kenya indicated the existence of substantial differences in the average earnings of employees between industries. These findings influenced the researcher to adopt the nine industry classification in the Kenya Statistical Abstract to operationalise industry type, the first attribute of the job concept.

The study employed the typical classification of seniority by using four levels in order of employee rank. The ranks used in the study were (i) clerical or factory worker, officer or technician; (ii) supervisor; (iii) management; and (iv) a director or shareholder. Sampled employees were requested to indicate by a tick mark their level of seniority from this choice. Finally, the length of employment service was measured by the number of years of employment in intervals of 5 years, with the longest being 40 years and above. This reasoning followed the practice of Agnew, Balduzzi and Sunden (2000) in their panel study of participants in US 401(k) retirement investment plans. This framework was used to measure the length of employment service in interval scale.

3.8.2.6 Education

Six classifications were used to operationalise education in terms of the highest level attained as shown in Appendix 9, Question 4. The classification was supported by evidence from other wealth studies (Arrondel & Masson, 2002; Banks & Smith, 2000; Mitchell & Moore, 1997; Poterba, 2001b; Sunden & Surrette, 1998).

3.8.2.7 Marital status

This study used a five-part classification of marital status to enable detailed analysis of investment patterns. The self-reported marital status that were envisaged were: single male (never married), single male (divorced or separated or widowed), single female (never married), single female (divorced or separated or widowed), couple. This was a more detailed classification compared to that applied by Mitchell and Moore (1997) and other researchers who use three classes:

i. Single (Male) for those divorced or never married or separated or widowed
ii. Single (Female) for those divorced or never married or separated or widowed
iii. Married couple

In Kenya, the KIHBS report uses a similar three-part classification too: married, others (single, separated, divorced, widowed and living together) and female-headed households. This researcher was alive to the practice of polygamy and was satisfied that it would not invalidate the marital groupings used, because such family units comprise only 5.3% of the urban population, and therefore, are a small minority per KIHBS (GoK, 2007a).

3.8.2.8 Family size and number of dependants

In this study, 'family size' was measured by the declared number of members of the nucleus family comprising parents and children. The nearest indicant of family size in Kenya is a household, where the recent KIHBS shows that the mean household size in urban areas is four members. Informed by this fact, the researcher measured family size in discrete numbers, where the lowest was one member and the highest was '8 and above'. The sampled employees were also asked to indicate the number of dependants above the nucleus family.

3.8.2.9 Culture

Given the population structure in Kenya, this researcher operationalised culture by using an environmental classification of employees in two respects: where an employee was born and

where most of the childhood years (up to 15 years of age) were spent. This compares well with the classification by Fan and Xiao (2003) who employ a geographical grouping of American culture vis-a-vis Chinese culture, while Keister (2003,5) uses race and ethnicity classification.

3.8.2.10 Religion

The concept of religion was operationalised by six parameters based on an employee's self-reported belief: Catholics, Protestants or Evangelicals, Muslims, Traditional believers, Non-religious, and Others. Customized to fit into the major religious and denominational groups in Kenya, this approach followed Iannaccode (1998), Giddens (2001) and Keisler (2003).

3.8.3 *Measurement of the Intervening Variable*

Employees' ability to save for investments was measured using two parameters that were computed from their responses. The first one was the commonly applied measure of the percentage of savings to gross income. Secondly, employees were asked to indicate the reasons for saving by indicating the relative proportions of their savings.

The use of debt finance, also called leverage, in the acquisition of wealth was measured using a seven-point bipolar Likert scale question, where employees were asked to indicate the extent to which they used debt to finance investments. This information was supplemented by a computed ex-ante quantitative ratio of the self-declared proportion of loans and mortgages to the gross wealth.

3.9 *Statistical Analyses*

The data collected for this study was subjected to statistical analysis using the SPSS package as discussed in Chapters Four and Five. The main statistical techniques are summarised below.

To examine the distribution patterns of the data, fundamental statistical measures were computed. Firstly, means, modes, and medians were computed to measure the central tendency of the data. Secondly, standard deviations were computed to measure wealth dispersion. Additionally, data asymmetry was measured using coefficient of skewness, while the peakedness of the wealth distribution was measured by coefficient of kurtosis. Where possible, supporting statistical evidence on the underlying functional relationships and

distribution patterns of the data was provided to enrich the study.

Various statistical techniques were applied to carry out the hypotheses tests. The choice of technique was based on the character of the variables under examination and the underlying construct that was being tested. Univariate and bivariate tests were done.

Student's t-tests were applied to examine the equality of: mean proportions of asset values in the wealth portfolios; mean net wealth; proportions of risky assets to gross wealth; number of assets held and replacement rates. The significance of the relationships between hypothesized variables and dependent variables was tested through ANOVA, for the independent variables that were measured in nominal scale, and through Pearson product moment correlation coefficient for the independent variables that were measured in either interval or ratio scale.

Two multivariate statistical analysis techniques were applied in hypotheses tests as discussed hereafter. Firstly, multiple regression analysis was used to test the significance of the metric scale independent variables, when considered together, in predicting point estimates of the net wealth of employees. This operation further permitted the construction of a mathematical prediction model of net wealth, where the qualifying predictor variables had to be significant in the equation with the cut off p-value = 0.05. Secondly, multiple discriminant analysis was applied to test whether the metric scale personal attributes of employees could be used to profile and distinguish employees by the category of wealth holding level they belonged to. This analysis was useful in developing a predictive framework for wealth holding levels.

Finally, factor analysis was applied to examine whether all the hypothesized determinants of wealth can be reduced to a manageable number by identifying those variables which belong together and have overlapping measurements. This multivariate technique helped to identify underlying and unobservable constructs in the predictor variables that can be used to develop a simplified model for the study of the size and determinants of personal wealth portfolios.

3.10 *Summary*

A suitable research design for the study was identified and discussed in this Chapter. Using this basis, the researcher delved into the justification and specific approaches that were necessary to collect primary data from a representative sample of employees in the category of interest to permit and carry out appropriate analyses and administer fitting tests for the hypotheses advanced in Chapter One. Care was taken to ensure that threats to data validity

and instrument reliability were addressed. This research used cross-sectional primary data that was obtained from the sampled elements in a field setting, in their places of work. The data collection and subsequent analyses were conducted between March and December 2010. The appropriate data analysis techniques were also identified.

CHAPTER FOUR

DESCRIPTIVE DATA ANALYSIS AND PRESENTATIONS

4.1 *Introduction*

This Chapter discusses and presents the descriptive and inferential data analysis procedures for this study. The unit of analysis in this study was individual employees.

The process of data analysis involved data collection, assembly, coding, editing and explanation. Chapter Three on Research Methodology discussed in detail the first three. To detect anomalies in the responses received, the data was cleaned up through reasonableness checks, editing and tabulations. Furthermore, the researcher followed the recommendations by Cooper and Schindler (2006) and applied Exploratory Data Analysis (EDA) techniques to test the representativeness of the sample and employed frequency distribution tables and cross-tabulations to examine the distribution of the dependent and independent variables that were of interest in this study as shown in Section 4.4 below. In addition, the symmetry and scatter plot of the depended variable, wealth, were examined to ascertain its distribution pattern. This was necessary for application of parametric tests such as Student's t-test, ANOVA and multiple linear regressions, which require that normality and homoscedasticity conditions are met.

The data was analysed using SPSS software. To facilitate processing, the variable codes that had been pre-designed were used during the input stage. Additional quality control of the data included a spot check of a random sample of 5% of the data entries back to the original questionnaires and verification of all outliers for possible erroneous entries. Appropriate changes were made and errors corrected. The output was also checked by eyeballing and locating outliers.

4.2 *Industry Categories for Data Analysis*

The computed proportionate sample units for the mining and quarrying industry of four employees as indicated in Chapter Three, Table 3.2, fell below the minimum cell frequency of five that is necessary for Chi-square analysis. To improve the level of analysis and quality of tests, the following steps were taken. Within the mining and quarrying industry, two establishments were selected randomly from which four employees were selected randomly for interview. For further analysis, the industry category and the data collected were merged

with agriculture and forestry which shares a number of characteristics with mining and quarrying. For instance, land is a key input in the production process, and both sectors tend to rely on low-skilled workers. Support for this treatment is also borne out by empirical evidence from macro data, whereby analysis of annual wage and employment statistics in Kenya shows that the mean employee earnings for these two sectors are very similar and are indeed the lowest compared to other sectors in Kenya.

4.3 *Sample Response Rate*

This section discusses the sample response rate achieved in this study. It also examines the reverse, that is, the non-responses by sampled employees and the non responses on specific questions.

4.3.1 *Unit Non-responses*

This study targeted a sample of 1,067 respondents in the category of salaried middle and upper income employees. For this study, a unit non response arose when employees who were selected for interview refused to participate or did not answer the key questions regarding wealth, income, age and gender. Unit response was measured by the number of respondents (complete and partial interviews) divided by the number of eligible subjects in the sample. A cut-off date for receiving the questionnaires was set as 30th September 2010. Based on this framework, a total of 832 employees responded to the questionnaires, yielding a response rate of 78%. Out of this total, 27 questionnaires were edited out and excluded from further analysis because of lack of answers to the questions on wealth holding, and other inconsistencies. This exclusion did not affect the results because they were only 3.2% of those received and were not concentrated in one industry. Finally, 805 questionnaires were available for analysis, yielding a final unit response rate of 75.4%. The distribution of the unit responses by industry type, which was the primary basis of the stratified random sampling, is tabulated in Table 4.1 below.

Table 4.1: Unit Response Rates by Industry Type

Industry	Sampled Middle and Upper income Employees	Responses Received in Complete Form for Data Analysis	As Percent of Target Total
Agriculture and forestry plus mining and quarrying	73	61	83.6
Manufacturing	170	140	82.6
Electricity and water	14	10	71.4
Construction	36	29	80.5
Trade, restaurants and hotels	189	111	58.7
Transport and communications	118	75	63.5
Finance, insurance, real estate and business services	114	87	76.3
Community, social and personal services/public sector	353	292	82.7
Total	**1,067**	**805**	**75.4**

The results in Table 4.1 above indicate that the unit response rate was fairly even among the primary sampling units, industry, which suggested the absence of a unit response bias. The response rate was considered acceptable for this study based on an industry floor limit of 50 % and an overall lower limit of 75% response rate. These lower limits are supported by the evidence discussed below.

This response rate compares well with empirical evidence on wealth surveys reviewed. Specifically, Bailey (1987) and Fowler (2002) advise that a unit response rate above 75% is desirable based on good practice. This is further supported by guidelines issued by research associations that require the same minimum rate to be targeted (AAOPR, 2000; European Social Survey 2004) to be 75%.

4.3.2 *Item Non-Responses*

Item non-response arose when a question was not answered. The results from the review of responses received for all the questions showed an acceptable response rate to permit further analyses as detailed in Section 4.4 below.

4.4 *Characteristics of Sampled Employees*

This Section examines the descriptive statistics for this study and seeks to ascertain the correctness of the data collected. The analysis covers all the variables of interest in the study.

4.4.1 *Income Distribution of Employees*

Literature reviewed in Chapter Two showed that employment income is likely to influence

personal wealth portfolios substantially. Using the income classification that was developed in Chapter Three, respondents were asked to tick against the income bands that corresponded with their monthly gross income from employment then and when they started working. The use of income bands rather than point estimates is informed by wealth and income studies that have shown that this approach yields higher response rates (Borsch-Supan et al., 2003). The results of the survey are shown in Table 4.2.below.

Table 4.2: Sample Distribution by Current Employment Incomes

Employees' Monthly Income Group	**Frequency**	**%**
Below Shs 28,000	0	0.0
From Shs 28,000 to 37,999	420	52.2
From Shs 38,000 to 47,999	119	14.8
From Shs 48,000 to 57,999	67	8.3
From Shs 58,000 to 67,999	43	5.3
From Shs 68,000 to 77,999	26	3.3
From Shs 78,000 to 87,999	23	2.9
From Shs 88,000 to 97,999	20	2.5
From Shs 98,000 to 107,999	20	2.5
From Shs 108,000 to 117,999	10	1.2
From Shs 118,000 to 127,999	5	0.6
From Shs 128,000 to 137,999	10	1.2
From Shs 138,000 to 147,999	5	0.6
From Shs 148,000 to 157,999	20	2.5
From Shs 158,000 and above	17	2.1
Total	**805**	**100**

These results indicate that a large proportion of the employees sampled reported a monthly employment income in the range of Shs 28,000 to Shs 37,999. The mean and median monthly employment incomes were Shs 52,900 and Shs 32,900, respectively. As highlighted in Chapter One and Three, the highest salary band in Kenya according to the Statistical Abstract is Shs 30,000 and above. For this reason, it is not possible to compare these employment income results with existing secondary data. However, using the definitions adopted in Chapter Three, an observation is made that the sampled employees were all within the category of middle and upper income category.

The results further enable a disaggregation of sampled employees on the basis of income, the defining characteristic of the target population. In line with Government policy, those earning a monthly gross employment income between Shs 28,000 and Shs 120,000 were categorized as middle income employees, while those earning above Shs 120,000 per month were

referred to as upper income employees. This separation permits carrying out statistical tests (in Chapter Five) to investigate whether these two categories exhibit the same behaviour in wealth holding. Further analyses of the responses received are laid out in Table 4.3 below.

Table 4.3: Sample Distribution of Middle and Upper Income Employees

Employee Category	Gross Monthly Employment Earnings	Number of Employees	Per cent of Total Responses Received	Share of Monthly Employment Income %	Mean Monthly Employment Income in Shs
Middle Income	From Shs28,000 to Shs120,000	748	92.9	80.1	45,880
Upper income	Above Shs120,000	57	7.1	19.9	148,965
Total		805	100	100	

This analysis shows that middle income employees comprised the vast majority in the sample. Also, upper income employees comprising only 7.1%, of the sample had a mean monthly income that was about three times higher than that of the middle income employees. It is to be noted that the mean incomes are higher than the "Shs30,000 and above" highest category that is reported in Kenya's national employment earnings statistics, which therefore fails to differentiate between these two groups of employees.

4.4.2 *Age Distribution of Employees*

Informed by LCH, age is one of the most important independent variables in this study. Besides, age also has a close relationship with the length of employment service and is potentially positively correlated with job seniority, hence income and wealth portfolio. In this study, respondents were asked to indicate their age group by choosing from specified age bands as discussed in Chapter Three. The results are shown in Table 4.4 below.

Table 4.4: Age Distribution of Sampled Employees

Age Group of Employees in Years	Frequency	%
Below 25	60	7.5
From 25 to 29.5	210	26.1
From 30 to 34.5	206	25.6
From 35 to 39.5	116	14.4
From 40 to 44.5	111	13.8
From 45 to 49.5	50	6.2
From 50 to 54.5	46	5.7
From 55 to 59.5	2	0.2
From 60 and above	4	0.5
Total	**805**	**100**

The responses analysed in Table 4.4 above indicated that the majority of employees, were aged between 25 and 35 years, reflecting a relatively young working population. These proportions are in line with expectations based on the household characteristics data that was compiled in the GoK (2007a) survey and the 2009 Kenya population and housing census (GoK, 2010a). The proportions are also consistent with retirement ages ranging between 55 and 60 years of age, following the raising of the retirement age for all public servants to 60 years from July 2009 (GoK, 2009b). These age groups have important wealth holding implications from a family life-cycle perspective in that, whereas early working years are associated with lower income and lower family expenses, middle age is associated with increased income and higher costs to maintain the family. The latter years are associated with high income and lower family expenses and therefore relatively higher savings.

4.4.3 *Distribution of Responses on Maximisation of Earnings*

A three-stage process was used to assess whether the investment decisions of sampled employees are motivated by the desire to maximise earnings. It was assumed that employees seeking to maximize earnings would seek advice from professional advisors such as investment bankers and stock brokers, and would agree to the Likert scale question that their investment decisions are motivated by the desire to maximize earnings. Information obtained from this analysis provided useful input regarding the role of the MPT in the investment process as discussed below.

4.4.3.1 Source of investment advice

In the first instance respondents were asked to indicate their source of investment advice when investing. From the choices offered, employees with a desire to maximise earnings

would have indicated that their investment choices were based on professional advice. The results are analysed in Table 4.5 below. Some employees indicated more than one choice.

Table 4.5: Reported Sources of Investment Advice for Employees.

Source of Investment Advice	Frequency	Per cent of replies received
Self	118	14.8
Friends	150	18.8
Work colleagues	356	44.5
Professional advice	**383**	**47.9**
Read newspapers and books	141	17.6
Family and Relatives	19	2.4
Other Sources of Advice	8	1.0
Actual responses received	**800**	**100**
No responses received on this item	5	
Number of responses received	**805**	

Analysis of responses in Table 4.5 indicated that the most frequent sources of investment advice for employees were professional advisors and work colleagues. The finding that about half of the employees seek professional advice when making investment decisions is however surprising and in contrast to the findings by Kennickell, et al. (1996), who reported from a nationally representative data set of 4,000 households in the 1983 US SCF data that only one quarter sought advice from professionals (bankers, brokers, accountants, lawyers, tax advisors). The substantial reliance on professionals that is found in the current study may be explained by the fact that the sample was delimited to middle and upper income employees who are likely to be more informed and conversant with financial markets, especially due to the high activity involving initial public offers and privatizations in the recent past.

4.4.3.2 Type of professional investment advice sought by employees

Given the substantial reliance by the respondents on professional advice, the researcher further examined the type of professional advice sought by the 383 employees in order to shed more light on whether employees seek to maximize their earnings. This information was supplied by employees by ticking from a choice of sources of investment advice. The distribution of the choice(s) for the 383 employees, who indicated that they seek professional advice when making investment decisions, in Table 4.5, is analysed in Table 4.6 below. Note that the frequency column of choices indicated exceeds the number of employees, in this case, 383, because some employees indicated more than one source of professional advice.

Table 4.6: Reported Sources of Professional Investment Advice for Employees

Source of Professional Advice	**Frequency**	**Per cent (of those who seek professional advice)**	**Conditional probability for middle and upper income employee**
Investment bankers	273	71.2	0.341
Stock broker	160	41.8	0.200
Banker	96	25.1	0.120
Accountant	26	6.7	0.033
Tax advisor	26	6.7	0.033
Lawyer	25	6.5	0.031
Other advisors	7	1.8	0.009
Seekers of Professional advise	**383**		

Table 4.6 shows that about three-quarters of employees who seek professional advice consult investment bankers. The next popular source of professional advice is stockbrokers, which was cited by 42% of the employees who seek professional advice when investing. The results also show that the conditional probability that an employee seeks investment advice from an investment banker is 34.1% (0.479 times 0.712), while that for stock brokers is 20.0% (0.479 times 0.418). This evidence suggests that about one-third and one-fifth of all middle and upper income employees are likely to seek professional advice from investment bankers and stock brokers, respectively. The clear preference for seeking specialized professional advice from investment bankers and stockbrokers, who are likely to be informed on maximization of earnings, may be explained by the recent liberalisation of capital markets in Kenya and the substantial number of such advisors in urban areas.

4.4.3.3 Do employees strive to maximize earnings when investing?

The third indicator of whether employees set out to maximize their earnings was their direct response to a seven-point Likert scale question as to their degree of agreement/disagreement to the question of whether their choice of investments was driven by the desire for maximum earnings. These results are presented in Table 4.7 below.

Table 4.7: Responses Regarding Maximisation of Earnings from Investments

Strength of feeling	Frequency	%	Cumulative %
Strongly agree	306	38.5	38.5
Agree	216	27.2	65.7
Slightly agree	**168**	**21.2**	**86.9**
Neutral	82	10.3	97.2
Slightly disagree	6	0.8	98.0
Disagree	8	1.0	99.0
Strongly disagree	8	1.0	**100.0**
Subtotal	**794**	**100.0**	
Number of responses not received	11		
Total	**805**		

Table 4.7 shows that most of the employees tend to agree that their main desire in investing is maximisation of earnings; 87% of them responded positively to this question. The results are also in tandem with the findings that a high number of employees seek professional advice when investing, and majority consults professionals such as investment bankers and stockbrokers, who are likely to advise them on how to maximize earnings. This is also supported by the fact that 54.1% of the respondents indicated that the investment returns available influence their choice and amount of investments to a very large extent.

In addition, a Likert scale test using scores ranging from one to seven was applied, whereby respondents who 'strongly disagreed' or 'strongly agreed' that their investments were motivated by a desire to maximize returns were scored one and seven, respectively. The results of a one-sample t-test at $t_{\alpha=0.05;}$ (t= 54.675, df=793, p-value =.000) showed that the mean ratio of the respondents' scores of 5.9 significantly exceeded the test value of 3.5. This suggests that the investment decisions of the sampled employees are motivated by the desire to maximize earnings.

Given the strong indication that the vast majority of the sampled employees attested to maximise their earnings, further analysis was made to examine the relationship that may exist between this disposition and two dependent variables in this study; the employees' level of wealth holding and the risk perception as shown by the riskiness of the wealth portfolio. These results are depicted in Tables 4.8 and 4.9 below, respectively.

Table 4.8: Relationship between Maximisation of Earnings Decision and Wealth Level

	Whether choice of investment is driven by desire to maximize earnings						
	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Below average wealth holders percent	37.5	87.5	66.7	29.3	29.2	34.7	31.4
Average wealth holders percent	25.0	0	0	46.3	52.4	30.6	24.2
Above average wealth holders percent	37.5	12.5	33.3	24.4	18.5	34.7	44.4

Table 4.8 indicates that employees who strongly agreed that their investment decisions were motivated by the desire to maximize earnings were mainly in the category of "above average wealth holders". Conversely, those who strongly disagreed that their investment decisions were motivated by the desire to maximize earnings had a large proportion of them in the category of "below average wealth holders". Overall, respondents who strongly agreed that they invest to maximise their earnings had relatively balanced wealth portfolios with distinct patterns as opposed to those who disagreed that their investment decisions are motivated by the desire to maximise earnings. This phenomenon may suggest a role for rationality among employees who agree that their investment decisions are made to maximise earnings.

Table 4.9: Relationship between Maximisation of Earnings Decision and Risk Perception

	Whether choice of investment is driven by desire to maximize earnings						
	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Risk takers Per cent	1.0	1.0	0.0	6.5	5.5	32.5	53.5
Least risk takers Per cent	2.0	0.0	1.5	5.5	12.4	28.9	49.8
Risk averse Per cent	0.5	0.0	0.0	20.3	44.6	18.3	16.3
Very risk averse per cent	0.5	3.1	1.6	8.9	22.0	29.3	34.6

Table 4.9 above indicates a clear difference in the risk perception of employees depending on whether they disagree or agree that their investment decisions are motivated by the desire to maximise earnings. Respondents who disagreed that they invest to maximise their earnings had a relatively high proportion of their group in the risk-averse category. In contrast, respondents who agreed that their investment decisions were driven by the desire to maximise earnings had a higher proportion of their group in the risk takers category. Overall, respondents who agreed that they invest to maximize earnings depicted a more distinct pattern in risk perception than those who disagreed that their investment decisions are motivated by the desire to maximize earnings. Perhaps this may indicate a role for rationality among employees who agree that their investment decisions are made to maximise earnings.

4.4.4 *Employees' Risk-taking Behaviour*

Risk-taking behaviour among employees was considered to be an important aspect in the current study because it is an integral part of modern portfolio theory. In line with literature reviewed, it was expected that the wealth portfolios of highly risk-averse investors were likely to be conservative and undiversified, while those for the least risk averse would depict a wider range of assets, tending towards a diversified portfolio. In this study, risk-taking behaviour was measured using three methods: risk perception, risk preference, and attitude to risk.

4.4.4.1 Employees' risk perception

Actual risk-taking behaviour was measured by a quantitative inference based on economic theory in which relative risk aversion was calculated as the proportional holding of the self-reported value of risky assets (equity and property) in an employee's gross wealth. To operationalise this measure, the survey results were used to compute the proportion of risky assets in wealth for each respondent. The results for each individual were then ranked in an ordinal scale and split into quartiles. Following Schooley and Worden (1996) and Sunden and Surette (1998), employees in the fourth and top quartile were labeled "risk takers", followed by "least risk averse", then "risk averse". Those in the first and bottom quartile were denoted to be "very risk averse". Using this 'scaling', the employees' responses were thereafter coded accordingly for input into further analysis in Chapter Five. The overall mean holding of risky assets to gross wealth was 18.9%. This low holding of risky assets suggests that the sampled employees are largely risk averse.

4.4.4.2 Employees' risk preference

The second and third approaches focused on behaviour and were used to measure risk preference in the subjective form by the self-reported attitude towards risk in line with Dohmen et al. (2005) and Venter (2006). The first method was to apply the standard lottery question where employees were asked to indicate their willingness to invest in a hypothetical lottery with explicit stakes and probabilities as described in Chapter Three. The responses from the employees were analysed and displayed in Table 4.10 below.

Table 4.10: Distribution of Employees' Responses by Risk Preferences-Response to Lottery Question.

Scale	Total	Least Risk Taker	Low Risk Taker	Moderate Risk Taker	Medium Risk Taker	High Risk Taker	Highest Risk Taker
Frequency	805	108	157	252	156	90	42
Per cent	100	13.4	19.5	31.3	19.4	11.2	5.2
Cumulative Per cent		13.4	32.9	64.2	83.6	94.8	100

The above results indicate a tendency of the sampled employees to exhibit conservative attitude to risk-taking where almost two-thirds of the respondents were rated to take up to moderate risk. This is not unexpected in a developing country and could be due to high dependency rates, high transaction costs and uncertainties associated with unstable financial systems, high rates of unemployment and significant inflation. This disposition to risk taking is consistent with the findings in Subsection 4.4.4.1 that the sampled employees were to a large extent risk averse. The implications of these perceptual attitudes to risk-taking in the investment process are that the wealth portfolios of the sampled elements are likely to reflect low risk-taking behaviour thereby suggesting a low ratio of risky assets to wealth portfolios, a narrow range of assets held and little diversification.

4.4.4.3 Employees' attitude towards risk

The third measure of risk-taking behaviour focused on risk attitudes. This was measured by responses received from employees on their willingness to take risks in general. An 11-point scale was used whereby 10 represented 'fully prepared to take risks' and 0 denoted 'complete unwillingness to take risks'. The data was supplied by employees by ticking choices provided and the results shown in Table 4.11 below.

Table 4.11: Distribution of Employees by Attitude towards Risk

Scale	Frequency	%	Cumulative %
0=Unwilling to take risks	25	3.1	3.1
1	14	1.7	4.8
2	65	8.1	12.9
3	74	9.2	22.1
4	100	12.4	34.5
5	120	14.9	49.4
6	91	11.3	60.7
7	77	9.6	70.3
8	58	7.2	77.5
9	84	10.4	87.9
10=Fully prepared to take risks	97	12.1	**100**
Total	**805**	**100**	

The results of these tabulations were not conclusive and did not reveal a clear inclination in terms of employees' attitudes towards risk in general. This suggests that risk-taking behavior, in the general sense that is measured by respondents' attitude towards risk may not be appropriate for assessing investor behaviour and therefore studying wealth portfolios.

4.4.5 *Seniority of Sampled Employees*

The seniority of employees in this study was measured using a simple ranking scale of five levels starting from the lowest rank of 'clerk or factory worker or messenger' to the highest position of director or policymaker. This classification was designed to follow closely the scheme that is adopted by the public service and many organizations in Kenya. The results from the responses are shown in Table 4.12 below.

Table 4.12: Sample Distribution by Job Seniority

Level of Job Seniority	Frequency	%
Director or policymaker	37	4.6
Manager	193	24.0
Supervisor	197	24.5
Officer or technician	132	16.4
Clerical or factory worker or messenger	246	30.5
Total	**805**	**100**

The tabulated responses indicated a high percentage of employees in the category of 'clerical

or factory worker or messenger' and the least in the position of director or policymaker. Indeed, a pyramid structure was expected in the frequency distribution of respondents in line with known staffing structures in Kenya. The results imply that the sample selected is a fair representation of the population of salaried middle and upper income employees in Kenya and therefore suitable for statistical tests.

4.4.6 *Distribution of Length of Employment Service*

A nine-point grouping was applied to obtain detailed information on length of years of service. This scaling was designed in recognition of the fact that working life starts at about 20 years of age and that official retirement age in Kenya ranges between 55 and 60 years. The length of service was deemed to be important as a possible determinant of wealth portfolios through its close association with employees' income and age. These results were analysed and presented as shown in Table 4.13 below.

Table 4.13: Sample Distribution by Length of Employment Service

Scale	Up to 5 Years	6 to 10 Years	11 to 15 Years	16 to 20 Years	21 to 25 Years	26 to 30 Years	31 to 35 Years	36 to 40 Years	> 40 Years
Frequency	253	335	129	53	19	13	2	0	1
Per cent	31.4	41.6	16.0	6.6	2.4	1.6	0.3	0	0.1

The above results indicated that majority of the sampled employees had relatively short years of service in line with their age profile as shown in subsection 4.4.2 above. Thus, employees with up to 10 years of service accounted for 73% of the responses received, while only 2% had over 30 years of employment service. This distribution profile is consistent with a younger cohort of employees.

A reliability and accuracy test of the sample data using Pearson product moment correlation coefficient showed that the ages and lengths of employment service of the employees have a moderately strong positive correlation of 0.62, at a level of significance of 0.01. The finding that employees' ages and their lengths of employment service tend to move together and in the same direction is in line with expectation, and provided comfort for use of the data for inferential analyses.

4.4.7 *Education Levels of Employees*

Studies on wealth portfolios (King & Leape 1998; Mitchell & Moore, 1997; Supan & Eymann, 2000) have documented that education influences investing capacity and style. For this reason, this study sought to ascertain the highest education level of the sampled employees using six classifications. These classifications ranged from a lowest of below 'ordinary' (O) level but with other certificate, for example, grade test, up to a highest level of a Master's degree and above. This scheme followed literature with a customisation to suit the local situation; the results are shown below in Table 4.14.

Table 4.14: Sample Distribution by Highest Education Level Attained

Highest Education Level Attained	**Frequency**	**%**
Below 'O' level: with other certificate for example, grade test	16	2.0
Up to 'O' level or 'Advanced' level and no other certificate	33	4.1
Up to 'O' level or 'Advanced' level but with other certificate	240	29.8
Professional qualification for example Diploma but no degree	243	30.2
University degree —Bachelors	153	19.0
University degree —Bachelors plus professional qualification	75	9.3
University degree— Masters and above	45	5.6
Total	805	100

These results show that about two thirds of the respondents had not attained university level of education. This is much better than the national statistics, (GoK, 2007a) which show that for people aged 20 years and above, the highest school attained of primary school, secondary school and university were 60%, 39 % and 2.3%, respectively. The better education performance by the study respondents may be explained by the fact that middle and upper income employees are likely to have completed their secondary school education and pursued further studies in order to qualify for their jobs.

4.4.8 *Distribution of Employees by Gender*

Gender was measured by a dichotomous variable, male or female. This attribute was deemed important based on empirical evidence indicating that gender affects investment styles and wealth portfolios through risk taking, types of jobs, levels of income, and length of planning horizon. The results are analysed and shown in Table 4.15 below.

Table 4.15: Distribution of Employees by Gender

Gender of Respondent	Frequency	%
Female	318	39.5
Male	487	60.5
Total	**805**	**100**

The above results indicate that male employees were about one and a half times the number of female employees. This is not uncharacteristic and compares well with the total wage employees in Kenya as reported in the Statistical Abstract 2010, (GoK, 2010), where male employees earning above Shs 25,000 per month were about double the female employees.

4.4.9 *Distribution of Employees by Marital Status*

Data for this analysis was obtained from respondents who indicated their marital status from a choice of five different categories. The rationale for seeking this data was that wealth studies have shown that especially for women, marital status affects peoples' investment styles and risk tolerance. Table 4.16 shows the distribution of respondents by marital status.

Table 4.16: Distribution of Employees by Marital Status

Gender of Respondent	Frequency	%
Single male—never married	142	17.6
Single male—divorced or separated or widowed	26	3.2
Single female—never married	152	18.9
Single female—divorced or separated or widowed	29	3.6
Married couple	456	56.7
Total	**805**	**100**

These results indicated a fairly wide distribution of the sampled employees with respect to their marital status with the highest number falling in married couple category. The low percentage of employees in the category of divorced or separated or widowed is corroborated by GoK (2007a) which reported that this group comprised 12.6% of all urban households. The same report, on people aged above ten years, showed that those who were married couples and those never married comprised 50% and 39%, respectively, of urban households. These national survey results are closely mirrored by the data obtained in the current study, suggesting that it has external validity.

4.4.10 *Family Sizes and Number of Dependants*

The study took cognizance of the potential influence on investment styles and hence wealth portfolios that could be exerted by family sizes, substantially high dependence levels and altruistic African tendencies. To ascertain the family sizes, respondents were asked to indicate the size of their nucleus family from a discrete choice with the highest being above eight persons. The same procedure was also used to seek information on the number of dependants, over and above the nucleus family. The resulting distributions are shown in Table 4.17 for the family sizes and in Table 4.18 for the number of dependants.

Table 4.17: Sample Distribution by Size of Nucleus Family

Persons in Nucleus Family	Frequency	%	Cumulative %	1998/99 Labour Force Survey-urban households- %
1	217	27.0	27.0	28.8
2	107	13.2	40.2	15.9
3	185	23.0	63.2	14.4
4	131	16.3	79.5	14.4
5	102	12.7	92.2	10.7
6	42	5.2	97.4	6.4
7	15	1.8	99.2	4.7
8	3	0.4	99.6	2.2
More than 8	3	0.4	100	2.5
Total	**805**	**100**		**100**

These sample results indicate that about 80% of the respondents had a nucleus family size of 4 persons and below. The mean family size was 3.0. Very few of the sampled employees had family sizes with more than 5 members. These family units are slightly smaller than the reported mean urban household size in Kenya of 4 in the most recent national survey (GoK, 2007a) partly because middle and upper income employees are likely to be more educated and have smaller families. The study results are corroborated by the 1998/99 Labour Force Survey (GoK 2003a) figures which indicated that about three quarters of urban households had not more than 4 persons.

An examination of the number of dependants above the nucleus family provides a useful indicator of the demographics of the sampling units as shown in Table 4.18 below.

Table 4.18: Sample Distribution by Number of Dependants above Nucleus Family

Number of dependants	Frequency	%	Cumulative %
0	100	12.4	12.4
1	195	24.3	36.7
2	326	40.5	77.2
3	80	9.9	87.1
4	35	4.4	91.5
5	26	3.2	94.7
6	13	1.6	96.3
7	8	1.0	97.3
8	4	0.5	97.8
More than 8	18	2.2	100
Total	**805**	**100**	

The results above indicate that the number of dependants above the nucleus family tended to be low; 12.4% of the respondents had no such dependants, while those with one or two dependants were about two-thirds. The mean number of dependants was 2.1. This high number of dependants is not unexpected and may be explained by high unemployment levels and low per capita income in the country. It is also vindicated by an urban age dependency ratio in 2006 of 60.2% (GoK, 2007a), which is computed as the ratio of the sum of those aged below 15 years and above 64 years to the working population; those aged between 15 years and 64 years.

