

**DETERMINANTS OF THE GROWTH OF INVESTMENT
INCOME OF PENSIONS FUND SCHEMES: THE CASE OF LAPF
IN DODOMA**

By

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CERTIFICATION

We, the undersigned, certify that we have read and hereby recommended for acceptance by the Mzumbe University, a dissertation titled “Determinants of the Growth of Investment Income of Pensions Fund Schemes: The case of the LAPF Pensions Fund in Dodoma”, in partial fulfillment of the requirements for the Award of a Masters Degree in Economics (Project Planning and Management) of Mzumbe University.

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I, Shola, Eliya declare that this thesis report is my own original work and has not been presented and will not be presented to any other University for a similar or any other Degree Award.

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Date

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey-Fuller Test
Bn	Billions
GEPF	Government Employees Provident Fund
GVT	Government
ILO	International Labor Organization
LAPF	Local Authorities Pensions Fund
NSSP	National Social Security Policy
NSSS	National Social Security Schemes
NSSF	National Social Security Pensions Fund
OLS	Ordinary Least Square
OECD	Organization for Economic Co-operation and Development
PAYG	Pay- As –You- Go
PPF	Parastatals Pensions Fund
RBA	Retirement Benefits Authority
SSS	Social Security Schemes
SSP	Social Security Program
STATA	Statistical software for Data Analysis.
SPSS	Statistical Package for Social Sciences
U.N.D.P	United Nations Development Programme

ABSTRACT

This paper examines the determinants of the growth of investment income of pensions fund schemes. Local Authorities Pensions Fund was taken as a case study. Time series data were used and ordinary least square method was used to estimate the model. Results show that; the variables “members’ contributions” and “investment made in fixed deposits” are positively related to the growth of investment income and are statistically significant at one percent level. However, the variable “investment in government securities,” is positively related to the growth of investment income and statistically significant at five percent level. The estimated parameters for investment in government securities is 1234.84 while for members contribution is 0.22 and that of investment made in fixed deposits is 0.12. All these estimated parameters refer to the magnitude of change of investment income when the respective variable changes by one unit. Lastly, it is recommend that, the LAPF pensions fund should maintain the same share of investment in government securities. This is because investment in this area is considered to be the safest. It is also recommended to increase investible funds in fixed deposits because the results showed that the variable is positively related and significant to the growth of investment income. On other side, it is recommended that; more effort should be made to increase membership base of the Fund. This is due to the fact that, the variable “members’ contributions” has shown to affect positively and significantly related to the growth of investment income of LAPF pension fund in Dodoma.

CHAPTER ONE

1.0 INRODUCTION

1.1Background of the Study

Every human being is vulnerable to risks and uncertainties with respect to income as a means of life sustenance. To contain these risks, everyone needs some form of social security guaranteed by the family, community and the society as a whole (NSSP, 2003).

Social security funds are held by social security schemes in order to safeguard the schemes' ability to pay benefits and provide services, to generate investment income that helps to finance benefits and services, and, in many instances, to ease transitory demographic pressures. As experience has shown, the investment of these funds can make a critical contribution to the financial sustainability of social security systems (ISSA, 2004). Social Security Schemes, particularly Pension Funds, are investing funds according to a set of investment objectives in securities (i.e treasury bonds, corporate stocks and bonds), real estate, fixed deposits, and equities(Levišauskait, 2010).

Investment of funds is an inseparable function of Pension funds. Sustainability of the schemes and improvement of benefits depend on investment income (NSSP, 2003). The survival of social security schemes is determined by actuarial valuation which assesses the current level of funding of the scheme by comparing scheme assets with liabilities accrued at the date of valuation (NSSP, 2003). Hirose (1999) argues that the requirements for long-term solvency are, in many cases, formulated in terms of financial indicators. Investment of members' funds must therefore be done prudently so as to ensure an increase of asset base through investment incomes for long run survival of the social security schemes.

Like other countries in the world, Tanzania has social security schemes operating in the country. These schemes are National Social Security Fund (NSSF), Parastatals Pensions Fund (PPF), Public Services Pensions Fund, Zanzibar Social Security Fund and Local Authorities Pensions Fund (LAPF). In this study the Local Authorities Pensions Fund has been taken as a case.

The Local Authorities Pensions Fund was a product of the “Local Authorities Provident Fund” which was established in 1944 in order to create a single Fund for all Local Authorities employees in the then colonial Tanganyika (LAPF, 2006). In 1972 Town and District Councils were abolished and the provident Fund became dormant. The Local Authorities Provident Fund was revived in the financial year 1986/87, under Section 16 of the Local Government Service Commission Act, No.10 of 1982, following the re establishment of Town and District Councils in 1982(LAPF,2006). It became an autonomous statutory corporate body under a Board of Trustees in July 2000. Further changes were made in 2006 following the enactment of the Local Authorities Fund Act No.9 of 2006. This was a milestone in the Fund’s history as it marked the commencement of providing an improved package under a Pension scheme and therefore referred to as the Local Authorities Pensions Fund (LAPF, 2006).

1.1 Research Problem

Previous studies indicate that the Social Security Scheme (SSS) industry, (specifically Pensions funds) is a major component of the financial sector and needs to be thoroughly studied (Mogera, 1999). Pensions funds managers need to know the performing portfolio for better allocation of financial resource.

Many studies such as “Determinant factors of the investment performance of voluntary Pension Funds in Romania (Mos and Seulean, 2010) and “An Evaluation of Factors Influencing Pension Managers’ Investment Decisions in Kenya (Rono, 2009) and (Mchomvu, 2002) in his study Social Security Systems in Tanzania have

investigated the performance of Pensions Funds and asset allocation in other economies. In addition, (Baur, 2007) investigated it in United States while (Antolin, 2008) investigated the same in France. However, little is known about factors which determine the growth of investment income of Pensions funds in Tanzania. This study intended to determine such factors for LAPF in Dodoma since no similar study has been done in that place.

1.2 Objective of the Study

1.2.1 General objective

The general objective of the study was to analyze the determinants of the growth of investment income of Pensions Funds in Tanzania.

1.2.2 Specific objectives

The specific objectives were:

- i) To determine the effect of members' contributions on the growth of investment income of the LAPF in Dodoma.
- ii) To determine the effect of income from government securities on the growth of investment income of the LAPF in Dodoma.
- iii) To determine the effect of investment in fixed deposits on the growth of LAPF's investment income in Dodoma.
- iv) To determine the effect of benefit payments on the growth of investment income of LAPF in Dodoma.
- v) To recommend ways of increasing income for LAPF investments in Dodoma.

1.3 Research Hypotheses

Researcher tested the following hypotheses:

- (a) H0: Members' contributions do not have any impact on the growth of investment income of the LAPF in Dodoma.
H1: Members' contributions have a positive impact on the growth of LAPF investment income in Dodoma.
- (b) H0: Investments made in government securities have no impact on the growth of investment income of the LAPF in Dodoma.
H1: Investments made in government securities have a positive impact on the growth of investment income of the LAPF in Dodoma.
- (c) H0: Investments made in fixed deposits have no effect on the growth of investment income of the LAPF in Dodoma.
H1: Investments made in fixed deposits do affect positively the growth of investment income of the LAPF in Dodoma.
- (d) H0: Benefit payments have no impact on the growth of LAPF investment income in Dodoma.
H1: Benefit payments have a negative impact on the growth of investment income in Dodoma.

1.4 Significance of the Study

This study intended to analyze the determinants of the growth of the LAPF investment income in Dodoma. Thus, the management of LAPF is expected to find the study findings useful in formulating appropriate investment policies by

ensuring that investments are made in better performing sectors of the economy. This is because the aim is to ensure that there is sustainable growth of investment income so as to increase asset base of the fund in order to improve pension benefits to beneficiaries.

The relevant Ministry and Government, at large, are expected to use the study findings to implement necessary corrective measures so as to enhance the performance of pensions fund. The study will also contribute to the stock of knowledge in the academic field, research institutions, and individuals on how to utilize and allocate financial resource efficiently.

1.5 Limitation and Delimitations of the Study

1.5.1 Limitations

Research like other tasks that need resources, is always confronted with certain limitations. These limitations included the following:-

- Minimum cooperation by staff during data collection.
- Financial constraints: the completion of this study required a lot of financial resources especially the cost for stationeries and transport. Researcher faced a budget constraint to cover costs and this ultimately created delay in data collection and thesis writing.
- Researcher encountered the problem of data availability in respect of some of the variable(s) investigated. Some data were not consistent with years and others were not easily obtained. This affected researcher to drop the variable “benefit payment expenditures” in his study.
- Accuracy of data and confidentiality syndrome: Other staffs were not ready to avail the required information to the researcher. In addition, some data provided were not consistent with internal reports.

- Researcher could have studied the direct relationship on how the variable “members’ contributions” affected investments in fixed deposits and government securities on the growth of investment income of the LAPF pensions fund. Instead, he was interested in indirect relationship between members’ contributions and the growth of investment income.

1.5.2 Delimitations

- Researcher visited the department responsible for custodian of data several time without getting tired. This created friendship with staff who later on gave cooperation in data collection.
- Financial constraints: Researcher used the available financial resources with care in order to attain the intended objective.
- Dropping of the variable: The variable “benefit payment expenditures” was dropped in order to solve the problem of data inaccuracy, inconsistent and availability. The fact is that, quarterly data for this variable in the year 2003 was not obtained. Moreover, only one observation was obtained in the year 2004.
- Recommended that further studies to consider direct relationship on how the variables “fixed deposits” and “investment in government securities” can be affected by the variable members’ contribution on the growth of investment income.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter gives a review of literature on social security schemes, specifically pensions funds. It deals with theoretical and empirical literature review and then provides a conceptual framework, followed by a conceptual model.