4.4.11 *Distribution of Employees by their Background*

In this study, ethnicity was operationalised and approximated using two surrogates: the place of birth of the respondent and where an employee spent the childhood years, say, up to 15 years of age. This was premised on the fact that ethnicity may influence peoples' culture and beliefs and hence investment styles and wealth portfolios. The choice of background, rather than tribe, was preferred because the latter has recently been associated with negative connotations and non-nationalistic posture.

Employees were asked to indicate the place where they were born as shown in Table 4.19 below and also where they spent their childhood years as shown in Table 4.20. A choice of possible places was provided to simplify and standardize the responses. To improve the quality of data, further options were given to identify those born outside Kenya and others born in Nairobi and other urban centres.

Table 4.19: Distribution of Employees by Place of Birth.

Place of Birth	Frequency	%
Outside Kenya	16	2.0
Urban centre—Nairobi	105	13.1
Urban centre—any other town in Kenya	84	10.4
Central Province	186	23.1
Coast Province	50	6.2
Eastern Province	86	10.7
North Eastern Province	21	2.6
Nyanza Province	112	13.9
Rift Valley Province	53	6.6
Western Province	92	11.4
Total	**805**	**100.0**

The above results indicate the following spread in the distribution of the respondents with respect to where they were born: 2% outside Kenya, 23.4% in urban areas, and the balance of 74.6% in rural areas. These results, which show that a vast majority were born in rural areas are consistent with a population distribution in Kenya where 66% are rural based (GoK, 2010a).

Table 4.20: Distribution of Employees by Place of Childhood Years

Place of Childhood (first 15 years)	Frequency	%
Outside Kenya	31	3.9
Urban centre—Nairobi	172	21.3
Urban centre—any other town in Kenya	114	14.2
Central Province	159	19.8
Coast Province	46	5.7
Eastern Province	51	6.3
North Eastern Province	6	0.7
Nyanza Province	90	11.2
Rift Valley Province	47	5.8
Western Province	89	11.1
Total	**805**	**100.0**

The above tabulation provides details of where the respondents spent their early childhood years. The results indicate the following proportions; outside Kenya was 3.9%; urban areas was 35.6%, while the balance of 60.5% spent their early childhood years in the rural areas. The results suggest that some respondents who were born in the rural areas may have spent their early childhood years either in urban areas or outside Kenya. This can partly be explained by the phenomenon of rural-urban migration where a large number of people move to urban areas upon attaining adulthood and completion of formal schooling to look for jobs. Thus the parents of the respondents may have moved to urban areas and outside Kenya in

search of opportunities for their families.

4.4.12 Distribution of Employees based on Religious Affiliation

Respondents were asked to indicate their spiritual affiliation by ticking appropriately from a choice of the common religions in Kenya. A further split for Christians was provided to seek more data as shown in Table 4.21 below because most people in Kenya are Christians.

Table 4.21: Distribution of Employees by Religious Affiliation

Religion	**Frequency**	**%**
Protestant/Evangelical	457	56.8
Catholic	259	32.2
Muslim	57	7.1
Indigenous beliefs	19	2.3
Others	13	1.6
Total	**805**	**100.0**

These results indicate that Christians were the majority at 89% of the respondents, while Muslims at 7.1% ranked second. These broad proportions are somewhat mirrored by the 2009 Kenya population and housing census results that indicated the following religious composition in the Kenyan population: Protestants and Catholics 83.4% and Muslims 11% (GoK, 2010b).

4.4.13 *Saving Levels of Salaried Employees in Kenya*

Saving by employees was assessed at three levels. The first was the quantifiable saving rate. This was supplemented by an appraisal of the main reasons for saving and an evaluation on the extent to which employees borrow to finance their investments.

4.4.13.1 Saving Rates of Employees

The saving rate that each respondent achieved was assessed using the flow method. This method was elaborated in Chapters One and Three. To obtain the pertinent savings data, sampled employees were asked to indicate their estimated percentage saving rate from their monthly gross income by ticking appropriately from 10 choices. Thereafter, the mean saving rates were computed to generate estimated saving rates by classes of employees and groupings. These results are summarized in Table 4.22 as shown below.

Table 4.22: Distribution of Employees by Saving Rates on Employment Income

Saving Rate as Per cent of Gross Employment Income	Frequency	Per cent of employees	Cumulative %
Saves nothing	17	2.2	2.2
From 1 to 10	111	14.2	16.3
From 11 to 20	226	28.9	45.2
From 21 to 30	265	33.8	79.1
From 31 to 40	108	13.8	92.8
From 41 to 50	36	4.6	97.4
From 51 to 60	8	1.0	98.5
From 61 to 70	5	0.6	99.1
From 71 to 80	5	0.6	99.7
More than 80	2	0.3	100
Subtotal of responses	**783**	**100**	
No responses received	22		
Total	**805**		

The above results indicate that the largest percentage of employees, at 33.8%, say, a third, indicated that their monthly saving rates on employment income were in the 21–30% range followed by those who save between 11% and 20% who comprised 28.9% of the responses received. A small number, of about 2.2%, of the respondents indicated they saved nothing.

The data also showed that 79.1% save less than one-third of their employment income. The grand mean saving rate was 22.5%, while the median was 25.5%. The low saving rates are consistent with expectations and evidence. Micro data from Kenya's income and expenditure surveys provide useful comparisons. The 1993/94 Urban Household Budget Survey (GoK, 2002) and the Report of the 1998/99 Integrated ILFS (GoK, 2003a) indicated household savings rates of 17% and 13 %, respectively. Macro data obtained in 2008 indicates a gross national saving rate (percentage to GDP at market prices) of 14.8% (CBK, 2010).

Further analysis using Student t test showed that the computed mean savings rate of the sampled employees at (t=46.99, df=804; p-value =0.000) was significantly different from zero, at $\alpha=0.05$. Therefore, the sample mean saving rate of 22.5% on current employment income is significant and can be used for further tests as an independent variable.

4.4.13.2 Reasons why employees save

Given the potential role of savings in the investments process, specific information was sought on the reasons why employees save. In this case, sampled employees were asked to indicate the estimated percentage of their savings that is allocated to various needs. The

results from the responses received were analysed and are shown in Table 4.23 below.

Table 4.23: Distribution of Employees by Reasons for Saving

Reasons why employees save	Frequency	Per cent of Respondents Saving	Mean Per cent of Saving	Median Per cent of Saving
Emergencies (ill health, accidents)	629	80.2	8.1	10.0
Future needs when in retirement	631	80.5	14.2	10.0
Education	746	95.2	19.6	20.0
To buy a plot/build a house	376	48.0	13.8	10.0
Buy a car	258	32.9	8.5	5.0
Other consumption needs	745	95.0	32.3	30.0
Own investments	726	92.6	22.4	20.0
Leisure/entertainment	22	2.8	8.5	10.0
Others	150	19.1	11.5	10.0
Net number of respondents	**784**			
No responses received	21			
Total	**805**			

The above results show that the largest portion of savings was devoted to other consumption needs and own investments. The tabulation also shows that a large proportion of the respondents made savings for education, own investments, other consumption needs, future needs while in retirement, and emergencies. The high score for savings for future consumption needs may reflect the need for a cushion and assurance against uncertainty due to the risk of losing a job and the obligation to provide financial support to dependants and the extended family. Saving for investments with a high score of 92.6% of the responses received and a mean rate of 22.4% of amounts saved could be explained by the fact that this was a selected group of high-earning employees.

4.4.13.3 Extent to which employees rely on loans to finance investments

Further insight into the investment activity of the sampled employees was sought by examining the extent to which employees rely on credit to fund their investments. This step was necessitated by the awareness of the low penetration rate of banks in Kenya, where for instance, the FSD Kenya (2007) survey of 4,420 households on their banking behaviour found that 42% were excluded from using banking services. In this regard, Likert scale data from the questionnaires on the extent to which employees relied on loans for investments was obtained and analysed as shown in Table 4.24 below.

Table 4.24: Distribution of Employees by Extent of Reliance on Loans for Investments

Scale	Frequency	%
Never	91	11.5
To a little extent	159	20.1
To some extent	190	24.0
To a large extent	222	28.0
To a very large extent	130	16.4
Subtotal	**792**	**100**
No responses received	13	
Total	**805**	

The results indicated that only 11.5% of employees never rely on loans for investments. The remaining 88.5% rely on loans for investments to the extent that a cumulative 44.4% indicated that they rely on loans to a large and very large extent. The high proportion of employees who rely on loans for investments is consistent with other findings from this study where the ownership rate for cooperative shares, as well as loans and mortgages, was reported to be 53.8% and 31.4%, respectively. The substantial use of cooperative and other loans suggests that savings and leverage may play an important role in influencing the wealth portfolios of employees. This provides a justification for this study's extended conceptual design to examine the role of savings on the wealth portfolios employees.

The results, however, are inconsistent with evidence from the KIHBS 2005/06 survey (GoK, 2007a) where only 29% of urban households surveyed were found to seek credit. Besides, for those who sought credit, only 27.2% used it for investments. Thus, only 7.9% of urban households indicated that they financed their investments using credit. These national statistics showing low utilization of credit to finance investment could be explained by the phenomenon of wide interest spread coupled with potentially low financial knowledge, whilst the higher proportions in this study can be explained by the fact that middle and upper income employees are likely to be more educated, more informed and have higher incomes than the rest of the urban population. These attributes enable the employees to take on more debt in their investments when compared with the rest of the urban population.

4.4.14 *Wealth Portfolios of Sampled Employees*

In this study, the nature of wealth portfolios was depicted by the asset types, composition, and market values of wealth as reported by the sampled employees. This information was obtained with respect to current and inherited wealth. The respondents were asked to choose from a matrix grid itemizing different asset types and debt within specified bands of the estimated monetary values in Shillings. The midpoint value for each band was taken as the

indicant of the market value of the asset and debt, while the highest and lowest coded bands were imputed. Each respondent's gross wealth and net wealth was computed by aggregating these monetary values. Net wealth was derived by deducting debt from the gross wealth.

4.4.14.1 Types and ranges of assets held

The first measure of wealth was the types and range of assets. This assessment provided the data to describe and ascertain the nature and the level of diversification of the wealth portfolios of the sampled employees.

The results from the responses received indicate that the sampled employees hold a wide range of assets. All the seven asset types that are taken to denote wealth were held. These include cash and bank balances, treasury bills and bonds, corporate bonds, cooperative shares, shares in the stock exchange and mutual funds, life assurance and pension scheme assets as well as property (buildings and houses). A dominance and concentration of liquid assets such as cash, cooperative shares and listed shares was also noted. In addition, the same data revealed a markedly low ownership of illiquid and riskier assets such as buildings and houses. This could be explained by the challenge of house acquisition because of the large sums of money required, or low asset appeal due to poor marketability of property.

Whilst not considered as part of personal wealth portfolios in this study, responses received indicated other forms which employees use as stores of wealth. These stores of wealth and the ownership rates were as follows: businesses owned by self (44.5%), cows or goats or sheep or crops (25.3%), farmland and town plots (52.5%), foreign investments (6.5%); motor vehicles (33.4%), and other assets (50.1%). The high ownership rate of farmland and town plots could partly be explained by considerable attachment to land where most Kenyans tend to have interests in land in various forms. For memorandum purposes, the estimated values of these assets are shown in Appendix 14. These alternative stores of wealth have been ignored in this study to maintain consistency with published works, and also due to problems of transfer and valuation, especially with respect to businesses and farmland, which sometimes may have no proper title.

4.4.14.2 Asset ownership rate

The second measure of wealth was asset ownership, which was computed as the fraction of sampled employees who reported owning a particular asset or a class of assets. The ownership rate of the three classes of assets was found to be as follows: cash and near cash

(representing cash, cooperative shares, pension schemes and life assurance policies) 28.6%; fixed income assets (treasury bills, treasury bonds and corporate bonds) 1.9% and risky capital (shares in stock exchange and property) 22.3%. The low ownership rate of fixed income assets is indicative of a relatively undeveloped debt market coupled with asset scarcity. Such low ownership rate of fixed return assets may suggest that middle and upper income employees may not be holding diversified wealth portfolios. At a more detailed level, the ownership rate of specific asset types is displayed in Table 4.25 below.

Table 4.25: Ownership Rate of Assets by Employees

Asset Type	Frequency of Asset Ownership	Per cent of Employees owning Asset Type
Cash and bank balances	805	100.0
Cooperative shares	433	53.8
Pension schemes assets and Life assurance policies	369	45.8
Shares in listed companies/mutual funds	313	38.9
Property (buildings and houses)	253	31.4
Treasury bills and bonds	43	5.3
Corporate bonds	15	1.9
Total	**805**	

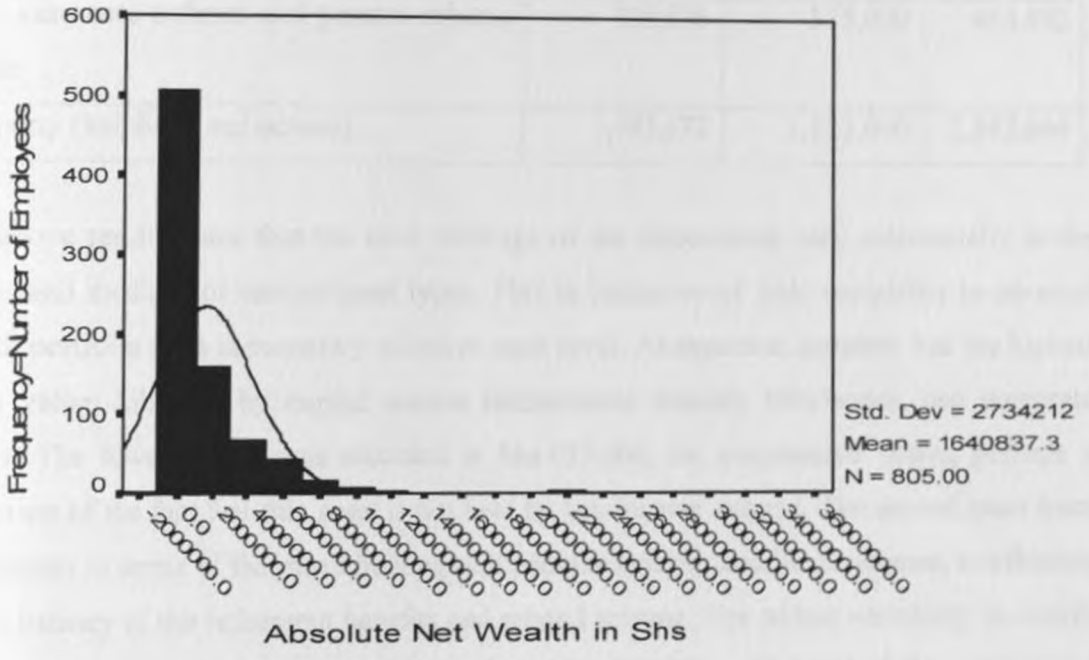
The data displayed in Table 4.25 above indicates that the highest ownership rate was for cash at 100%, which was followed by cooperative shares at 53.8%. The lowest ownership rates of 5.3% and 1.9% were reported for treasury bills/bonds and corporate bonds, respectively. This ownership pattern is not unexpected and is in line with evidence from wealth studies in other countries where most people are found to own cash. The notably meagre ownership rate of fixed return assets is explained by the underdeveloped capital markets in Kenya, while the low ownership rate of property could be linked to the problem of asset scarcity in this category.

The evidence noted above is in tandem with the tenure distribution findings of the 2005/06 Urban Household Budget Survey (GoK, 2007a), which showed that 16.6% and 75.4 % of households lived in own and rented houses, respectively. The high ownership rate of shares in cooperatives could be explained by the popularity of cooperatives where FSD Kenya (2009) reports that 17.9% of the adult population is served by microfinance institutions and SACCOs, compared to 22.6% of the population who are served by banks.

4.4.14.3 Descriptive statistics of the values of the wealth portfolios of employees

Descriptive statistics were computed to establish the distribution patterns of the absolute values of the wealth portfolios for individuals, the whole sample, asset classes and specific assets. Measures of central tendency and dispersion were used to highlight key attributes of the sample wealth data as shown in Figure 4.1 below.

Figure 4.1: Sample Distribution of Current Net Wealth Portfolios.



The distribution pattern shown in Figure 4.1 above for the responses received above indicated that the mean values of personal wealth portfolios and standard deviation were Shs 1,640,837 and Shs 2,734,212, respectively. The scores of Kurtosis and skewness of 45.1 and 5.1, respectively, showed that the wealth distribution lay outside the boundaries of normality. These boundaries are between -3.098 and +3.098 for Kurtosis, and between -1.55 and +1.55 for skewness. Also, the results indicated that the wealth holding profile had a sharp peakedness and large positive skew, suggesting substantial heterogeneity in line with expectation. This was supported by the fact that the median wealth holding was Shs 624,995, while the range was wide, from a lowest of Shs -2,000,001 to a highest of Shs 36,675,000. The challenges to normality cited above were addressed by using a relatively large sample to justify using the respondents' data in cases where the assumption of normality was required. Even so, the distribution and dispersion statistics provide useful insights for designing future studies to examine the wealth holding of middle and upper income employees in Kenya. The distribution of personal wealth at asset level is displayed in Tables 4.26.

Table 4.26: Sample Distribution of Net Wealth Portfolios by Asset Types

Type of Asset	Mean Wealth (Shs)	Median Wealth (Shs)	Standard Deviation
Cash and bank balances	745,745	375,000	1,094,796
Treasury bills and bonds	991,279	1,125,000	598483
Cooperative shares	406,755	125,000	408,605
Corporate bonds	825,000	1,125,000	656,016
Shares in the stock exchange/mutual funds	514,182	375,000	550,173
Life assurance policies and pension scheme assets	435,636	375,000	464,892
Property (buildings and houses)	1,485,672	1,125,000	2,342,664

The above results show that the asset holdings of the respondents vary substantially in the means and medians of various asset types. This is indicative of wide variability in personal wealth portfolio sizes in monetary values at asset level. As expected, property had the highest mean value, followed by capital market instruments; treasury bills/bonds, and corporate bonds. The lowest mean was recorded at Shs 407,000, for cooperative shares, perhaps a reflection of the fact that this asset is not held by top income earners. The second asset from the bottom in terms of the mean holding was pension scheme and life assurance, a reflection of the infancy of the retirement benefits and related scheme. The widest variability in wealth was recorded in buildings, followed by cash and bank holding. The rest of the assets had a fairly similar standard deviation.

4.4.14.4 Sizes of personal wealth portfolios

This study followed the practice by Bodie and Crane (1997) who measured the dispersions in the wealth holdings of respondents using frequency distributions and quartiles. With this insight, the wealth distribution patterns of the sampled employees was analysed by ranking them in order of the total net value of their wealth. This array was then divided into three equal groups, called treciles, and used to classify all the employees by their wealth size. The top group was labeled as 'above average wealth holders', the middle was 'average wealth holders', and the bottom 'below average wealth holders'. Within this classification, the wealth value for 'average wealth holders' was from Sh 375,000 to Shs 1,249,998, while those for 'above average' and 'below average' were higher and lower than this range, respectively. This three-tier breakdown of the respondents provided a dependent wealth variable that was used to carry out discriminant analysis in Chapter Five, Section 5.2.5.

On the basis that the primary sampling unit was industry type, some examination was made on the distribution of personal wealth at industry level with respect to mean, median and standard deviation. This was done to discern additional features of the distribution of the dependent variable as shown in Table 4.27 below.

Table 4.27: Sample Distribution of Wealth Portfolios by Industry

Industry Category in Kenya	Mean Employee Wealth in Shs	Median Employee Wealth in Shs	Skewness	Standard Deviation
Agriculture, forestry, mining and quarrying	5,277,867	5,124,998	2.085	3,463,762
Manufacturing	1,612,677	624,999	4.070	2,708,447
Electricity and water	6,192,499	3,187,498	3.009	10,853,143
Construction	2,206,895	1,124,999	0.998	2,337,169
Trade, restaurants and hotels	581,080	375,000	2.709	769,934
Transport and communications	1,124,999	625,000	1.260	1,285,147
Finance, insurance, real estate and business services	1,823,562	749,999	3.990	3,146,065
Government, community, social and personal services	1,163,355	624,998	2.996	1,639,128

Table 4.27 shows that employees in trade, restaurants and hotels had the least mean wealth. Investigations based on cross-tabulations and ratio analysis showed that the substantial deviations from the grand mean net wealth of Shs 1,641,000 can largely be explained by the employment positions and education levels and therefore the income of the sampled employees. For instance, the employees in the category of middle and upper income category comprised the higher cadre in agriculture, forestry and mining, as well as electricity and water, where managers and directors sampled accounted for over 50% of the respondents. With respect to trade, restaurants and hotels, only 19% of the respondents were in the cadre of manager and director.

The highest variability in net wealth as depicted by the computed standard deviations was in agriculture, forestry and mining as well as electricity and water, while the least was in manufacturing. In line with the distribution pattern of the whole data, all the industries showed a positive skewness in the net wealth of the employees. The highest skewness of 4.07 was noted among employees in manufacturing, suggesting that the sampled elements had a large number with low wealth and a minority with large wealth portfolios.

4.4.15 *Diversification of Employees' Wealth Portfolios*

In this study, the level of diversification at the portfolio level for employees was measured by computing three metrics: the number and percentage of employees who held a certain number of assets or a given asset class, and the relative composition in the value of the wealth portfolio by asset class (cash and near cash assets, fixed income and risky assets).

4.4.15.1 Asset types held

Analysis of responses received on the basis of the number of asset types held is shown in Table 4.28 below. The analysis is premised on the fact that a high number of assets held and a wide class of assets held, suggest a higher likelihood of a diversified portfolio. Following literature reviewed, the three asset classes that were examined in this study were: cash and near cash, fixed income capital, and risky assets. The asset class ownership rate for the sampled employees was as follows: 51.2% owned only one asset class; 43.7% owned at least two asset classes, while only 5.1% owned all the three asset classes. This suggests a tendency of employees to hold few assets; majority own only one asset class.

Table 4.28: Employees' Wealth Holding by Number of Asset Types Held

Number of Assets Held	Frequency	%	Cumulative %
One asset	158	19.6	19.6
Two assets	254	31.5	51.1
Three assets	156	19.4	70.5
Four assets	114	14.2	84.7
Five assets	99	12.3	97.0
Six assets	21	2.6	99.6
Seven assets	3	0.4	100.0
Total	**805**	**100.0**	

This analysis indicates that the wealth portfolios of the sampled employees were concentrated in a few assets. Only about one-third held more than three asset types, while the mean number of asset types held was 2.7 with a standard deviation of 1.4. These results suggest the possibility of low diversification. This is in line with the expectation of narrow portfolios with a high concentration in cash and property; a phenomenon that could be explained by asset scarcity, undeveloped capital markets and information asymmetry. A role for borrowing

constraints in keeping the range of assets held low could be attributed by the fact that only 31.4 % of the employees indicated to have loans and mortgages.

4.4.15.2 Relative proportions of specific assets

The second method of measuring diversification was the relative values of specific assets in the wealth portfolio. This measurement enabled an assessment of the composition of the wealth portfolio to provide key information regarding the total holdings of all the sampled employees. The relative proportions were computed in two ways.

The first approach was at an aggregate level by adding all the employees' values for each asset type and dividing the result by the total value of the wealth portfolios of all the employees. This yielded two arrays of figures depending on the denominators, either net wealth or gross wealth. The resulting proportions were called component share of net or gross wealth as the case might be. In the second approach, the personal asset-specific proportions to gross wealth were aggregated and final asset specific grand mean proportions for all employees computed. The results of these two processes are shown in Table 4.29 below.

Table 4.29: Employees' Wealth Holding by Relative Proportions of Specific Assets

Asset Type	Component Share in Net Wealth Value %	Component Share in Gross Wealth Value %	Mean of Asset Specific Proportions- %
Cash and bank balances	45.4	39.3	56.7
Property (buildings and houses)	28.5	24.6	35.7
Cooperative shares	13.4	11.5	24.9
Pension assets and life assurance policies	12.2	10.5	21.0
Shares in listed companies	12.1	10.5	19.8
Treasury bills and bonds	3.2	2.8	20.5
Corporate bonds	0.9	0.8	9.6
Total net wealth		**100.0**	
Loans and mortgages	-15.7		
Total gross wealth	**100.0**		

This tabulation of the mean proportions of assets held shows cash to have the highest holding at 57 %, followed by property at 36 %. Also, at an aggregate level, the proportion of cash was the highest at 45.4 % of net wealth and 39.3% of gross wealth. In tandem with the low ownership rates, and partly a reflection of lack of depth in the capital markets, the proportionate holding of fixed income securities was very low at below 5%. Also referred to as negative assets, loans and mortgages were found to be 15.7% of net wealth.

4.4.15.3 Relative proportions of asset classes held

A third measure of diversification involved assessing the relative proportion of the three main asset classes to the gross wealth for the sampled employees. Understanding this distribution pattern was deemed to be important for this study because it would provide information on naïve diversification. In this case, fairly diversified portfolios require that employees hold their assets by the thirds in proportionate values of asset classes. Analysis of the responses from sampled employees in this respect was done for each sampled employee to estimate the relative proportion of each asset class to the individuals' total portfolio. Some key descriptive statistics of the distribution pattern of the composition of the three asset classes were firstly computed as shown in Table 4.30 below. Thereafter, these results were used to compute the percentage of employees holding certain proportions of the three asset classes in their

portfolios as shown in Table 4.31 below.

Table 4.30: Sample Distribution of Proportions of Wealth Portfolios

Asset Type	Number of Employees	Value to Gross Wealth %	Mean Proportion held %	Standard deviation	Highest Proportion %	Lowest Proportion %
Cash and near cash	805	61.3	79.8	25.1	100	1.9
Fixed income capital	48	3.6	21.3	17.9	83.3	2.2
Risky assets	387	35.1	18.9	20.5	98.1	4.0

The above results indicate that the wealth portfolios are dominated by the asset class of 'cash and near cash' with mean proportional holding of 80%. Note that these totals do not add up to 100% because they are means of proportions rather than the relative proportions of each asset class to grand totals in the sample. Again, cash and near cash accounted for the highest proportion of all assets at 61.3%. Risky assets had the highest per-person mean wealth value, mainly due to indivisibility and high unit values of property. The low per-person holding in value of fixed income capital may be explained by the marketability and divisibility of the assets as well as the aspect of financial asset scarcity which is expected in a low-income developing country with undeveloped capital markets. The highest and lowest holdings were in line with mean and median holdings.

An assessment of whether naïve diversification is achieved through investment in the thirds is demonstrated by the descriptive statistics that show the percentage of employees who hold one third in value of the three respective asset classes as shown in Table 4.31 below.

Table 4.31: Composition of Employees' Wealth Portfolios by Asset Classes

Range of Proportionate Wealth holding (%)	Employees Holding Cash and Near Cash in the Range (%)	Employees Holding Fixed Income Capital in the Range (%)	Employees Holding Risky Assets in the Range (%)
0	0.0	94.0	51.9
>0 to 10	0.6	2.1	3.0
>10 to 20	2.1	1.6	7.0
>20 to 30	2.4	0.8	6.3
>30 to 40	**3.1**	**0.6**	**11.1**
>40 to 50	9.6	0.5	9.2
>50 to 60	7.6	0.1	4.6
>60 to 70	9.4	0.2	2.5
>70 to 80	6.3	0.1	2.2
>80 to 90	5.7	0	1.7
>90 to 100	53.2	0	0.5
	100	100	100

These results show that only a small percentage of employees' portfolios reflected an asset class holding within the 30–40% range for the three asset classes which in this study would be taken to signify investing in the 'thirds'. The results show that only 3.1%, 0.6% and 11.1% of the employees held their total wealth in 'cash and near cash', fixed income and risky assets, respectively. This pattern suggests that employees' wealth portfolios may not be held in the 'thirds'.

For all the respondents, the proportionate share of the three asset classes in the value of total gross wealth portfolio was as follows: cash and near cash 61.3%, fixed income capital 3.6%, and risky assets 35.1%. These results are notably different from the asset composition of the investments and wealth portfolios of pension schemes in Kenya as reported by Alexander Forbes Financial Services (2009) whose three years' average weights to December 2009 were: fixed income capital 57%, equity 32%, property 6%, and offshore investments 5%. The high weighting in fixed income assets and negligible investment in cash is notable. Interestingly, the combined investment in equity and property by all the pension schemes at 38% is almost comparable to the current study results that report 35.1%.

4.4.15.4 Holding of shares in listed companies

With respect to employees who indicated to hold listed shares, diversification at securities level was measured by the absolute number of different shares held. In line with literature

reviewed, naïve diversification for non–systematic risk was assumed to be achieved when the companies in which shares are held exceeded 11 as expounded in Subsection 2.4.1.3 (p.44). To obtain the requisite data, sample employees were asked to indicate the number of listed companies in which they hold shares. Table 4.32 summarises the responses received.

Table 4.32: Distribution of Employees by Number of Companies in which Shares Held

Number of Companies in which Shares are Held	**Frequency**	**%**	**Cumulative %**
One	42	14.6	14.6
Two	78	27.1	41.7
Three	82	28.5	70.2
Four	52	18.1	88.3
Five	18	6.2	94.5
Six	2	0.7	95.2
Seven	4	1.4	96.6
Eight	5	1.7	98.3
Nine	0	0	98.3
Ten	4	1.4	99.7
Eleven and above	1	0.3	100
Total	**288**	**100**	
No responses/no shares held	517		
Grand total of employees sampled	**805**		

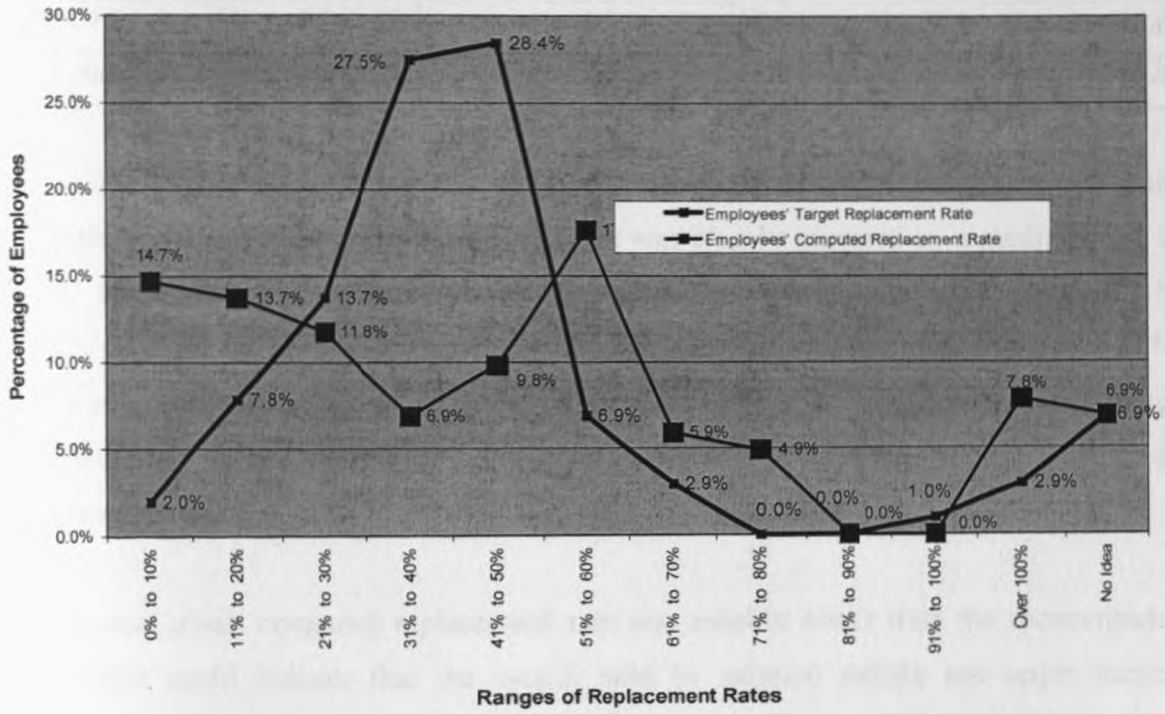
The results showed a high concentration of employees who held shares in not more than three companies with a mean 3.03 companies. The tendency to hold shares in few companies could be explained by Kenya's undeveloped capital markets, information asymmetry and borrowing constraints on account of high interest rates on loans, significant spreads, and non-availability of sufficient security for employees to borrow for investments. The low number of different shares held is likely to result in a low level of diversification at securities level.

4.4.16 *Adequacy of Employees' Wealth Portfolios*

The adequacy of wealth was measured for sampled employees aged 45 years and above using the 'replacement rate'. These employees were 102 and comprised 12.5% of the responses received. Literature shows that the computed replacement rate offers the best metric for assessing the adequacy of wealth. This statistic was derived by working out the ratio of the estimated annual income from respondents' individual wealth portfolios to the reported annualized gross monthly income from employment, and expressing the results as a percentage. In this study, this computed measure was supplemented by the self-reported target replacement rate based on direct responses where the sampled employees were asked

to specify their target replacement rate from a choice of 12 ranges. The frequency distribution of the employees was graphed against the ranges of replacement rates as shown in Figure 4.2 below. Additionally, the mean replacement rates by age groups for all the employees aged 45 years and above were summarised as shown in Table 4.33 below.

Figure 4.2: Computed and Target Employees' Replacement Rates



To gain further insight into the adequacy of wealth, additional information regarding the age-distribution of the mean computed and target replacement rates for the candidate age groups was calculated and analysed as shown in Table 4.33 below.

Table 4.33: Replacement Rates for Employees Aged 45 Years and Above

Age Group in Years	Total Number of Employees	No Idea	No Responses Received	Total Responses Received	Mean Computed Replacement Rate (%)	Mean Target Replacement Rate (%)
45-50	50	2	0	48	35.8	37.3
51-55	46	2	2	42	51.9	40.4
55-60	2	0	0	2	12.6	60.0
Above 60	4	0	0	4	52.9	45.0
Total	**102**	**4**	**2**	**96**	**43.0**	**39.4**

The results in Table 4.33 show that for employees aged 45 years and above, the mean computed replacement rate was 43%. This score was closely mirrored by a median value of 38.8%. The highest concentrations of computed replacement rates were in the range of 51% to 60% and 0% to 10% with frequency distribution of employees at 17.6% and 14.7%, respectively as shown in Figure 4.2 above. Since the numbers of employees in the older age categories were small, these results could not be used to infer inter-age group pattern of replacement rates.

The reported mean computed replacement rate was notably lower than the recommended 70% which could indicate that the wealth held by salaried middle and upper income employees may not be adequate to enable them to support the same standard of living after retirement. Only 19.6% of the candidate employees had an estimated computed replacement rate that was above the recommended 70%. The low computed replacement rate is in line with the low median and mean net wealth holding of employees in this age category of Shs 3,500,000 and Shs 4,600,000, respectively.

Additional information to support the findings above was also provided by examining the target replacement rates. The results in Figure 4.2 show the ranges of target replacement rates. The highest number of employees was found to be in the 41 to 50% and 31 to 40% range, and the employees were 28.4% and 27.5%, respectively. The resulting mean and median target replacement rates of 39.4% and 35.5% were comparable to the computed replacement rate (of 43%) and lower than the recommended rate of 70%. A Pearson correlation test (t=0.05, p-value =0.05, n=96) indicated a positive though weak correlation of 0.285 between the target and computed replacement rates. This reaffirmed the correctness of the latter. The margin of 3.6% by which the computed replacement rate exceeded the target

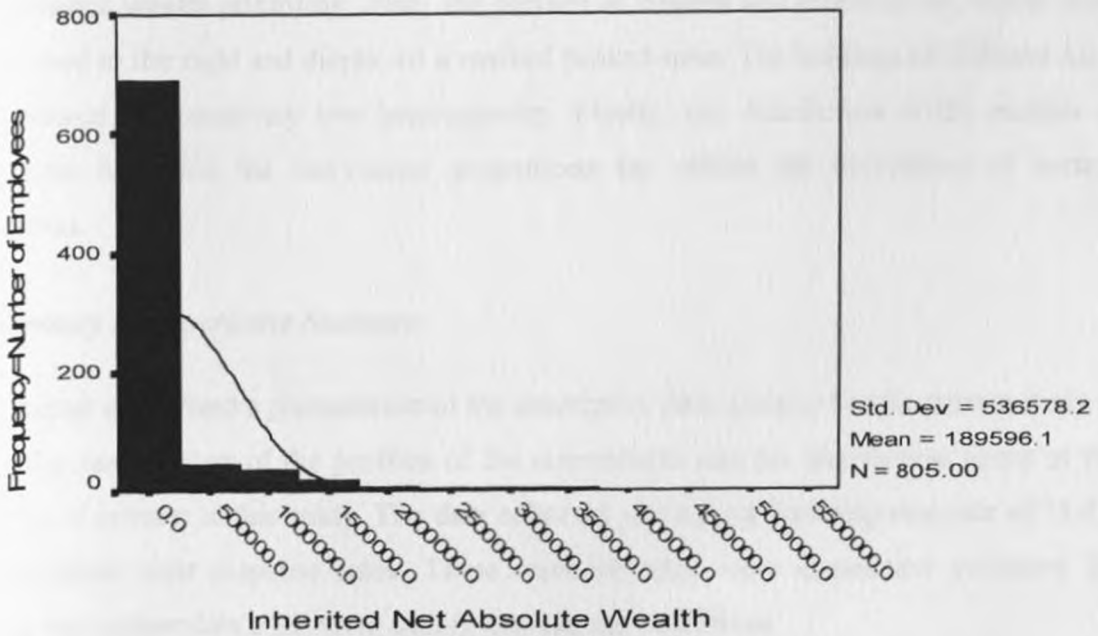
replacement rate implies the existence of a "retirement income expectations surplus".

To further ascertain the correctness of the results for the data analysis for employees aged 45 years and above, the target replacement rates were compared with the results obtained from all the 805 respondents. A slightly lower mean target replacement rate of 32.9% was reported, with only 14.3 % of the respondents indicating they had 'no idea', and 3 % failing to respond at all. Based on literature reviewed, this study returned better performance than expected. For instance, Yakoboski and Dickemper (1997) report from their survey of US data, that 37% have given little or no thought to their retirement, while only 36 % of current workers have tried to plan for retirement. The better performance shown in this study may be explained by the fact that middle and upper income employees may have good access to financial planning through employer sponsored pension schemes.

4.4.17 *Distribution of Inherited Wealth*

Only 27 % of the respondents indicated to have inherited wealth. This low figure was in line with expectation because the Kenyan population is not well endowed with resources and wealth as is the case with most developing countries.

Figure 4.3: Sample Distribution of Inherited Net Wealth



As shown in Figure 4.3 above, inherited wealth was reported to be of low value compared to the current wealth portfolios of the employees. A right-tailed distribution with a very large

concentration of zero level inheritance was therefore witnessed.

4.4.18 *Heterogeneity of the Employees' Wealth Portfolios*

The degree of homogeneity in the wealth portfolios of the sampled employees was examined using measures of central tendency, dispersions and normality. These statistics included means, medians, standard deviations, skewness and kurtosis as shown below. The four main indicators of wealth that were examined thus were: current net wealth, number of asset types held, percent of risky assets to gross wealth and inherited net wealth.

Table 4.34: Distribution Statistics of Key Wealth Indicators

	Current net wealth	**Number of asset types held**	**Risky assets as a percent of gross wealth-%**	**Inherited net wealth**
Mean	Shs 1,640,837	2.77	18.91	Shs 189,596
Median	Shs 625,000	2.00	.00	Shs 0
Standard Deviation	2,734,212	1.41	24.26	536,578
Skew ness	5.12	.556	1.06	4.56
Kurtosis	45.06	-.586	.117	26.76

The above results indicated that current net wealth, risky assets proportions and inherited net wealth had large standard deviations which exceeded the respective means. These distribution patterns are indicative of lack of homogeneity, which is in line with expectations of heterogeneous wealth portfolios. Also, the profiles of current and inherited net wealth were both skewed to the right and displayed a marked peaked-ness. The holdings of different asset types showed comparatively low heterogeneity. Finally, the distribution of the number of asset types held and the risky-asset proportions lay within the boundaries of normal distribution.

4.5 *Summary of Descriptive Statistics*

This Chapter comprised a presentation of the descriptive data analysis for the current study to enable the examination of the profiles of the respondents and the distribution forms of the attributes of interest in this study. The data collected yielded an item response rate of 75.4% and acceptable unit response rates. These response rates were considered sufficient for carrying out further data analysis to satisfy the research objectives.

The highlights of this analysis are summarsed below. The monthly earnings from employment for about three-quarters of the respondents were between Shs 28,000 and

Shs60,000. About 7% of the sampled employees earned more than Shs 120,000 monthly and therefore fell into the upper income category. The sampled employees comprised a youthful cohort in which about 70% were aged below 35 years and had relatively short lengths of employment service. A large number of employees indicated that they invest to maximize their earnings and consult professional advisors. However, most of the employees were found to be risk averse and consequently the range of assets held was low with a meager ownership rate of risky assets and a high ownership rate of cash and cooperative shares. The mean saving rate on employment income of 22.5% suggests the need for loans to finance investments where over 90% of the respondents indicated they rely on loans for investments. The computed replacement rate of 43% against a recommended 70% suggests that the wealth portfolios may be inadequate to support consumption in retirement.

Finally, the current and inherited net wealth of the sampled employees were found to be heterogeneous, right skewed and highly peaked. This was demonstrated by the large standard deviations, positive skewness scores and high measures of kurtosis. The challenge to normality due to the high scores of skewness and kurtosis on net wealth were overcome by using a relatively large sample that was selected randomly.

Overall, the variety of techniques used to investigate the characteristics of the data with respect to the independent and dependent variables that were of interest in this study did not reveal substantial bias and confirmed its suitability for hypothesis testing. This conclusion enabled the researcher to proceed and advance into the testing of hypotheses and make inferences with respect to the objectives of the study as discussed in Chapter Five.

CHAPTER FIVE

HYPOTHESIS TESTING AND FINDINGS

5.1 Introduction

This Chapter discusses the tests of the five hypotheses that were formulated in Chapter Two. Selected reference is made to the relevant descriptive statistics that were computed and discussed in Chapter Four. This process helps to reveal further relationships between the independent and dependent variables.

In this Chapter, appropriate statistical tools were applied to test all the research hypotheses. Parametric tools were applied in certain instances on the premise that the sample size was large enough to permit statistical tests for normally distributed data. Where the variable of interest was measured in a non-numeric scale, distribution-free non-parametric tests were applied. This treatment averted the need to make restrictive assumptions regarding the distribution forms of the data. In all cases, a significant level of 5 % was used.

The Pearson product-moment coefficient was computed to ascertain the level of correlation between wealth and the hypothesized determinants such as age, income, length of employment service, family size and savings rate. With respect to categorical data, both Student's t-test and ANOVA were applied to test for equality of various means of net wealth, the proportions of risky assets held in gross wealth, and other dependent variables.

Three multivariate techniques were applied. Multiple regressions were used to ascertain the relative importance of the independent variables in estimating the dependent variables. Whereas Multiple Discriminant Analysis (MDA) was applied to ascertain which independent variables could be used to classify the sample employees on the basis of the level of net wealth, factor analysis was used to determine the interrelationships among the determinants of the sizes and composition of employees' wealth portfolios.

5.2 Tests of Hypotheses

The primary data that was collected was used to test for patterns of relationships between the wealth portfolios of sampled employees and hypothesized predictor variables in line with the sub-hypotheses as summarised in Appendix 4. The resulting empirical evidence from these tests was used to test the hypotheses for this study, in order to meet the study objectives. Findings from these analyses were then interpreted alongside the results from the literature

review to generate recommendations and derive suggestions for further study.

5.2.1 Hypothesis H_1: *The wealth portfolios of salaried middle and upper income employees in Kenya are diversified.*

This hypothesis was formulated to satisfy objective number one which sought to "establish the composition in asset types and percentage of the wealth portfolios of salaried middle and upper income employees and therefore extent of diversification". To test this hypothesis, two sub-hypotheses were designed and tested as discussed below.

5.2.1.1 Sub-hypothesis $H_{1.1}$: *Salaried middle and upper income employees hold equal proportions of all the seven principal types of assets: cash, cooperative shares, life assurance policies and pension schemes benefits, treasury bills and bonds, corporate bonds, shares in listed companies, and property.*

The hypothesis that for the seven principal assets that are examined in this study, the sample employees hold equal proportions of every asset type was stated as follows:

$$H_i: p_{ca} = p_{sc} = p_{lp} = p_{tb} = p_{cb} = p_{sl} = p_{pr} = 14.3\%$$

where:

p_{ca} is the mean of the proportions of cash and bank balances in the gross wealth portfolio;

p_{sc} is the mean of the proportions of shares in cooperatives in the gross wealth portfolio;

p_{lp} is the mean of the proportions of life assurance policies and pension scheme benefits in the gross wealth portfolio;

p_{tb} is the mean of the proportions of treasury bills and bonds in the gross wealth portfolio;

p_{cb} is the mean of the proportions of corporate bonds in the gross wealth portfolio;

p_{sl} is the mean of the proportions of shares in listed companies in the gross wealth portfolio; and

p_{pr} is the mean of the proportions of property in the gross wealth portfolio.

A two-tailed one sample t-test was applied to test for equality of the means of the proportions for all the seven principal assets so as to reject the hypothesis if the means of the proportions for the assets was different from 14.3 % at a five per cent significant level. The sample statistics are shown in Table 5.1 below.

Table 5.1: One-Sample T Test for Equality of Means of Asset Proportions Held

	Test Value = 0.143					
	t	df	Sig. (2-tailed) p-values	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Proportion of cash and bank to gross wealth	55.137	804	.000	56.62	54.60	58.64
Proportion of cooperative shares to gross wealth	34.426	432	.000	24.79	23.38	26.21
Proportion of value of pension scheme asset/life assurance policies to gross wealth	26.871	368	.000	20.88	19.35	22.41
Proportion of treasury bills/bonds to gross wealth	7.176	42	.000	20.39	14.66	26.13
Proportion of corporate bonds to gross wealth	8.097	14	.000	9.46	6.96	11.97
Proportion of value of shares/mutual funds to gross wealth	23.606	311	.000	19.64	17.80	21.27
Proportion of property to gross wealth	26.790	252	.000	35.65	33.03	38.27

The sample results for the means of the proportions of the holdings of the seven principal asset types were as follows: cash at (t= 55.1, df= 804, p-value=0.00); cooperative shares at (t= 34.4, df= 432, p-value=0.00); treasury bills and bonds at (t= 7.2, df = 42, p-value=0.00), pension scheme assets and life assurance policies at (t= 26.9, df= 368, p-value=0.00), corporate bonds at (t= 8.1, df= 14, p-value=0.00), shares and mutual funds at (t= 23.6, df = 311, p-value=0.00) and properties at (t= 26.8, df= 252, p-value=0.00). Since all the p-values were less than 0.05, the implication is that the means of the proportions of the holdings of these assets are significantly different from 14.3%. Consequently, the hypothesis was rejected and the conclusion made that salaried middle and upper income employees do not hold their wealth portfolios in equal proportion for all the principal asset types, and therefore their wealth portfolios do not achieve naïve diversification.

This conclusion was supported by the descriptive statistics showing that the means of the proportions of assets to gross wealth are notably unequal. Subsection 4.4.15.2 shows mean proportions ranging from a highest of 57 % for cash and bank balances and a lowest of 10 % for corporate bonds. It is to be noted that these mean proportions do not add up to 100 % because the results are not weighted.

The sample results in Table 5.1 above are reinforced by the fact that the mean number of principal assets held per section 4.4.15.1 was found to be 2.7, which is significantly different from 7 at (t= -85.3, df = 804, p-value =0.00). This is interpreted to mean that salaried middle and upper income employees do not hold all the seven asset types, suggesting that their wealth portfolios are narrow.

Further analysis shows that the mean net wealth held increases steadily from a lowest of Shs 254,000 for one-asset holders to a mean of Shs 8,750,000 for holders of six and seven assets, say, about 33.5 times higher. To gain more insight into the nature of the relationship between wealth size and number of assets held, further analysis was conducted. The best estimate of the relationship was a polynomial equation that shows a moderately strong positive correlation (r =0.616) between the number of assets held and net wealth at (F= 245.26; df = 802 and p-value = 0.000). The resulting quadratic function is shown below:

$$W=860{,}658.59-742{,}872.88\Psi+293{,}847.83\Psi^{2}$$
$$(0.0101) \quad (0.0019) \quad (0.0000)$$

where W is net wealth holding in Shs, and Ψ is the number of principal asset types held. Since all the variables in this equation are significant, the implication is that net wealth increases at an increasing rate with the number of asset types held. This intuitively shows that holding a diverse portfolio is beneficial in terms of higher net wealth.

In addition, the number of asset types held, and percentage of risky assets held are found to have a moderately strong correlation (r=0.551) at (F=175.28, df=802 and p-value =0.000). The best estimate for the mathematical relationship was found to be a quadratic function:

$$\dot{\rho}= -19.088+19.211\Psi -1.579\Psi^{2}$$
$$(0.000) \quad (0.000) \quad (0.000)$$

where:

$\dot{\rho}$ is the percentage of risky assets held to gross wealth and Ψ is the number of asset types held. Although significant, the constant, -19.1%, is meaningless because this is for a zero asset holding. The derived equation shows that the proportion of risky assets held, in percentage terms, increases at an increasing rate with the number of asset types held within the seven assets range that were examined. The model however, is not very strong because it

explains only 30 % of the variations ($R^2 = 0.3046$) in the risky assets proportions. The identified relationship is supported by other statistics which show that the risky assets ratio and number of assets held tend to move in the same direction as shown in Table 5.2 below. Thus, the least holding of risky assets was nil percent for one-asset holders, and peaked at 39.71% for five-asset holders.

Table 5.2: Risky Assets Proportion by Number of Asset Types Held

Numbers of assets held	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Proportion of employees in per cent	19.0	31.6	19.4	14.2	12.3	2.6	0.4
Risky assets per cent	0	12.3	20.8	37.0	39.7	30.1	30.8

5.2.1.2 Sub-hypothesis $H_{1\text{-}2}$: *The equity portfolios of salaried middle and upper income employees comprise share holding in more than 11 listed companies*

The hypothesis that the mean number of listed companies in which shares held by sampled employees is more than eleven is stated as follows.

$H_{1\text{-}2}$: $D_n > 11$

where:

D_n is the grand mean number of companies in which shares were held by the sampled employees who held investments in shares. A one-tailed one sample t-test for the mean number of companies in which the sampled employees hold shares was applied in order to reject the hypothesis if the mean types of shares held was more than 11 at $t_{\alpha=0.05}$. The results are shown in Table 5.3 below.

Table 5.3: Sample Test for the Mean Number of Companies in which Shares were Held

	Test Value = 11					
	t-value	**df**	**Sig. (2-tailed) p-value**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	Upper
Share currently held by respondents in Nairobi Stock Exchange	-78.4	287	.000	-8.0	-8.2	-7.8

The sample results in Table 5.3 at (t = -78.4, df = 287, p-value = 0.000) indicated that the

mean number of companies in which shares were held by equity investing employees is significantly different from 11, because p-value was less than 0.05. From these results the hypothesis was rejected, yielding the conclusion that salaried middle and upper income employees do not hold shares in more than 11 companies and therefore their equity portfolios do not achieve naïve diversification. This conclusion is supported by findings in Subsection 4.4.15.4 which showed that the mean number of companies in which shares were held was (3) three.

The results of tests for sub-hypotheses $H_{1\text{-}1}$ to $H_{1\text{-}2}$ yield the conclusion that the wealth portfolios of salaried middle and upper income employees in Kenya do not achieve naïve diversification. This conclusion was based on the findings that the sampled employees do not hold equal proportions of assets and that the mean number of companies in which shares were held by equity portfolio investors was 3, against the minimum 11 that is required for naïve diversification.

Further analysis revealed that the number of asset types held is important in that it is positively correlated with net wealth and the proportion of risky assets, which is used to proxy the composition of employees' wealth portfolios.

5.2.2: Hypothesis H_2: *The estimated income that can be generated from the wealth portfolios of salaried middle and upper income employees in Kenya is adequate for their consumption needs during retirement.*

Hypothesis two was formulated to satisfy the requirements of objective two, to "ascertain the monetary values of the wealth portfolios of salaried employees with reference to whether they can generate adequate income for the employees to rely on during retirement". This hypothesis sought to investigate the adequacy of employees' wealth portfolios to generate earnings that would support their habitual consumption needs when in retirement. Two sub-hypotheses were designed to test the hypothesis as shown below.

5.2.2.1 Sub-hypothesis $H_{2\text{-}1}$: *The estimated mean monthly earnings from the wealth portfolios of salaried middle and upper income employees in Kenya who are about to retire exceeds 70 percent of their current mean monthly employment income.*

The hypothesis that for employees aged 45 years and above in the sampled population, the

mean ratio of their estimated asset earnings to their current mean employment income exceeds 70 % was stated as follows.

$H_{2\text{-}1}$: $P_c > 70\ \%$

where:

P_c is the ratio of the computed estimate of mean monthly earnings from the wealth portfolio to the current reported monthly employment income for sampled employees aged 45 years and above which is hereby also referred to as 'computed replacement rate'.

A one-tailed one-sample t-test for the 'computed replacement rates' for the sampled employees was applied to reject the hypothesis if this ratio was not more than 0.7 at $t_{\alpha=0.05}$

Table 5.4: One-Sample T-Test for the Mean Computed Replacement Rate

	Test Value = 70%					
	t-value	**df**	**sig. (2-tailed) p-value**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	Upper
Computed Replacement Rate=P_c	-7.05	101	.000	-.2730	-.3498	-.1961

The results of the tests (t= -7.050, df=101, p-value =.000) indicated that there is a significant difference between the computed replacement rate and the minimum 70 % ratio. These results implied that the mean computed replacement rate of 43 % was significantly lower than the recommended 70 %, thereby indicating that salaried middle and upper income employees who are about to retire are likely to have inadequate earnings from their wealth portfolios to support their usual standards of living while in retirement.

Therefore, the hypothesis was rejected, leading to the conclusion that the estimated earnings from the wealth portfolios of salaried middle and upper income employees aged 45 years and above are less than the recommended 70 % of their employment income.

5.2.2.2 Sub-hypothesis $H_{2\text{-}2}$: *The mean 'target replacement rate' for salaried employees who are about to retire exceeds the recommended replacement rate of 70 percent.*

The hypothesis that for sample employees aged 45 years and above, 'their target replacement rate' exceeds 70 % was stated as follows:

$H_{2\text{-}2}$: $P_d > 70\ \%$

where:

P_d is the mean of self-declared target post-retirement ratios of the estimated annual asset earnings to the current annual employment income for all sample employees aged 45 years and above. This ratio is hereby referred to as the 'target replacement rate'.

A one-tailed one sample t-test for the 'target replacement rates' for the sampled employees aged 45 years and above was applied to reject the null hypothesis if this ratio was not more than 70 % at $t_{\alpha=0.05}$

Table 5.5: One-Sample T-Test for the Mean Target Replacement Rate

	Test Value = 70 %					
	t-value	**df**	**Sig. (2-tailed) p-value**	**Mean Difference**	**95 % Confidence Interval of the Difference**	
					Lower	Upper
Target Replacement Rate	20.5	94	.000	36.1	32.6	39.6

The results of the tests (t= 20.5, df =94, p-value=0.000) in Table 5.5 above indicated that there is a significant difference between the sampled employees' target replacement rate and the recommended 70 % minimum. The null hypothesis that the targeted earnings by salaried middle and upper income employees are higher than 70 % of their pre-retirement income from employment was rejected, leading to the conclusion that salaried middle and upper income employees may not have adequate wealth during retirement. This conclusion was supported by the finding that the mean targeted replacement rate for employees who are about to retire was 39 % (see section 4.4.16), indicating that based on their expectations, middle and upper income employees who are about to retire are likely to have inadequate earnings from their wealth portfolios to support their usual standards of living while in retirement. These results reconfirm the veracity of the computed replacement rate.

The results from the tests on the two sub-hypotheses above indicate that the estimated income that can be generated from the wealth portfolios of salaried middle and upper income employees in Kenya is not sufficient to support their retirement consumption needs and therefore their wealth portfolios are inadequate.

5.2.3 Hypothesis H_3: *The personal attributes of salaried middle and upper income employees in Kenya have no significant relationship with the absolute sizes of their wealth portfolios.*

This hypothesis was formulated to satisfy the requirements of objective three 'to ascertain which personal attributes explain the sizes of employees' wealth portfolios'. Consequently, the hypothesis sought to investigate whether some hypothesized personal attributes of employees have a significant relationship with the monetary sizes of their wealth portfolios. This was done for all the hypothesized independent variables using 21 sub-hypotheses, $H_{3\text{-}1}$ to $H_{3\text{-}21}$. The tests included ANOVA, Student's t-tests and Pearson correlation analysis.

Analysis of Variance tests of Independence of Mean Net Wealth

In this Section, tests of the sub-hypotheses were done using ANOVA for equality of means of net wealth for multichotomous categorical variables. The decision rule was to reject the null hypothesis if the p-value was smaller than the level of significance of 0.05. The outcomes of these tests are summarized in Table 5.6 below.

Table 5.6: One-Sample ANOVA Tests for Mean Net Wealth

Sub-hypotheses	F	Df	Sig	Decision
$H_{3\text{-}1}$: The net wealth holding of salaried middle and upper income employees is independent of the industry in which one is employed	29.522	7	0.000	Reject H_0
$H_{3\text{-}2}$: The net wealth holding of salaried middle and upper income employees is independent of their level of seniority in the job	66.875	4	0.000	Reject H_0
$H_{3\text{-}3}$: The net wealth holding of salaried middle and upper income employees is independent of their education levels	33.739	6	0.000	Reject H_0
$H_{3\text{-}4}$: The net wealth holding of salaried middle and upper income employees is independent of their marital status	5.427	4	0.000	Reject H_0

Sub-hypotheses	F	df	Sig	Decision
$H_{3\text{-}5}$: Employees' attitude to risk has no significant relationship with their net wealth holdings	1.604	10	0.101	Fail to Reject H_0
$H_{3\text{-}6}$: The risk preference of salaried middle and upper income has no significant relationship with their net wealth holdings	4.315	5	0.001	Reject H_0
$H_{3\text{-}7}$: The risk perception of salaried middle and upper income has no significant relationship with their net wealth holdings	65.955	3	0.000	Reject H_0
$H_{3\text{-}8}$: The net wealth holding of salaried middle and upper income employees is independent of where they were born	16.913	9	0.000	Reject H_0
$H_{3\text{-}9}$: The net wealth holding of salaried middle and upper income employees is independent of where one spent their childhood years (upto 15 years of age)	13.409	9	0.000	Reject H_0
$H_{3\text{-}10}$: The net wealth holding of salaried middle and upper income employees is independent of their religious affiliation	5.941	4	0.000	Reject H_0
$H_{3\text{-}11}$: The net wealth holding of salaried middle and upper income employees is independent of whether an employee's investment decision is maximisation of returns or not	6.860	6	0.000	Reject H_0

The results of these ANOVA tests are discussed below with respect to the sub-hypotheses that were tested.

$H_{3\text{-}1}$: The net wealth holding of employees is not independent of the industries they work in at ($F= 29.522$; $df = 7$; p-value= 0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with the industry in which a person works. The descriptive data shows that sampled employees from electricity and water sector had the highest mean wealth of Shs 6,193,000 compared to the lowest in trade, restaurants and hotels at a mean net wealth of Shs581,000. However, part of the reason for this difference is because the sampled employees in electricity and water industries had higher proportions of managers, directors and policymakers, while those in trade, restaurants and hotels had high proportions in junior

positions.

H_{3-2}: The net wealth holding of employees is not independent of their levels of seniority in the job at (F= 66.875; df = 4; p-value = 0.000). The null hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with the persons' level of seniority in the job. In tandem with the above, the descriptive statistics show that the mean net wealth for factory worker and messengers was the lowest at Shs 675,000 and rose steadily to Shs 6,300,000 for managers, directors and policymakers, about 9.5 times higher.

H_{3-3}: The net wealth holding of employees is not independent of employees' levels of education at (F= 33.739; df = 6; p-value = 0.000). The hypothesis was rejected and the conclusion made that there is a significant relationship between the net wealth holding of salaried middle and upper income employees and the levels of education. The descriptive statistics show that employees' net wealth is a function of the highest educational level attained by the person. Those who hold only an ordinary level education without other certificates had the least mean net wealth of Shs 428,000 compared to those with a masters degree and above, whose mean net wealth of Shs 5,550,000 was about 13 times higher.

H_{3-4}: The net wealth holding of employees is not independent of their marital status at (F= 5.427; df = 4; p-value =0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with their marital status. This conclusion was supported by the descriptive statistics that show that the highest mean net wealth was held by employees from single families who are divorced or separated or widowed, followed by married couples at Shs 1,930,000 and Shs 1,920,000, respectively, which was about twice that of bachelors and spinsters with an average mean net wealth of Shs 943,000.

H_{3-5}: There was no significant difference between the net wealth holding of employees based on employees' attitude to risk at (F=1.604; df = 10; p-value = 0.101). The hypothesis was not rejected. The conclusion was made that the net wealth holding of salaried middle and upper income employees has no significant relationship with employees' attitude to risk. This lack of a relationship was surprising and suggested that self-declared disposition towards risk taking, also called willingness to take risks, may be too general and therefore not a good measure of risk taking behaviour with respect to investments.

$H_{3\text{-}6}$: There was significant difference between the net wealth holding of employees based on their risk preference at (F= 4.315; df = 5; p-value = 0.001). The hypothesis was rejected and the conclusion made that there is no significant relationship between the net wealth holding of salaried middle and upper income employees and their risk preference. Unlike the employees' attitude to risk that was discussed above, risk preference is more contextual because it relates to specific courses of action that an investor takes in making the choice of investment. As shown in Table 5.7 below, higher risk preference was associated with higher net wealth such that employees who were the highest risk takers had the highest mean net wealth of Shs 3.2 million. This was three times that of least risk takers whose mean net wealth was Shs 1.06 million.

$H_{3\text{-}7}$: There was significant difference in the net wealth holding of employees based on their risk perception at (F= 65.955; df = 3; p-value = 0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with employees' risk perception. The descriptive statistics indicated that higher risk-taking as depicted by high risky assets proportion to total wealth was associated with higher mean net wealth holding. Thus, as shown in Table 5.7 below employees who emerged to be high risk takers had the highest mean net wealth at Shs 2.97 million which was about 21 times that of employees who were classified as very risk averse, on account of being in the lowest and fourth quartile of proportion of risky assets held to gross wealth. These statistics also show that revealed risk-taking behaviour, say, risk perception, has a prominent influence on the size of wealth held.

Table 5.7: Mean Net Wealth of Employees by Risk Preferences and Risk Perception.

Risk Preference (lottery question)	**Mean net Wealth Shs**		**Risk Perception (Risky assets/gross wealth**	**Mean Net Wealth Shs**
Highest risk takers	3,206,546		Risk takers	2,967,909
High risk takers	1,865,277		Least risk averse	2,701,864
Medium risk takers	1,380,127		Risk averse	758,662
Moderate risk takers	1,748,411		Very risk averse	139,304
Low risk takers	1,579,139			
Least risk takers	1,060,184			

$H_{3\text{-}8}$: The net wealth holding of employees is not independent of where they were born at (F= 16.913; df = 9; p-value = 0.000). The hypothesis was rejected and the conclusion made that

the net wealth holding of salaried middle and upper income employees has a significant relationship with where they were born. This conclusion was supported by the descriptive statistics: those born outside Kenya had the highest mean net wealth of Shs 8.82 million, followed by those born in Nairobi at Shs 2.37 million. The third group in ranking was those born in the rural areas whose average net wealth was Shs 1.38 million, while the fourth was those born in other urban centres at Shs 1.18 million. These differentials clearly show the net wealth holdings implication of where one was born.

$H_{3\text{-}9}$: The net wealth holding of employees is not independent of where one spent their childhood years at (F= 13.409; df = 9; p-value = 0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with where one spent their childhood years, of up to 15 years. This early childhood environment effect was that those who grew up outside Kenya had the highest mean net wealth of Shs 5.95 million, followed by those who grew up in Nairobi at Shs 2.28 million. The third group in ranking comprised those born in the rural areas whose average net wealth was Shs 1.31 million while the fourth and last group comprised those born in other urban centres with a mean net wealth of Shs 922,000.

$H_{3\text{-}10}$: The net wealth holding of employees is not independent of one's religion at (F= 5.941; df = 4; p-value = 0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with a person's professed religious affiliation. The statistics show that Muslims had the highest mean net wealth of Shs 1.98 million, followed by Catholics at Shs 1.60 million. Protestants were last with a mean net wealth of Shs 1.49 million. These results are in line with the findings by Kesiter (2005) in the US which showed that Catholics tended to have more wealth than Protestants. The higher net wealth holdings of Muslims could be a possible area for further research.

$H_{3\text{-}11}$: The net wealth holding of employees is not independent of whether the investment decisions are to maximize earnings at (F= 6.860; df = 6; p-value = 0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees has a significant relationship with whether the investment decisions are made to maximise returns. Further inquiry was made into this inference to ascertain the direction of the relationship between the desire to maximize earnings and the net wealth. In this respect, analysis of the descriptive statistics in subsection 4.4.3.3 showed that sampled

employees who indicated to agree that they invest to maximize earnings had a mean net wealth holding of Shs 1.74 million, which was surprisingly similar to that held by employees who indicated to disagree. In contrast, employees who were undecided held the least mean wealth of Shs 889,000. Whereas, these results indicate that higher net wealth is associated with decisiveness regarding earning maximization or not, the findings are somewhat ambiguous due to the lack of a clear direction in the relationship with net wealth.

Independent Samples Tests for Mean Net Wealth

For dichotomous categorical independent variables, the sub-hypotheses were tested using two-tailed one sample t-tests for a difference of the means of net wealth. The decision rule was to reject the hypothesis if p-value exceeded the significance value of 0.05. Table 5.8 and 5.9 summarise the outcome of the two tests in this category.

Sub-hypothesis $H_{3\text{-}12}$: *The net wealth holding of salaried middle and upper income male employees is not significantly different from that of females.*

Table 5.8: Independent Samples T-Test for Mean Net Wealth by Gender

Levene's Test for Equality of Variances		**t-test for Equality of Means**					
F	**Sig.**	**t-value**	**df**	**Sig. (2-tailed) p-value**	**Mean Difference**	**95% Confidence Interval of the Difference**	
						Lower	Upper
.388	.534	.508	803	.612	100,122.9	-287,006.3	487,252.02

The above results of the Levene's test for equality of variances yielded a p-value =0.534>α=0.05, which meant that there is no significant difference in the variances of the net wealth of male and female employees.

The test results at (F= 0.388; df=803; p-value =0.612) show that there is no significant difference between the mean wealth holding of the sampled male and female employees. The hypothesis was therefore not rejected and the conclusion made that the wealth holding of male employees was not significantly different from that of the female colleagues. Therefore, gender has no significant influence on the net wealth holding of salaried middle and upper income employees. This is supported by the fact that this study found that the mean net wealth holding for males was Shs 1,680,000 compared to that for females at Shs 1,580,000.

Sub-hypothesis H_{3-13}: *The net wealth holding of middle income employees is not significantly different from that of upper income employees.*

Table 5.9: Independent Samples T-Test for Mean Net Wealth for Middle versus Upper Income Employees

	Levene's Test for Equality of Variances		**t-test for Equality of Means**					
	F	**Sig.**	**t-value**	**df**	**Sig. (2-tailed) p-value**	**Mean Difference**	**95% Confidence Interval of the Difference**	
							Lower	Upper
Equal variances assumed	131.811	.000	-17.88	803	.000	-5,684,943	-6,309,015	-5,060,871
Equal variances not assumed			-6.87	56.63	.000	-5,684,943	-7,342,389	-4,027,496

The results of the Levene's test for equality of variances yielded a p-value of 0.000, which meant that there was significant difference in the variances of the net wealth holdings of middle income earners and that of upper income earners.

The test results at (F = 131.811; df=56.63; p-value=0.000) show that there was significant difference between the mean net wealth holding of middle income earners and that of upper income employees. The hypothesis was therefore rejected and the conclusion made that the mean wealth holding of middle income employees is significantly different from that of upper income employees. This is supported by the descriptive statistics that show that the mean wealth holding for the 748 middle income employees was Shs 1.2 million compared to that for upper income employees which was Shs 6.9 million. This suggests that the distinction of these two groups of employees is very important from a policy perspective.

Pearson Correlation Tests on Mean Net Wealth

Seven sub-hypotheses were tested for the existence of significant correlation between net wealth and certain hypothesized quantifiable independent variables. These variables were: employees' employment income, inherited wealth, age, length of employment service, size of nucleus family, number of dependants, and proportion of risky assets. The Pearson correlation test at α=0.05 was applied and the results summarized in Table 5.10 below.