2.2 Theoretical Literature Review

Theories on Pension Funds/Social Security Schemes can be partitioned into two broad categories which are efficiency and Narrative theories:-

2.2.1 Efficiency Theories

These have been so categorized in order to identify market inefficiencies and explain how a social security program (SSP) might be created to alleviate them. Typically, although not always, these theories explain why it must be the government which administers the social security programs (Mulligan, 1999).

2.2.1.1 Systems Theory View of Pension Funds

Njuguna (2010) used systems theory view of pension funds (inputs – conversion – outputs) to study the strategy to improve pension funds efficiency. He used the variables membership age, design, regulations and operational efficiency (inputs) as independent variables. The results showed that these variables exerted no significant influence on their financial efficiency (outputs). (Davis, 2005:5) argues that, Pension funds like other organizations, can be considered as open systems since they collect and accumulate contributions from their contributing members and invest the same in various investment avenues and hold the proceeds in stewardship for the benefit of the members upon retirement.

2.2.1.2 Theory of Financial Statement Analysis

Financial statement analysis is prepared to help investors and creditors understand the financial history of the company and use that knowledge to predict future cash flows (John, 2002). He also added that, the foundation of reliable analysis is an understanding of its objectives. This understanding leads to efficiency of effort, effectiveness in application and relevance in focus. Pension Fund efficiency can be measured by calculating cash flow return on investment made and cash flow return on revenue (John, 2002). The higher the ratios the higher the efficiency of cash usage in investment portfolio and therefore the safer the members' funds.

2.2.2 Narrative theories

These theories are not obviously “political” or “efficiency” theories; they explain the future of pension fund schemes given the designs of the present generation on saving behavior. The theories take the following perspectives:-

2.2.2.1 Social Security a Chain Letter

Some people argue that a pensions fund scheme is like a Ponzi-type chain letter, by which the first generation of elderly takes a pension from the young, and “promises” that the future generations will pay the money back with some positive rate of return (Friedman, 1972; Romer, 1994). However, the past and present generations believe that it is a good idea to pay social security taxes because, by continuing this chain means that future generations will pay even more taxes to fund benefits.

2.2.2.2 Lump of Labor

Popular European theory of pensions' funds schemes argues that jobs need to be redistributed from the old to the young in a world where there is a lot of unemployment. The fact is that, there is involuntary unemployment (due to some

imperfection in the labor market, or to excessive regulation or to the existence of powerful unions, etc.) therefore the government may wish to take some of the jobs currently done by citizens of “near retirement age” in exchange for pensions’ funds schemes, and give them to the young (Mulligan and Martin, 1999).

2.3 Sub-but-Nearly-Optimal Policy Response to Private Pensions

Private pension plans are also associated with rules encouraging or mandating retirement (Kotlikoff and Wise, 1987). If these alone cause enough people to retire, then perhaps it is not a big deal if a public SS program provides an additional retirement incentive. Nor, the argument goes, would it be a big deal if the government were to mimic private pension plans in other dimensions such as choice of retirement age or use of the payroll tax (Mulligan and Martin, 1999).

2.4 Overview of Pensions Funds Schemes (Social Security Schemes)

2.4.1 Historical development of social security schemes in developing countries

Msalangi (1998) argues that social security in developing countries of Africa began with limited programmes which were introduced by the imperial governments between the two world wars although many schemes were established after the Second World War. The schemes which were introduced during that time were civil service pensions schemes and employers’ liability schemes known as workmen’s compensation (Mchomvu, 2002).

2.4.2 Historical development of social security schemes in post independence African countries

After attaining independence, the new governments of most African Countries maintained the existing schemes which were introduced before independence and modified them slightly in order to fit the demands of a new society (Mchomvu, 2002).

At the same time attempts were made to establish new additional schemes in order to cover a larger population. The build up of the schemes has been carried out mainly with the assistance of the I.L.O and U.N.D.P, on consultancy basis, and much of what is presently available owe from these international organizations regarding their determination and scope of benefits (Msalangi,1998).

2.4.3 Nature and operations of pension funds

A pension fund is a legally separated pool of assets bought with contributions to the fund for the exclusive purpose of financing pension fund retirement benefits (OECD 2008; Yermo, 2002). A distinction is however often made between a pension fund and a pension plan (OECD, 2008b). A pension plan has a legally binding contract with a clear retirement objective that may be part of the employment contract or may be required by law. Pension plans may offer additional benefits such as disability, sickness and survivors' benefits (Yermo, 2002). A pension fund can be incorporated to manage pensions assets of various pension plans. In Kenya however, each pension plan is allowed to manage only pensions assets of their own (RBA, 2008). The pensions fund members have a legal or contractual claim on the assets of the fund (Yermo, 2002). He also added that, Pensions funds are therefore trusts with legal capacity to invest and manage beneficiary funds with diligence and stewardship.

Pensions funds collect and accumulate contributions from employees and their sponsors (employers who establish the pension scheme), invest the contributions and hold the proceeds in stewardship for the benefit of the members on retirement (OECD 2004; EBRI, 2004).

2.4.4 Rationale of pension funds investments

Pension's funds invest in order to safeguard the value of its members' contributions from the effects of inflation and economic downturns (NSSP, 2003).

According to the URT (2003), investment of social security funds is an inseparable function of the social security institutions because sustainability of the schemes and improvement of benefits depend on investment income.

Baruti (2009) argues that, Social Security Schemes mobilize funds in terms of members' contributions and income from investments. These funds are invested in various high yielding avenues to safeguard the members' interest by paying improved benefits and provide quality services. Oliver (2005), examines this based on various studies carried out by the World Bank and other multi-lateral institutions, and reveals that the returns on the investments of social security institutions in Africa in the last three decades have been negative, thus these losses have been passed on to members in the form of poor benefits.

Tamongo (2001) argues that, the first factor which must be taken into account in the investment of social security funds is the purpose for which such investments are being made. On initial consideration, the objective would seem to be obvious: The funds are being invested in order to increase the amount of money available to pay promised benefits.

Boatin and Nyarko (2006), argue that SSNIT (Ghana) generates investment income that helps in financing the payment of benefits and the provision of services to its members. However, the investment of the funds under its management is not without risk. They may yield negative returns and could disappear altogether if imprudently invested.

2.4.5 Performance of pension funds

There are three critical elements in the financial stability of any funded social security system, namely, benefits, contributions and asset allocation (investment). Unless these three elements are consistent with one another, the system will ultimately collapse.

If, for example, a decision is taken to increase the benefits, contributions must also be increased, otherwise with each subsequent year there will be a widening gap between benefits and funds available to provide them. Equally, if the scheme's asset allocation delivers too low returns, then the benefits may not be payable without an increase in the level of contributions. Thus social security stability depends on all three elements.

Assuming that both benefit levels and contributions are fixed, the role of asset allocation (investment) must be to generate a targeted return that maintains the scheme's solvency, which means contributions plus investment returns equals or exceeds the benefits.

Social security trustees are bestowed with various responsibilities including the power to increase income through investment of the member's funds by means of proper investment in order to achieve a good investment performance (Rono, 2009). Fortune (2004), argues that investment is like exploring for gold. Pensions funds trustees are bestowed with various responsibilities, including the power to produce income by means of proper investment and to have a prudent investment policy.

Njuguna (2010) argues that high administrative costs of pension funds reduce returns on investments. Pension funds should therefore increase returns and reduce costs to be efficient. He adds that, competitive investment returns should at least correspond to the returns available on government bonds. It also suggests that if the benefit is payable on retirement, the return payable on withdrawal should be adequate to match or "replace" the retirees income after leaving active employment. An efficient pension fund makes returns on investments that ensure adequacy of benefits to the retirees.

2.4.6 Forces shaping the future of pension systems

The World Economic Forum (2008) classifies variables that are likely to shape the future of the world pension systems in two groups, namely macro factors and stakeholder forces.

The macro factors include demographic shifts of the population since life expectancy is increasing as a result of better medical and living conditions; global economic performance and investment returns; income and wealth distribution in the emerging markets; changing patterns of infections and chronic diseases; climate change and environmental degradation and urbanization.

Stakeholder forces, on the other hand, include changing attitudes of individuals toward retirement; changing roles of governments in social welfare since many governments are moving away from the Pay- As –You- Go (PAYG) pension systems; changing roles of employers in social welfare as employers now recognize the critical role of human capital in production; changing roles of families in social welfare since many households are working towards reducing old age poverty; health care innovation and regulation may increase life expectancies(World Economic Forum, 2008); and financial innovation and regulation which may lead to decreased losses due to stock market failures. All these forces, combined with the importance of pension funds as reviewed above, emphasize the need to explore efforts to improve the performance and efficiency of pension funds.

2.4.7 Investment areas of the LAPF Pension fund

According to the LAPF investment plan 2009/10, the investment activities of the Fund are guided by section 49 of the LAPF act No. 9 of 2006 (LAPF, 2006). The investment activities are also guided by the LAPF investment policy which stipulates categorically the investment criteria, investment areas and proportions for each portfolio.

The LAPF investment portfolio structure currently comprises of investments in fixed and non-fixed income instruments. These include government securities (i.e. Government Stocks, Treasury Bonds and Treasury Bills, Bank Fixed Deposits, Corporate Bonds, Equity/Shares, Loans and Real estates.