Table 5.10: Sample Correlation Tests for Quantitative Variables with Net Wealth

Sub-hypotheses	N	Pearson Correlation (r)	Sig. (2-tailed) p-value	Decision
$H_{3\text{-}14}$: There is no significant relationship between the net wealth holding of salaried middle and upper income employees and their monthly income from employment	805	0.640	0.000	Reject H_0
$H_{3\text{-}15}$: There is no significant relationship between the net wealth holding of salaried middle and upper income employees and the amount of inherited wealth	805	0.368	0.000	Reject H_0
$H_{3\text{-}16}$: There is no significant relationship between the net wealth holding of salaried middle and upper income employees and their ages.	805	0.434	0.000	Reject H_0
$H_{3\text{-}17}$: There is no significant relationship between the net wealth holding of salaried middle and upper income employees and the lengths of their employment service.	805	0.356	0.000	Reject H_0
$H_{3\text{-}18}$: There is no significant relationship between the size of the nucleus family unit and the net wealth holding of salaried middle and upper income employees.	805	0.214	0.000	Reject H_0
$H_{3\text{-}19}$: There is no significant relationship between the number of dependants above the nucleus family and the net wealth holding of salaried middle and upper income employees.	805	0.049	0.161	Fail to reject H_0
$H_{3\text{-}20}$: There is no significant relationship between the proportion of risky assets held by salaried middle and upper income employees and their net wealth.	805	0.394	0.000	Reject H_0
$H_{3\text{-}21}$: There is no significant relationship between the net wealth held by salaried middle and upper income employees and their savings rates.	805	0.327	0.000	Reject H0

The results of these correlation tests are discussed below with respect to the sub-hypotheses that were tested.

$H_{3\text{-}14}$: There was a significant relationship between the net wealth holding of employees and their employment income at (r=0.64; p-value =0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of salaried middle and upper income employees

has a significant relationship with their current employment income. A moderately strong positive correlation of 0.64 between employment income and net wealth was reported, meaning that employees with higher incomes had higher absolute net wealth.

This conclusion is supported by the descriptive statistics that show that employees' mean net wealth holdings are almost linearly related to their monthly employment income level, where the top earning group with about five times the monthly employment income of the lowest has a net wealth of Shs 6.7 million, that is about 16 times that of the bottom group with a net wealth holding of Shs 600,000. The mean net wealth at the midpoint of monthly employment income increases from a monthly income multiple of 18 for the lowest earners, to above 40, for the higher income earners.

Further support of the above conclusion is provided by the finding of a strong and positive association between employees' net wealth holding and their monthly employment income. Analysis of the descriptive data returns a coefficient of determination (R^2) =0.8701 and correlation of 0.93 for the power function relating employees' net wealth to their income groups. The function shows that employees' mean net wealth W (in Shs) = $605{,}832\Omega^{0.8976}$, where $\boldsymbol{\Omega}$ stands for employment income groups. Employees are placed in 14 income groups which are spaced at equal monthly employment income intervals of Shs 10,000 such that the lowest group designated as '1' starts from a monthly income of Shs 28,000, while the top group denoted as '14' starts at Shs 158,000 monthly income. The very strong correlation suggests that income levels are key factors in explaining the wealth portfolios of employees.

$\mathbf{H}_{3\text{-}15}$: There was a significant relationship between the net wealth holding of employees and their inherited wealth at (r=0.368; p-value =0.000). The hypothesis was rejected and the conclusion made that the net wealth holding of employees had a significant relationship with their inherited wealth. A moderately weak positive correlation of 0.368 between inherited and current net wealth was reported. This meant that employees who had inherited more wealth were likely to have higher holdings of net wealth, other things remaining equal.

$\mathbf{H}_{3\text{-}16}$: There was a significant relationship between the net wealth holding of employees and their ages at (r=0.434; p-value =0.000). The hypothesis was rejected and the conclusion made that age has a significant relationship with the net wealth holding of salaried middle and upper income employees. A moderately weak positive correlation of 0.434 between an employee's age and net wealth was reported, meaning that older employees had higher net

wealth. This was supported by the fact that the descriptive statistics showed that mean wealth holdings increased from Shs 827,000 for employees aged below 25 years to Shs 5,900,000 for those aged between 50 years and 54.5 years. (note: the oldest six employees are omitted in this analysis because they are too few).

These conclusions were affirmed by further analysis that showed that employees' net wealth and their age had a close statistical relationship that could be represented by a third order polynomial function in the form $W_i = 281{,}727 + 613{,}137\tilde{\omega} - 219{,}809\tilde{\omega}^2 + 34706\tilde{\omega}^3$, with an almost perfect correlation r= 0.99. The terms W_i and $\tilde{\omega}_i$ are the value of mean net wealth and the nominal rank for the 'i^{th}' age group, from the first to the seventh group, respectively. (See Appendix 9, Question 5 for rankings by age groups).

$H_{3\text{-}17}$: There was a significant relationship between the net wealth holding of employees and the length of employment service at (r=0.356; p-value =0.000). The hypothesis was rejected and the conclusion made that the length of employment service has a significant relationship with the net wealth holding of salaried middle and upper income employees. A moderately weak positive correlation of 0.356 between an employee's length of service and net wealth was reported. Longer serving employees had on average higher net wealth holding.

$H_{3\text{-}18}$: There was a significant relationship between the net wealth holding of employees and the size of the nucleus family unit at (r=0.214; p-value =0.000). The hypothesis was rejected and the conclusion made that the size of the nucleus family has a significant relationship with the net wealth holding of salaried middle and upper income employees. A weak positive correlation of 0.214 between employees' size of the nucleus family and net wealth holding was reported. Thus, employees with larger family units were found to have higher net wealth. This was supported by descriptive data whereby employees' mean net wealth increased steadily with the size of the nucleus family; one-person family had the lowest mean net wealth of Shs 961,000 while seven-member families had the highest at Shs 3.34 million.

$H_{3\text{-}19}$: There was no significant relationship between the net wealth holding of employees and the number of dependants at (r=0.049; p-value =0.161). The hypothesis was not rejected and the conclusion made that there was no significant relationship between the number of dependants and the net wealth holding of salaried middle and upper income employees. An insignificant and very weak positive correlation of 0.049 between an employee's number of dependants and the net wealth was reported. This meant that the number of dependants was

not a determinant of an employee's net wealth holding.

$\mathbf{H}_{3\text{-}20}$: There was a significant relationship between the net wealth holding of employees and the proportion of risky assets (to gross wealth) held at (r=0.394; p=0.000). The hypothesis was rejected and the conclusion made that the proportion of risky assets held has a significant relationship with the net wealth holding of salaried middle and upper income employees. A significant and moderately weak positive correlation of 0.394 between employees' holding of risky assets (which is also a measure of risk perception) and net wealth was reported. Thus, employees who held higher proportions of risky assets were found to have more net wealth.

In support of the above inference, further analysis of the data collected showed that net wealth can be predicted by the proportion of risky assets held through a polynomial equation r=0.492; at (F=85.23; df=801; p-value=0.000) with the cubic function shown below:

$$W = 462{,}574.19 + 261{,}234.64\dot{\rho} - 7239.36\dot{\rho}^2 + 55.79\dot{\rho}^3$$
$$(0.0001) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

Where W is net wealth and $\dot{\rho}$ is the proportion of risky assets held to gross wealth and ranges from 0 to 100%. The moderate positive correlation of 0.49 between net wealth and the proportion of risky assets held, suggests that the two move together and in the same direction. All the variables in this equation were significant at $t_{\alpha = 0.05}$.

$\mathbf{H}_{3\text{-}21}$: There was a significant relationship between the net wealth holding of employees and their savings rates at (r=0.327; p=0.000). The hypothesis was rejected and the conclusion made that the savings rates of salaried middle and upper income employees have a significant relationship with their net wealth holding. The significant, though moderately weak positive correlation suggests that employees' savings rate vary in the same direction with wealth size and can therefore be regarded as a determinant of employees' net wealth.

Various statistical tests for hypothesis 3 regarding whether the personal attributes of salaried middle and upper income employees have a significant relationship with the size of their wealth portfolios were carried out and discussed in sub-hypotheses $\mathbf{H}_{3\text{-}1}$ to $\mathbf{H}_{3\text{-}21}$. These tests established which personal attributes have a significant relationship with their net wealth and those which do not.

Table 5.11 below provides an improvised system to assess the magnitude of the differences in net wealth within each of the categories that were found to have a significant relationship with net wealth. Each significant variable was analysed into: the number of categories, the number of times that the group with the highest wealth exceeded the least, and a factor based on the number of groups. A ranking of the variables was then created based on this factor where the variable with the highest factor was ranked number one and vice versa.

Table 5.11: Summary of Categorical Determinants of the Net Wealth of Employees

Personal Attribute	**Number of Categories**	**Times highest mean wealth more than least wealth group**	**Factor: Times/per group**	**Rank**
Risk Perception	4	21.4	5.34	1
Middle or Upper income earner	2	5.6	2.80	2
Job seniority	5	9.5	1.90	3
Place where employee was born (Outside Kenya, Nairobi, Rural areas; other urban centres)	4	7.5	1.88	4
Education level	7	13	1.86	5
Place where employee spent childhood years (as above)	4	6.4	1.61	6
Industry-respondent is employed	8	10.7	1.33	7
Marital Status	3	2.1	0.68	8
Risk Preference	6	3.1	0.50	9
Religious affiliation	3	1.3	0.44	10

This ranking shows that the personal attributes with the highest differentiating power of net wealth within the categories of that independent variable are: risk perception, classification into either middle income or upper income, an employee's job seniority and place of birth in that order. The ranking excludes the categorical value 'whether the choice of investment is driven by desire to maximize earnings' because the mean wealth scores lacked direction.

In addition, the quantitative variables were analysed in Table 5.12 below in the order of the highest in terms of stand-alone correlation with net wealth.

Table 5.12: Summary of Quantitative Determinants of the Net Wealth of Employees.

Personal Attribute	Correlation (r) with net wealth	Type of relationship	Rank
Estimated employment income	0.640	Moderately strong positive	1
Age	0.434	Moderately weak positive	2
Risky assets to gross wealth (percent)	0.394	Moderately weak positive	3
Inherited net wealth	0.368	Moderately weak positive	4
Length of employment service	0.356	Moderately weak positive	5
Savings rate	0.327	Moderately weak positive	6
Size of nucleus family	0.214	Weak positive	7

The above shows that the significant quantitative personal attributes that had the highest correlation to net wealth were estimated employment income followed by age of employee, proportion of risky assets held and inherited net wealth, in that order.

From the forgoing the personal attributes that were found to have significant relationship with employees' net wealth were current employment income; classification of employee into either middle or upper income earner; employee's inherited wealth; age; length of service; size of nucleus family; industry; job seniority; education; marital status; risk preference; risk perception; where one was born; where one spent childhood years (up to 15 years of age) and religious affiliation. The personal attributes that were found to have no significant relationship with net wealth were: gender, attitude to risk, and number of dependants above the nucleus family.

Based on the tests and conclusions in sub-hypotheses $\mathbf{H_{3\text{-}1}}$ to $\mathbf{H_{3\text{-}21}}$ above, the hypothesis was rejected and the conclusion made that personal attributes of employees have a significant relationship with the absolute size of net wealth. This conclusion partially satisfies objective four and reinforces the use of the conceptual model that was developed for this study.

5.2.4 *Hypothesis H_4: The personal attributes of salaried middle and upper income employees in Kenya have no significant relationship with the composition of their wealth portfolios*

Hypothesis four was formulated to satisfy the requirements of objective four which was to 'ascertain which factors explain the composition of employees' wealth portfolios. The

hypothesis sought to investigate whether some hypothesised personal attributes of employees can be used to explain the composition of their personal wealth portfolios. Asset composition was measured by the proportion of risky assets to the absolute monetary value of gross wealth portfolio, and was expressed in percent.

Appropriate tests were done for each of the hypothesised independent variables in turn through 19 sub-hypotheses numbered $\mathbf{H}_{4\text{-}1}$ to $\mathbf{H}_{4\text{-}19}$. The tests included ANOVA and Student t-tests for categorical independent variables, and Pearson correlation analysis for independent variables that were measured in metric scale.

Analysis of Variance Tests of Independence in Composition of Employee Wealth Portfolios

Tests of the 10 sub-hypotheses listed below were done using ANOVA for equality of means of proportions of risky assets for multichotomous categorical variables. The decision rule was to reject the hypothesis if p-value exceeded the significant level at α =0.05. Table 5.13 summarises the outcome of the tests in this category.

Table 5.13: One Sample ANOVA Tests for Mean Proportions of Risky Assets

Sub-hypothesis	F	df	Sig	Decision
$\mathbf{H}_{4\text{-}1}$: The proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in Kenya is independent of the industry in which one is employed	5.867	7	0.000	Reject H_0
$\mathbf{H}_{4\text{-}2}$: The proportion of risky assets held by salaried middle and upper income employees in Kenya is independent of the person's job seniority	23.067	4	0.000	Reject H_0
$\mathbf{H}_{4\text{-}3}$: The proportion of risky assets held by salaried middle and upper income employees in Kenya is independent of the person's education level	21.897	6	0.000	Reject H_0
$\mathbf{H}_{4\text{-}4}$: The proportion of risky assets held by salaried middle and upper income employees in Kenya is independent of their marital status	4.522	4	0.000	Reject H_0
$\mathbf{H}_{4\text{-}5}$: The proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in Kenya is independent of their attitude to risk	2.344	10	0.010	Reject H_0

Sub-hypothesis	F	df	Sig	Decision
$H_{4\text{-}6}$: The proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in Kenya is independent of their risk preferences	2.874	5	0.014	Reject H_0
$H_{4\text{-}7}$: The proportion of risky assets (to the gross wealth) held by salaried middle and upper income employees in Kenya is independent of the employee's place of birth	2.651	9	0.005	Reject H_0
$H_{4\text{-}8}$: The proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in Kenya is independent of the employee's childhood environment	4.864	9	0.000	Reject H_0
$H_{4\text{-}9}$: The proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in Kenya is independent of the person's religious affiliation	1.746	4	0.138	Fail to Reject H_0
$H_{4\text{-}10}$: The proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in Kenya is independent of whether employee's investment decision is aimed at maximising returns	17.02	6	0.000	Reject H_0

The results of the ANOVA tests in Table 5.13 above are discussed below.

$H_{4\text{-}1}$: The proportion of risky assets (to gross wealth) held by middle and upper income employees was not independent of the industry in which employees work at (F= 5.867; df = 7; p-value = 0.000). The hypothesis was rejected and the conclusion made that the proportion of risky asset held by middle and upper income employees has a significant relationship with the industry in which a person is employed. Thus, employees in trade, restaurant and hotels industry had the lowest mean proportion of risky assets held of 13.9% compared to 34.1% for those in electricity and water industry, and 35.2% for employees in agriculture, forestry, mining and quarrying industries.

$H_{4\text{-}2}$: The proportion of risky assets held by middle and upper income employees was not independent of the employees' seniority in the work place at (F= 23.067; df = 4; p-value = 0.000). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by middle and upper income employees has a significant relationship with employees' seniority at work. This inference was in line with expectation whereby the mean proportions of risky assets held increased with seniority at work. Factory workers or

messengers had the lowest mean proportions of risky assets of 9.3% compared to managers who held 30.4% and directors or policy makers whose mean proportion was 23.9%.

H_{4-3}: The proportion of risky assets (to gross wealth) held by middle and upper income employees was not independent of the person's education level at ($F= 21.897$; $df = 6$; p-value = 0.000). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by salaried middle and upper income employees has a significant relationship with one's level of education. The risky assets holding proportion was noted to increase with education, which suggested that more educated employees, demonstrated more risk-taking behaviour. Thus, employees whose education was up to ordinary and advanced level and no other certificates had the lowest mean proportion of risky assets holding of 7.4% compared to 37.6% for those who had masters degrees and higher.

H_{4-4}: The proportion of risky assets (to the gross wealth) held by middle and upper income employees was not independent of one's marital status at ($F= 4.522$; $df = 4$; p-value = 0.001). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by middle and upper income employees has a significant relationship with one's marital status. The highest mean proportion was found among single employees (divorced or widowed or separated) at 27.8% followed by couples at 20.0%. Bachelors and spinsters held the most conservative wealth portfolios with a mean proportion of risky assets in their wealth portfolios of 14.2%. This could partly be explained by the age effect since the mean age of this group was about 10 years lower than for the other two groups.

H_{4-5}: The proportion of risky assets (to gross wealth) held by middle and upper income employees was not independent of their attitude to risk at ($F= 2.344$; $df = 10$; p-value = 0.010). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by middle and upper income employees has a significant relationship with their attitude to risk. Further analysis of the descriptive data did not show a progressive pattern in the relationships since the highest mean proportions of risky assets held were found among both the employees who were unwilling to take risks and also those who were fully prepared to take risks. Also, employees who were undecided with respect to willingness to take risks were shown to have the least mean proportions of risky assets.

H_{4-6}: The proportion of risky assets held by middle and upper income employees was not independent of the employees' risk preferences at ($F= 2.874$; $df = 5$; p-value = 0.014). The

hypothesis was rejected and the conclusion made that the risk perception of middle and upper income employees has a significant relationship with their risk preference. Analysis of the descriptive statistics showed that employees' risk preference increased in line with the proportion of risky assets held; employees who were classified as least risk takers had the lowest mean proportion of risky assets of 17% while the highest risk takers had a mean proportion of risky assets of 27%.

H_{4-7}: The proportion of risky assets held by middle and upper income employees was not independent of where one was born at (F= 2.651; df = 9; p-value = 0.005). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by middle and upper income employees has a significant relationship with where the employee was born. The clear pattern that emerged was that employees who were born in Nairobi had the highest mean proportion of risky assets of 24.7% closely followed by those born outside Kenya with a mean of 22.8%. The third ranked were the mean proportions for employees born in other urban areas which was 21.1%. Employees who were born in the rural areas recorded the least mean proportions of 17.5%.

H_{4-8}: The proportion of risky assets held by middle and upper income employees was not independent of the employees' childhood environment (F= 4.864; df = 9; p-value = 0.000). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by employees has no significant relationship with the place where one spent their childhood years. The data showed that employees who spent their childhood years in Nairobi had the highest mean proportions of risky assets, 26.0 %, and were followed by those who spent that time outside Kenya with a mean of 19.6%. The third and fourth ranked were employees who spent their childhood years in other urban areas and rural areas whose mean risky assets proportions were 17.3% and 15.0%, respectively.

H_{4-9}: The proportion of risky assets held by middle and upper income employees was independent of their religious affiliation at (F= 1.746; df = 4; p-value = 0.138). The hypothesis was not rejected and the conclusion made that there is no significant relationship between the proportion of risky assets held by middle and upper income employees and the employees' religion. In support of these results the data showed that the mean proportions of risky assets held was somewhat similar, at about 20% for all religious groups.

H_{4-10}: The proportion of risky assets held by middle and upper income employees was not

independent of the employees' investment decisions as to whether to maximise returns or not at (F= 17.028; df = 6; p-value = 0.000). The hypothesis was rejected and the conclusion made that the proportion of risky assets held by salaried middle and upper income employees has a significant relationship with whether or not their investment decisions are made to maximise returns. Further analysis of the descriptive statistics in Subsection 4.4.3.3 showed that employees who either strongly agreed or strongly disagreed with this statement had the highest mean proportions of risky assets, while the undecided ones held the least risky asset portfolios. This suggests that the relationship between employees' dispositions towards maximization of investment returns and their holding of risky assets, which proxies the composition of their wealth portfolios lacks obvious direction, a paradox of some sort.

Independent Samples Tests for the Composition of Employee Wealth

Tests of sub-hypotheses were done using two tailed t-tests for differences in the mean proportions of risky assets to gross wealth for dichotomous categorical variables. The decision rule was to reject the null hypothesis if p-value exceeded α =0.05. Tables 5.14 and 5.15 summarise the outcome of the two tests.

Sub-hypothesis $H_{4.1}$: *The proportions of risky assets held (to the gross wealth) held by salaried middle and upper income employees is independent of gender.*

Table 5.14: Independent Samples Test for Mean Proportions of Risky Assets Held by Gender

Levene's Test for Equality of Variances		**t-test for Equality of Means**					
F	**Sig.**	**t-value**	**df**	**Sig. (2-tailed) p-value**	**Mean Difference**	**95% Confidence Interval of the Difference**	
						Lower	Upper
1.516	.219	1.490	803	0.1371	2.6047	-0.82627	6.0356

Levene's test for equality of variances in Table 5.14 yielded a p-value =0.219>α=0.05, indicating that there was no significant difference in the variances of the two categories of employees. The test results at (F= 1.516; df=803; p-value =0.1371) indicated that there was no significant difference between the proportions of risky assets held for male and female employees. The hypothesis was therefore not rejected and the conclusion made that there is no significant relationship between the proportion of risky assets held by employees and gender. This was supported by the fact that the difference in the mean proportions of risky

assets held was very small, at 2.6%: female employees recorded a higher mean proportion of risky assets held of 20.5% compared to 17.9% for male employees. In this regard, female employees held insignificantly riskier wealth portfolios compared to their male counterparts.

Sub-hypothesis $H_{4\text{-}12}$: *The proportion of risky assets (to gross wealth) held by middle income employees is not significantly different from that for upper income employees.*

Table 5.15: Independent Samples Test for Mean Proportions of Risky Assets Held: Middle income versus Upper income Employees

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t-value	df	Sig. (2-tailed) p-value	Mean Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Equal Variance Assumed	7.966	.005	4.433	803	0.000	14.61	8.14	21.08
Equal Variance Not Assumed			4.898	67	0.000	14.61	8.66	20.56

The results of the Levene's test for equality of variances yielded a p-value of $0.005 < \alpha=0.05$, which meant that there was a significant difference in the variances of the two categories of employees. The test results at ($F=7.966$; $df=67$; p-value=0.000) indicated that there was significant difference in the proportions of risky assets held by middle income employee and those held by upper income employees. The hypothesis was therefore rejected and the conclusion made that there is a significant relationship between the proportions of risky assets (to gross wealth) held and the classification of wealth holders into either middle or upper income employees. Whereas the mean proportion of risky assets held by middle income employees was 17.9 %, middle income employees had a significantly higher mean proportion of 32.5 %. Thus, upper income employees held a higher proportion of their wealth in risky assets compared to middle income earners.

Pearson Correlation Tests on Composition of Employee Wealth Portfolio

Five sub-hypotheses were tested for the existence of significant correlation between current net wealth and certain quantitative independent variables. These variables were: inherited wealth, age, length of employment service, size of nucleus family and number of dependants. Tests using Pearson correlation coefficient at $\alpha=0.05$ were applied and the results

summarized as shown in Table 5.16 below

Table 5.16: Sample Correlation Tests for the Proportions of Risky Assets held by Employees

Sub-hypotheses	N	Pearson Correlation, r	Sig. (2-Tailed)	Decision
$H_{4\text{-}13}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees and their inherited wealth.	805	0.236	0.000	Reject H_0
$H_{4\text{-}14}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees and the employees' age.	805	0.245	0.000	Reject H_0
$H_{4\text{-}15}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees and the employees' length of employment of service.	805	0.223	0.000	Reject H_0
$H_{4\text{-}16}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees and the employees' size of nucleus family.	805	0.243	0.000	Reject H_0
$H_{4\text{-}17}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees and the number of dependants that the employees support.	805	0.136	0.000	Reject H_0
$H_{4\text{-}18}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees and the employees' employment income	805	0.307	0.000	Reject H_0
$H_{4\text{-}19}$: There is no significant relationship between the proportion of risky assets (to gross wealth) held by salaried middle and upper income employees in and the employees' savings rate	805	0.050	0.153	Fail to Reject H_0

The results of the correlation tests in Table 5.16 are discussed below with respect to the respective sub-hypotheses that were tested.

$H_{4\text{-}13}$: There was significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and a person's inherited net wealth at (r=0.236; p-value =0.000). The hypothesis was rejected and the conclusion made that there is a significant relationship between the proportion of risky assets held by middle and upper

income employees with their inherited net wealth. The significant though weak positive correlation of 0.236 that was noted implied that employees who inherited high net wealth tended to have high proportions of risky assets in their wealth portfolios and vice versa.

$H_{4\text{-}14}$: There was significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and a person's age at (r=0.245; p-value =0.000). The hypothesis was rejected and the conclusion made that there is a significant relationship between the proportion of risky assets held by middle and upper income employees and a person's age. The significant but weak positive correlation of 0.245 that was reported meant that older employees had higher proportions of risky assets in their wealth portfolios when compared to the younger workers.

$H_{4\text{-}15}$: There was significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and a person's length of employment service at (r=0.223; p-value =0.000). The hypothesis was rejected and the conclusion made that there is a significant relationship between the proportion of risky assets held by salaried middle and upper income employees and a person's length of employment service. The significant though weak positive correlation of 0.223 implied that employees who had worked for long periods held higher proportions of risky assets than those who had worked for a shorter time.

$H_{4\text{-}16}$: There was significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and the employee's size of nucleus family unit at (r=0.243; p-value =0.000). The hypothesis was rejected and the conclusion made that there is a significant relationship between the proportion of risky assets held by middle and upper income employees and the size of a person's nucleus family unit. The significant and weak positive correlation of 0.243 that was reported meant that employees who had larger nucleus family units tended to hold a higher proportion of risky assets in their wealth portfolios when compared to those with smaller families.

$H_{4\text{-}17}$: There was significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and the number of dependants above the nucleus family that an employee supports (r=0.136; p-value=0.000). The hypothesis was rejected and the conclusion made that there is a significant relationship between the proportion of risky assets held by middle and upper income employees and the number of dependants one supports above the nucleus family. A significant and weak positive

correlation of 0.136 was reported implying that employees with a higher number of dependants tend to hold a higher proportion of risky assets in their wealth portfolios when compared to those with fewer dependants.

$H_{4\text{-}18}$ There was significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and an employee's monthly employment income at (r= 0.307; p-value=0.000). The hypothesis was rejected and the conclusion made that there was a significant relationship between the proportion of risky assets held by middle and upper income employees and their estimated monthly employment income. A significant and moderately weak positive correlation of 0.307 was reported. Thus, employees with higher monthly employment income tended to have riskier wealth portfolios when compared with those with lower incomes.

$H_{4\text{-}19}$ There was no significant correlation between the proportion of risky assets held (to gross wealth) by middle and upper income employees and an employee's savings rate at (r= 0.050; p-value=0.153). The hypothesis was not rejected and the conclusion made that there was no significant relationship between the proportion of risky assets held by middle and upper income employees and their savings rates on employment income.

The foregoing statistical tests for hypothesis 4 on whether there is a significant relationship between the personal attributes of salaried middle and upper income employees in Kenya and the composition of their wealth portfolios were carried out and discussed in sub-hypotheses **$H_{4\text{-}1}$** to **$H_{4\text{-}19}$**. These tests identified the personal attributes with a significant relationship with the composition of salaried employees' wealth and those without. Based on the study's conceptual design, the variables that are found to have a significant relationship with the composition of wealth portfolios can be construed as determinants and vice versa.

The personal attributes that were found to have a significant relationship with the composition of salaried employees' wealth portfolios, as measured by the proportion of risky assets held, were as follows: industry; job seniority; level of education; marital status; risk preference; where one was born; where one spent childhood years (up to 15 years of age); classification of employee into either middle or upper income earner; employees' net wealth; current employment income; age; size of nucleus family; employee's inherited wealth; length of service; and number of dependants above nucleus family. Table 5.17 below shows the ranking in terms of the magnitude of the correlation between the proportion of risky assets

held and the significant quantitative variables. Since all the correlations are weak, it can be inferred that the association between the composition of wealth and the tested quantitative personal attributes is not strong, though positive.

Table 5.17: Summary of Quantitative Determinants of the Composition of Wealth Portfolios

Personal Attribute	**Correlation (r) with Net wealth**	**Type of relationship**	**Rank**
Estimated employment income	0.307	Moderately weak positive	1
Age	0.245	Weak positive	2
Size of nucleus family	0.243	Weak positive	3
Inherited net wealth	0.236	Weak positive	4
Length of employment service	0.223	Weak positive	5
Number of dependants above nucleus family	0.136	Weak positive	6

The above analysis provides further information on the ranking of the quantitative personal attributes in order of the strength of their correlation with the composition of wealth. In descending order of the strength of the correlation, these attributes are: employment income, age, size of nucleus family, inherited wealth, length of employment service, and number of dependants above the nucleus family. The correlation between net wealth and the proportion of risky assets was already tested in $H_{3\text{-}19}$ and therefore not repeated. The moderately weak positive correlation ($r = 0.394$) means that the quantitative variable with the highest association with wealth composition was net wealth; a vindication of the close relationship.

In addition, the tests show that the personal attributes which did not have significant relationship with the composition of wealth portfolios were gender, religious affiliation and savings rates (see $H_{4\text{-}9}$, $H_{4\text{-}11}$, and $H_{4\text{-}19}$). Notwithstanding the fact that the attributes 'whether an investment decision is aimed at maximizing returns' (see $H_{4\text{-}10}$) and 'an employee's attitude to risk' (see $H_{4\text{-}5}$) were found to have significant relationships with the composition of employees' wealth portfolios, the lack of obvious direction in their relationship with the proportion of risky assets held implies that these two attributes can be treated as minor determinants of the composition of wealth portfolios. Consequently, hypothesis four was rejected and the conclusion made that personal attributes have a significant relationship with the composition of personal wealth portfolios of salaried middle and upper income employees. This conclusion satisfies objective four and yields the identified determinants of the composition of the wealth portfolios of salaried employees in Kenya.

5.2.5 Hypothesis H_5: *The personal attributes of salaried middle and upper income employees cannot be used to model the sizes and determinants of their wealth portfolios*

Hypothesis five was formulated to satisfy the requirements of objective five which sought to develop a model for explaining the wealth portfolios of salaried middle and upper income employees. This was satisfied by identifying suitable mathematical expressions for the relationships between personal attributes and the dependent variable wealth as measured by employees' net wealth and employees' wealth levels. Multiple regression analysis and multiple discriminant analysis were applied in the tests outlined under sub-hypotheses $H_{5\text{-}1}$ and $H_{5\text{-}2}$ as discussed below.

5.2.5.1 Sub-hypothesis $H_{5\text{-}1}$: *The quantitative personal attributes of salaried middle and upper income employees in Kenya are not significant in building a model to predict the absolute net wealth holdings of the employees.*

Multivariate analysis using linear multiple regression was applied to ascertain the relative importance of predictor variables and the predictive power of the resulting model with respect to employees' net wealth. Since these tests require that the variables are measured in metric scale (interval or ratio scale), the independent variables were restricted to the seven that were found to have a significant correlation with net wealth in subsection 5.2.3 above. These variables are: employment income, proportion of risky assets to gross wealth, age, inherited wealth, length of employment service, per cent of employment income that is saved and size of nucleus family. Tables 5.18 to 5.20 summarise the key statistics for this analysis.

A multiple linear regression model of $W=a+\beta_1X_1.. \beta_nX_n$ was developed and tested.

The null hypothesis was therefore set as:

H_0: $\beta_0 = \beta_i = \beta_2 \ldots\ldots \beta_n = 0$

where

W is the absolute value of net wealth per employee in Shs

"a" is the intercept

β_i is the weight for i^{th} personal attribute used as a predictor variable

X_i is the i^{th} personal attribute used as a predictor variable

r is the correlation coefficient computed from the resulting function.

Table 5.18: Model Summary for Prediction Equation of Net Wealth.

r	R Square
0.711	.505

Predictors: (Constant); monthly employment income; proportion of risky assets; age, inherited net wealth; length of employment service; savings; and size of nucleus family.

From Table 5.18, the correlation coefficient r= 0.711 shows a positive and strong correlation between net wealth and the predictor variables while the coefficient of determination r^2 =0.505, means that this model can explain about half of the variations in the net wealth of salaried middle and upper income employees. Hence, these predictor variables are good determinants of the absolute size of employees' wealth holdings.

Table 5.19: Analysis of Variance for Prediction Equation of Net Wealth

Model		df	F	Sig.
1	Regression	7	116.349	.000
	Residual	797		
	Total	804		

a *Predictors: (Constant), monthly employment income; proportion of risky assets; age, inherited net wealth; length of employment service; savings; and size of nucleus family*

b *Dependent variable: Net wealth*

The ANOVA results in Table 5.19 above indicate that overall, the multiple regression model is significant at (F= 116.35; df= 7 and p-value =0.000).

Table 5.20: Coefficients Prediction Equation for Employees' Net Wealth Holdings

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t-value	Sig.
(constant)	-2,798,407.33	316,203.41		-8.85	.000
Monthly income from employment Shs	34.81	2.63	.42	13.23	.000
Age (in years)	47,574.76	12,377.18	.15	3.84	.000
Risky assets as a per cent of gross wealth	22,126.04	3,044.22	.20	7.27	.000
Inherited net wealth (Shs)	.718	.14	.14	5.21	.000
Length of employment (in years)	34,183.21	15,292.40	.07	2.24	.026
Savings rate—per cent	24,674.45	5,525.08	.12	4.47	.000
Size of nucleus family	-139,833.51	51,471.00	-.09	-2.72	.007

a Predictors: monthly employment income; risky assets proportion; age; inherited net wealth; length of employment service; savings; and size of nucleus family.

b Dependent variable: Net wealth

The above statistics can be interpreted as follows: all the predictor variables are significant since p-value is less than 0.05 and are retained in the multiple regression equation. Therefore, all the predictor variables were significant in explaining the net wealth of salaried middle and upper income employees. These results also support the inferences made using Pearson product moment coefficient regarding existence of significant correlation between net wealth holdings and assumed wealth predictor variables in subsection 5.2.3 above.

The prediction equation for the net wealth holding of employees is then stated as follows:

$$W = -2{,}798{,}407.33 + 34.81X_1 + 47{,}574.76X_2 + 22{,}126.04X_3 + 0.72X_4 + 34{,}183.21X_5 + 24{,}674.45X_6 - 139{,}833.51X_7$$

(0.000) (0.000) (0.000) (0.000) (0.000) (0.026) (0.000) (0.007)

where W is the predicted net wealth in Shs; X_1 is the monthly employment income in Shs, X_2 is the employee's age in years, X_3 is the risky assets' proportion to gross wealth, X_4 is the value of inherited net wealth, X_5 is the length of employment service in years, X_6 is the percentage of employment income saved, and X_7 is the size of the nucleus family. These seven quantitative personal attributes are the predictors of the net wealth of employees.

This model indicates that the predicted net wealth value would be Shs-2,798,403 when each of the seven predictor variables has a value score of zero and would rise progressively with increases in all the predictor variables except for the size of the nucleus family which in this model, is negatively correlated with net wealth. Thus, in this model, bigger family sizes are associated with less net wealth; they exert a negative drag on wealth. Overall, the model has a moderate predictive power on account of the strong correlation (r=0.71) and moderate coefficient of determination (R^2 =0.51). Whereas the above computations indicate that these seven personal attributes could help in modeling and predicting the net wealth holding of salaried middle and upper income employees, a case could be made that point estimates may be hard to defend, especially on account of the fact that respondents' wealth data was reported in ranges. Category-based modeling in terms of wealth levels may therefore be more practical as shown in subsection 5.2.5.2 below.

The test results on sub-hypothesis $H_{5\text{-}1}$ indicate that a wealth prediction model can be built. Therefore, the null hypothesis is rejected and the conclusion made that quantitative personal attributes of salaried middle and upper income employees in Kenya can be used to build a model to predict their absolute net wealth holdings.

The key statistics for the variables and coefficients on the prediction model for the net wealth holding of salaried middle and upper income employees in Kenya as discussed above are summarised in Appendix 15.

5.2.5.2 Sub-hypothesis $H_{5\text{-}2}$: *The quantitative personal attributes of salaried middle and upper income employees in Kenya cannot discriminate employees between 'above average wealth holders', 'average wealth holders' and 'below average wealth holders'*

In order to profile and identify (the personal attributes of) groups of employees who fit into certain ranking of wealth levels, MDA was done based on the recommendations by Hair, Anderson, Tatham, and Black (1998). This was achieved by breaking down the wealth holding of the sampled employees into treciles: 'above average wealth holders' (top one third); 'average wealth holders' (middle one-third) and 'below average wealth holders' (bottom one-third) whereby each group was treated as a distinct categorical variable. This framework was used to construct a prediction model to show which wealth category an employee with certain attributes is likely to fall into. The model helps to determine which

predictor variables discriminate between employees based on their wealth levels.

The discriminant analysis used the seven quantitative predictor personal attributes that emerged to be significantly correlated to net wealth in Section 5.2.3 above, and these were: monthly employment income; age; inherited wealth; risky assets proportion; length of employment service; savings rate; and size of nucleus family. The results of this analysis are shown in Tables 5.21 to 5.26 below.

Table 5.21: Group Statistics for Prediction of Wealth Levels

Rank of employees by net wealth		Mean	Standard. Deviation	Valid N (Listwise) Unweighted	Weighted
Below average wealth holders	Monthly income from employment	38,671.14	17,001.78	268	268
	Age	30.46	7.00	268	268
	Risky assets as a percentage of gross wealth	9.54	18.14	268	268
	Inherited net wealth	60,634.18	226,019.76	268	268
	Savings rate—per cent	17.52	12.52	268	268
	Length of employment service	6.90	5.44	268	268
	Size of nucleus family	2.54	1.68	268	268
Average wealth holders	**Monthly income from employment**	**42,701.00**	**19,638.70**	**268**	**268**
	Age	**33.40**	**7.17**	**268**	**268**
	Risky assets as a percentage of gross wealth	**12.99**	**22.61**	**268**	**268**
	Inherited net wealth	**99,813.31**	**311,784.51**	**268**	**268**
	Savings rate—per cent	**20.71**	**10.99**	**268**	**268**
	Length of employment service	**8.04**	**5.01**	**268**	**268**
	Size of nucleus family	**3.00**	**1.57**	**268**	**268**
Above average wealth holders	Monthly income from employment	77,237.42	4,0811.21	269	269
	Age	38.87	8.62	269	269
	Risky assets as percentage of gross wealth	34.17	23.92	269	269
	Inherited net wealth	407,527.63	802,274.07	269	269
	Savings rate—per cent	27.54	14.03	269	269
	Length of employment service	11.05	5.92	269	269
	Size of nucleus family	3.52	1.71	269	269
Total	**Monthly income from employment**	**52,900.12**	**32,857.15**	**805**	**805**
	Age	**34.25**	**8.38**	**805**	**805**
	Risky assets as a percentage of gross wealth	**18.91**	**24.26**	**805**	**805**
	Inherited net wealth	**189,596.10**	**53,6578.15**	**805**	**805**
	Savings rate—per cent	**21.93**	**13.24**	**805**	**805**
	Length of employment service	**8.67**	**5.74**	**805**	**805**
	Size of nucleus family	**3.02**	**1.70**	**805**	**805**

These group statistics indicate that the mean scores for each of the seven predictor variables are different between the wealth holding groups. For all the predictor variables, the mean scores for 'above average wealth' holders were higher than the means for 'average wealth' holders while the mean scores for 'below average wealth' holders were the least. The predictor variables that had the highest relative differences in the means were inherited net

wealth and risky assets proportion (to gross wealth), while those with the least relative differences in means were size of nucleus family and length of employment service. From these mean scores, it shows that we can continue with MDA. Therefore, these discriminant variables can be used to predict the grouping of employees by wealth.

Table 5.22: Pooled Within–Groups Matrices of Correlation for Prediction of Wealth Levels

	Monthly employment	Age	Risky assets as a %	Inherited net wealth	Savings rate	Length of employment service	Size of nucleus family
Monthly employment income	1.000						
Age	**.350**	1.000					
Risky assets as a proportion of gross wealth	.093	.077	1.000				
Inherited net wealth	.203	.096	.124	1.000			
Savings rate	.236	.035	-.105	.085	1.000		
Length of employment service	.266	**.563**	.102	.062	.025	1.000	
Size of nucleus family	.175	**.577**	.165	.054	-.012	**.413**	1.000

The results of the correlation matrix show low and high correlations, meaning that the predictor variables used are likely to discriminate the groups by wealth holding levels.

Table 5.23: Wilks' Lambda Test for Prediction of Wealth Levels

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.569	450.197	14	.000
2	.981	15.490	6	.017

The p-values of 0.000 for function 1 through 2; and p-value 0.017 for function 2 in the Wilks' Lambda test in Table 5.23 above indicated that these discriminant functions were significant and therefore fit for the prediction. The seven predictor variables can be used to discriminate salaried middle and upper income employees by the categories of wealth levels.

The Wilks' Lambda was used to test whether the means of the discriminant functions differ significantly between the wealth groups. In the case above, the observed significance level (p-value = 0.000 and 0.017) is small, so we conclude that the groups do not have the same mean, which therefore implies that there is a relationship between the wealth groups and the quantitative personal attributes.

Table 5.24: Canonical Discriminant Function Coefficients for Prediction of Wealth Levels

	Function	Function
	1	2
Monthly income from employment	.000	.000
Age	.046	.094
Risky assets as a percentage of gross wealth	.026	-.005
Inherited net wealth	.000	.000
Savings rate	.025	.039
Length of employment service	.006	-.022
Size of nucleus family	-.073	.195
(constant)	-3.365	-3.013

Unstandardized coefficients

The canonical analysis yielded two discriminant functions, 1 and 2 as shown in Table 5.24 above. In both cases, monthly employment income and inherited net wealth had a coefficient of zero and therefore did not emerge as predictor variables in the final discriminant equations.

The two functions for MDA are as follows:

Function 1:

$Y_1 = -3.365 + 0.046X_1 + 0.026X_2 + 0.025X_3 + 0.006X_4 - 0.073X_5$

(0.000) (0.000) (0.000) (0.000) (0.000) (0.000)

Function 2:

$Y_2 = -3.013 + 0.094X_1 - 0.005X_2 + 0.039X_3 - 0.022X_4 + 0.195X_5$

(0.000) (0.000) (0.000) (0.000) (0.000) (0.000)

where Y_1 and Y_2 are predicted wealth categories; X_1 is the employee's age in years; X_2 is the employee's risky assets as a proportion to gross wealth; X_3 is the employee's rate of savings on employment income; X_4 is the length of employment service in years; and X_5 is the size of the nucleus family. These five quantitative personal attributes emerge as the predictors of the wealth category in which a salaried middle and upper income employee is likely to fall.

The results of the multiple discriminant analysis have established five predictors of wealth category to test sub-hypothesis $H_{5\text{-}2}$. The hypothesis is therefore rejected and the conclusion made that the quantitative personal attributes of salaried middle and upper income employees in Kenya can be used to build a model to profile and group them into either holders of 'above average wealth' or 'average wealth' or 'below average wealth'.

The key statistics for the variables and coefficients on the profiling model for salaried middle

and upper income employees in Kenya into either 'above average wealth' or 'average wealth' or 'below average wealth' based on their personal attributes are summarised in Appendix 16.

Table 5.25: Functions at Group Centroids for Prediction of Wealth Levels

	Function	Function
Rank of employees by net wealth	1	2
Above average wealth holders	1.181	-0.0334
Average wealth holders	-.416	.185
Below average wealth holders	-.769	-.152

Unstandardized canonical discriminant functions evaluated at group means

The group centroids results in Table 5.25 above show that in discriminant function 1, employees in the category of 'above average wealth' holders would be predicted to have a score near 1.181; 'average wealth holders' would be predicted to have a score near -.416, while 'below average wealth' holders would be predicted to have a score around -.769. The same analogy can also be applied on the centroids for function 2.

Table 5.26: Classification Results for Prediction of Wealth Levels.

			Predicted group membership			Total
		Rank of employees by net wealth	**Below average**	**Average**	**Above average**	
original	count	Below average	163	85	20	268
		Average	101	132	35	268
		Above average	30	54	185	269
	%	Below average	60.8	31.7	7.5	100.0
		Average	37.7	49.3	13.1	100.0
		Above average	11.2	20.1	68.8	100.0
Cross-validated	count	Below average	161	86	21	268
		Average	108	123	37	268
		Above average	30	54	185	269
	%	Below average	60.1	32.1	7.8	100.0
		Average	40.3	45.9	13.8	100.0
		Above average	11.2	20.1	68.8	100.0

a. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

b 59.6% of original grouped cases were correctly classified into their categories.

c 58.3% of cross-validated grouped cases correctly classified.

Within the first group, 60.8% of the 'below average wealth' holders were correctly classified as such; 31.7% of the 'below average wealth' holders were wrongly classified as 'average wealth holders'; while 7.5% of the 'below average wealth' holders were incorrectly classified as 'above average wealth' holders.

In the second group, 49.3% of the 'average wealth' holders were correctly classified as such; 37.7% of the 'average wealth' holders were wrongly classified as 'below average wealth' holders; while 13.1% of the 'average wealth' holders were incorrectly classified as 'above average wealth' holders.

Within the third group, 68.8% of the 'above average wealth' holders were correctly classified as such; 20.1% of the 'above average wealth' holders were wrongly classified as 'average wealth holders' while 11.2% of the 'above average wealth' holders were incorrectly classified as 'below average wealth' holders.

Finally, the cross validation showed that overall, 59.6% of original grouped cases were correctly classified, while 58.3% of cross-validated grouped cases were correctly classified, way above the required minimum of 41.6% [$(0.333^2*3)*1.25$] at 25% above chance. These results indicate that the predictive power of the independent quantitative variables is moderate thereby suggesting a need to include categorical variables in explaining the wealth levels of salaried middle and upper income employees. These conclusions are fitting in that they corroborate the results from the point prediction model in subsection 5.2.5.1 above, where multiple regression analysis was applied to model net wealth.

5.3 Data Reduction

In order to determine the existence of multivariate interrelationships among the hypothesized input variables in the study of the determinants and size of employees' wealth portfolios and further explore the nature of those relationships, factor analysis multivariate computational technique was carried out in this Section. This statistical technique was applied to reduce the independent variables to a manageable number by identifying those variables which belong together and have overlapping measurements. Through this process, underlying and not observable constructs would be identified as a basis for a simplified model. Using the SPSS package, the principal components approach was applied on the 21 variables that were selected for analysis. These variables captured all the inputs as defined in the conceptual

design of the model used in this study as shown in Chapter Two, Section Five. The descriptive statistics for the variables under consideration are shown in Table 5.27 below.

Table 5.27: Descriptive Statistics

Personal Attribute	**Mean**	**Std. Deviation**	**Analysis N**
Industry	6.44	2.67	786
Job seniority	2.55	1.28	786
Length of employment service—in range	2.13	1.15	786
Education level	4.10	1.30	786
Age group	3.47	1.65	786
Gender	1.39	.49	786
Marital status	3.98	1.53	786
Size of nucleus family	3.00	1.69	786
Dependants on top of the nucleus family	2.09	1.75	786
Place of birth	5.53	2.70	786
Place of childhood years (up to 15 years)	4.95	2.86	786
Religious affiliation	1.59	.84	786
Whether choice of investment is driven by desire to maximise earnings	5.85	1.21	786
Risk preference: amount one is ready to invest	3.11	1.35	786
Attitude to risk: willingness to take risks in general	6.76	2.72	786
Extent of reliance on loans	3.19	1.25	786
Risky assets as a percentage of gross wealth	19.15	24.28	786
Current employment income	53,088.56	32,942.60	786
Savings rate—in percentage	22.08	13.05	786
Income category (middle or upper income)	1.07	.26	786
Inherited net wealth	189,726.28	533,813.62	786

As can be seen from the above tabulation, the 786 valid cases satisfied the requirement that the cases examined must exceed 5 times the number of variables. Since the variables in this analysis were 21, the minimum cases for this operation were 105.

Thereafter, the appropriateness of the principal components analysis for factor extraction was examined through the correlation matrix and test of sampling adequacy as shown in Tables 5.28 and 5.29, respectively.

Table 5.28: Correlation Matrix

		V01	V02	V03	V04	V05	V06	V07	V08	V09	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21
Industry	V01	1																				
Job seniority	V02	-0.10	1.00																			
Length of employment service-range	V03	-0.17	**0.33**	1.00																		
Education level	V04	0.06	**0.55**	0.17	1.00																	
Age group	V05	-0.14	**0.53**	**0.63**	**0.41**	1.00																
Gender	V06	0.03	-0.07	-0.11	-0.03	-0.15	1.00															
Marital status	V07	0.00	0.27	0.25	0.19	**0.42**	0.02	1.00														
Size of nucleus family	V08	-0.08	**0.39**	**0.45**	0.25	**0.61**	-0.16	**0.62**	1.00													
Dependants on top of the nucleus family	V09	-0.07	0.10	0.23	0.09	0.18	-0.06	0.16	0.28	1.00												
Place of birth	V10	0.04	-0.17	0.00	-0.14	-0.04	-0.05	-0.06	-0.02	0.15	1.00											
Place of childhood years (upto 15 years)	V11	0.04	-0.22	-0.01	-0.16	-0.08	-0.05	-0.05	-0.06	0.11	**0.75**	1.00										
Religious affiliation	V12	-0.10	0.14	0.10	0.03	0.08	-0.04	-0.01	0.05	0.04	-0.06	-0.11	1.00									
Whether choice of investment is driven by desire to maximise earnings	V13	-0.12	0.24	0.02	0.16	0.14	0.03	-0.04	0.15	-0.04	-0.13	-0.20	0.16	1.00								
Risk preference:Amount one is ready to invest	V14	0.06	**0.32**	-0.04	0.19	0.15	-0.03	0.14	0.20	-0.04	-0.14	-0.19	0.00	0.19	1.00							
Attitude to risk: Willingness to take risks in general	V15	0.15	0.16	-0.09	0.12	0.03	-0.08	0.11	0.15	-0.01	-0.12	-0.14	-0.05	0.14	**0.48**	1.00						
Extent of reliance on loans	V16	-0.14	**0.31**	0.21	0.16	0.25	-0.02	0.12	0.24	0.10	-0.10	-0.16	0.18	**0.39**	0.14	0.01	1.00					
Risky assets as a percent of gross wealth	V17	-0.09	**0.30**	0.23	**0.34**	0.26	0.05	0.09	0.26	0.14	-0.13	-0.14	0.08	0.24	0.08	0.06	0.25	1.00				
Current employment income	V18	-0.18	**0.54**	**0.38**	**0.58**	**0.50**	-0.04	0.19	0.27	0.13	-0.16	-0.18	0.08	0.15	0.10	-0.02	0.19	**0.31**	1.00			
Savings rate in percent	V19	-0.23	0.22	0.13	0.22	0.17	-0.06	0.02	0.08	0.00	-0.04	-0.08	0.03	-0.01	0.12	0.04	-0.07	0.04	**0.35**	1.00		
Income category (middle or upper income)	V20	-0.14	**0.36**	0.28	**0.40**	**0.35**	-0.06	0.10	0.17	0.10	-0.15	-0.17	0.03	0.08	0.01	-0.02	0.11	0.16	**0.81**	0.26	1.00	
Inherited net absolute wealth	V21	-0.06	0.23	0.15	0.21	0.22	0.00	0.02	0.13	0.00	-0.14	-0.16	0.12	0.17	0.11	0.03	0.10	0.24	0.30	0.17	0.25	1.00

The correlation matrix in Table 5.28 above indicates that the requirements for principal components analysis were satisfied because about one eighth of the correlations were above 0.30 as highlighted in the tabulation. These results show that there are common shared factors and therefore, we can go ahead with the factor analysis.

Table 5.29: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.758
Bartlett's Test of Sphericity	Approx. Chi-Square	5347.768
	df	210
	Sig.	.000

Table 5.29 above shows the results of the Kaiser-Meyer-Olkin (KMO) statistic that were used to predict if the data is likely to factor properly. This was based on correlation and partial correlation as well as the results of Bartlett's Test of Sphericity to test for the presence of correlations among variables. The KMO measure of sampling adequacy (MSA) at 0.758 was acceptable since it was higher than the recommended minimum of 0.50. Additionally, the Bartlett's Test of Sphericity was significant and recorded an acceptable p-value of 0.000, which was lower than the test value of 0.05, thereby indicating that there is correlation between the variables.

In order to obtain a simple and meaningful data structure that has a non-zero loading of the explained variable for each individual factor, a varimax rotation was carried out. The extracted factors and the variables with loadings equal to or greater than 0.50 were isolated as shown in Tables 5.30 and 5.31, and the Scree plot in Figure 5.1. This operation identified six factors and their respective variables.

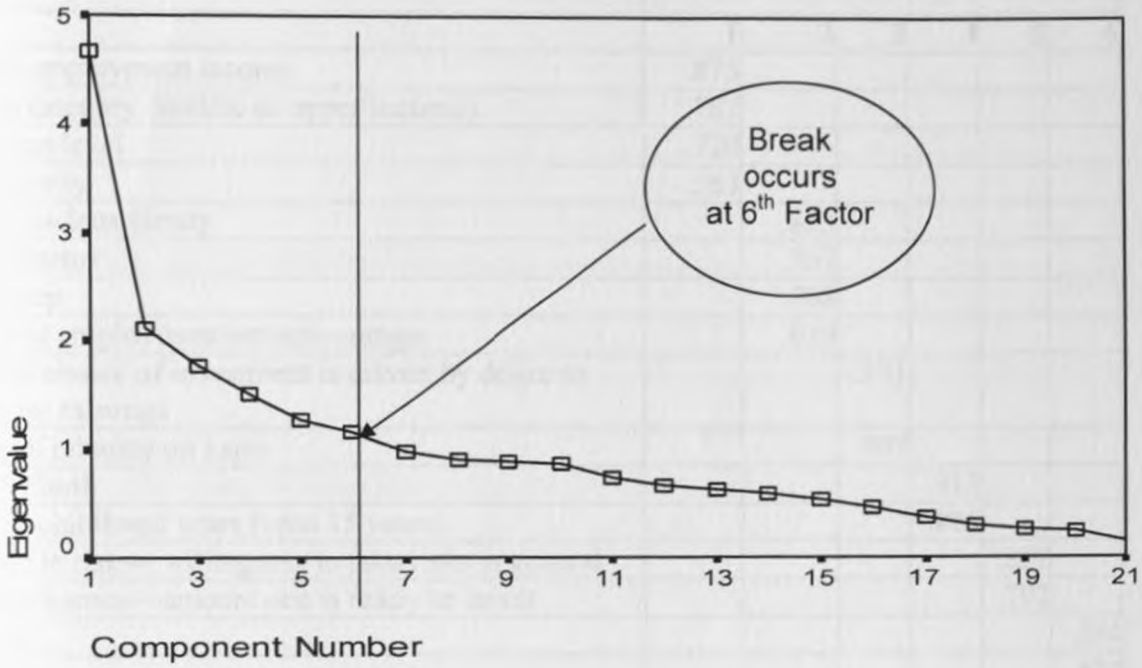
Table 5.30: Total Variance Explained

Initial Eigen values				Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	Percentage of Variance	Cumulative %	Total	Percentage of Variance	Cumulative %e	Total	Percentage of Variance	Cumulative %
1	4.68	22.28	22.28	4.68	22.28	22.28	3.07	14.70	14.70
2	2.12	10.10	32.38	2.12	10.10	32.38	2.73	13.02	27.72
3	1.76	8.39	40.77	1.76	8.39	40.77	1.85	8.80	36.52
4	1.50	7.15	47.92	1.50	7.15	47.92	1.79	8.53	45.05
5	1.26	6.01	53.94	1.26	6.01	53.94	1.77	8.40	53.45
6	1.15	5.48	59.42	1.15	5.48	59.42	1.25	6.00	59.42
7	.98	4.67	64.08						
8	.91	4.32	68.40						
9	.88	4.20	72.60						
10	.86	4.08	76.68						
11	.73	3.50	80.17						
12	.66	3.15	83.32						
13	.62	2.96	86.28						
14	.60	2.84	89.12						
15	.54	2.55	91.67						
16	.46	2.18	93.84						
17	.37	1.75	95.59						
18	.29	1.39	96.97						
19	.26	1.23	98.21						
20	.24	1.13	99.34						
21	.14	.66	100.00						

Extraction Method: Principal Component Analysis

Table 5.30 shows the linear combination of variables, called factors, that account for the variance in the data as a whole. The output shows that there were six eigen values greater than 1.00, which indicates that there are six factors to extract based on the latent root criterion for the number of components to derive. These six factors explain a cumulative sample variance of 59.42%.

Figure 5.1: Scree Plot for Factor Analysis



The Scree plot in Figure 5.1 provides a diagrammatic view of the initial eigen values associated with all the factors. The curve shows that at factor six, a distinct break occurs separating the steep slope of the large factors and the gradually trailing off of the rest of the factors. From the total variance table and the Scree plot, it was noted that an extraction of six factors which cumulatively accounted for 59.42% of the variance would be sufficient. The rotated component matrix in Table 5.31 below shows this extraction and the variables that comprise each factor.

Table 5.31: Rotated Component Matrix

	Factors					
	1	2	3	4	5	6
Current employment income	.875					
Income category (middle or upper income)	.787					
Education level	.720					
Job seniority	.563					
Size of nucleus family		.833				
Marital status		.767				
Age group		.708				
Length of employment service—range		.639				
Whether choice of investment is driven by desire to maximise earnings			.731			
Extent of reliance on loans			.707			
Place of birth				.913		
Place of childhood years (upto 15 years)				.885		
Attitude to risk— willingness to take risks in general					.807	
Risk preference—amount one is ready to invest					.792	
Industry						.584
Gender						.574
Savings rate in per cent						-.528

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation

The extractions in the rotated table matrix detailed out the selected six factors by the grouping variables that were commonly associated. The extraction for each factor showed in addition the correlation of each grouped variable to the factor.

The results of the principal components analysis where the varimax rotation method and Kaiser Normalization were used as shown in Table 5.31, indicated that the independent variables that were examined in this study could be reduced to six factors. These factors are discussed in decreasing order by which each factor accounts for the variance in the sample.

Factor 1: Earning Capacity: This factor explained the largest proportion of the variation of 14.7% and comprised the following: current employment income, income category (middle of upper income), education level, and job seniority. These four variables can be uniquely identified by the fact that they define an employee's earning capacity, which in turn informs savings and ability to invest for wealth creation. The emergence of earning capacity as an important factor reaffirms the appropriateness of the research design adopted in this study where the target population, salaried middle and upper income employees, was identified

principally on the basis of levels of employment income and hence earning capacity. This observation is fundamental because it implies that studies on personal wealth portfolios should factor in the level and type of the person's earning capacity as an essential input in the research design. From a conceptual level, it can also be inferred that the Life-Cycle Hypothesis (LCH) of studying personal wealth portfolios is supported in this instance because earning capacity underpins LCH. This factor defines what an employee can do.

Factor 2: Life-Cycle Factors: The second largest amount of the variance in the sample of 13.02 % was explained by the grouping comprising: size of nucleus family, marital status, age, and length of employment service. The underlying characteristic about these four variables is that they reflect an employee's stage in life and therefore can be commonly referred to as life-cycle factors. This can also be interpreted to provide support for the conceptual design of this study where age is the main input variable in the LCH approach for studies on personal wealth portfolios. This factor defines what an employee needs to do.

Factor 3: Investment Objective: The third factor accounted for 8.8% of the variance and consisted of two related variables: whether the choice of investment is driven by desire to maximise earnings, and the extent to which employees rely on loans. These variables can be easily understood with respect to the investment objective and choice of financing. Furthermore, descriptive data from this study shows that 86% of the sampled employees agreed that they invest to maximize earnings, and that the vast majority of them, say, 78%, rely on loans to some extent. This factor embodies the investment process.

Factor 4: Employee's Cultural Background: The fourth factor accounted for 8.5% of the variations. The variables for this factor related to an employee's background as operationalised by place of birth and childhood environment. These sets of variables were designed to denote the cultural element of ethnicity. Consequently, these results suggest that the sociological-related inputs in this study can be grouped under this factor. The results have vital implications and offer useful logic by implying an inter-play between nature and nurture in molding the beliefs that influence employees in the investment process.

Factor 5: Employees' Risk–Taking Behaviour: The fifth factor was employees' risk–taking behaviour which in this analysis was measured by two related variables of attitude to risk and risk preference. It accounted for 8.4% of the sample variance. Whereas the former is a general term and relates to a person's willingness to take risks of whatever nature, the latter is specific and measures a person's preparedness to make a risky investment given a choice

of less risky alternatives. Significantly, risk–taking behaviour is central to modern portfolio theory and an important input in the study of personal wealth portfolios under this conceptual framework. In this regard, factor 5 deals with the finer aspects of deciding where to invest and how much to invest.

Factor 6: Savings: The sixth component, savings, accounted for only 6% of the variance in the sample. Savings was depicted by the industry the respondent is employed in, gender, and the percentage of earnings that the respondent saves. The statistics derived from the data show that the mean saving rates by industry were significantly different at (F=10.33, df=7 and p-value=0.000) with agriculture showing the highest mean saving rate of 32.7% compared to the lowest mean of 18.07% for transport and communication. The savings rates for male (22.5%) and females (21.1%) were, however not significantly different at (t = 1.494, df = 803 and p-value = 0.136).

The data reduction carried out shows that the 21 variables that were considered for analysis in the current study can be reduced to six factors that are a simpler grouping. This factor-based grouping is easier to conceptualise and model. These results show that factors relating to LCH in studying wealth are the most important since they accounted for 33.7% of the sample variance. These were factors 1, 2 and 6 for 'earning capacity', 'life-cycle factors' and 'savings', respectively. The next conceptual framework that followed in prominence was MPT in factor 3 and 5, which both accounted for 15.2% of the sample variance. The groupings were labeled 'investment objective' and 'risk–taking behaviour'. Lastly, a role was noted for sociological factors where 'cultural background' was depicted by place of origin, factor 4. This factor accounted for 8.5% of the total variance. The key statistics for the variables and coefficients are summarised in Appendix 17.

5.4 Findings of the Study

These findings are derived from the tests of hypotheses in Section 5.2 and are supplemented by the analyses in Section 5.3. The interpretations are informed by the descriptive statistics and the literature reviewed in Chapter Four and Two, respectively. Each subsection relates to a research objectives.

5.4.1 The nature and diversification of employees' wealth portfolios.

Employees' wealth holdings are found to be heterogeneous in value and composition as depicted by large standard deviations, wide ranges and high scores of Kurtosis and Skewness.

However, the distribution of the number of asset types held by the sampled employees is less varied in comparison. The respondents also hold other assets which are not considered to be part of personal wealth, based on literature reviewed (see Appendix 14). The holding of other assets in the farms such as crops, animals and land captures the context of this study; over two–thirds of Kenyans are rural–based and engaged in some agrarian activities.

The *first major finding* was that the wealth portfolios of the sampled employees are under-diversified as assessed using the naïve diversification method. Objective one was thus satisfied as discussed below.

The first indication of under-diversified wealth portfolios was that the sampled employees do not hold all the seven principal types of assets in equal proportions as recommended in DeMiguel et al. (2009), among others. Subsection 5.2.1.1 above shows that the proportions held of the various assets are significantly unequal; the highest and lowest proportions are 57% and 10% held in cash and corporate bonds, respectively.

The above conclusion is supported by other findings that the respondents hold on average 2.7 assets which is significantly lower than the 7 asset types that are considered to comprise wealth portfolios in this study. Unequal holding of assets is also confirmed by findings of low ownership rates of treasury bills and bonds at 5.3% and corporate bonds at 1.9%, respectively. On the other hand, cash and bank balances has a 100% ownership rate and accounts for 39.3% of the net wealth value of the sampled employees. The narrow and concentrated wealth portfolios coupled with low ownership rate and a meagre share in gross wealth of capital market instruments is consistent with the phenomenon of asset scarcity that is common in developing countries. Further evidence of under-diversification is shown by results in subsection 4.4.15.3 showing that the asset class proportions are significantly different from the 'thirds'. The dominant asset class is cash and near cash assets with an average proportion of 80%, followed by fixed income capital class, and then risky assets classes with average proportions of 21% and 19%, respectively. The finding that cash accounts for the largest share of wealth is inconsistent with evidence from developed countries which show that property is the dominant asset. The low ownership of risky assets is consistent with empirical evidence where for instance, Georgarakos (2002) reports that most investors in the UK do not hold risky assets.

Another indicator of under-diversification (subsection 5.2.1.2) is that the equity portfolios are

narrowly invested in 3 listed companies on average, which is lower than the minimum recommended of 11 listed companies to achieve naïve diversification. Other findings that only 0.3% of the respondents hold shares in more than 10 companies while only one-third reported to own shares are reflective of a young capital market and supported by evidence from developed countries. For instance in the USA, Statman (1987) found that 50% of investors own up to two securities and only 11% hold more than ten, leading the researcher to conclude that USA investors hold undiversified equity portfolios.

Notwithstanding the observed lack of diversification in the current study, sampled employees were found to be inclined towards diversifying their wealth holdings. For instance, 48 percent of them hold at least one risky asset, while 5% hold all the three asset classes. Also, the proportionate holding of the risky assets class in the total wealth portfolios is 35%, which is second to cash and near cash at 61% of the total wealth portfolios. Moreover, 87% of the employees were found to seek to maximise their wealth when investing, while 48% of these seek professional advice.

5.4.2 Adequacy of employees' wealth portfolios for consumption while in retirement

The second objective of this study was to ascertain whether the wealth portfolios of the sampled employees can generate sufficient income to cater for their consumption needs while in retirement. This analysis was guided by the principle applied to assess the adequacy of wealth holding in the USA (Au, Mitchell & Phillips, 2005; Munnell et al., 2006).

The study's *second major finding* was that the estimated earnings from the wealth portfolios of the sampled employees who are about to retire, was less than the recommended minimum proportion of 70% of their current employment income. This ratio is referred to as the replacement rate. The mean and median computed replacement rates, that measure wealth adequacy, are 43% and 39%, respectively. These findings were corroborated by the target replacement rates given by all the respondents whose mean and median were 39% and 36%, respectively (subsection 4.4.16). A positive, though weak correlation (r= 0.29) between the computed and target replacement rates affirmation the correctness of these above. These findings suggest that these wealth portfolios are not adequate to support employees' habitual consumption needs during retirement, implying that they are small in monetary value.

The finding that the wealth portfolios of salaried employees are inadequate is not unusual. Using the yardstick of replacement rates, similar cases have been widely documented by

wealth researchers especially in the USA and Europe where majority of the people about to retire are found to have inadequate wealth (Mitchell & Moore 1997; Munnell et al., 2006). This puzzling phenomenon has been explained by inadequate financial knowledge, poor fiscal planning, lack of diversification and low savings, among others. The low replacement rate noted in the current study may be explained by low incomes, underdeveloped capital markets, and a poor investment culture. Granted, earnings from investments would be expected to play a bigger role in financing consumption during retirement, the low replacement rate observed in this study raises a non-trivial policy issue. This is particularly significant considering Kenya's paltry levels of social security where the mean pension earnings don't exceed 20% of pre–retirement employment income and a low participation rate of employees in pension schemes currently estimated at 15% according to Retirement Benefits Authority (2006). The situation is aggravated by the low savings rate relative to GDP of 14.8 percent, CBK (2010) and high age dependency rates of 77% (GoK, 2008a).

In addition, it was found that 14.3% of the respondents indicated they had 'no idea' about their target replacement rates, whilst 3% failed to respond to the question. These results suggesting that the sampled employees have a high level of awareness of their financial needs during retirement' contradict evidence from literature reviewed. In their survey of USA national data, Yakoboski and Dickemper (1997), for instance, found that 37% of the workers gave little or no thought to their financial needs during retirement, while only 36% of the respondents indicated to have planned for their retirement. The higher awareness of the need for retirement financial planning that was noted in the current study may be explained by the relatively higher degree of financial literacy of the sampled employees, better access to financial education through employer–sponsored pension schemes, and interventions by the Retirement Benefits Authority (RBA) in Kenya.

5.4.3 Explanatory factors for the wealth sizes of salaried employees

The third objective of the study was to determine the personal attributes that have a relationship with the absolute monetary size of the wealth portfolios of salaried middle and upper income employees in Kenya. Using the conceptual model in Figure 2.3 above, appropriate tests were carried out to establish the nature and extent of the relationships between the hypothesised personal attributes of the sampled employees and the monetary value of their net wealth. In this study's *third major finding*, the determinants of wealth sizes were classified either as categorical or quantitative.

Regarding categorical predictor variables for wealth, the study results were used to rank the wealth determinants on the basis of their relative effect on the employees' net wealth according to the number of times the mean net wealth of the sampled employees who are placed in the top category exceeds that of the employee grouping at the bottom. Using this ordinal scale, the determinants of net wealth size were ranked in descending order. This way employees' risk perception was ranked highest, followed by employment income earning classification (middle or upper income), job seniority, place where one was born, education level, childhood environment for the first 15 years of one's life, industry type, marital status, risk preference, and religious affiliation.

As expected, upper income earners had higher net wealth compared to middle income earners whilst employees who were either born or spent their first 15 years of life outside Kenya had higher net wealth than the rest. Also, sampled employees that hold high proportions of risky assets had higher net wealth compared to those with lower proportions of risky assets. Single employees who are either widowed or separated or divorced and those who are highly educated, senior in their jobs, and those predisposed towards making risky investments have higher net wealth. In addition, employees who indicated to subscribe to the Muslim faith have more wealth than Christians.