2.4.8 Increasing investment income of Pensions funds

Pension funds' investment performance is measured by the use of the rates of return reported on pension fund investments at certain time periods (Yang and Mitchell, 2005). High returns are preferable since they enable the pension fund to maintain appropriate funding levels while avoiding extra contributions.

It has been noted that, efficient pension funds thus maximize returns and are consequently well funded. O'Neill (2007) argues that good returns on investment are crucial to maintain and encourage sustainable pension payments. He recommends the inflation adjusted returns on investment as the best measure of the rates of return and suggests that an efficient pension fund is one that achieves high inflation adjusted rates of return over the years of its existence.

Barros and Garcia (2006) depict the return obtained on assets of a pension fund as one of the most important determinants of efficiency. They argue that high administrative costs of pension funds reduce returns on investments, thus lowering the fund's efficiency. Pension funds should therefore increase returns and reduce costs to be efficient. An efficient pension fund makes returns on investments that ensure adequacy of benefits to the retirees and achieve appropriate replacement rates.

Henon and Kanouse (2004) reported that in the United States declining rates of return on investments created under-funding situations and forced employers to make substantial unbudgeted contributions to the pension funds. They added that, this would not have been the case if the pension funds took measures to increase

their rates of return on investment. Good performance can therefore be achieved if pensions fund adopt practical measures to increase their rates of return while controlling their costs. Asebedo and Grable (2004) add that pensions fund should aim at generating real financial returns over the long term in order to ensure pension payouts. A pension fund's ability to generate returns over the long term is an indication of good performance and efficiency.

2.4.9 Functions of the LAPF Pensions fund

The major function of LAPF pensions fund is registration of members and payment of benefits to their members. In addition, the pensions fund collects contributions from their members and thereafter uses the funds for investment activities. Investments are made with an intention of increasing the value of the members' funds.

2.5 Empirical Literature Review

Kumado and Gockel (2003) studied social security scheme in Ghana where they used descriptive statistics to present their findings for the period covered of 1991-2000. The findings revealed that, the core business of SSS (Pension funds) entails collection of contributions, investing such collected funds and making pension payments. However the pensions funds face higher administrative costs. Indeed, not only were the costs of administering the fund high but they were also in ascendancy, reaching as high as 30.1% in 1998. The experience of SSNIT, especially since 1997, was really worrisome. Between 1997 and 2000, SSNIT was using, on average, about 26% of total contributions to administer the Fund. More disturbing was the fact that such general and administrative costs exceeded the amounts paid out in benefits. For example, in 2000, the administrative cost was ₵123172m compared to total benefits payment of ₵95462m. These administrative expenses of SSNIT were undoubtedly a major area of concern, especially if the pensions fund had to be made efficient so that resources could be stretched for improved benefits through an increased income from investment.

Pieris and Fultz (1999) conducted a study on Social security schemes in Southern Africa where they examined an overview and proposal for future development of pension funds. Their study used descriptive statistics covering the period from 1985 to 1995. The findings revealed, among others, that the social security schemes/pensions funds faced higher administrative costs.

For instance, in Tanzania, administrative spending was 36 percent, averaging between 25 and 30 percent of members' annual contributions during 1985–95; in Swaziland, about 40 percent; and in Zambia, between 65 and 110 percent. Thirty seven (37) percent of these costs were driven by high staffing levels and employee benefits. Today personnel costs comprise approximately 50 percent of total administrative spending in Swaziland, 48 percent in Tanzania, and 70 percent in Zambia. This reduces investible funds which could otherwise produce interest income and hence generate more investment income.

Mos and Seulean (2010) studied on determinants of investment performance of voluntary pension fund in Romania by analyzing the factors that determine the changes in the value of the fund unit and establishing the relationship that exists between the fund's total asset allocation and the value of the fund unit. Various components of investments performance were examined; these included, fixed deposits, mutual funds, government bonds, municipal bonds, supranational bonds, corporate bonds, cash and deposits, and listed equity. The objective of their study was to examine the components which had greater impact on investment performance, taking into consideration the investible funds spent in each investment category as inputs in order to generate a certain income referred to as output. They used quarterly panel data from the year 2007 to 2010 and results revealed that the investments made in deposits, government bonds and listed equity had positive impact on the performance of voluntary pension funds. They further revealed that, the rates of returns obtained by the voluntary private pensions funds were clearly affected by the risk preference adopted by the funds' managers

through the investments they make. On other side, the value of the fund unit was influenced mainly by changes in the return rates of the deposits made by the managers of the pension funds due to the massive investments made at the beginning as part of a safer investment strategy.

Alestalo (2005) researched on asset allocation in Finnish Pension Funds to assess various components of asset allocation. The study used descriptive statistics covering the period from the year 2002 to 2005 for 44 pension funds. In his study he analyzed the decisions made by fund managers on asset allocation and thus variables such as fixed income, equity, age, and solvency were studied; they also included a dummy. Findings revealed that the total investment of pension funds in Finland amounted to €6.4 billion and it was composed of fixed income securities which were the most popular investments, accounting for €2.6 billion (40% of the total investments). Equity investment came next with €1.5 billion (24%), real estate amounted to €1.1 billion (18%) and short-term money market investments were €0.9 billion (14%). Investments in Finland pension funds amounted to a total of €0.6 billion (9%). Other investments amounted to 0.2 billion (4%). These investments were broken down into equity investments, amounting to €0.2 billion (3% of total investment portfolios and 12% of total equity investments) and fixed income investments totaling €0.4 billion (6% of total investment portfolios and 15% of total fixed income).

Schoeman and Nhabinde (2005), in their study titled “Does Social Security Enhance Growth in SADC Countries?” used a combination of panel data and dummy variable to investigate the effects of social security schemes, specifically pension funds on per capita economic growth of four SADC countries. These included Mozambique, Zambia, South Africa and Zimbabwe. The panel data which were used for comparison purposes in respect of each country covered a period from 1994 to 2003. The findings revealed that, social security benefit

payments have negative effects on economic growth in both regressions with and without South Africa. However, when South Africa was excluded results were not statistically significant. According to them, this was due to the structural differences between the countries in the region and also the more advanced capital market and social security systems in South Africa.

Rono (2009) studied on “An Evaluation of Factors Influencing Pension Managers Investment Decisions in Kenya”. He used descriptive statistics to summarize data obtained from twelve registered pensions funds in order to identify factors that are considered by fund managers when making investment decisions and identify challenges faced by fund managers in making investment decisions.

The study found out that returns, investment risks and trends in interest rates were the most important factors affecting managers’ investment decisions. Decision-making preferences, investment portfolio, past performance and legal framework were rated as less important. Consistency and return maximization in the rate of returns (sustainable long term returns), prevailing economic and political situations, inflation, global markets which determine key indicators like interest rates/ exchange rates and risk profile of the scheme investment (risk assessment of the board of trustees), in that order, were also observed as important qualitative factors in decision making for pensions fund investment. The findings also revealed that few investment avenues, bureaucracy in consultations with trustees and unpredictable/turbulent and dynamic market situations, in that order, were major challenges facing fund managers in investing pensions fund.

2.6 The Conceptual Framework

The LAPF pensions fund faces a challenge concerning how to make the growth of investment income. Researcher examined the net change of investment income caused by the effects of the variables member’s contributions, investment made in

fixed deposits and investments made in government securities (independent variables). The growth of investment income in this study was treated as the dependent variable. The relationship stated thereon is diagrammatically represented in Figure 1.

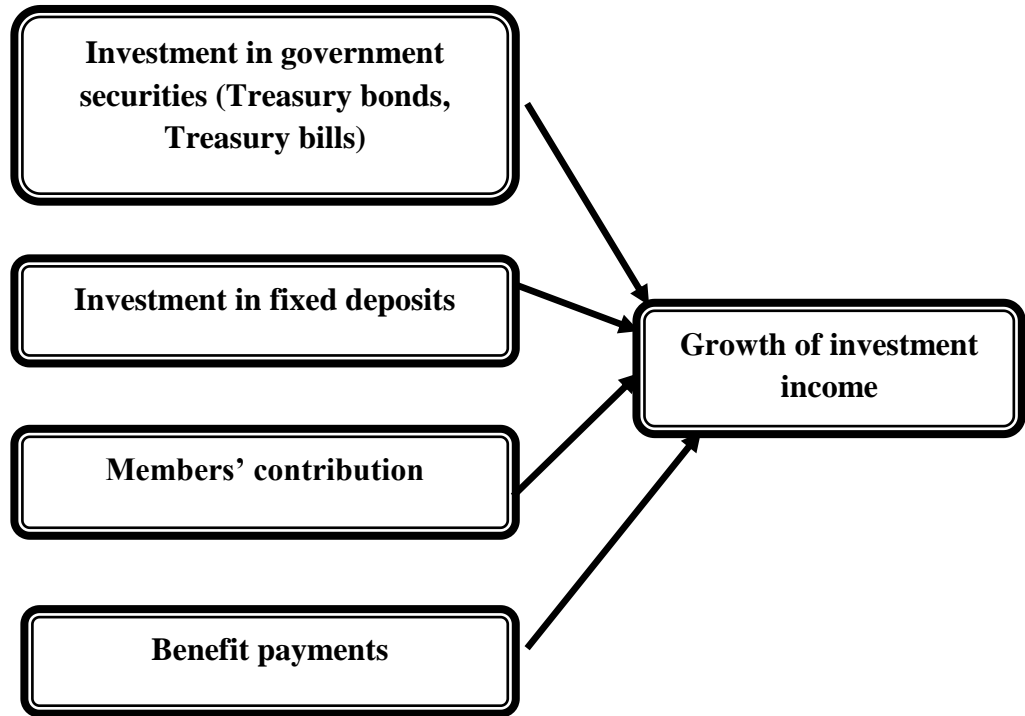


Figure 1: Conceptual framework

From the conceptual framework (Figure 1), the growth of investment income was expected to be affected negatively by the growth of benefit payments since investible funds are drawn to pay the beneficiaries. This would make growth of investment income depend much on the number of members who are due for various payments.