Three aspects of the foregoing finding warrant further elaboration. Firstly, the finding that single employees who are widowed, separated or divorced are wealthier than those who are either married or never married is unusual. This situation can partly be explained by the age of sampled employees by relying on the propositions of LCH; that older employees should have higher wealth than younger ones. In this case, the study data shows that employees who were never married were on average younger than the other categories; and 98% were below 40 years compared to 64% for the other groups. However, the age factor does not help to explain the wealth differential between single employees and those who are married since the age proportions for these two groups are not dissimilar. Moreover, the study data indicates that single employees are not superior to other employees in terms of employment income, education or job seniority, which emerged as major determinants of net wealth. Therefore, the study finding that single employees who are either divorced, widowed or separated, have higher wealth than the rest could be attributed to wealth accumulated in previous marriages.

Also, evidence that employees who were either born or spent their childhood years outside Kenya emerged to be wealthier suggests that the socio-economic environment under which a

person is nurtured has an important bearing on their disposition towards investment and wealth holding. This study affirms this inference by establishing that employees who were either born or spent their childhood years outside Kenya surpassed others in terms of employment income, education and job seniority. These findings may suggest a role for ethnicity in determining wealth holdings.

Finally, results showing that Muslims were wealthier than employees of other religious affiliations contradict evidence. For instance, the study by Heaton, James and Oheneba-Sakyi (2007) in Ghana, shows that Protestant and Catholic Christians had significant advantage in wealth holding and education over Muslims and those practicing traditional beliefs. Also, data from the current study shows that the sampled Muslims were not dissimilar from other employees in income or education or job seniority. This could be an area for further study.

The current study further identified the quantitative predictor variables that have a significant relationship with the size of the wealth of the sampled employees. Using correlation coefficient (r) tests, the significant determinants of the net wealth of employees in descending order are: current employment income ($r = 0.64$); employee age ($r = 0.43$); risk perception, denoted by the proportion of risky assets held ($r = 0.394$); inherited net wealth ($r = 0.37$); length of employment service in years ($r = 0.36$); savings rate ($r = 0.33$); and size of the nucleus family ($r = 0.214$). Thus, except for the variable 'size of nucleus family' which had a weak positive correlation, the other *six* predictor variables had a 'moderately weak' to 'moderately strong' positive correlation with net wealth. This suggests that the variables with moderate positive correlation can be regarded as the determinants of employees' net wealth.

The foregoing findings regarding the determinants of employees' portfolio sizes largely conform to literature on the subject matter. For instance, in a study on the role of age on personal wealth in the UK, Shorrocks (1975) found that an investor's age is the most important determinant of the person's net wealth. Supporting findings on the importance of age are also reported by Bodie and Crane (1997) in their review of TIAA–CREF employees' records in the USA. The researchers reported a positive moderate correlation ($r=0.346$) between an employee's age and net wealth, which compares well with the correlation ($r=0.434$) that is found in the current study.

A widely-quoted USA study on the determinants of wealth is that by Mitchell and Moore (1997) who carried out comprehensive empirical tests on whether wealth is associated with

potentially explanatory factors. The researchers report that household wealth levels strongly increase with education and income. Corroborating evidence is also cited in UK by Banks and Smith (2000) who find that age, income and education have a positive relation with household wealth. Similar findings are also reported by Gibson and Scobie (2003) who explore the key factors that explain the differences in net non-human capital among households in New Zealand. They report that the most important determinants of net wealth are income, years of secondary schooling, number of children and inheritances. The finding of a moderately weak positive correlation between net wealth and income (r= 0.33) is much lower than the moderately strong positive correlation (r=0.64) in the current study possibly because the subjects for the current study comprised middle and upper income employees.

Some personal attributes were found to be neutral to net wealth. These were: gender, attitude to risk and the number of dependants above nucleus family.

5.4.4 Determinants of the composition of the wealth portfolios of salaried employees

The *third major finding* in this study was on the categorical and quantitative personal attributes that have a relationship with the composition of the wealth of the sampled employees. Based on the finding of a significant relationship, such variables would be regarded as significant determinants of the composition of the employee's wealth portfolios as measured by the percentage of risky assets to gross wealth. This finding satisfied the third objective of the current study.

The significant categorical determinants of the composition of the wealth of the sampled employees were: classification into either middle income or upper income earner; job seniority; level of education; place where one was born; environment for the first 15 years of one's life; industry type; marital status and risk preference. The minor determinants were 'whether an employee's motivation is to maximise investment returns', and 'attitude to risk'. Gender, religious affiliation and savings rates were neutral to wealth composition.

Further analysis revealed that employees with higher levels of employment income held more risky assets compared to the rest. The said analysis also showed that upper income employees have riskier portfolios than middle income earners. In addition, it was found that employees who hold riskier portfolios are those who were born or spent their early childhood outside Kenya. Other employee categories that were found to have riskier wealth portfolios included singles who were either widowed or separated or divorced as well as those who are senior in

their jobs, the highly educated and those who prefer to take higher risk while investing.

Results showing that employees with foreign backgrounds have riskier asset portfolios are consistent with observations from the study data that they had higher education and more incomes. From the sample data, the holding of riskier portfolios by single employees who are either widowed or separated or divorced, which appears unusual, could be explained by the observation that this group has higher wealth holding than the rest. This is line with other findings in this study that net wealth has a significant and moderately weak positive correlation (of r=0.39) with the composition of wealth portfolios.

However, the finding in this study that gender may not be a determinant of the composition of wealth is inconsistent with evidence from studies in the USA by Bajtelsmit & Bernasek (1996) and Ghokale et al. (1996). The two researches report that after age and income, gender is the third most significant determinant of investment style and hence net wealth and wealth composition. An explanation for the above inconsistency may be offered by Jianakoplos & Bernasek (1998) who found from their empirical study that when individuals have the same level of education irrespective of their knowledge of finance, women are no more risk averse than men. Consequently, the role of gender in influencing the investment decisions of salaried employees may be overshadowed by commonality in other attributes such as education, income levels, and job seniority.

Regarding quantitative attributes, the current study identified seven predictor variables for the wealth composition of the sampled employees. Correlation coefficient (r) tests showed and ranked the determinant quantitative variables as follows: employees' net wealth (r=0.394), current employment income (r = 0.307); age (r = 0.245); size of nucleus family (r = 0.243); inherited net wealth (r = 0. 236); length of employment service (r = 0.223); and number of dependants above nucleus family (r=0.136). These results show that except for employees' net wealth and employment income which have a moderate positive correlation, the other tested variables have a weak positive correlation with the riskiness of the wealth portfolios held by respective sampled employees. The finding that only two variables have moderate correlation to the riskiness of the wealth portfolios of sampled employees suggests that the tested determinants do not have a strong relationship with the composition of the wealth portfolios of sampled employees. It was noted that employees' savings rate have no relationship with the composition of their wealth portfolios.

Specific evidence on the determinants of the composition of wealth is provided by a number of studies. In their USA study on the link between risk aversion and wealth holding, McInish, Ramaswami and Srivastava (1993) find that people with higher incomes take more risks as depicted by the ratio of risky assets to their total wealth, and that higher holdings of risky assets are associated with high wealth size. The researchers also report that risk tolerant investors tend to have more wealth. Further evidence is provided by Ucello (2000) who examines the asset allocation behaviour by investor characteristics and spousal actions based on 410(k) data in the USA and finds that employees with higher job security and longer service have higher proportions of shares in their portfolios. Also, Borsch-Supan and Eymann (2000), in their study of the investment habits of German households, report that investors' willingness to hold risky assets increases with household age, education and financial knowledge. Related findings are provided by Arrondel and Mason (2002) whose study of the portfolio choice of French households shows that the significant determinants of the composition of wealth portfolios are wealth size, age and education.

The role of culture in determining the size and composition of wealth portfolios is reported by Badu et al. (1999) who found that black households in the USA have lower mean assets and liabilities compared to white households. Related findings showing a role for culture in influencing wealth holdings are also reported by Keister (2005) in the USA, that conservative Christians are asset poorer than liberal Catholics and Jewish people. Similarly, Heaton, James and Oheneba-Sakyi (2007) find that Christians had significant advantage in wealth holding and education over Muslims and those practicing traditional beliefs in Ghana.

5.4.5 Development of explanatory models for the wealth portfolios of salaried employees

To achieve the fifth objective of this study, multiple regression and multiple discriminant analyses were used to develop mathematical models for predicting the net wealth and wealth category for employees, respectively. The seven significant determinant variables of net wealth (subsection 5.4.3 above) were the independent variables. Also, factor analysis was applied on all the 21 potentially explanatory variables for the wealth portfolios of employees to analyse and condense them into a smaller set of components that offer a simpler representation for the composite model of studying personal wealth portfolios.

The *fifth major finding* in this study was that the net wealth of salaried middle and upper income employees can be predicted using the significant quantitative variables. *Firstly,* the wealth size can be predicted using multiple regression where the coefficient of determination

R^2=0.51, shows that the model has a moderate predictive power of employees' net wealth holding (Subsection 5.2.5.1 above). The resulting model is shown below.

$$W = -2{,}798{,}407.33 + 34.81X_1 + 47{,}574.76X_2 + 22{,}126.04X_3 + 0.72X_4 + 34{,}183.21X_5 + 24{,}674.45X_6 - 139{,}833.51X_7$$

where W is the predicted net wealth of an employee in Shs, X_1 is the monthly employment income in Shs, X_2 is the employee's age in years, X_3 is the risky assets as a proportion of gross wealth, X_4 is the value of inherited net wealth, X_5 is the length of employment service in years, X_6 is the percentage of employment income saved, and X_7 is the size of the employee's nucleus family.

Since the model does not explain about 49% of the variability in an employee's wealth, the implication is that categorical determinants of employees' net wealth holdings have an important role to play when making point estimates of an employee's net wealth.

Secondly, the wealth level category for a salaried employee can be predicted. As shown in Subsection 5.2.5.2 above, the study establishes that two functions can be used to profile and group employees into 'above average wealth holders', 'average wealth holders' or 'below average wealth holders'. The functions for the multiple discriminant analysis are as follows:

Function 1 :

$$Y_1 = -3.365 + 0.046X_1 + 0.026X_2 + 0.025X_3 + 0.006X_4 - 0.073X_5$$

Function 2 :

$$Y_2 = -3.013 + 0.094X_1 - 0.005X_2 + 0.039X_3 - 0.022X_4 + 0.195X_5$$

where Y_1 and Y_2 is the predicted wealth category, X_1 is the employee's age in years, X_2 is the employee's risky assets as a percent of gross wealth, X_3 is the employee's rate of savings on employment income, X_4 is the length of employment service in years, and X_5 is the size of the employee's nucleus family. These five personal attributes emerge as the predictors of the wealth category in which a salaried middle and upper income employee is likely to fit in. The model has a moderate predictive power in profiling employees because overall, 60% of original grouped cases are correctly classified, while 58% of cross-validated grouped cases are correctly classified; Table 5.26 refers. These moderate scores call for the inclusion of categorical predictor variables in profiling salaried employees' wealth holding categories.

Thirdly, the factor analysis in Section 5.3 helps to rationalise the results on the determinants of wealth portfolios and the outcomes of the wealth modeling process. The analysis yielded six factors which are explained below in descending order of importance.

The most important variables are grouped under factor 1, which emerges to be 'earning capacity'. The variables in this factor are related to an employee's earnings which in turn inform savings and ability to invest for wealth creation. These variables are: monthly employment income; income category of an employee (whether middle income or upper income); education level; and job seniority. Factor 2 is 'lifecycle' and consists of size of nucleus family, marital status, age and length of employment service. These variables reflect an employee's stage in life. 'Investment objective' is the third factor. The factor depicts whether an employee's choice of investment is driven by a desire to maximise earnings and the extent to which the person relies on loans to finance investments. The fourth factor captures the role of the environment and is labeled 'cultural background'. It comprises the place of birth and where one spent their childhood years. Employees' 'risk–taking behaviour' is the fifth factor and is represented by their attitude to risk and risk preference. Finally, factor 6 is identified as 'savings' whose variables comprise the industry the respondent is employed in, gender, and the savings rate on employment income.

The factor-grouping provides a simpler and easier conceptual framework to model and study the wealth portfolios of salaried employees. From this analysis, the factors underpinning the LCH framework emerge as the most prominent, that is, factor 1, 2 and 6; which stand for 'earning capacity'; 'lifecycle'; and 'savings', respectively. The next conceptual framework that follows in prominence is modern portfolio theory as represented by factor 3 and 5, to represent 'investment objective' and 'risk taking behaviour', respectively. Lastly, the study establishes a minor role for sociological factors where the 'cultural background' is depicted by the place of an employee's origin in factor 4. All the six factors enumerated above account for 59.4% of the variances. Whereas the factors relating to the LCH framework account for the largest share of the sample variance at 33.7%, factors relating to the MPT and SA account for 17.2% and 8.5% of the variance, respectively. The results suggest that the composite model of studying personal wealth portfolios offers a sound conceptual model which is likely to be superior to stand-alone frameworks of the LCH or the MPT or the SA.

CHAPTER SIX

SUMMARY, IMPLICATIONS AND CONCLUSIONS

6.1 Introduction

This Chapter summarises the major findings of the study and discusses the implication to theory, practice and policy. Recommendations that highlight suggested improvements are proposed. The Chapter also discusses the limitations and delimitations of the study and closes with suggestions for further research to fill up knowledge gaps that emerge in this study.

6.2 Discussion of Major Findings of the Study

The study establishes that the wealth portfolios of salaried middle and upper income employees in Kenya are low, heterogeneous and simple. They comprise mainly cash and a few assets. Also, the wealth portfolios and shareholdings are under-diversified using the naïve diversification framework. According to Table 4.25, the highest ownership rate was for cash at 100%, followed by cooperative shares at 54%, while pension scheme assets and life assurance policies were third at 46%. Assets which accounted for the largest proportions in value were cash and property, with mean proportions of individuals' holdings of 57% and 36%, respectively. These under-diversified portfolios with mean asset types held of 3 were despite the fact that 87% of the respondents indicated that their investments decisions were motivated by the desire to maximise returns, with a large number stating that they rely on professional advice when making investment decisions.

The tests also show that the mean computed replacement rate that measures the adequacy of wealth holding at retirement is 43%, which was significantly lower than the recommended 70% minimum (of pre-retirement employment income). This implies employees who are about to retire are likely to have inadequate earnings from their wealth portfolios to support their usual standards of living thereafter. These results were corroborated by findings on the views of all the respondents which showed that their mean target replacement rate was 33%.

The *third major finding* relates to the personal attributes that have a significant relationship with the absolute monetary sizes of the wealth portfolios of the sampled employees. The findings that are in accord with expectations from literature reviewed showed that that the key quantitative determinants of the size of wealth portfolios are employment income, employee age, proportion of risky assets held, inherited wealth, savings rate, and length of

employment service. The categorical personal attributes with the greatest differentiating power of employees by net wealth were: income classification, job seniority, background, and education. Other significant but minor determinants of net wealth were: size of the nucleus family, industry, marital status, risk preference, religion, and wealth maximisation intension. Personal attributes that were found to have no relationship with net wealth size were: gender, willingness to take risks, and number of dependants above nucleus family.

The *fourth major finding* was with respect to the personal attributes that are significant determinants of the composition of employees' wealth portfolios as measured by the proportion of risky assets in wealth. The major quantitative determinant variables were: net wealth size, and employment income. Other significant but minor determinants were: age, the size of nucleus family, inherited wealth, length of employment service and the number of dependants above the nucleus family. Categorical variables that were found to have a relationship with wealth composition were: income classification, job seniority, level of education, one's background, industry type, marital status, risk preference, and wealth maximisation intension. Personal attributes that were found to have no relationship with wealth composition were: gender, savings rate and religious affiliation.

The *fifth major finding* was the formulation of models to predict the absolute sizes of the wealth portfolios of salaried employees, and to classify employees according to their wealth holdings. Using the significant quantitative determinants of net wealth, the first model applies multiple regression analysis to provide a point estimate of an employee's monetary wealth holdings, while the second uses multiple discriminant analysis to classify an employee according into a wealth level. These models are shown in Figures 6.1 and 6.2 below.

Figure 6.1: Multiple Regression Prediction Model for Employees' Net Wealth

$$W = -2{,}798{,}407.33 + 34.81X_1 + 47{,}574.76X_2 + 22{,}126.04X_3 + 0.72X_4 + 34{,}183.21X_5 + 24{,}674.45X_6 - 139{,}833.51X_7$$

where W is the predicted net wealth of an employee in Shs, X_1 is the monthly employment income in Shs, X_2 is the employee's age in years, X_3 is the risky assets as a proportion of gross wealth, X_4 is the value of inherited net wealth, X_5 is the length of employment service in years, X_6 is the percentage of employment income saved, and X_7 is the size of the employee's nucleus family.

Figure 6.2: Multiple Discriminant Analysis Model for Classifying Employees into Wealth Levels

Function 1 :

$Y_1 = -3.365+0.046X_1+0.026X_2+0.025X_3+0.006X_4-0.073X_5$

Function 2 :

$Y_2 = -3.013+0.094X_1-0.005X_2+0.039X_3-0.022X_4+0.195X_5$

where Y_1 and Y_2 is the predicted wealth category, X_1 is the employee's age in years, X_2 is the employee's risky assets as a per cent of gross wealth, X_3 is the employee's rate of savings on employment income, X_4 is the length of employment service in years, and X_5 is the size of the employee's nucleus family.

The foregoing five major findings adequately fulfill the objectives of the current study as spelt out in Section 1.6. Whilst the findings fully address the research gaps pertaining to the adequacy and determinants of the personal wealth portfolios of the sampled employees, the diversification issue was answered partially. Nevertheless, the results fully satisfy the research hypotheses articulated in Section 2.7.

6.3 Implications and Recommendations

The current study was motivated by the fact that personal wealth is a critical factor in improving people's standards of living. Literature surveyed shows that this notion is premised on the fact that wealth helps to even out consumption by insulating households against adverse events and is also a key enabler of consumption, especially during retirement. By providing financial security, wealth contributes to thriving communities and thereby fosters community economic development, with the result of positive behavioural outcomes that in turn improve the well–being of the holder and the wider community. However, recent deregulations, financial liberalisation and product innovations have made the investment process quite complicated on account of the wide array of choices and numerous products. The recent global financial crisis that saw many asset values reduced substantially attests to the challenges that investors face. The situation is not helped by the fact that studies show that wealth holding tends to be concentrated among the rich few and by regions. This is worsened by evidence that the most people tend to pay little attention to financial planning, save very little and invest inappropriately. Consequently, majority hold inadequate wealth, especially to cushion against shocks and finance their consumption needs in retirement.

Available information indicates that related empirical studies in Kenya, as outlined in Appendix 18, focus on assessing the level, determinants, distribution and alleviation of poverty rather than wealth and wealth creation. This preoccupation could have been informed by the wide availability of data from national poverty surveys, the policy orientation of the Poverty Reduction Strategy that was adopted from 1997, and more specifically, the national development blue print titled, *Kenya: Economic Programme for 2003–2007: Economic Recovery Strategy for Employment Creation and Poverty Reduction* (GoK, 2003b).

The fact that poverty is an antithesis of wealth suggests the need to reposition wellness studies away from poverty reduction to a positive orientation. This thinking is in line with the current development blue print, *Kenya Vision 2030,* whose overarching goal is 'a globally competitive and prosperous nation that will attain a middle income status by 2030 (GoK, 2008b)'. Cognisant of this framework, this study sought to ascertain the nature and determinants of the wealth portfolios of salaried middle and upper income employees in Kenya. To achieve this objective, secondary data was reviewed whilst, primary data from a cross-sectional survey of salaried middle and upper income employees in Kenya was collected, analysed and tested. The choice of the study subjects was informed by two main reasons: firstly, this group accounts for a large part of Kenya's GDP, which was estimated at one–third in 2008 (CBK, 2009), and secondly, as Kenya moves to middle income status, this cadre of employees is expected to increase substantially.

The finding that the wealth portfolios of sampled employees are under–diversified in terms of few assets held, are dominated by cash and that only 19 percent of the portfolios are in risky assets has several implications. This is more so given the paradox that most employees indicated to seek to maximise their earnings and that many consult professionals while investing. The challenge of under–diversified wealth portfolios assumes wider dimensions when it is noted that the number of assets held has a significant positive moderate correlation with net wealth ($r= 0.37$) and with the per cent of risky assets held ($r= 0.55$), while the proportion of risky assets held has a moderate positive correlation ($r= 0.49$) with net wealth.

Whilst these findings conform to empirical evidence from similar wealth studies, a need is established for further studies to examine the underlying reasons for under-diversification of employees' wealth portfolios and ascertain its costs. To fill this gap, the analysis could also include ascertaining how the level of diversification is influenced by personal attributes.

The noted positive relationship between the number of assets held on the one hand and both

the proportion of risky assets held and the net wealth, on the other, implies that by holding narrow under-diversified portfolios that are dominated by low-return cash, the sampled employees are missing out on high wealth holding. This may in turn contribute to inadequate wealth holdings and further dependency retired employees. A further implication is that the creation of wealth by middle class workers is challenged, thereby denying Kenya the opportunity to develop a strong and wealthy base of professional investors.

In order for salaried employees to address this problem and achieve higher wealth holdings it is recommended that they endeavour to widen their asset base and also include more risky assets in their portfolios. Also, investment advisors who most employees consult as they seek to maximise their returns when investing can help their clients to improve their wealth portfolios in the manner suggested above.

The challenge of poor diversification, narrow asset ownerships and high concentration of wealth portfolios in cash can be reduced by government's intervention through appropriate policies, programmes and incentives. Such measures should facilitate the availability of asset earnings data, reduce investment–related transaction costs and widen investment choices. Financial knowledge among employees should be improved to enable them practice good cash-flow management, carry out credit management, save and invest for wealth creation.

Given that salaried employees in Kenya were found to aim to maximise earnings, the level of diversification in their portfolios can be improved if the government provides or causes to be provided detailed, accurate and up to date information on asset yields preferably in electronic form. This information can be provided in the format of the USA Yearbook that publishes monthly return data for treasury bills and bonds, corporate bonds, stocks and inflation (Ibbotson & Associates, 2003). The challenge of asset scarcity can be addressed somewhat by the development of real estate indices and listed investment trusts.

Findings from the current study of low replacement rates among the employees imply that they are likely to have inadequate incomes to continue with their usual standards of living while in retirement. These findings are consistent with empirical evidence from various studies in the USA; implying that the conceptual approach of measuring wealth adequacy applies in a low-income developing country. However, there is need to determine whether the 70% recommended replacement rate suffices for developing countries where high dependency rates and substantial inflation present a substantial drain on personal resources.

The evidence of low computed and target replacement rates implies that employees may not be aware that they will end up with income streams which will not be sufficient for their consumption needs during retirement. These findings have ominous implications to the pension sector and government in general because they suggest that retired workers are likely to retrogress into poverty and swell the ranks of dependants. This calls for provision of suitable advice to salaried employees to enable them appreciate the role of wealth in funding their retirement and therefore structure their investment targets and wealth holdings accordingly. It is recommended that employers, pension sector institutions, trade unions, and relevant professional associations should design and implement appropriate programmes to encourage employees to engage in sound financial planning, with reasonable goals of achieving high replacement rates. Also, institutions of higher learning and the government should play a leading role in providing the necessary policy framework to achieve this goal.

The findings that personal attributes of salaried middle and upper income employees in Kenya are important determinants of the sizes and composition of their wealth portfolios has non-trivial implications to theory, practice and policy. These are discussed below.

Firstly, analysis of the determinants of the size and composition of the wealth portfolios of salaried employees provides support on the applicability of the three conceptual frameworks that are commonly used in personal wealth studies, namely the LCH, the MPT and SA. In this respect the study establishes that the determinants of the wealth portfolios feature the key variables for the above three frameworks of wealth portfolio studies. Thus, these three frameworks that are often used to study personal wealth are supported by the findings in this study. Also savings rate, which is commonly treated as an intervening variable in wealth studies, is found to be a significant determinant of wealth size. It is recommended that studies of personal wealth portfolios adopt an integrated approach with several conceptual frameworks that include savings rate as an independent variable.

Secondly, the determinants of the size and composition of the wealth portfolios of employees tend to overlap. This suggests that these two constructs of wealth are closely related as evidenced by findings of a moderately weak positive correlation between net wealth and risky assets ($r=0.394$). Indeed, out of all the quantitative independent variables examined in this study, net wealth has the highest correlation with wealth composition. This confirms the existence of a looping relationship between the size and composition of wealth and that the proportion of risky assets held by salaried employees is a key factor in understanding the size

of their wealth portfolios. The implication to theory is that studies on net wealth should incorporate wealth composition as a key independent variable and vise versa.

Thirdly, it is noted that the quantitative determinants of wealth portfolios that include employment income, age, risk perception, inherited wealth, size of nucleus family, number of dependants, and length of employment service, tend to have a higher correlation with net wealth than its composition. The exception is the size of nucleus family as shown in Appendix 19 and 20. With respect to theory, these findings suggest that the results can be applied with more ease to model and study the size of employees' wealth rather than its composition.

The foregoing discussions on the determinants of the personal wealth portfolios of salaried employees have two other implications. The first one is that such study can be carried out using scientific methods in a developing country such as Kenya, just as is done in developed countries. The government can promote this process by commissioning wealth surveys, availing the data and publishing the results. Also, academicians and researchers should target personal wealth portfolios in their research endeavours. Secondly, practitioners and policymakers can use the information regarding the identified wealth determinants to enhance the wealth portfolios of salaried employees. Employees can improve their net wealth by targeting the wealth determinants that are within their control such as striving for higher employment income, savings more and investing in risky assets. The government can assist through targeted policy to influence desired outcomes on the size and composition of the wealth portfolios of this important cadre of citizenry. Such interventions include facilitations for further education and skills development of employees to enhance their earning capacity and provision of incentives for higher savings.

The point estimate and class prediction models for wealth holdings that were developed in this study signify an attempt to extend the frontiers of knowledge in this field of study. Such models can be used by academicians, researchers, practitioners and policymakers to address employees' wealth portfolios. These models can be used to provide inputs into and inform the conceptual frameworks on wealth studies. Also, the models provide employees and professional advisors with functional mathematical tools that can be employed to enhance and test the quality of investments made. It is also recommended that government encourages investment advisers and employees to use such objective and evidence-based tools to improve the standards of investment practice and help investors achieve enhanced wealth.

The results of the data reduction where 21 hypothesised independent variables in the current study were reduced to six factors have an important inference for theory. These findings show that in a descending order, the most important personal attributes in wealth portfolio studies are associated with life-cycle factors, followed by modern portfolio theory, and lastly, sociological factors. These results imply a conceptual supremacy of LCH and a low significance of sociological factors. However, the results also suggest that personal efforts to enhance wealth portfolios may not achieve desired results easily because life cycle factors and culture are usually not within a person's control.

Firstly, it is noted that the Government currently defines middle income employees as those earning between Shs 23,671 and Shs 120,000 per month, while upper income employees are those earning in excess of Shs 120,000 per month. However, this study yields a mean monthly employment income of Shs 52,900 for employees earning in excess of Shs 28,000 per month. Related data from KNBS in GoK (2009a) shows that in 2008, this group accounted for 53% of the country's formal sector employment earnings. Unfortunately, KNBS does not provide sufficient income details since the highest income earners are lumped together as 'greater than Shs 30,000 per month'. The findings from this study that middle and upper income employees hold significantly different wealth portfolios and that an employee's income group is a significant predictor of net wealth, suggest the need to report middle income employees separately from upper income earners. It is therefore recommended that the class intervals be widened and the income categories be increased to provide improved statistics on the earnings of middle income and upper income employees in Kenya.

The second incidental recommendation is for the government to carry out periodic panel wealth surveys and avail the data and reports in electronic form for use by investors, wealth researchers, investment advisors and the general public. Wide availability of this information would provide increased knowledge on personal wealth holdings in the market place and therefore help simplify the processes.

The findings enumerated in Section 6.2 and the implications and recommendations outlined above indicate that the study has made a net contribution to knowledge in various ways. The quantified results on the under-diversification and inadequacy of the wealth portfolios of the sampled employees underscores the magnitude of the problem and provides critical information that can be used to enhance the employee's welfare. The study has also provided new information on the relative importance of the personal attributes that influence wealth

portfolios. When combined with the prediction models of the levels and point estimates of net wealth, this finding makes the planning of personal wealth a more objective and scientific process.

6.4 Limitations and Delimitations of the Study

Whereas this research yielded encouraging results which are to a large extent consistent with expectations from theoretical literature, evidence from empirical literature and the environment in Kenya, some limitations were faced. It is, however, important to clarify that these limitations did not in any way compromise or interfere with the outcomes of the study.

Firstly, the study experienced time and resource limitations. In the absence of a complete sampling frame of the target population, a known population variance and documented population distribution form, the researcher estimated the required sample size to be 1,067 employees. A number of the sampled employees did not feel free to give personal information and therefore did not complete the questionnaires. Nonetheless, the 75.4% response rate that was achieved is regarded to be adequate for the purposes of this study.

At a conceptual level, a second limitation emanates from the nature of the subject of the study. In a social study like this, the candidate variables are a mixture of the reference person and the household. Whereas some independent variables such as gender, age, attitude to risk, education, employment income, occupation and background are person-specific, others such as family type are measured at household level. It may also be argued that household size as well as the number of children and dependants relate both to the reference person and the household. This study was not designed to examine the interaction effect and interplay between the fundamental constructs of the individual and household.

Thirdly, the study applied a composite asset earnings rate of 11.9% per annum to estimate the potential monthly earnings of the wealth portfolios of employees who are about to retire. This was done to compute a plausible replacement rate and was necessitated by the lack of objective data on asset returns in Kenya. However, an affirmation that this estimation is defendable is provided by the observation that the computed replacement rates of the sampled employees were not significantly different from their target replacement rates.

Fourthly, literature on comparable studies on personal wealth portfolios in Kenya was not available. This would have provided benchmark data for comparison with the study findings.

This is not withstanding government efforts to fill the information gap by enlisting financial and technical support from the World Bank, GTZ and UNDP, to carry out periodic surveys of employment, inflation, household incomes and expenditures in Kenya as shown in Appendix 18. These surveys were, however, not targeted at employee wealth as shown by the accompanying reports (GoK, 1996, 1998, 2000, 2002, 2007a & 2007b), which discuss the nature, distribution and levels of poverty. Moreover, Rweria (2005) points out that the wealth declaration forms that all public servants completed in 2003 showing their incomes, assets and liabilities, are not useful because the focus of the exercise was on corruption and the results have neither been analysed nor released to the public.

Finally, the sampled employees indicated that they have other stores of wealth in addition to the seven principal assets that were used to depict wealth in this study. These other stores of wealth include own business, farm animals and crops, farmland and town plots, motor vehicles, and foreign investments. In a developing country such as Kenya, these other stores of wealth are relevant constructs in a wealth portfolio study because they provide useful cushions against external shocks, especially noting the challenge of asset scarcity. This study did not consider the role that such stores of wealth play in influencing the wealth portfolios of salaried middle and upper income employees in Kenya. This was a delimitation for this study.

6.5 Suggestions for Further Study

Five issues can be followed up in further studies as outlined below. Suggestions one and two below would help to fill the research gap on diversification that was not fully satisfied by the current study.

Firstly, future research could focus on the role of investment advisors on people's saving and investment decisions and hence the composition and size of the wealth portfolios of employees. Such research is recommended on the basis that the current study shows that 87% of the sampled employees indicated that they consult investment advisors and many desire to maximise returns. Therefore, it is paradoxical that almost all the sampled employees were found to hold narrow and under-diversified wealth portfolios. Moreover, it is expected that investment advisors may in future play a bigger role in personal financial decisions in view of the increasing complexity of the investment process and the need to assist investors to avoid risky exposures while preserving and growing their investment.

A second subject of study is to examine the impact of different environmental conditions on

the risk preference and risk perception of employees. This is premised on the fact that this study has established that risk–taking behaviour has a significant relationship with both the composition and the size of wealth holdings of sampled employees.

A study can also be carried out to examine the investment styles, wealth portfolios and debt burden of workers and employers in the informal sector. A justification for such a study is that the informal sector accounts for 68% of total employment, and 19% of the GDP in Kenya according to GoK (2009b). Such a study would be useful in understanding the nature and size of the wealth portfolios of a large section of the Kenyan society. This would be in contrast to many surveys and studies in the past that have targeted poverty in this group.

Fourthly, further studies should examine the interplay between person-specific attributes and the household-level characteristics. Such a study can interrogate and isolate the interaction effects of person-specific attributes such as gender, age, attitudes to risk, education, employment income, occupation, and cultural background on the one hand, and household level variables such as household size, the number of children, and the number of dependants on the other. This inquiry would provide a better understanding of the impact that each of these variables has on the composition and size of personal wealth portfolios.

Finally, the current study reveals that both the composition of gross wealth and net wealth holdings are highly heterogeneous. Premised on the notion that higher holdings of net wealth are desirable, and on the findings in this study that larger proportions of risky assets in the wealth portfolio are associated with more net wealth holding, a further study could examine the determinants of the variability of wealth portfolios in order to ascertain what informs extremes. Such a study can also examine the earning structure of different asset types in Kenya to determine the consequences of holding very risky wealth portfolios; a phenomenon which this study has shown to be closely associated with high net wealth holding.