On the other hand, growth of investment income was expected to be affected positively with the investment made in government securities. Higher yield makes higher growth of investment income and vice versa.

Moreover, in this study, the growth of investment income of the pension funds took into consideration the Managers decisions to invest in fixed deposits. Fixed deposits were considered to have positive relationship with the growth of investment income of pension's fund.

2.7 Model Specification

Furthermore, the above conceptual framework indicates a relationship between growth of investment income and the contributions from members of the pensions fund. As contribution collection increases the impact would be on the growth of the pension's fund's investment income. From the above conceptual framework, the conceptual model was constructed as below;

$$GWINCOME=f(GVTSECUR,MECR,FDEPOSIT,BENPAY).....Eqn(1)$$

$$d(f)/d(GVTSECUR)>0,d(f)/d(MECR)>0,d(f)/d(FDEPOSIT)>0, \\ d(f)/d(BENPAY)<0$$

Where;

GWINCOME = Growth of investment income

FDEPOSIT=Investments made in fixed deposits

GVTSECUR=Investments made in government securities

MECR= member's contribution

BENPAY=Benefit payments

d=differential

2.7.1 Expected relationship of the variables

This section clarifies and operationalizes the variables included in the conceptual model.

- Members' contribution: This variable was expected to have a positive relationship with investment income because it adds more money for investment expenditure.

- Benefits payments: This variable was expected to have negative relationship effect on the growth of investment income because it reduces investible funds.
- Investment in fixed deposits: This variable was expected to have a positive relationship with the growth of LAPF investment income.
- Investment in government securities: This variable was expected to have positive relationship with the growth of investment income.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes how the study was carried out in order to achieve the objectives. The main interest was to evaluate the determinants of the growth of investment income of pensions fund schemes, taking LAPF in Dodoma as a case.

3.2 Research Design

3.2.1 Case Research Design

Researcher used a case research design where LAPF Pensions fund in Dodoma was selected as the case. This method gives accurate results to specific area of study; however results obtained cannot be generalized to other pensions fund.

3.3 Types of Data and Sources of Data

Researcher used secondary data in order to extract the relevant information for the study. The data were obtained from annual statement reports, files, and performance reports (i.e. monthly, quarterly, and annually). Furthermore, data were collected for all variables presented in the conceptual model; these included data for investment income, funds invested in government securities and fixed deposits, income collected from members (members' contribution). All these data were collected in monetary terms.

3.4 Data Analysis

Researcher used STATA in regression analysis, and all data were in form of a ratio scale.

Mos and Seulean (2010) developed an input-output model to study the link between the value of the fund unit and the assets in which the voluntary private pensions have invested by examining various components of investment of voluntary pension funds in Romania. These components were municipal bonds, fixed deposits, mutual funds, government bonds, supranational bonds, corporate bonds, cash and deposits, and listed equity.

The objective of this study was to examine the components which had greater impact on investment performance, taking into consideration the investible funds spent in each investment category as inputs in order to generate a certain income (output) referred to as output. The theoretical framework for his study was based on the multiple regressions model shown below:

$$FUV = \beta_0 + \beta_1.GB + \beta_2.MB + \beta_3.SB + \beta_4.CB + \beta_5.LE + \beta_6.MF + \beta_7.CD + \mu \dots \dots \dots \text{eqn}$$

(2)

Where;

FUV=Fund Unit Value

SB=Supranational bonds

MF=Mutual funds

GB=Government bonds.

CB= Corporate bonds

CD= Cash and deposits

MB=Municipal bonds

LE= Listed equity

Wooldridge (2002) argues that before estimating the parameters of the model some basic assumptions have to be considered. The assumptions provided by the specialized literature are: Linear model with respect to the parameters, random sampling, and zero conditional mean.

Adopting the theoretical framework above, the new study on analysis of determinants of the growth of investment income of pensions fund was conducted basing on Mos and Seulean's model with some modification. The Fund Unit Value which was the dependent variable in the above study was replaced by the growth of investment income, and other variables such as funds collected from member's contribution, funds invested in government securities, funds used for payment of members benefits and funds invested investment in fixed deposits were taken as exogenous variables replaced government bonds, Municipal bonds, supranational bonds, corporate bonds, listed equity, mutual funds and cash deposits. This resulted into the following multiple regression model.

$$GWINCOME=f(GVTSECUR, MECR, FDEPOSIT, BENPAY)$$

Model Specification: The model was specified as:-

$$GWINCOME = \beta_0 + \beta_1 \cdot GVTSECUR + \beta_2 \cdot MECR + \beta_3 \cdot FDEPOSIT + \beta_4 \cdot BENPAY + \mu \dots \dots \dots \text{eqn (3)}$$

$$\beta_1 > 0, \quad \beta_2 > 0, \quad \beta_3 > 0 \quad \beta_4 < 0$$

Where;

GWINCOME = Growth of investment income

FDEPOSIT=Investments made in fixed deposits

GVTSECUR=Investments made in government securities

MECR= member's contribution

BENPAY=Benefit payments

3.5 Model Estimation

This section describes the estimation technique used to assess the determinants of the growth of investment income of Pensions funds. As shown above, the multiple linear regression model to estimate the determinants of the growth of investment income.

The Ordinary least squares (OLS) was applied as an estimation technique in the study. However, the data for benefit expenditures were inconsistent; we couldn't extract quarterly data for this variable for some period. Thus, the model to be estimated did not include the variable "benefit payment expenditure"

$$GWINCOME=f(GVTSECUR, MECR, FDEPOSIT)$$

Empirical model: For empirical analysis, the model was specified as:-

$$GWINCOME = \beta_0 + \beta_1 \cdot GVTSECUR + \beta_2 \cdot MECR + \beta_3 \cdot FDEPOSIT + \mu \dots \dots \dots \text{eqn}$$

(4)

3.5.1 Testing the Model

3.5.1.1 Testing the problem of non-stationary

A unit root test is a statistical test for the proposition that in an autoregressive statistical model of a time series, the autoregressive parameter is one. The unit root for all explanatory variables were tested, these include "members contribution", "investment in government securities" and investment in fixed deposits. The same test was performed for dependent variable which is the "growth investment income".

3.5.1.2 Testing the Problem of Serial Correlation

In practice, it often happens that the errors are not independent (as assumed in standard regression models) but instead are autocorrelated. Such error

autocorrelation, or "serial correlation", has many undesirable but correctable consequences (e.g., the least-squares estimates sub-optimal, standard confidence intervals for β s are incorrect, the error term is forecastable). Thus, it is highly desirable to try to detect error autocorrelations.

The Durbin-Watson Test for serial correlation assumes that the ϵ are stationary and normally distributed with mean zero. It tests the null hypothesis (H0) that the errors are uncorrelated against the alternative hypothesis H1 that the errors are AR (1).

Literatures suggest that, if the test results of Durbin Watson "d" is within 2, there is no serial correlation, but if "d"<2, there is positive serial correlation and if "d" is higher than 2, there is negative serial correlation. That being the case, serial correlation was tested by using "estat dwatson" command to check if the problem of serial correlation appears in the model.

3.5.1.3 Testing the problem of multicollinearity

Multicollinearity refers to a high correlation that may exist between independent variables and that they (independent variables) should indicate some relationship with the dependent variable (Pallant, 2007). To test for multicollinearity, two ways were used; the first one was to check for correlations between each independent and dependent variables as well as between independent variables themselves. Secondly, was diagnostic for collinearity (Tolerance value and VIF values).

3.5.1.4 Testing the problem of heteroscedasticity

Testing for heteroscedasticity using Breusch Pagan/Cook –Weigh berg test was done. Heboyan (2007) points out that if P-Value is very small we reject the null hypothesis and accept the alternative that the variance is heteroscedastic. In addition, literature shows that, the model shall have a problem of heteroscedasticity if the total χ^2 is less than 10.

It should be noted that with time series data, heteroscedasticity is not a serious problem and thus regression may continue with or without solving this problem. However, in this study, solution for removal of heteroscedasticity problem was recommended in the model.

3.5.2 Dealing with non-stationarity, serial correlation, multicollinearity and heteroscedasticity in the model

3.5.2.1 Non-stationarity

Literature shows that using non-stationary time series data could yield spurious results, as pointed out by Gujarati (2007). The researcher transformed some of the data of the above model into natural logarithms to make the series stationary.

Researcher performed unit root tests on our variables before proceeding with estimation so as to avoid the spurious regression problem and to account for the appropriate dynamic specification. Stationarity of the variables was tested using the Augmented Dickey-Fuller (ADF) test. This test requires a unit root test against a null Hypothesis that $d = 0$. If the computed t value is more than critical t value, in absolute terms, then we reject null Hypothesis that $d=0$, therefore the time series is stationary (Gujarati, 2007). In addition Mackinnon test determines P –values for the stationarity of the series.

Results showed that all variables were stationary with an exception of the variable “investment in government securities”. This variable was replaced by its natural logarithm. The transformation of this variable into its natural logarithm was done so as to make it stationary.

3.5.2.2 Multicollinearity

Gujarati (2007) suggests that if there is multicollinearity among the variables then some correlated variables have either to be dropped or combine cross sectional and time series data, or additional of new variables, or transformation of variables be

done; or do nothing. In addition he explains that, if multicollinearity problem is serious only two choices can be done; follow some rules of thumb or do nothing.

The new model was specified as:

$$GWINCOME = \beta_0 + \beta_1$$

$$\ln GVTSECU + \beta_2 \cdot MECR + \beta_3 \cdot FDEPOSIT + \mu \dots \dots \dots \text{eqn(5)}$$

$$\beta_1 > 0, \quad \beta_2 > 0, \quad \beta_3 > 0$$

Where;

GWINCOME = Growth of investment income

GVTSECU = Natural logarithm of investment made in
government securities

MECR = Member's contribution.

FDEPOSIT = Investment made in fixed deposits

μ = stochastic variables

$\beta_0, \beta_1, \beta_2, \beta_3$, are the parameters to be estimated (explanatory variables) while μ is the stochastic variable with standard properties (Alam, 2010). β_0 is the constant.

CHAPTER FOUR

4.0 RESEARCH FINDINGS

4.1 Introduction

This chapter presents an analysis and discussion of the findings from the empirical study based on considering the research questions, the research design and data analysis techniques. The aim was to determine the factors which influence the growth of investment income of pension funds schemes in Tanzania as shown in hypotheses.

Data were analyzed using STATA. The variables regressed were members' contributions, investment in government securities, benefit payments expenditures and investment in fixed deposits as independent variables, and the dependent variable was the growth of investment income. Results were presented in percentages, tables, and figures.

4.2 Why LAMPF invests

URT (2003) argues that investment of social security funds is an inseparable function of social security institutions because sustainability of the schemes and improvement of benefits depends on investments, since these safeguard the value of members' contributions from the effects of inflation and economic downturns.

LAMPF has been doing the same as per given policy thereon. The fact that pensions and other benefits tend to be provided after long periods of time while the value of money tends to decrease with time, investment of the members funds are done for the sake of increasing income from investment so as to pay various benefits to the pension funds members in terms of various benefits.

4.3 LAPF performance areas of investment: 2009 and 2010

According to the LAPF investment plan 2009/10, the investment activities of the Fund are guided by section 49 of the LAPF act No. 9 of 2006.

The investment activities are also guided by the LAPF investment policy which stipulates categorically the investment criteria, investment areas and proportions for each portfolio.

The LAPF investment portfolio structure is currently comprised of investments in fixed and non-fixed income generating instruments. These include: Government Securities (i.e Treasury bonds and Treasury bills), Bank Fixed Deposits, Corporate Bonds, Equity/Shares, Loans and Real estates.

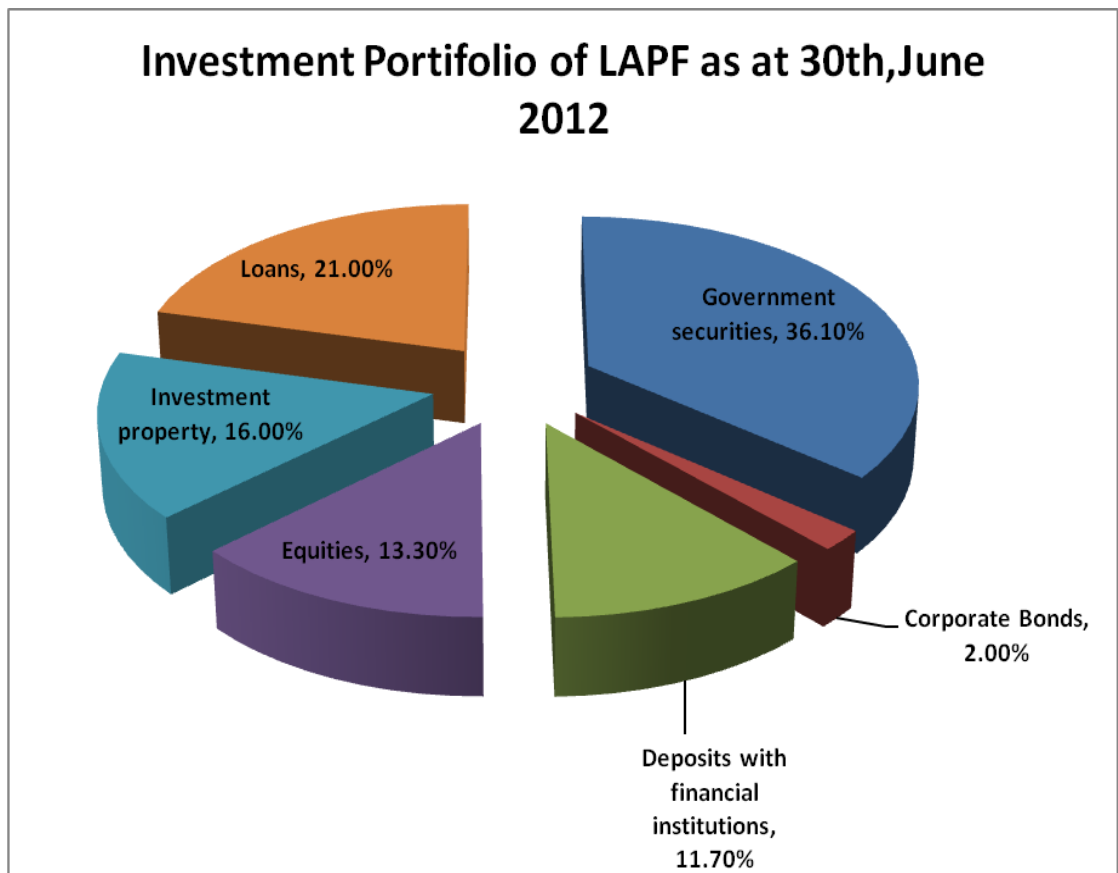


Figure 2: LAPF investment Portfolio for the period ending 30th June, 2012

Source: LAPF five Years Corporate Plan 2008/09-2012/13, (2006)

Table 1: Investment portfolio of LAPF as at 30th June, 2012 (in TZS Billions)

S/N	Type of Investment	As at 30th June 2009	As at 30th June 2010	As at 30th June 2011	As at 30th June 2012
1	Government securities	104.782	133.5	145.54	176.8
2	Corporate Bonds	2.08	1.56	9.98	9.8
3	Deposits with financial institutions	55.04	46.64	62.88	57.3
4	Equities	15.94	16.25	45.5	65.1
5	Investment property	21.39	42.14	53.65	78.6
6	Loans	10.47	37.41	70.06	102.9
	TOTAL	209.7	277.5	387.61	490.36

Source: LAPF Five Years Corporate Plan 2008/09-2012/13, (2006)

Table 1 shows that most of the investment assets of the LAPF pensions Fund has been concentrated in government securities. Its portfolio has been increasing with an increasing trend from TZS 104.78 billion for the period ended June 2009 to 176.8 billion as at 30th June 2012. In addition, the table shows that the Fund's investment portfolio is largely depend on loans. It has been noted that the total loans wealth TZS 10.47 billion was available in the end of 2008/09 and the same escalated to TZS 102 billion as at 30th June 2012. Nonetheless, investment properties' wealth has been increasing with an increasing trend from TZS 21.39 billion in the end of 2008/09 to TZS 78.6 billion as at 30th June 2012 followed by investment in equities which increased from TZS 15.94 billion in 2008/09 to TZS 65.1 billion as at 30th June 2012.

Table 2: Investment portfolio of LAPF as at 30th June, 2012 in percentage terms

S/ N	Type of Investment	As at 30th June 2009	As at 30 th June 2010	As at 30 th June 2011	As at 30 th June 2012
1	Government securities	50.0%	48.1%	37.5%	36.1%
2	Corporate Bonds	1.0%	0.6%	2.6%	2.0%
3	Deposits with financial institutions	26.2%	16.8%	16.2%	11.7%
4	Equities	7.6%	5.9%	11.7%	13.3%
5	Investment property	10.2%	15.2%	13.8%	16.0%
6	Loans	5.0%	13.5%	18.1%	21.0%
	Total	100%	100%	100%	100%

Source: LAPF Five Years Corporate Plan 2008/09-2012/13

Table 2 above shows the percentage breakdown of each investment portfolio of LAPF from the year 2008/09 to 2011/12 as explained below:-

4.3.1 Investment in Government Securities and Fixed Deposits

The allocation in the portfolio shows that most of the funds were invested in Government securities (40%), followed by loans, with 17%. In addition investments made in fixed deposits and real estates have shown equal utilization of investible funds with 15%, while investment in corporate bonds, loans, real estates and investment properties take the lowest share.

4.3.2 Investment Income

The contribution of each investment portfolio towards generation of investment income of the Fund is summarized in the Table 3.

Table:3 Investments Income – 2009/10 - 2012/13 (Fig. in TZS Billion)

S/N	Type of Investment	As at 30th June 2009	As at 30th June 2010	As at 30th June 2011	As at 30th June 2012
1	Government securities	13	15.9	19.5	22.4
2	Corporate Bonds	0.3	0.2	0.8	1.1
3	Fixed Deposits	3.9	5.9	3.3	5.4
4	Equities	0.5	0.7	0.8	1.7
5	Loan	1.3	1.8	3	5
6	Real Estate	1.7	1.7	1.3	1.3
	Total	20.66	26.21	28.58	36.85

Source: LAPF Five Years Corporate Plan 2008/09-2012/13,(2008)

From the table above, the actual investment income of LAPF increased from TZS 20.66 billion in 2009/10 to 36.85 billion in 2011/12. In addition, investment in government securities has had the largest contribution on the growth of investment income followed by investment in fixed deposits.