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Appendix 1: Characteristics of Households and Individual

		HOUSEHOLD	INDIVIDUAL
1	Definition	All persons who share a residential place, domestic resources and productive tasks to pursue the same goals.	One person
2	Composition	Can be an individual or related family members or unrelated family members. The composition and structure varies both between and within a society as over time.	One person, therefore no definitional challenges.
3	Resources	Resources are pooled together by the members.	Resources are not pooled together since they are person-specific
4	Scale of activities	Economies of scale are possible in household services	Single investment activities
5	Insurance on incomes	Pooling provides insurance in the face of individual income risks	Individual's income risk is not shared
6	Gender specialization	Invokes gender specialization issues where men are regarded as the jural and productive centers while women are emotional and reproductive centers	No gender specialization. Enables further analysis of impact of gender differences
7	Underlying models for decision making and preferences	The traditional and neoclassical model treats married couple as a single decision-making agent with unitary preferences where either the members of the family have identical preferences or the household head imposes his preferences to the other members. The collective and non-unitary model recognizes negotiations, bargaining and conflict in the allocation of household resources there by allowing for investigation of distribution within the household where there could be gender inequality	No assumptions about decision making and preferences and therefore avoids the complications associated with households.
8	Policy/Program targeting	They are intermediate between policy/programs and the target individual	Individual is the target of policies and programs
9	Aggregation	They are aggregates and can mask intra-household differences in resources and income	Disaggregated level and specific

Appendix 2: A Comparison between Developed and Low Income Developing Countries

	DEVELOPED COUNTRIES	LOW INCOME DEVELOPING COUNTRIES
Examples	U.S.A, Japan, Western Europe, Canada, Australia, New Zealand	Kenya, Ethiopia, Ghana, Nigeria, Bangladesh etc
Material Well being	High per capita income hence high material well being and wealth holding	Low per capita income hence low material well being and wealth holding, thus widespread poverty Per 2007 Word Bank GNI (Gross National Income) per capita for low income countries was Usd 935 and below.
Institutional and legal Infrastructure	Modern and functional physical and institutional structures that are stable and predictable	Relatively outdated and inappropriate physical and institutional structures that are inadequate and unreliable
Social	Low age dependence rate due to: • Inverted pyramid population structure • Small size of households • Low unemployment rate • High literacy level	High age dependence rate due to: • Pyramid population structure • Large size of households • High unemployment • Low literacy level
Informatics	Highly developed markets for goods, services and capital with automated information systems	Imperfect markets and incomplete information usually based on manual processes.
Technological	High levels of productivity with specialized exploitation of resources Economy relies on service and manufacturing industries	Low levels of productivity and dependence on primary production especially agriculture and extractive industries.
Political	Mature and stable political systems with established democratic processes.	Weak political systems with young democracy that is highly vulnerable.

(Note: Developed/Developing classification is by IMF while the income-based classification is by World Bank)

Radar Screen
Digital roadside billboards pose threat to drivers
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Ideas & Debate
Kenyans need to be fully involved in nation building
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Life
An object of desire for car enthusiasts
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BUSINESS DAILY

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Row rages as Kemu sacks 6 top managers

BY MWAURA KIMANI

Six senior managers at the Kenya Methodist University have been sent packing, deepening the management crisis that began two weeks ago with the ouster of vice chancellor Mutuma Mugambi.

It was not clear whether their removal was temporary or permanent, but sources within the university's council told *Business Daily* that more changes were on the cards and would affect at least 10 senior staff.

The shake-up is linked to a determination by the new administrator, Prof Alfred Mutema, to clear the executive suites of Prof Mugambi's associates.

The list of top managers who have been asked to leave include the associate principal, Jane Kimemia Mugambi, ICT and Strategy director Hudson Aluvanze, and the dean of students, Japheth Githaiga. Others are Alfred Muchai, the director of the Mombasa campus and Ms Mukami Njoroge, the administrative registrar.

"This is to inform you that following the appointment of the acting VC, it has been found necessary to make changes in various departments for purposes of improving service delivery both on the academic and administrative fronts," reads one of the letters signed by Prof Mutema. "Please make arrangements to hand over immediately and report to the deputy VC (finance and administration) for further instructions."

Two weeks ago, the Kenya Methodist University found itself on the horns of dilemma when the chair of the board reversed Prof Mugambi's order of immediate closure of the college, citing inability to access the offices and lecture rooms.

It was thought that Prof Mugambi's exit would bring the management feud to an end, but the latest sackings indicate that many more heads are likely to roll before the dust settles at the church-sponsored college.

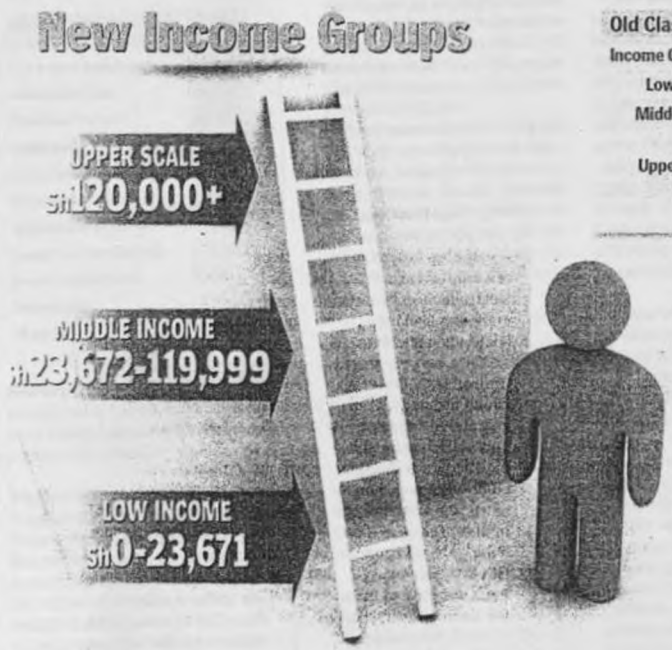
Educationists have warned that the ongoing tussles at the institution could hurt learning for the 8,000 students.

The university's troubles have been linked to VARSITY, Page 5»

ECONOMY | BY GEOFFREY IRUNGU

New income bands spark wage rate war

Controversy ensues after the Kenya National Bureau of Statistics releases fresh data that raised the low-income threshold to Sh23,000



Old Classification

Income Group	Shillings
Low	0 to 10,000
Middle	10,001 to 40,000
Upper	More than 40,000

SOURCE: KNBS

WAGES

- The low-income band – which earns Sh23,671 a month and below – has been bearing the heaviest inflation estimated at 6.2 per cent against 2.9 per cent for the middle-income and 5.6 per cent for the top earners.
- Economists said the revised figures should help employers set realistic minimum living wages for purposes of keeping workers comfortable and the labour market calm.

Inequality in EAC countries
*Measure of inequality (Richest versus Poorest)

Country	Measure
Kenya	21
Rwanda	18
Uganda	13
Tanzania	9
Burundi	7

* High measure indicates high inequality

Source: UNDP Human Development Report 2009

At least 72 per cent of Kenyans belong to the bottom band of the income bracket, official data that the government released yesterday shows, sparking anxiety over its implications in the labour market.

Data from the Kenya National Bureau of Statistics showed that the upper limit of the low income band has been revised from Sh10,000 per month to Sh23,671 per month sparking anger among trade unionists and causing alarm among employers. A senior official at the Central Organisation of Trade Unions (Cotu), who declined to be named because the union had not deliberated on the matter, described the move as amounting to recognition by the government that under the current prices, workers needed much higher incomes to meet their obligations and justifies demands for higher pay.

But employers warned that any agitation for higher pay in a fragile business environment that is only beginning to INCOME, Page 4»

BRIEFING

European demand boosts tea exports
An upsurge in purchases by consumers in Europe, north America and the middle East seeking to build up their beverage stocks over winter helped grow Kenya's tea exports over January with prices of the commodity also improving on demand.
Page 6»

Kenya set to become key grapes grower
Kenya is set to emerge as a major grapes growing country after researchers unveiled a new chemical to improve temperatures for its farming.
Page 7»

Euro zone services sector in slow growth
Euro zone's services sector expanded more slowly in February than previously expected as the divergence among the big four economies in the 16-member euro area persisted, a survey showed yesterday.
Page 20»

Manufacturing lifts business confidence
South Africa's business confidence index rose in February, lifted by higher manufacturing output and evidence that an economic recovery that started in the third quarter had gathered speed. Page 21»

NEWS IN DEPTH

Why EU is in dilemma over payment of funds for regional development
Pages 12-13»

Top News

New inflation basket captures changes in household spending

BY WASHINGTON GIKUNJU

About 10 years ago, the average Kenyan household set aside slightly over half of its total monthly income for buying food. But according to the Kenya National Bureau of Statistics (KNBS) — which collects data and tracks changes in people's spending patterns — the proportion of expenditure on food items has over the years fallen to just over one third (36.04 per cent) of monthly household budgets.

This is however just one of many changes captured in the new "inflation basket" officially released yesterday by the statistics bureau. The inflation basket is a select list of commonly used goods and services in Kenyan households that is used to compute a "consumer price index" (CPI) whose periodical changes indicate the rate of inflation in the economy.

"It also reflects social and economic trends and expenditure patterns in the economy," said KNBS director general Anthony Kilele at the launch of the new basket. Following more than 10 years of use of the older inflation basket that was developed from a household expenditure survey conducted in the mid 1990s, the bureau has now revised the list of goods and services in the basket in the hope of capturing more accurately how most Kenyans are allocating their earnings.

The technological revolution that the world has experienced in the last two decades has influenced the way of life for millions of Kenyans, and expenditure on mobile phone airtime is now a key item in many people's budgets as are internet costs, prices of cellular handsets and computers. Increased awareness on healthy eating has seen foods such as arrow roots, wimbi flour, black grams (njahi), capsicum (pilipili hoho) and mineral water claim a bigger portion of families' daily menus. Urbanisation has, on the other hand, raised the proportion of household incomes spent on parking charges and bodaboda fares while more people are now taking medical laboratory tests and optician services. All these are new items that economists at the bureau of statistics will use to measure inflation in Kenya until another household budget survey is done, typically after five to 10 years. Adoption of this new basket saw the inflation rate for the month of February rise to 5.7 per cent from 4.7 per cent reported in January. This is the first time that the bureau is using the new basket. Late last year the bureau switched to a new "geometric mean" formula of calculating inflation rates, but retained the old inflation basket. The move saw the rate of inflation drop to 6.6 per cent in October from 17.9 per cent in November. The bureau said the switch in methodology of computing inflation data was necessary as the old formula tended to "exaggerate" the overall inflation figure by a factor of two and had an upward bias in times of price volatility particularly of the food segment of the index.

The statistics bureau gives weight to different expenditure items based on their proportion in the consumption basket.

BROAD ITEMS GROUP	NEW BASKET
Food and non-alcoholic beverages	36.04
Alcohol, tobacco and narcotics	2.06
Clothing and footwear	7.43
Housing, water, electricity, gas, other fuels	18.30
Household goods and services	6.16
Health	3.13
Transport and communication	8.66
Communication	3.82
Recreation and culture	2.25
Education	3.14
Restaurant and Hotels	4.48
Miscellaneous goods and services	4.52
All groups	100

BROAD ITEMS GROUP	OLD BASKET
Food and non-alcoholic drinks	50.50
Alcohol and tobacco	2.97
Clothing and footwear	9.00
Housing costs	11.74
Fuel and power	4.18
Household goods and services	5.82
Medical goods and services	1.59
Transport and communication	5.75
Recreation and education	6.02
Personal goods	2.45
All groups	100

Triggered rally

Surging food prices triggered a rally in the rate of inflation to a peak of 31.5 per cent in May 2008, prompting government bureaucrats to pile pressure on the bureau of statistics to reduce the weighting of food prices on the overall inflation index. Food will now count for only 36.04 per cent of the inflation basket. Mr Kilele said expenditure surveys by the bureau had shown housing, water, electricity, gas and fuel now account for almost a fifth (18.3 per cent) of household budgets. Changes in cost of transport (8.7 per cent), clothing and footwear (7.4 per cent), furnishings and other household equipment (6.2 per cent) will also have significant bearing on the overall rate of inflation. Kenyans are also spending significantly more money in restaurants and hotels and on miscellaneous goods and services which have been added as new categories to the inflation basket.

Workers at a plant. KNBS said headline inflation stood at 5.2 per cent in February further eroding the purchasing power of the low-income group. FILE

Income bands now spark minimum wage debate

»From Page1

improve could cause turbulence in the labour market and slow down the pace of economic recovery. Under the new classification that KNBS unveiled yesterday, all Kenyans earning between Sh23,672 and Sh119,999 belong to the middle income band and account for 24 per cent of the population while the top earners take home more than Sh120,000.

Some economists argued that with only 3.7 per cent of the population classified as belonging to the top income group, Kenya's income inequality appears to be deepening with the recent economic growth and called for strong redistribution mechanisms to shield the country from future social upheavals.

Though revision of the cost of living measures has been on the cards since the government conducted the last household income survey in 2006, their inclusion in official data sparked controversy in the labour market.

Some trade unionists promised to mount pressure on Treasury to increase the minimum taxable amount in its June 2010 budget to conform to the State-sponsored application of the survey results.

"Income tax for individuals has not been reviewed since 2005 and yet inflation has been rising. Now that the figures for income levels have been revised, we need to see also the taxable income levels revised upwards," said Ms Shaban Osman Vayani, a tax adviser at HLB Ashvir, an audit, tax and consulting firm.

Ms Vayani reckoned that there was need to widen the brackets so that individuals do not reach the top tax band of 30 per cent at low-income levels.

Currently, taxpayers reach the top tax band with a salary of Sh38,893 a month. The figure has not been revised in the past five years.

Similar pressure is expected to apply on the State in the area of minimum wage setting. Kenya taxes any incomes above Sh12,196, a threshold that was last reviewed in 2005. Since then, inflation rose by an average of 10 percentage points annually until it fell last October with the launch of a new method of computation.

The low-income band – which earns Sh23,671 a month and below – has been bearing the most heaviest inflation estimated at 6.2 per cent against 2.9 per cent for the middle-income and 5.6 per cent for the top earners. KNBS said headline inflation stood at 5.2 per cent in February further eroding the purchasing power of the low-income group. "Consumption patterns have changed over time and we now have a new basket of goods and services," said Mr Antony Kilele, who released the new inflation figures.

Causing upheaval

KNBS had initially concluded that the disparity in well-being across provinces and districts was an important policy instrument that can be used to formulate targeted interventions.

But recent attempts to effect affirmative action such as maize subsidies have been captured by forces of corruption causing upheaval in the political arena. The 2006 household budget survey found that the worst incidences of poverty are in North-Eastern and Coast provinces. Last year, a UNDP survey found that Kenya is the most unequal country in eastern Africa compared to neighbouring Rwanda, Uganda, Tanzania and Burundi.

KNBS has also reconstituted the consumer price index (CPI) - a select basket of goods and services used to track price movements – to include new items such as mobile phone airtime and *boda boda* fares.

The move has reduced the importance of household spending on food, setting the stage for reduced volatility in the pricing of goods and services in the economy.

Food now accounts for only 36.04 per cent of the CPI, down from 50.2 per cent in the old basket.

Economists said the revised figures should help employers set realistic minimum living wages for purposes of keeping workers comfortable and the labour market calm.

It is, for instance, expected that clear knowledge of staff numbers in terms of lower, middle and upper income strata, should help employers determine the possible annual wage bill. The new figures are expected to be particularly controversial in the public service and some private firms where some senior managers are paid lower wages. Last year, Pricewaterhouse-Coopers found that the management positions recording the lowest average cost of employment (CoE) is that of the Purchasing Officer in the Manufacturing and Processing sector, at a total cost of employment of Sh13,203.

In the 2007 survey, the lowest paid management position was an Assistant Accountant in the professional services sector, costing Sh10,000 per month.

Under the new classification for purposes of calculating inflation, those earning between Sh23,672 and Sh119,999 a month will be considered as middle income earners and those earning Sh120,000 a month are in the top category of high-income earners.

Whether these figures will actually lead to changes in wages in an environment where overall inflation appears to have dropped significantly remains to be seen.

Jacob Omolo, a research fellow at the Institute of Policy Analysis and Research (IPAR), said several factors will have to be considered before a wage increase based on new classification is made. The guidelines further indicate that inflation need not be the only criteria for raising wages, but the ability to pay must also be considered.

The Chairman of Federation of Kenya Employers, Mr Patrick Obath, however said the categorisation would not really impact on the private sector because companies had their own way of structuring staff and management.

Appendix 4: Summary of Results of Hypothesis Testing

Hypothesis Number, Statement and Sub-Hypotheses	Testing Procedure	Main Findings	Conclusion: Null Hypothesis Rejected ??
Research Hypothesis #(H_1) **The wealth portfolios of salaried middle and upper income employees in Kenya are diversified**			**Reject: The wealth portfolios of salaried middle and upper-income employees in Kenya are not diversified.**
$H_{1\text{-}1}$ Salaried middle and upper income employees hold equal proportions of all the seven principal types of assets: (i) cash, (ii) cooperative shares, (iii) pension scheme benefits and life assurance policies, (iv) treasury bills and bonds, (v) corporate bonds, (vii) shares in listed companies and (viii) property.	Two tailed one sample t-test for the mean proportions of the values of the asset types held **Test value= 0.143**	All p-values =.000	**Reject:** Hence, employees do not hold all the seven asset types in equal proportions and therefore their wealth portfolios do not achieve naïve diversification.
$H_{1\text{-}2}$ The equity portfolios of salaried middle and upper income employees comprise share holdings in more than 11 listed companies	Two tailed one sample t-test for the mean number of shares held. **Test value= 11**	p-value=.000	**Reject:** Hence, the equity portfolios of salaried and middle income employees doe not achieve naïve diversification
Research Hypothesis #(H_2) **The estimated income that can be generated from the wealth portfolios of salaried middle and upper-income employees in Kenya is adequate for their consumption needs during retirement.**			**Reject:** **Conclude that the wealth portfolios of employees are inadequate.**
$H_{2\text{-}1}$ The estimated mean monthly earnings from the wealth portfolios of salaried employees who are about to retire exceeds 70 percent of their current mean monthly employment income.	One tailed one sample t-test of estimated monthly earnings from wealth against 70 percent of current monthly income	p-value=.000	**Reject:** Conclude that the estimated earnings from the wealth portfolios of employees who are about to retire are less than the recommended 70 percent of their employment income.
$H_{2\text{-}2}$ The mean targeted replacement rate for salaried employees who are about to retire exceeds the recommended minimum replacement rate of 70 percent.	One tailed one sample t-test of targeted replacement rate Test value =70%	p-value=.000	**Reject:** Conclude that the target replacement rates for employees who are about to retire are less than the recommended 70

			percent of their employment income
Research Hypothesis #(H_3) **The personal attributes of salaried middle and upper income salaried middle and upper income employees in Kenya have no significant relationship with the absolute sizes of their wealth portfolios**			**Reject:** **Conclude that the personal attributes of employees have a significant relationship with the absolute sizes of their wealth portfolios.**
$H_{3\text{-}1}$ The net wealth holding of SM&UI employees is independent of the industry in which one is employed.	ANOVA for equality of mean wealth among industries	p-value=.000	**Reject:** Conclude that there is a significant relationship between the net wealth holding of employees and the industry in which a person works
$H_{3\text{-}2}$ The net wealth holding of SM&UI employees is independent of their level of seniority in the job	ANOVA for equality of mean wealth among job levels	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has no significant relationship with the person's seniority in the job
$H_{3\text{-}3}$ The net wealth holding of SM&UI employees is independent of their education levels	ANOVA for equality of mean wealth for different education levels	p-value=.000	**Reject:** Conclude that there is a significant relationship between the net wealth holding of salaried employees and their education levels
$H_{3\text{-}4}$ The net wealth holding of SM&UI employees is independent of their marital status	ANOVA for equality of mean wealth among different marital groups	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has a significant relationship with the persons' marital status
$H_{3\text{-}5}$ Employees' attitude to risk has no significant relationship with their net wealth holdings	ANOVA for equality of mean wealth by risk attitude groups	p-value=.101	**Fail to Reject:** Conclude that the net wealth holding of salaried employees has no significant relationship with employees' attitude to risk
$H_{3\text{-}6}$ The risk preference of SM&UI has no significant	ANOVA for equality of	p-value=.001	**Reject:**

relationship with their net wealth holdings	mean wealth by risk preference groups		Conclude that there is no significant relationship between the net wealth holding of salaried employees and their risk preference
H_{3-7} The risk perception of SM&UI has no significant relationship with their net wealth holdings	ANOVA for equality of mean wealth by risk perception groups	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has a significant relationship with employees' risk perception
H_{3-8} The net wealth holding of SM&UI employees is independent of where they were born.	ANOVA for equality of mean wealth by place of birth	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has a significant relationship with where they were born
H_{3-9} The net wealth holding of SM&UI employees is independent of where one spent their childhood years(up to 15 years of age)	ANOVA for equality of mean wealth by place of childhood environment	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has a significant relationship with where one spent their childhood years, of up to 15 years
H_{3-10} There net wealth holding of SM&UI employees is independent of their religious affiliation.	ANOVA for equality of mean wealth by religious groups.	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has a significant relationship with a person's religious affiliation.
H_{3-11} The net wealth holding of SM&UI employees is independent of whether employee's investment decision is maximization of returns or not	ANOVA for equality of mean wealth by groups of "how investment decisions are made".	p-value=.000	**Reject:** Conclude that the net wealth holding of salaried employees has a significant relationship with whether the investment decisions are made to maximise returns.
H_{3-12} The net wealth holding of SM&UI male employees is not significantly different from that of females	One tailed t-test for equality of means for gender groups	p-value=.612	**Fail to Reject:** Conclude that there is no significant difference between the net wealth holding of employees and gender
H_{3-13} The net wealth holding of middle income employees is not significantly different from that of upper income	One tailed t-test for equality of means of employees by	p-value=.000	**Reject:** Conclude that there is a significant difference between the

employees.	income groups		wealth holding of middle income employees and upper income employees
$H_{3\text{-}14}$ *There is no significant relationship between the net wealth holding of SM&UI employees and their monthly income from employment*	Pearson Correlation Analysis between employment income and current wealth portfolio Pearson coefficient "r" and associated p-value	p-value=.000 r=0.64 (Moderate positive)	**Reject:** Conclude that there is a significant relationship between the net wealth holding of salaried employees and their monthly income from employment.
$H_{3\text{-}15}$ There is no significant relationship between the net wealth holding of SM&UI employees and the amount of inherited wealth.	Pearson Correlation Analysis between inherited wealth and current wealth portfolio. Pearson coefficient "r" and associated p-value	p-value=.000 r=0.368 (Moderate positive)	**Reject:** Conclude that there is a significant relationship between the net wealth holding of salaried employees and their inherited wealth.
$H_{3\text{-}16}$ There is no significant relationship between the net wealth holding of SM&UI employees and their ages	Pearson Correlation Analysis between age and value of current wealth portfolio. Pearson coefficient "r" and associated p-value	p-value=.000 r=.434 (Moderate positive)	**Reject:** Conclude that there is a significant relationship between age and the net wealth holding of middle and upper income employees.
$H_{3\text{-}17}$ There is no significant relationship between the net wealth holding of SM&UI and the length of their employment service	Pearson Correlation Analysis between size of employee's family unit and value of current wealth portfolio. Pearson coefficient "r" and associated p-value	p-value=.000 r=.356 (Moderate positive)	**Reject:** Conclude that the length of service has a significant relationship with the absolute wealth of middle and upper income employees.
$H_{3\text{-}18}$ There is no significant relationship between the size of the nucleus family unit and the net wealth holding of SM&UI employees	Pearson Correlation Analysis between size of nucleus family and value of current wealth portfolio. Pearson coefficient "r" and associated p-value	p-value=.000 r= .214 (weak positive)	**Reject:** Conclude that the size of nucleus family has significant relationship with the absolute wealth of middle and upper income employees.

$H_{3\text{-}19}$ *There is no significant relationship between the number of dependants above the nucleus family and the net wealth holding of SM&UI employees*	Pearson Correlation Analysis between number of dependants above nucleus family and value of current wealth portfolio. Pearson coefficient "r" and associated p-value	p-value=.161 r= .049 (Very weak positive)	**Fail to Reject:** Conclude that the number of dependants above the nucleus family has no significant relationship with the net wealth holding of middle and upper income employees.
$H_{3\text{-}20}$ There is no significant relationship between the proportion of risky assets held by SM&UI employees and their net wealth	Pearson Correlation Analysis between proportion of risky assets and value of current wealth. Pearson coefficient "r" and associated p-value	p-value=.000 r= .394 (Moderate positive)	**Reject:** Conclude that the proportion of risky assets held has a significant relationship with the net wealth holding of middle and upper income employees.
$H_{3\text{-}21}$ There is no significant relationship between net wealth holding of SM&UI and their saving rates.	Person Correlation Analysis employee saving rates and value of current wealth portfolio Pearson coefficient "r" and associated p-value	p-value=.000 r=0.327 (positive moderate correlation)	**Reject:** Conclude that the net wealth holdings of employees has a significant relationship with the percentage of employment income that they save.
Research Hypothesis #(H_4) **The personal attributes of salaried middle and upper income employees in Kenya have no significant relationship with the composition of their wealth portfolios**			**Reject: Conclude that the personal attributes of employees have a significant relationship with the composition of their wealth portfolios.**
$H_{4\text{-}1}$ The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of the industry in which one is employed.	ANOVA for equality of mean proportion of risky assets held among industries	p-value=.000	**Reject:** Conclude that there is a significant relationship between the proportion of risky assets held by salaried employees and the industry in which one is employed.
$H_{4\text{-}2}$ The proportion of risky assets (to the gross wealth) held	ANOVA for equality of	p-value=.000	**Reject:**

by SM&UI employees in Kenya is independent of the *person's job seniority*.	mean proportion of risky assets held by employees in different levels of job seniority		Conclude that the proportion of risky assets held has a significant relationship with the job seniority of middle and upper income employees.
H_{4-3} The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of the person's education level..	ANOVA for equality of mean proportion of risky assets by education levels	p-value=.000	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a significant relationship with the person's education level.
H_{4-4} The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of their marital status.	ANOVA for equality of mean proportion of risky assets held by employees of different marital status	p-value=.000	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a significant relationship with the person's marital status.
H_{4-5} The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of their attitude to risk.	ANOVA for equality of mean risky asset proportions between employees of different attitudes to risk	p-value=.010	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a significant relationship with employees' attitude to risk.
H_{4-6} The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of their risk preferences.	ANOVA for equality of mean proportions of risky assets held by employees with different risk preferences	p-value=.014	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a significant relationship with the person's risk preferences.
H_{4-7} The proportion of risky assets (to the gross wealth) held by SM&UI employees in Kenya is independent of the employees' place of birth.	ANOVA for equality of mean proportion of risky assets held by employees of different places of birth	p-value=.005	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a relationship with a person's place of birth
H_{4-8} The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of the employees' childhood environment	ANOVA for equality of mean proportion of risky assets held by employees of different childhood back grounds	p-value=.000	**Reject:** Conclude that the proportion of risky assets held by salaried has a significant relationship with a person's childhood environment.

$H_{4\text{-}9}$ The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of the person's religious affiliation.	ANOVA for equality of mean proportion of risky assets held to employee's religious affiliation	p-value=.138	**Fail to Reject:** Conclude that the proportion of risky assets held by salaried employees has no significant relationship with their religious affiliation.
$H_{4\text{-}10}$ The proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya is independent of whether employee's investment decision is maximization of returns.	ANOVA for equality of mean proportion of risky assets held to employee's type of investment decision	p-value=.000	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a significant relationship with their investment decisions on returns.
$H_{4\text{-}11}$ The proportion of risky assets held (to the gross wealth) of SM&UI employees is independent of gender.	One tailed t-test for equality of mean proportions of risky assets by gender.	p-value=.137	**Fail to Reject:** Conclude that the proportion of risky assets held by salaried employees has no significant relationship with gender.
$H_{4\text{-}12}$ The proportion of risky assets (to gross wealth) held by SM&UI employees is independent of an employee's classification between middle income or upper income employee.	One tailed t-test for equality of mean proportions of risky assets by income category.	p-value=.000	**Reject:** Conclude that the proportion of risky assets held by salaried employees has a significant relationship with the person's income level category.
$H_{4\text{-}13}$ There is no significant relationship between the proportion of risky assets (to the gross wealth) held by SM&UI employees in Kenya and their inherited wealth	Pearson Correlation Analysis between inherited wealth and risky asset proportion Pearson coefficient "r" and associated p-value	p-value=.000 r=.236 (Weak positive)	**Reject:** Conclude that there is a significant relationship between the proportions of risky assets held by salaried employees and their inherited wealth.
$H_{4\text{-}14}$ There is no significant relationship between the proportion of risky assets (to the gross wealth) held by SM&UI employees in Kenya) and their age.	Pearson Correlation Analysis between age and risky asset proportions Pearson coefficient "r" and associated p-value	p-value=.000 r=.245 (Weak positive)	**Reject:** Conclude that there is a significant relationship between the proportions of risky assets held by salaried employees and their ages.
$H_{4\text{-}15}$ There is no significant relationship between the proportion of risky assets (to the gross wealth) held by SM&UI employees in Kenya and the employees' length of	Pearson Correlation Analysis between length of employment service and	p-value=.000	**Reject:** Conclude that there is a significant relationship between the proportion of

employment of service.	risky asset proportion Pearson coefficient "r" and associated p-value	r=.223 (Weak positive)	risky assets held by salaried employees and the lengths of their employment service.
$H_{4\text{-}16}$ There is no significant relationship between the proportion of risky assets (to the gross wealth) held by SM&UI employees in Kenya and the employees' size of nucleus family unit.	Pearson Correlation Analysis between nucleus family size and risky asset proportion Pearson coefficient "r" and associated p-value	p-value=.000 r=.243 (Weak positive)	**Reject:** Conclude that there is a significant relationship between the proportion of risky assets held by salaried employees and the size of the nucleus family unit.
$H_{4\text{-}17}$: H_0: There is no significant relationship between the proportion of risky assets (to gross wealth) held by SM&UI employees in Kenya and the number of dependants that the employee supports.	Pearson Correlation Analysis between number of dependants above nucleus family and risky asset proportion Pearson coefficient "r" and associated p-value	p-value=.000 r=.136 (Very weak positive)	**Reject:** Conclude that there is a significant relationship between the proportions of risky assets held by salaried employees and the number of dependants above the nucleus family.
$H_{4\text{-}18}$ There is no significant relationship between the proportions of risky assets (to the gross wealth) held by SM&UI employees in Kenya and their employment income.	Pearson Correlation Analysis between employment income and risky asset proportion Pearson coefficient "r" and associated p-value	p-value=.000 r=.307 (moderate positive)	**Reject:** Conclude that there is a significant relationship between the proportions of risky assets held by salaried employees and their employment income.
$H_{4\text{-}19}$ There is no significant relationship between the proportion of risky assets held (to gross wealth) by SM&UI SM&UI employees in Kenya and their savings rate on their employment income.	Pearson Correlation Analysis between savings rate and risky assets proportion Pearson coefficient "r" and associated p-value	p-value=.153 r=0.05 (positive very weak insignificant correlation)	**Fail to Reject:** Hence, there is no significant relationship between the employee's proportion of risky assets and their savings rate.
Research Hypothesis #(H_5) **The personal attributes of salaried middle and upper income employees cannot be used to model the sizes and determinants of their personal wealth portfolios.**			**Reject:** The personal attributes of employees can be used to model the sizes and determinants of their wealth portfolios.

$H_{5\text{-}1}$ The quantitative personal attributes of SM&UI employees in Kenya are not significant in building a model to predict the absolute net wealth holdings of the employees.	SPSS results for Multiple Regression formulae $Y=a+\beta_1X_{1+}\ldots\beta_nX_n+e$ where n=7	p-values are all <0.05	**Reject:** Conclude that quantitative personal attributes of employees can be used to build a model to predict their absolute net wealth holdings.
$H_{5\text{-}2}$ The quantitative personal attributes of salaried middle and upper income employees in Kenya cannot discriminate employees between 'above average wealth holders' or 'average wealth holders' or 'below average wealth holders'	SPSS results for Discriminant analysis linear function: $Z_{jk}=a+W_1X_{1k}$ where n=7	p-values are all <0.05 Overall, 59.6 percent of original grouped cases were correctly classified while 58.3 percent of cross-validated grouped cases were correctly classified	**Reject:** Conclude that the quantitative personal attributes of employees can be used to discriminate employees by wealth holding levels.