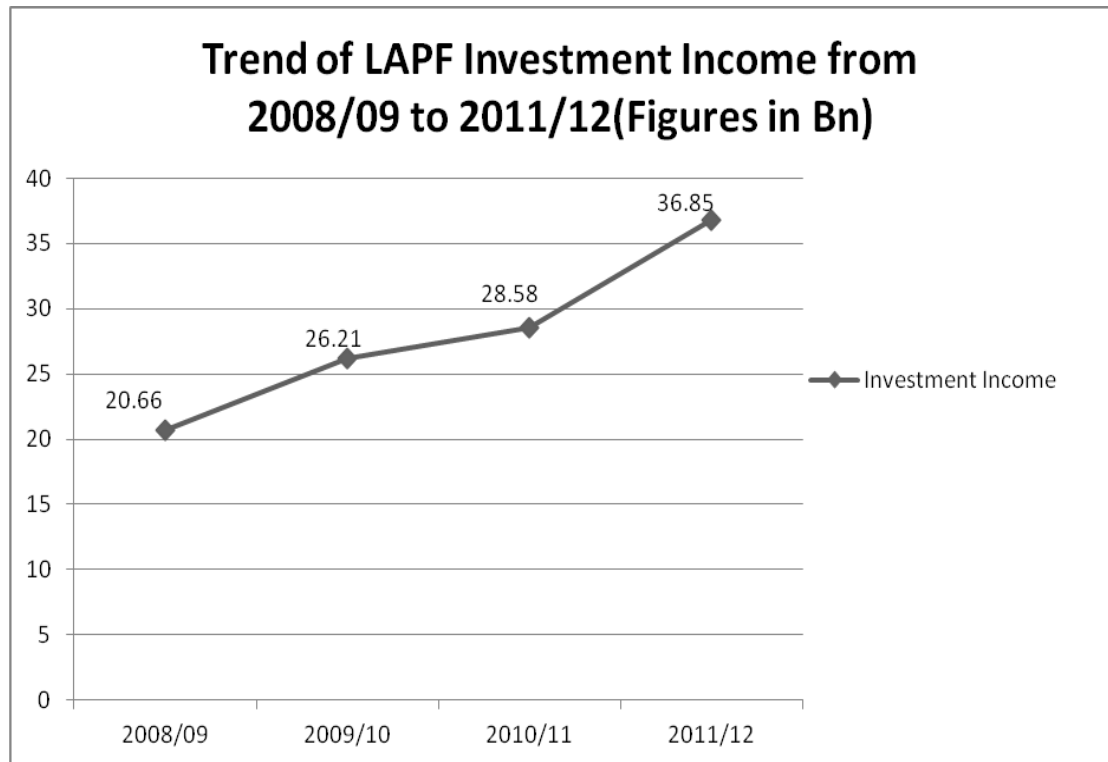


Figure 3: Graph of LAPF investment income performance from 2011/12

Source: LAPF Five Years Corporate Plan 2008/09-2012/13, and LAPF quarterly reports

4.4 Members Contribution (Contribution collection from members)

LAPF has been experiencing persistent increase in contributions over years. The increase in contributions is generally associated with increase in salaries, the reinforcement of employers' compliance rate attributable to the decision of the Government to deduct at source and remit the contributions directly to the Fund, the general increase in membership, efforts by the Fund to collect contributions payable directly by the Local Government Authorities and finally, stakeholders' awareness campaigns.

Contribution income stood at TZS 23.71 billion in 2007, TZS 32.21 billion in 2008 and TZS 86.06 billion was collected in 2011/12 (LAPF Annual Auditors Reports 2008/09, Annual Plan 2009/10).

Provisional figures for 2012/13 show that contribution income of TZS 107.66 billion will be collected in 2012/13. This represents an average year-on-year increase of 31.25%.

The fact is that, contribution collection from LAPF members (members' contribution) leads to an increase in investible funds. These funds are normally being invested in different investment avenues so as to generate investment incomes. It should be noted that, the value of asset base of LAPF pensions fund takes into consideration the investment income from different investment portfolios.

Table 4: Trend of members' contributions from 2006/07 to 2011/12(Figures in Billions TZS)

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13*
Total contribution	23.71	32.21	47.05	54.24	80.51	89.06	107.66
Percentage yearly increase		36%	46%	15%	48%	11%	21%

Source: LAPF Annual Report, 2008

**Estimates*

Table 4 above shows that, the growth rate of members' contributions over the years is fluctuating. However, the average growth rate of members' contributions for the period of 2006/07 to 2011/12 is 31% and it was expected that the overall growth rate at the end of the financial year 2012/13 would be 30%.

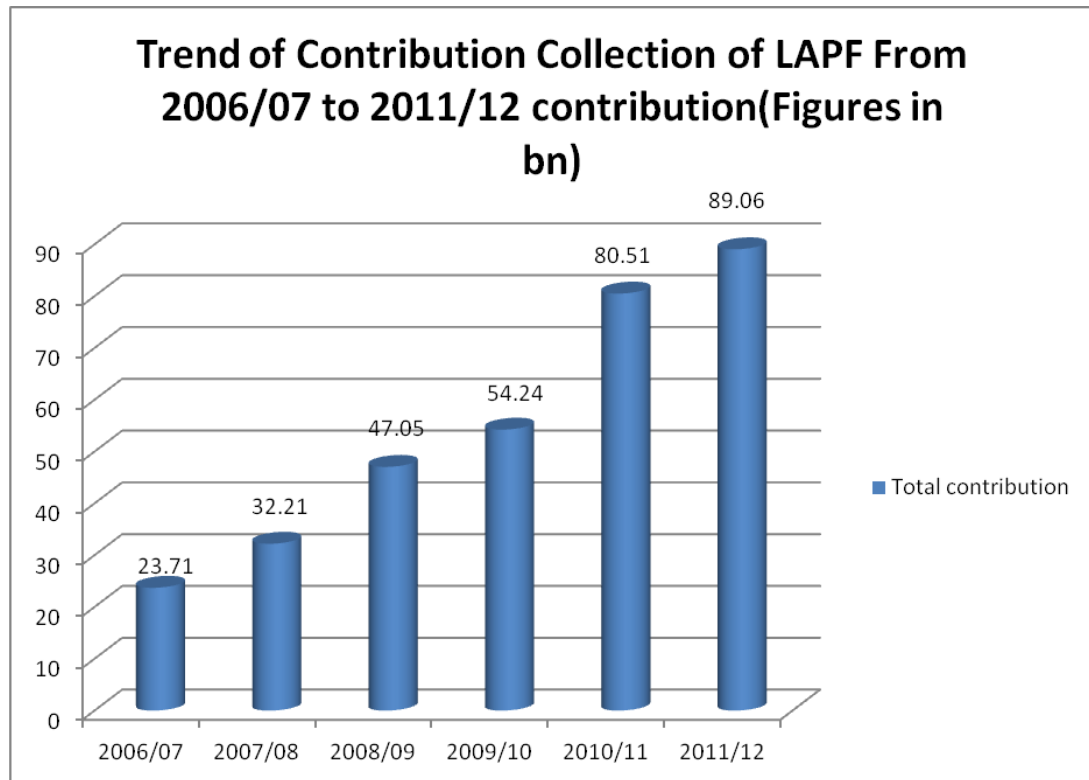


Figure: 4 Graph of members’ contribution from 2006/07 to 2011/12

Source: LAPF, 2008

4.5 Total Benefit Payments Expenditures

These represent total spending of the LAPF on various benefits payments to its members. Currently the Fund offers six types of benefits. These include withdrawal benefits, retirement benefits, invalidity benefits, survivor benefits, maternity benefits, and funeral grants. An increase in members who are due for benefits payments over years reduces investible funds and hence contributes to the lowering of investment income of the Fund. Table 5 shows the trend of benefit payments for the period of 2006/07-2012/13.

Table 5: Benefit payments from 2006/07 to 2011/12(Figures in Billions TZS)

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13*
Benefit Payment	6.5	9.29	14.89	22.51	26.51	38.3	56
Percentage yearly increase		43%	60%	51%	18%	44%	46%

Source: LAPF January 2013

*Estimates

Table 5 above shows that, the benefit payments in LAPF Dodoma are increasing with decreasing trend. However, the average growth rate of benefit payments for the period of 2006/07 to 2011/12 is 43% and it was expected that the overall growth rate at the end of financial year 2012/13 would be 44%. Efforts are needed to improve the growth of investment income due to the fact that an increase in benefit payments also reduces investible funds.

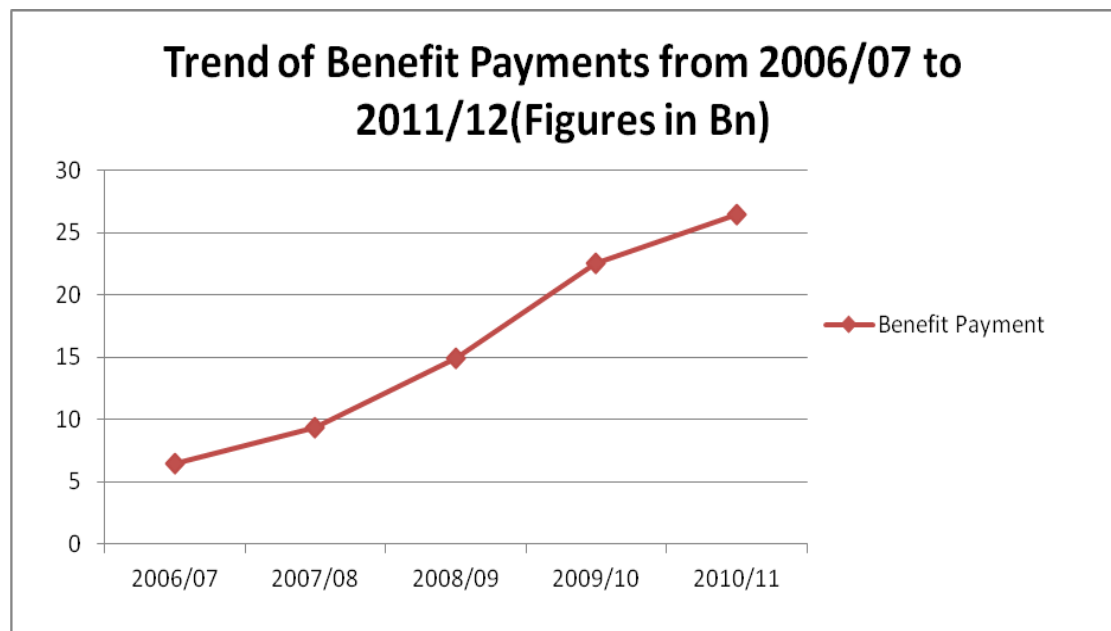


Figure 5: Graph of Benefit Payment Expenditures of the Fund From 2006/07 to 2011/12

Source: LAPF Annual Report, January 2013

Figure 6 shows that, the benefit payments in LAPF Dodoma are increasing but ability of the LAPF pensions fund to pay these benefits are also increasing. However, this ability is being contributed by increase in investment income as a result of investible funds collected from members' contributions.

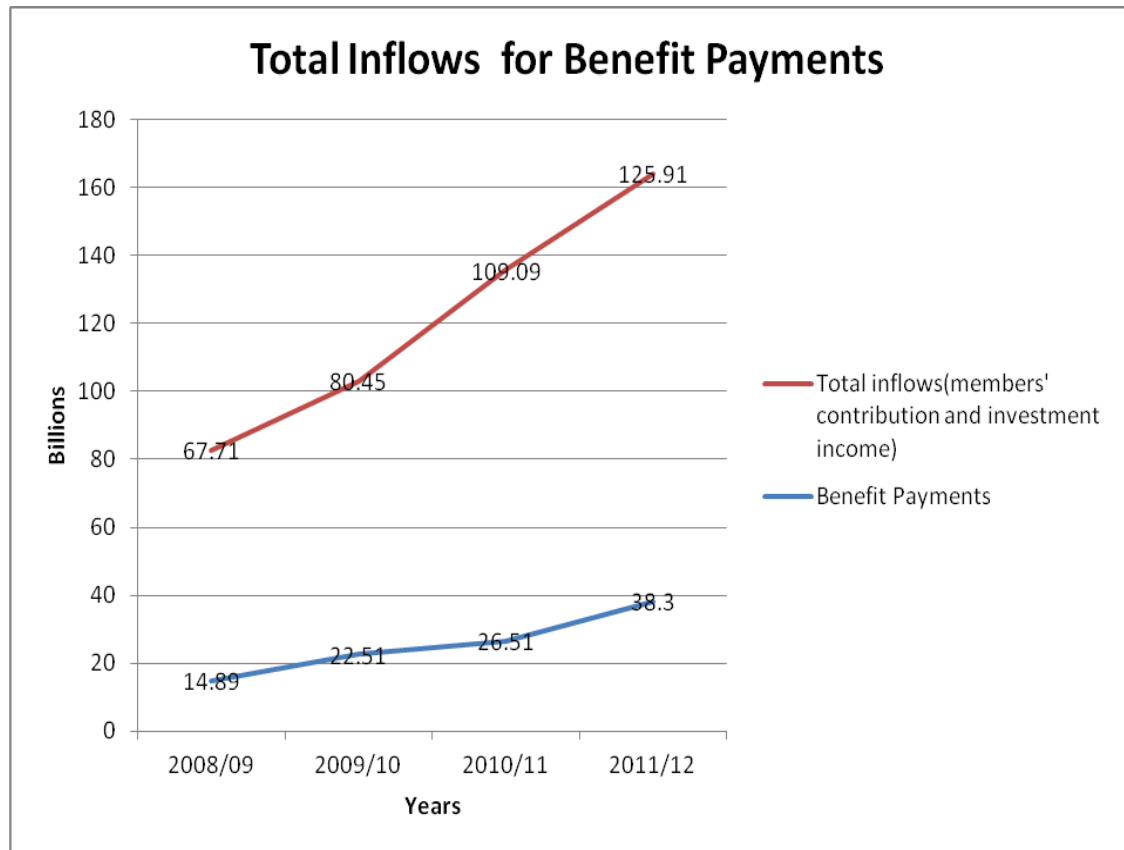


Figure 6: Graph of total inflows for LAPF benefit payments: 2008/09 to 2011/12

Source: LAPF, January 2013

4.6 Data Analysis

4.6.1 Augmented Dickey-fuller test for stationarity

The first step was to test for stationarity using the Augmented Dickey–Fuller (ADF) test. ADF test was applied basing on the following regression model:-

$$GWINCOME = \beta_0 + \beta_1 \cdot GVTSECUR + \beta_2 \cdot MECR + \beta_3 \cdot FDEPOSIT + \mu$$

The results are presented in the next page below:

Literature shows that using non-stationary time series data could yield spurious results. As pointed out by Gujarati (2007), we first perform unit root tests on our variables before proceeding with estimation so as to avoid the spurious regression problem and to account for the appropriate dynamic specification. In this study, test for stationarity was done using the Augmented Dickey-Fuller (ADF) test.

This particular test requires a unit root test against the null hypothesis; if the computed t-value is more than critical-t value both in absolute terms, then we reject null Hypothesis, and therefore the time series is stationary (Gujarati, 2007).

A critical t-value used in significance testing, is the value that a test statistic must exceed critical value in order for the null hypothesis to be rejected. For instance, the critical value of t (with 12 degrees of freedom using the 0.05 significance level is 2.18. This means that for the probability value to be less than or equal to 0.05, the absolute value of the t statistic must be 2.18 or greater.

Table 6: Results of the augmented Dickey-fuller test for stationarity

Variable	ADF statistic	1% Critical Value	5% Critical Value	Integration Order	MacKinnon p-value for Z(t)	Remarks
investment income	-5.223	-4.260	-3.548	<i>Trend I(0)</i>	MacKinnon approximate p-value for Z (t) = 0.0000	Stationary
Members' contribution	-5.350	-4.260	-3.548	<i>Trend I(0)</i>	MacKinnon approximate p-value for Z(t) = 0.0000	Stationary
Natural Logarithm of Investment in Government securities	-3.929	-4.260	-3.548	<i>Trend I(0)</i>	MacKinnon approximate p-value for Z(t) = 0.0111	Stationary
Investment in Fixed Deposits	-2.394	-2.434	-1.688	Drift (<i>I(0)</i>)	MacKinnon approximate p-value for Z(t) = 0.0110	Stationary

4.6.2 Interpretations of the results of the augmented Dickey-fuller test for stationarity

The ADF test allows for the rejection of the null hypothesis of non-stationarity for the levels of the variables as shown in Table 6 above. Results show that investment

income is stationary when it is integrated in order zero with trend regress i.e. $I(0)$ since the computed t-value, -5.223, exceeds -4.260, the critical t-value at 1% level of significance in absolute terms. This implies that the null hypothesis is rejected and therefore alternative hypothesis is accepted. This means that, the variable “investment income” is stationary. Mackinnon results also show that the variable has no unit root since the approximate p-value for $Z(t) = 0.0000$.

The variable “members contribution” is stationary (having no unit root) at $I(0)$ with trend regress as computed t value of -5.350 exceeds -4.260 critical t-value at 1% in absolute terms.

Dickey-Fuller test for stationarity was also performed for the fixed deposit variable; results show that the variable is stationary at drift regress lags (0) as computed t-value of -2.394 exceeds -1.688 DF critical t-value at 5% in absolute terms. In addition the variable became stationary with MacKinnon approximate p-value for $Z(t) = 0.0110$.

The variable “investment in government securities” was not stationary after being tested in different integration order. Therefore transformation of this variable was done to make it stationary. Thus the natural logarithm of investment in government securities was done and the same ADF test was conducted. The results showed that the transformed variable was stationary (having no unit root) with trend regress lags (0) since the computed t-statistics of -3.929 was greater than critical values of -3.548 at 5% level in absolute terms. The variable was also stationary with MacKinnon approximate p-value for $Z(t) = 0.0111$.

Consequently, after performing ADF with the variable investment in government securities replaced by its natural logarithm it was found that all variables used were stationary (having no unit). The results are presented in Table 6.

The empirical model after transformation was:-

$$GWINCOME = \beta_0 + \beta_1 \cdot \text{LnGVTSECUR} + \beta_2 \cdot \text{MECR} + \beta_3 \cdot \text{FDEPOSIT} + \mu$$

After having removing the problem of non-stationary, the second step was to conduct a test to see if the model was well specified or not by using a link test.