Note: The general interpretation of Person product moment correlation coefficients **'r' is as follows:*

For r=+/-1	*Perfect positive or negative correlation*
For r= 0	*No correlation*
For r=0.99	*Almost perfect correlation*
For r=0.90 to 0.98	*Very strong correlation*
For r= 0.7 to 0.89	*Strong correlation,*
For r=0.5 to 0.69	*Moderately strong correlation,*
For r=0.3 to 0.49	*Moderately weak correlation,*
For r= 0.10 to 0.29	*Weak correlation*
For r= 0.02 to 0.09	*Very weak correlation*
For r= 0.01	*Almost no correlation*

……0……

Appendix 5: Distribution of Wage Employment in Kenya 2008

	Shs/Month		Shs/Month	Number of Employees	Distribution	Cummulative Employees	Mid point Shs/Month	Estimated Earnings/Month in Shs	% of Total	Cummulative Earnings %
Les than			4,000	25,846	1.3%	1.3%	2,000	51,692,000	0%	0%
From	4,000	to	5,999	61,391	3.2%	4.5%	5,000	306,924,305	1%	1%
From	6,000	to	7,999	206,302	10.6%	15.1%	7,000	1,444,010,849	2%	3%
From	8,000	to	14,999	410,189	21.1%	36.2%	11,500	4,716,968,406	8%	11%
From	15,000	to	19,999	421,050	21.7%	57.9%	17,500	7,368,164,475	12%	23%
From	20,000	to	24,999	400,690	20.6%	78.5%	22,500	9,015,324,655	15%	38%
From	25,000	to	29,999	348,440	17.9%	96.4%	27,500	9,581,925,780	16%	54%
Above			30,000	69,548	3.6%	100.0%	400,683	27,866,689,531	46%	100%
Totals				1,943,456	100%			60,351,700,000	100%	
Estimate for those earning above Shs 28,000 +++										
From	25,000	to	27,999	209,064	11%		26,500	5,540,091,468	Employees 10.8%	
From	28,000	to	29,999	139,376	7%		29,000	4,041,834,312	7.2%	
Above ***			30,000	69,548	4%		400,683	27,866,689,531	3.6%	
Sub-Total of Shs 28,000 and above				208,924	11%		152,728	31,908,523,843	10.8%	
Lower Income group total				1,734,532			16,398	28,443,176,157		
Total Employees				1,943,456			31,054	60,351,700,000		
Twelve Months Employment earnings in 2008								724,220,400,000		

***The Estimated total Earnings for those above Shs 30,000 per month is a residual derived from an estimated total monthly earnings to yield the country total of shs 724.2 Billions in 2008

+++ Estimate of Shs 28,000 per month

This is derived as the upper cutoff for Lower Income Employees based on the 2008 Economic Survey GOK(2008) that shows how the groups were split

	Montly Incor of Householc KShs	Cummulative number of total households Percentage
Lower Income Households: upper limit May 2005 to May 2006 KIHBS study (GOK 2007a)	23,671	72.12%
Middle Income Households: upper limit May 2005 to May 2006 KIHBS study (GOK 2007a)	120,000	96.24%

The Distribution pattern where the top 21.5% of employees account for 62% of the total earnings is consistent with a 54% Gini Coeffficient on urban household income and a national household expenditure pattern whereby the top 20% spenders account for 63% of all household expenditure per GoK(2003d)

Source: GoK (2009b) Statistical Abstract 2009, Table 191, p259, and Table 198 p.274

Appendix 6: Computed Distribution of Wage Employment for Middle and Upper Income Employees in Kenya 2008

Shs/Month			Shs/Month	Agriculture & Forestry	Mining & Quarrying	Manufacturing	Electricity & Water	Construction	Trade, Restaurants & Hotels	Transport & Comm	Finance	Community, Social & Personal Services	Country Total	Distribution
Les than			4,000	17,540	65	1,020	-	-	470	1,145	3,959	1,647	25,846	1%
From	4,000	to	5,999	40,069	86	1,718	-	1,652	2,223	89	8,120	7,434	61,391	3%
From	6,000	to	7,999	114,466	756	16,153	41	3,239	4,963	905	1,230	64,549	206,302	11%
From	8,000	to	14,999	95,285	1,298	55,206	6,582	24,335	29,516	15,356	13,312	169,299	410,189	21%
From	15,000	to	19,999	33,028	1,561	57,386	3,250	19,671	34,196	27,791	15,274	228,893	421,050	22%
From	20,000	to	24,999	19,208	1,515	61,015	2,793	19,872	58,242	60,573	13,956	163,516	400,690	21%
From	25,000	to	29,999	12,066	1,231	64,036	6,459	14,883	59,645	47,809	29,739	112,572	348,440	18%
Above			30,000	9,052	18	7,561	163	1,143	13,126	3,987	10,471	24,027	69,548	4%
Totals				340,714	6,530	264,095	19,288	84,795	202,381	157,655	96,061	771,937	1,943,456	100%
Estimate for those earning KShs 28,000 and above per month														
													Country total Employees	
From	25,000	to	27,999	7,240	739	38,422	3,875	8,930	35,787	28,685	17,843	67,543	209,064	10.76%
From	28,000	to	29,999	4,826	492	25,614	2,584	5,953	23,858	19,124	11,896	45,029	139,376	7.17%
Above ***	30,000			9,052	18	7,561	163	1,143	13,126	3,987	10,471	24,027	69,548	3.58%
Sub-Total of above KShs 24,000				13,878	510	33,175	2,747	7,096	36,984	23,111	22,367	69,056	208,924	10.75%
Percentage of Middle/Upper Income				6.6%	0.2%	15.9%	1.3%	3.4%	17.7%	11.1%	10.7%	33.1%	100%	
Sampling Units				71	3	169	14	36	189	118	114	353	1,067	1067

Source: GOK (2009b) Statistical Abstarct 2008, Table 197(b) , pp.272-273

Appendix 7: Large Private Sector Institutions from which to Select a Sub-sample of 'Participating Establishments'

Source: ***List of Establishments, FKE***

Count	Agriculture, Forestry, Mining & Quarrying	Number of employees
1	Fides Kenya Ltd	710
2	Homegrown Kenya Ltd	658
3	James Finlay (Kenya) Ltd	1,350
4	Suera Flowers Ltd	937
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Count	Manufacturing	Number of employees
1	B.AT.	1,110
2	Brookside Dairy Ltd	1,303
3	Chemelil Sugar Co	1,312
4	Del Monte	5,302
5	EA Portland Cement	1,039
6	Farmers Choice	1,089
7	Ken-Knit	1,150
8	Kenya Breweries	614
9	Kenya Knut Co	1,200
10	Mastermind Tobacco	1,000
11	Mumias Sugar	2,151
12	Pan Africa Paper Mills	2,000
13	New Kenya Coop Creameries	1,000
14	Nzoia Sugar Co	2,000
15	South Nyanza Sugar Co	1,580
16	Umoja Rubber Products	1,080
17	West Kenya Sugar Co.	1,255
18	Mabati Rolling Mills	949
19	BATA shoe company	925
20	Sameer Africa Ltd	1,393

Count	Electricity and Water	Number of employees
1	Ken Gen	1,537
2	Kenya Power & Lighting	6,141
3	Nairobi City Water & Sewerage Company	2,159
4	Kenya Pipeline Company	1,470
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Count	Construction	Number of employees
1	Kenya Association of Building and Engineers	36,156
2	Engineering and Allied Industrial Employees	1,640
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Count	Trade, Restaurants and Hotels	Number of employees
1	Kenya Association of Hotel Keepers and Caterers	9,178
2	Uchumi Supermarkets	1,072
3	National Cereals and Produce Board	900
4	Kenya Tea Development Agency	897
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Count	Transport and Communications	Number of employees
1	Celtel Kenya	725
2	Kenya Airways	2,764
3	Kenya Ports Authority	7,030
4	Kenya Airports Authority	1,749
5	Nation Media Group Ltd	772
6	Safaricom Ltd	1,165
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Count	Finance, Insurance, Real Estate and Business Services	Number of employees
1	Kenya Commercial Bank	2611
2	Barclays Bank of Kenya	1762
3	Cooperative Bank of Kenya	1364
4	Standard Chartered Bank	1045
5	Equity Bank	884
6	National Bank of Kenya	853
7	K-Rep Bank	397
8	Commercial Bank of Africa	336
9	NIC Bank	252
10	CFC Bank	239
11	Housing Finance	223
12	Diamond Trust Bank	201
13	I&M Bank	196
14	Stanbic Bank	189
15	EABS Bank	171
16	Imperial Bank	163
17	Southern Credit Bank	150
18	Citibank	147
19	ABC Bank	139
20	Bank of Baroda	128

Appendix 8: Listing of Government of Kenya Ministries for Identifying a Sub-sample of 'Selected Ministries'

Count	Name of Ministry	Number of employees
1	Off of the Deputy Prime Minster and Min of Local Government	242
2	Office of the Deputy Prime Minister and Min of Finance	2,231
3	Public Service	538
4	Nairobi Metropolitan Development	63
5	Immigration and Registration of Persons	5,460
6	Health and Sanitation	9,342
7	Medical Services	23,575
8	National Heritage and Culture	364
9	Roads	3,069
10	Public Works	1,898
11	Education	5,087
12	Higher Education, Science and Technology	339
13	Agriculture	7,395
14	Livestock	5,881
15	Fisheries Development	753
16	Special Programmes	141
17	Justice, National Cohesion and Constitutional Affairs (+State Law Office	1,202
18	Foreign Affairs	673
19	East African Community	113
20	Gender, Sports, Culture and Social Development	1,402
21	Youth Affairs and Sports	2,351
22	Information and Communication	621
23	Transport	189
24	Water and Irrigation	4,391
25	Regional Development Authorities	105
26	Energy	294
27	Trade and Industrialization	813
19	Forestry and Wildlife	105
28	Tourism	186
29	Lands	3,182
30	Housing	664
31	Environment and Mineral Resources	1,225
32	Labour and Human Resources Development	952
33	Co-operative Development and Marketing	1,070
34	Planning and National Development and Vision 2030	729

Note: Ministries that are excluded are: Office of the President; Office of the Prime Minister; Office of the Vice President and Ministry of Home Affairs; Ministry of Defense; Ministry of State for Provincial Administration and Internal Security.

Source: Ministry of Public service, List of Public Servants by Government Ministries

Appendix 9: Study Questionnaire

In the interest of confidentiality, do not write your name anywhere on this questionnaire

Dear Sir/Madam

I kindly ask you to complete this questionnaire seeking information that will assist me in my research. The objective of the study is to establish **"the relationship that exists between the size and composition of employees' wealth on the one hand and the possible determining variables such as incomes, savings and personal attributes"**. Your participation will be of tremendous importance in furtherance of knowledge.

The questionnaire is in THREE parts and has 29 questions:

Instructions on how to complete is given for each question. It will take about thirty minutes to complete.

PART A: Information on your personal attributes

1. Please tick the appropriate box for the industry in which you are employed.

Code	Industry Category in Kenya	Please tick here
I	Agriculture and Forestry	
Ii	Mining and Quarrying	
Iii	Manufacturing	
Iv	Electricity and Water	
V	Construction	
Vi	Trade, Restaurants and Hotels	
Vii	Transport and Communications	
Viii	Finance, Insurance, Real Estate and Business Services	
Ix	**Government, Community, Social and Personal Services**	
X	Other (Specify)	

2. This question seeks to find a suitable description for your current employment position. Please tick the appropriate box.

Clerical/Factory worker/Messenger	Officer/ Technician	Supervisor	Manager	Director/ Policy maker
i	ii	iii	iv	v

3 Please tick the box that matches the number of years that you have been employed.

I	ii	iii	iv	v	vi	Vii	viii	ix
Upto 5 Years	6 to10 Years	11 to 15 Years	16 to 20 Years	21 to 25 Years	26 to 30 Years	31 to 35 Years	36 to 40 Years	Over 40 Years

4 Please tick the box that corresponds to your highest level of education achievement.

Code		**Please tick here**
I	Below 'O' level but with other certificate e.g. grade test	
Ii	Up to 'O' level or 'A' level and no other certificate	
Iii	Up to 'O' level or 'A' but with other certificate	
Iv	Professional Qualification eg Diploma, CPA (K), Etc, BUT no degree	
V	University degree –Bachelors	
Vi	University degree –Bachelors plus professional qualification	
Vii	University degree – Masters and above	

5 Please indicate by a tick in the appropriate box for your age group in years.

Code	**Age in years**	**Please tick here**
I	Below 25	
ii	From 25 to 29.5	
iii	From 30 to 34.5	
Iv	From 35 to 39.5	
V	From 40 to 44.5	
vi	From 45 to 49.5	
vii	From 50 to 54.5	
Viii	From 55 to 59.5	
Ix	From 60 and above	

6 Please tick the appropriate box for your gender.

Code	**Gender**	**Please tick here**
I	Male	
Ii	Female	

7. Please indicate your marital status by ticking in the appropriate box below.

Code	**Marital Status Categories**	**Please tick here**
I	**Single (Male)**- Never married	
Ii	**Single (Male)**-Divorced/Separated/Widowed	
Iii	**Single (Female)**-Never married	
Iv	**Single (Female)**-Divorced/Separated/Widowed	
V	**Married Couple**	

8 If your answer to 7 above was **married couple**, indicate the income status of your spouse.

Code	Income Status of Spouse	Please tick here
I	Not Employed	
Ii	Employed no income from Investments	
Iii	Employed with income from Investment	
Iv	Not Employed but has income from Investments	

9 Please tick the box that corresponds to the size of your nucleus family (you, your spouse and your children).

1 person	2	3	4	5	6	7	8	More than 8

10 Please tick the box that corresponds to the number of dependants, on top of your nucleus family that you support.

None	1 person	2	3	4	5	6	7	8	More than 8

11. This question seeks to obtain information about your background, where you were born. Please tick the box that best describes you.

Code	Place of Birth	Please tick here
I	Outside Kenya	
Ii	Urban Centre-Nairobi	
Iii	Urban Centre-Any other Town in Kenya	
Iv	Central Province	
V	Coast Province	
Vi	Eastern Province	
Vii	North Eastern Province	
Viii	Nyanza Province	
Ix	Rift Valley Province	
X	Western Province	

12. This question seeks information about your background, where you spent most of your time up to the age of 15 years. Please tick the box that best describes you.

Code	Place of childhood (first 15 years)	Tick tick here
I	Outside Kenya	
Ii	Urban Centre-Nairobi	
Iii	Urban Centre-Any other Town in Kenya	
Iv	Central Province	
V	Coast Province	
Vi	Eastern Province	
Vii	North Eastern Province	
Viii	Nyanza Province	
Ix	Rift Valley Province	
X	Western Province	

13. This question seeks information about your religion. Please tick the box that best describes you.

Code	Religion	Please tick here
I	Protestant/Evangelical	
Ii	Catholic	
Iii	Muslim	
Iv	Indigenous Beliefs	
V	Others	

PART B: Information on your investment activities.

14. How do you decide what kind of investment to make? Do you seek for help from any of the following (Tick the appropriate box).

Self	Friends	Work Colleagues	Read Newspapers/Books	Professional Advice	Others
i	ii	iii	iv	V	vi

Others specify:

.....

.....

.....

15. If you have ticked professional advice in 14 above, indicate which adviser(s) you consult - [Note, these could be more than one]. Otherwise go to Question 16.

Tax adviser	Banker	Accountant	Lawyer	Investment Banker	Stock Broker	Others
I	ii	Iii	iv	v	vi	Vii

Others specify:

.....

.....

.....

16. Please indicate by a tick your response: My choice of investments is driven by the desire for maximum earnings.

Strongly Agree	Agree	Slightly Agree	Neutral	Slightly Disagree	Disagree	Strongly Disagree
I	ii	iii	Iv	v	vi	Vii

If you indicated **Strongly Disagree or Disagree or Slightly Disagree** please comment about what drives your choice of investments:

.....

.....

.....

17. Imagine you have won a charity sweepstake and awarded **Shs 5 Million**. After collecting the money, you receive a financial offer from a reputable bank where the conditions are that you invest the money with the bank and there is a 50% chance that you can **double the money in two years time** and a 50% chance that you could lose half of what you have invested. Please tick the box that best indicates how much you are prepared to invest in the bank.

Shs 0	**Shs 1 Million**	**Shs 2 Million**	**Shs 3 million**	**Shs 4 Million**	**Shs 5 million**
i	ii	iii	iv	v	Vi

18. How do you see yourself: Are you generally a person who is fully prepared to take financial risks or do you avoid taking financial risks? Please tick the box that best describes you on the scale provided, where **"0"** means **"unwillingness to take risks"** and value **10** means **"fully prepared to take risks".**

I	**ii**	**iii**	**iv**	**v**	**vi**	**vii**	**viii**	**ix**	**x**	**Xi**
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

PART C: Information on your Personal Income, Savings and Wealth

Please think about your current monthly income from employment and any investments you have as well as your wealth and answer questions 19 to 27 as correctly as possible.

19. Tick in the appropriate box the best indication of your gross income from employment and other sources (before tax and loan payments) in a typical month.

Code	Range in KShs per Month	Monthly Income From Employment	Monthly Income From Investments
I	From Shs 28,000 to 37,999		
Ii	From Shs 38,000 to 47,999		
Iii	From Shs 48,000 to 57,999		
Iv	From Shs 58,000 to 67,999		
V	From Shs 68,000 to 77,999		
Vi	From Shs 78,000 to 87,999		
vii	From Shs 88,000 to 97,999		
viii	From Shs 98,000 to 107,999		
Ix	From Shs 108,000 to 117,999		
X	From Shs 118,000 to 127,999		
Xi	From Shs 128,000 to 137,999		
xii	From Shs 138,000 to 147,999		
xiii	From Shs 148,000 to 157,999		
xiv	From Shs 158,000 and above		

20. **Think back when you started working** and tick in the appropriate box the best indication of your gross income from employment and other sources

Code	Range in KShs per Month	Monthly Income From Employment	Monthly Income From Investments
I	From Shs 28,000 to 37,999		
Ii	From Shs 38,000 to 47,999		
Iii	From Shs 48,000 to 57,999		
Iv	From Shs 58,000 to 67,999		
V	From Shs 68,000 to 77,999		
Vi	From Shs 78,000 to 87,999		
vii	From Shs 88,000 to 97,999		
viii	From Shs 98,000 to 107,999		
Ix	From Shs 108,000 to 117,999		
X	From Shs 118,000 to 127,999		
Xi	From Shs 128,000 to 137,999		
Xii	From Shs 138,000 to 147,999		
Xiii	From Shs 148,000 to 157,999		
Xiv	From Shs 158,000 and above		

21. Think of a typical month: Please indicate what percentage of your earnings from employment you are able to save. Tick only one box.

	Saving Rate as % of Gross Income	**Please tick here** ↓
I	Saves nothing	
Ii	From 1% to 10%	
Iii	From 11% to 20%	
Iv	From 21% to 30%	
V	From 31% to 40%	
Vi	From 41% to 50%	
Vii	From 51% to 60%	
Viii	From 61% to 70%	
Ix	From 71% to 80%	
X	More than 80%	

22. Can you please split your typical monthly **savings** as shown below.

Code	**Reason for saving**	**Please indicate here**
I	**Emergency** expenditure (eg ill health, accident etc)	%
Ii	My own future personal expenditure-**when in retirement**	%
Iii	**Education** needs (self and family)	%
Iv	To buy or built a **house**/buy a **plot** to build a house	%
V	To buy a **car**	%
Vi	Savings for other consumption needs of my **nucleus family, extended family and other dependants**	%
Vii	Savings to make my own **Investments**	%
Viii	Others specify.....	%
	Total savings	**100%**

23. Please indicate by a tick, the extent to which you rely on loans to finance your personal investments.

Never	**To a Little Extent**	**To some extent**	**To a large extent**	**To a very large extent**
i	ii	Iii	iv	V

24. This schedule requires you to provide the best estimate of the **current market value of your personal assets and amount of debts**. Please tick in the appropriate box the estimated value in Kenya Shillings.

		Estimated Current Value									
		I	Ii	iii	Iv	v	Vi	vii	Viii	ix	X
	Type of asset/loan	Upto 249,999	250,000 to 499,999	500,000 to 749,999	750,000 to 999,999	1,000,000 to 1,249,999	1,250,000 to 1,499,999	1,500,000 to 1,749,999	1,750,000 to 1,999,999	2,000,000 to 2,249,999	**Above 2.5 m Specify Amount**
		Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs	**Shs**
A	Cash/bank accounts										
B	Treasury bills /bonds										
C	Corporate bonds										
D	Cooperative shares										
E	Value of shares in stock exchange /Mutual fund										
F	Estimated value of business owned by self										
G	Current value of pension and life insurance policies										
H	Cows/goats/sheep/ crops										
I	Farmland and town plots										
J	Buildings/houses										
K	Foreign investments										
L	Motor/Vehicles										
M	Any other assets										
N	Loans and mortgages										

If you are married, please answer question 25; if not, go to question 26.

25. This schedule requires you to provide the best estimate of the value of the **family/ household assets and amount of debts** that are jointly owned in the family in terms of your estimate of the current value. Please tick in the appropriate box the estimated value in Kenya Shillings.

		Estimated Current Value									
		I	Ii	iii	Iv	v	Vi	vii	Viii	ix	X
	Type of asset/loan	Upto 249,999	250,000 to 499,999	500,000 to 749,999	750,000 to 999,999	1,000,000 to 1,249,999	1,250,000 to 1,499,999	1,500,000 to 1,749,999	1,750,000 to 1,999,999	2,000,000 to 2,249,999	**Above 2.5 m Specify Amount**
		Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs	**Shs**
A	Cash/bank accounts										
B	Treasury bills /bonds										
C	Corporate bonds										
D	Cooperative shares										
E	Value of shares in stock exchange /Mutual fund										
F	Estimated value of business owned by self										
G	Current value of pension and life insurance policies										
H	Cows/Goats/Sheep/Crops										
I	Farmland and town plots										
J	Buildings/houses										
K	Foreign investments										
L	Motor/Vehicles										
M	Any other assets										
N	Loans and mortgages										

26. This schedule requires you to provide the best estimate of the wealth you inherited in terms of the current market value. Please tick in the appropriate box the estimated value in Kenya Shillings.

		Estimated Current Value									
		I	Ii	iii	Iv	v	Vi	vii	Viii	ix	X
	Type of asset/loan	Upto 249,999	250,000 to 499,999	500,000 to 749,999	750,000 to 999,999	1,000,000 to 1,249,999	1,250,000 to 1,499,999	1,500,000 to 1,749,999	1,750,000 to 1,999,999	2,000,000 to 2,249,999	**Above 2.5 m Specify Amount**
		Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs	Shs	**Shs**
A	Cash/bank accounts										
B	Treasury bills /bonds										
C	Corporate bonds										
D	Cooperative shares										
E	Value of shares in stock exchange /Mutual fund										
F	Estimated value of business owned by self										
G	Current value of pension and life insurance policies										
H	Cows/goats/sheep/ Crops										
I	Farmland and town plots										
J	Buildings/houses										
K	Foreign investments										
L	Motor/Vehicles										
M	Any other assets										
N	Loans and mortgages										

27. For the shares you currently hold in the Nairobi Stock Exchange (if you do), please indicate the number of different companies in which you hold shares by ticking in the appropriate box below.

1	2	3	4	5	6	7	8	9	10	11	More than 11

28. To the best of your knowledge, please rank the factors indicated below with regard to the extent to which they influence the choice and amount of investments that you put your money in:

		To a lower extent	**To a little Extent**	**Moderate**	**To a large extent**	**To a very large extent**
		I	ii	iii	Iv	V
A	Taxation Level					
B	Inflation					
C	General Price level					
D	General Costs					
E	Investment Options Available					
F	Investment Returns Available					
G	State of the Financial Markets					
H	General perception of stock market					
I	Advice available					

29. To the best of your ability, please indicate how much income (from investments and pensions) you expect to have after retirement **as a percentage** of your monthly gross employment income immediately before you retire:

	Expected monthly post retirement income as % of gross employment income before retirement	**Tick (√) Appropriate Line**
A	**NO IDEA**	
B	0% to 10%	
C	11% to 20%	
D	21% to 30%	
E	31% to 40%	
F	41% to 50%	
G	51% to 60%	
H	61% to 70%	
I	71% to 80%	
J	81% to 90%	
K	91% to 100%	
L	Over 100%	

Thank you very much for your time and cooperation. I greatly appreciate your help in furthering this research endeavor.

Julius M. Muia
Ph.D Candidate Number D/80/P/7780/2002

----------END----------

Appendix 10: Letter of Introduction from University of Nairobi

UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
SCHOOL OF BUSINESS
DOCTORAL STUDIES PROGRAMME

19th March, 2010

To WHOM IT MAY CONCERN

RE MUIA JULIUS M.-REG NO D/80/P/7780/2002

This is to certify that Muia Julius M. Reg. No D/80/P/7780/2002, is a Ph.D. candidate at the School of Business, University of Nairobi. The title of the study is: ***"The Nature and Determinants of the Wealth Portfolios of Middle and Upper Income Salaried Employees in Kenya".*** His research involves a survey to establish the relationship that exists between the size and composition of wealth and the possible determinants such as incomes, savings and other personal attributes. Requisite authorization to conduct the survey has been produced.

The purpose of this letter therefore, is to kindly request you to assist and facilitate the candidate in carrying the survey in your organization. A questionnaire for the same is herewith attached for your kind consideration and necessary action.

Data and information obtained through this exercise will be used for academic purposes only. Hence, the respondents are requested not to indicate their names anywhere on the questionnaire.

We look forward to your cooperation.

Prof N.D. Nzomo
Co-ordinator, Doctoral Studies Programme

Appendix 11: Request to Sampled Employees to Participate in the Survey

Julius M Muia
P.O. Box 39738-00623
NAIROBI
KENYA
Cellphone:0722 525 694
Email Address: juliusmuia08@gmail.com

The Manager
ABC
April 12th, 2010

Dear Sir,

RE: REQUEST FOR ACADEMIC RESEARCH DATA

I am a Ph.D candidate at the University of Nairobi currently conducting research on investments in Kenya. The title of the study is: **The Nature and Determinants of the Wealth Portfolios of Salaried Middle and Upper-Income Employees in Kenya.**

The institutions in which to carry out the survey have been selected randomly to cover all the sectors in the economy. Subsequent to this, and within the selected institutions, the sample of respondents for the survey will be selected randomly.

The information received will be treated with strict confidentiality in view of the nature of the disclosures by the sampled respondents. The identity of the employer and that of the respondent will be concealed to maintain utmost confidentiality of information received and will not be divulged to any party. The results of this study will be used solely for academic purposes.

I write to request that you please give assistance to the undersigned together with the research assistant who will be administering the questionnaire for this study. Attached is the questionnaire which has 29 questions to be answered and the Letter of Authority from the University of Nairobi, School of Business.

Yours faithfully,

Julius M Muia
Ph.D Candidate
School of Business, University of Nairobi
Nairobi, Kenya

Appendix 12: Research Hypotheses, Types and Sources of Data

Research Hypothesis Number	Type of Data to be gathered and tested	Source of data: Questionnaire, Question Number
(1)	Declared number of different types of assets held by ticking from a list Declared estimated value of assets held and debt by ticking from a band of values Number of companies in which shares held	24 and 27
(2)	Source of investment advice; Likert scale of self reported extent to which investments are driven by desire to maximize earnings Factors that influence choice of investments	14 to 16 28 + computed replacement rate
(3)	Self reported estimated value of assets held and debt by ticking from a band of values provided (self and inherited)	24 and 26
(4) and (5)	Self reported attributes: industry type; position in employment; number of years worked; highest education level; age in years range; gender; marital status; number in family and dependants; place of birth; place of childhood; religion type; level of risk preference-lottery choice (risk preference) and self assessed risk preparedness to take risks (attitude to risk). Self estimated Shs Value of assets held and debt by ticking from a band of values (self, family and inherited)	1 to 13, 17 to 20, 24 and 26
(6)	Self reported estimated % of income that is saved for investment purposes Extent of relying on loans for investment Self estimated value of assets held and debt by ticking from a band of values (self and inherited)	21, 22 and 23 24
(7)	Self reported personal attributes in multivariate tests as follows: i. Regression analysis: use self reported net wealth and all scale data for significant independent variables ii. Discriminant analysis: use derived net wealth levels and all scale data for significant independent variables iii. Factor analysis: Use all data for independent variables only.	Data from all the questions plus derived variables

Appendix 13: Operationalisation of the Research Variables

Research Variable	Operationalisation of the Research Variables	Question Number
Wealth(current and inheritances)	Self declared market value of net worth by asset categories. Estimated values will be in Shs using interval scale **Indicators of wealth:** (i) Market value of net worth (ii) Proportions of market value of assets held (iii) Types of assets held (iv) proportion of risky capital to total value of wealth (v) number of shares held (vi) ownership rate	Q. 24 Q. 25 Q. 26 Q. 27
Size of wealth	Absolute Shs value of self-reported market value of net wealth. Replacement rate: the % of estimated annual earnings from an employee's net wealth to estimated pre-retirement annual earnings	Q. 24, 25
Diversification	Proportion of asset types and asset classes to gross wealth Number of companies in which shares in held-diversified; Composition in wealth by class values	Q24,25,27
Risk preferences	Self reported choice in a lottery investment: the lowest investment is regarded as risk averse and highest investment is risk tolerant	Q.17
Risk attitude	Preparedness to take financial risks: scale of "10" to "0": where "10" is "fully prepared to take risks" and "0" is "completely unwilling to take risks"	Q.18
Risk perception (Risk-taking behaviour)	Computed proportion of risky assets to respondents' wealth from self reported market value of wealth: Top quartile "risk takers"; second quartile is "least risk averse", third quartile is "risk averse" and bottom quartile is "very risk averse".	Q. 24, 25
Income	Interval scale: Self reported monthly gross employment income in Shs (i) at the start of employment and (ii) now. **Indicant:** Shs value of average monthly income over the employee's working life.	Q. 8, 19, 20
Savings	(i) Self-reported saving rate, that is percentage of gross income that is saved (ii) Self-reported reasons for saving in percentage	Q. 21 Q. 22
Leverage	(i) Computed as a percentage of personal loans and mortgages to total wealth from self reported estimated market value of wealth and total amount of loans in Shs. (ii) Extent of using loans: Likert scale of behavioural assessment ascertained from respondent's opinion.	Q. 24,25 Q. 23
Gender	Self reported sex of employee	Q. 6
Age	Self reported age in number of years using interval scale	Q. 5
Marital Status	Self reported marital status of the employee	Q. 7
Type of job	Industry category based on categories per statistical abstract	Q. 1
Seniority of job	Self reported level of seniority in work place	Q. 2
Length of service	Number of self reported number of years worked	Q. 3

Research Variable	Operationalisation of the Research Variables	Question Number
Education level	Self reported highest education attained	Q. 4
Family size	Number of self reported size of nucleus family	Q. 9
Number of dependants	Number of Self reported dependants	Q. 10
Place of birth	Self reported region where one was born	Q. 11
Childhood environment	Self reported region where one spent most of their time in the first 15 years since birth	Q. 12
Religion	Self reported religion	Q. 13
Desire to Maximise Returns	(i)Self reported source of investment advice from a choice (ii) Self reported extent of agreement or disagreement whether respondents seek to maximize earnings from their investments using a Likert scale	Q. 14, 15 Q. 16
"Replacement Rate"	(i) Estimated as the percentage of expected returns from the personal wealth portfolio to pre-retirement employment income. This was the 'computed replacement rate' (ii) Self reported "target replacement rate" by respondents	 Q. 29

Appendix 14: Memorandum Record of Employees' Holding of 'Other Stores of Wealth'

	Frequency	Ownership Rate in %	Mean Value in Shs	Gross Value in Shs	% of Gross Wealth
Estimated value of business owned by self	358	44.5	1,626,257	582,189,846	37.5
Cows goats sheep, crops	204	25.3	422,794	86,249,899	5.6
Farm land and town plots	420	52.2	905,297	380,224,799	23.5
Foreign investments	52	6.5	2,458,173	127,824,980	8.2
Motor vehicles	269	33.4	761,710	204,899,871	13.2
Any other assets	403	50.1	423,263	170,574,801	11.0
Total			**1,204,901**	**1,551,974,195**	**100**

Note:

The sampled employees were further asked to provide information on other forms in which they store their wealth. These other stores of wealth are not considered in wealth studies as part of wealth portfolios as explained in Chapter Two of Literature Review. The estimated mean values for these 'stores of wealth' was Shs1.2 million per employee and valuation of Shs1,552 million compared to Shs1,321 million for the seven principal and conventional assets that were examined in the current study. The value of business owned by self was the most important and accounted for 38 percent of the value of these other stores of wealth followed by farm land and town plots at 24 percent. These valuations not withstanding, the assets were omitted in the current study in order to be consistent with international practice, due to problems of valuation and also on account of lack of ease of asset transferability.

Appendix 15: A Prediction Model for the Net Wealth Holding of Salaried Middle and Upper Income Employees

Independent Variable	Dependent Variable(s)	Coefficients	Coefficient of Determination (r^2)	Status of the Model
W=net wealth value		Pearson correlation r=0.711 a = -2,798,407.33	0.505	Moderately strong
	Monthly employment income	34.81		
	Age in years	47,574.76		
	Risky assets percent	22,126.04		
	Inherited wealth	0.72		
	Length of employment service	34,183.21		
	Savings rate	24,674.45		
	Size of nucleus family	-139,833.51		

Appendix 16: A Profiling Model for Salaried Middle and Upper Income Employees in Kenya into holders of 'Above Average Wealth', 'Average Wealth' or 'Below Average Wealth'

Function 1

Independent Variable	Dependent Variable(s)	Coefficients
Y_1=Predicted wealth category		a= -3.365
	Age in years	0.046
	Risky assets percent	0.026
	Savings rate	0.025
	Length of employment service	0.006
	Size of nucleus family	-0.073

Function 2

Independent Variable	Dependent Variable(s)	Coefficients
Y_2=Predicted wealth category		a = -3.013
	Age	0.094
	Risky assets percent	-0.005
	Savings rate	0.039
	Length of employment service	-0.022
	Size of nucleus family	0.195

Appendix 17: Summary of Factor Groupings and Variables

Factor number	Factor Grouping	Percent of Sample Variance Accounted for	Variables	Conceptual Framework
One	Earning Capacity	14.70	• Current employment income • Income category (middle or upper income) • Education level • Job seniority	LCH
Two	Life cycle factors	13.02	• Size of nucleus family • Marital status • Age group • Length of employment service	LCH
Three	Investment objectives	8.80	• Whether choice of investments is driven by desire to maximize earnings • Extent of reliance on loans	MPT
Four	Cultural background	8.53	• Place of birth • Place of childhood years (up to 15 years)	Sociological
Five	Risk taking behaviour	8.40	• Attitude to risk • Risk preference	MPT
Six	Savings	6.00	• Industry • Gender • Saving rate	LCH

Note: The following four variables were dropped in the Factor analysis:

- Religious Affiliation.
- Number of dependants above nucleus family.
- Risk perception (risky assets as percent of gross wealth).
- Absolute inherited net wealth.

Appendix 18: Income and Expenditure Surveys in Kenya

Name	Names of Survey	Periodicity	Latest	Sample Size and Coverage	Survey done By	Purpose
UHBS	Urban Household Budget Survey	1969 1970/71 1974 1979 1981/82 1993/94	1993/94	4,800 Households in all 57 Urban Centers[1] plus all District Head Quarters. 63% Response rate	Central Bureau of Statistics Results Published in 2002	To obtain information for use in updating the existing consumer price index; gain insight into patterns of expenditure (using 1994 prices) and Income distribution among different sociological groups and finally to collect household consumption data. See GoK (2002)
ILFS	The 1998/99 Integrated Labour Force Survey	1998/99 Was first of its Kind	1998/99	11,049 Households Randomly selected country wide. 86% Response Rate	Central Bureau of Statistics Results Published in 2003	To update data on the labour force, determine the size and output of the informal sector and estimate the extent of child labour. See GoK (2003a)
WMS	Welfare Monitoring Survey	WMS I 1992 WMS II 1994 WMS III 1997	1997	10,000 Households countrywide	Central Bureau of Statistics Results Published in 1998	To obtain data on in order to understand the magnitude, severity and dimensions of poverty among different socio-economic groups in the country and on how individuals and households respond to the challenge. The data would also provide input into the Social Dimensions of Development initiatives. See GoK (1996)
First Report on Poverty in Kenya Volume II	Welfare Monitoring Survey	1998	1998	Derived from 1997 WMS above	Central Bureau of Statistics Results Published in 2003	To provide information on the different faces of poverty in Kenya. See GoK (1998)
Second Report on Poverty in Kenya. Volume I	Welfare Monitoring Survey	2000	2000	Derived from 1997 WMS above	Central Bureau of Statistics Results Published in 2003	To provide information on the different faces of poverty in Kenya. See GoK (2000)
KIHBS 2005/06 Basic Report Volume I	Kenya Integrated Household Budget Survey (KIHBS)	2005/06	2007	13,430 Households in all the Districts in Kenya 2005/06	Kenya National Bureau of Statistics, Results Published in 2007	Designed to provide indicators and data needed to measure living standards and poverty in Kenya.
Statistical Abstract	Statistical Abstract	Annually	2005	Data from all employers: Labour Statistics showing employment earnings	Central Bureau of Statistics Published in 2006	Various. See GoK (2005)

[1] Urban denotes all Centers with a population of 10,000 and above.

Appendix 19: Correlations between Quantitative Determinants and Wealth Portfolios

	Net Wealth	Risky assets percent	Employment income Shs	Age years	Saving rate	Size of nucleus family	Inherited Wealth Shs	Employment service in years	Number of dependants above nucleus family
Correlation with net wealth	1.00	0.394	0.640	0.434	0.327	0.214	0.368	0.356	**Not significant**
Correlation with Risky Assets percent	0.394	1.00	.307	0.245	**Not Significant**	0.243	0.236	0.223	0.136

Source: Researcher's study findings in Sections 5.2.3 and 5.2.4 (See also graph in Appendix 20)

Appendix 20: Correlations between Quantitative Determinants and Wealth Portfolios-Graph