4.7 Estimation of the Empirical Model

Recall the following conceptual model with an omission of the variable “benefit payment expenditures”.

$$GWINCOME = f(\text{GVTSECUR}, \text{MECR}, \text{FDEPOSIT})$$

After conducting Augmented DFuller test, the variables in the conceptual model above, except investment in government securities were stationary with trend regress lags (0). The variable “investment in government securities” was transformed into its natural logarithm and thus was stationary with trend regress lags (0). The new empirical model as shown on page 33, for this study was now:-

$$GWINCOME = \beta_0 + \beta_1 \cdot \text{LnGVTSECUR} + \beta_2 \cdot \text{MECR} + \beta_3 \cdot \text{FDEPOSIT} + \mu$$

The regression results from stata for the above model are:-

Table 7: Regression results

Variable	Coefficient	Se	t-statistics	p-values>t
Constant	-9699.815	3703.691	-2.62	0.013
LnGVTSECUR	1234.84	454.29	2.72***	0.010
MECR	0.2164262	0.305916	7.07***	0.000
FDEPOSIT	0.1222343	0.1222343	4.14***	0.000

R-squared = 0.9085 Adj R-squared = 0.9006, Prob > F = 0.0000, root MSE=1104.8

t-statistics are in parentheses, A*** indicates significance at 1% level

The model becomes:

$$\text{GWINCOME})=9699.815+1234.84(\text{LnGVTSECUR})+0.2164262(\text{MECR})+0.1222$$

33

$$(\text{FDEPOSIT})+\mu\text{.....(1)}$$

From the estimated model above, all explanatory variables were significant since their p-values >t are within $1 <P(X) \leq 10$. However, this does not mean that the model was well specified (modeled). Something had to be done for the model to check correctness in specification. Thus, we tested for multicollinearity, serial correlation and heteroscedasticity.

4.8 Test Results

4.8.1 Serial Correlation

Literatures suggest that, if the test results of Durbin Watson “d” is within 2, there is no serial correlation, but if “d”<2, there is positive serial correlation and if “d” is higher than 2, there is negative serial correlation. That being the case, we tested for serial correlation by using “estat dwatson” command and our test results showed that “d” was 2.637436, hence no serial correlation problem.

4.8.2 Multicolleniarity

The test results showed that there was no perfect linear correlation between the variables since the mean VIF was 2.28. Literature suggests that for multicollinearity not to occur, the tolerance mean VIF should be range between 0 and10 percent. Thus, the results indicate an absence of multicollinearity because the mean VIF is 2.28 (as shown in Table 9, Appendix 1). However, other literature suggests that, besides the VIF results, researcher can detect the present of multicollinearity if the coefficient of variable is greater, with a very wide confidence interval and very small t-statistics. The fact is that, coefficients will have to be larger in order to be statistically significant. Just as in our case, the variable “investment in government securities” has a very larger confidence interval with a very small t-statistics.

However its magnitude coefficient is very large compared to other variables. A literature suggests that, when situation like this appears, the problem of multicollinearity has to be considered.

4.8.3 Heteroscedasticity

We also tested for heteroscedasticity using Bresuch Pagan/Cook –Weigh berg test and results showed that P-Value $>Chi^2$ is very small at 0.0018. Heboyan (2007) points out that if P-Value is very small we reject the null hypothesis and accept the alternative that the variance is heteroscedastic. In addition, literature shows that, the model shall have a problem of heteroscedasticity if the total chi^2 is less than 10. Results from this study show that the total chi^2 was 9.7 which also implies the presence of heteroscedasticity.

4.9 Dealing With the Problems of Multicollinearity, Serial Correlation and Heteroscedasticity

Since the variable “investment in government securities” showed the problem of multicollinearity, we applied a rule of thumb, that is do nothing though it is sometimes suggested that we “drop” the offending variable. The fact is that, if originally we added the variable “just to see what would happen in the model” dropping could be a fine idea. But, since the variable really belongs in the model, dropping led to specification error, which is even worse than multicollinearity.

Seemingly, since the empirical results showed also the problem of heteroscedasticity. Literature suggests that with time series data, heteroscedasticity is not a serious problem and thus regression may continue with or without solving this problem. However, in this study we recommended solution for removal of heteroscedasticity problem in the model. In view of this fact, regression was repeated, this time the variables were regressed with a robust command to correct the problem (i.e. Regress GWINCOME, LnGVTSECUR, MECR, FDEPOSIT,

robust). The results showed that the model was well specified with no problem of heteroscedasticity.

4.10 Regression results after dealing with multicolleniarity and heteroscedasticity

Recall the following empirical model resulted from stationarity of the series;

$$GWINCOME = \beta_0 + \beta_1 \cdot \text{LnGVTSECUR} + \beta_2 \cdot \text{MECR} + \beta_3 \cdot \text{FDEPOSIT} + \mu$$

An empirical model shown above was used to trace the determinants which affect the growth of investment income in the Local Authorities Pensions Fund.

Table 8: OLS Estimation Results of the Overall Regression Equation

Source	SS	Df	MS	Number of obs = 39	
Model	423980300	3	141326767	F(4, 34) = 157.38	
Residual	42721674.1	35	1220619.26	Prob > F = 0.0000	
Total	466701974	38	12281630.9	R-squared = 0.9085	
				Adj R-Squared=0.9006	
				Root MSE = 1104.8	
Investment income	Coefficient.	Robust Std.Err	Robust (t-statistics)	P> t	Robust [95% Conf. Interval]
Natural logarithm of government securities	1234.84	553.9775	2.23**	0.032	110.2056 2359.474
Members' contribution	0.2164262	0.388717	5.57***	0.000	0.01375124 0.29534

Fixed Deposits	0.1222343	0.0332326	3.68***	0.001	0.547685 0.1897001
Constant	--9699.815	4423.726	2.19	0.035	-18680 719.1743

The estimated model after robust command is now:-

(GWINCOME)=-

$$9699.815+1234.84(\text{LnGVTSECUR})+0.2164262(\text{MECR})+0.122234.3(\text{FDEPOSIT})+ \mu$$

Robust (Se)=	(4423.726)	(553.9775)	(0.388717)	(0.0332326)
t-statistics	(2.19)	(2.23)**	(5.57)***	(3.68)***

R-squared = 0.9085 Prob > F =0.0000 root MSE=110

Note:

t-statistics are in parentheses, A*** indicates significance at 1% level and A**indicates significance at 5% level.

Where:

GWINCOME = Growth of investment income

MECR= Member's contribution

FDEPOSIT=Investments made in fixed deposits

LnGVTSECUR=Natural Logarithm of investment in government securities

μ =Error term

$\beta_1, \beta_2, \beta_3,$ are parameters estimated from true regression model.

The level of significance chosen by the researcher is from 1% to 10%. This means that when the probability of variable lies within $1 < P(X) \leq 10$, the result is significant (because we reject H0).

4.11 Link- test For Model Specification Error

This particular test performs a link test for model specification after any single – equation command.

After conducting linear regression and performing a link test, it was found that the probability of $(P > |t|)$ of $_hatsq$ is 85.1 as indicated in Table 8 below. As per link test, the model is well specified if the probability of $_hatsq$ is as large as possible (Approaching one). Thus since the model above with the probability $(P > |t|)$ of $_hatsq$ is 0.85.1 is approaching one we conclude that the model is well specified with high probability. Table 8 shows the link test results.

Table 9: Link Test for Model Specification Error

					Adj R-squared = 0.9035 Adj R-squared = 0.9035 Prob > F = 0.000 Root MSE = 1088.80	
Growth of Investment income	Coef	Std. Err.	T	P> t	[95% Conf.interval	
$_hat$	1.035989	0.1972243	5.25	0.000	0.6359998	1.435979
$_hatsq$	-3.43e-06	0.0000181	-0.19	0.851	-0.0000401	0.0000333
$_cons$	-57.02371	436.9052	-0.13	0.897	-943.1085	829.061

In addition, the pattern of each independent variable in the model has been shown and presented in Appendix 2.

4.12 General Interpretation of the Model

4.12.1 R-squared and the Adjusted R-squared

The R-square is 90.85 meaning that 90.85 % of the variation in the growth of investment income is explained by independent variables (i.e. members' contribution, investment in government securities and investment in fixed deposits). The high value of R^2 indicates that the regression results make sense.

Also, since the computed F-value of 157.38 exceeds the critical F- value of 9.08 we reject the null hypothesis and accept the alternative hypothesis that the F -value is statistically significant, which means that the growth of investment income of the Local Authorities Pensions Fund in Dodoma depends on members contribution (contributions collection from members) and investment in fixed deposits.

4.13 Hypotheses Testing

Hypothesis 1

H0: Investments made in government securities have no impact on the growth of investment income of the LAPF in Dodoma.

H1: Investments made in government securities have a positive impact on the growth of investment income of the LAPF.

According to various literature reviewed earlier it is expected the co-efficient value of the variable investment in government securities to be positive (that means greater than zero) which means that there is a positive relationship between the two variables. Therefore the null hypothesis was tested to prove the validity of it.

According to the rules, specifically for observations above 30, normal distribution is therefore used to test the hypotheses as shown below:-

If $Se(\beta_1) < \text{estimated } \beta_1/2$, we therefore reject H_0 ; but if the observed $se(\text{estimated } \beta_1) > \text{estimated } \beta_1/2$, we accept H_0 :

In this study the calculated $se(\text{estimated } \beta_1) = 553.9775$ and $\text{estimated } \beta_1 = 1234.84$, thus $553.9775 < 617.42$, Hence H_0 ; is rejected.

Therefore the null hypothesis $H_0 \leq \beta_1 = 0$ is rejected and alternative $H_1: \beta_1 \geq 0$, is not rejected. This implies that investment in government securities have an impact on the growth of LAPF investment income in Dodoma.

The fact is that 1234.84 is the partial regression coefficient of the variable “investment in government securities” which is statistically significant at 5%. The variable takes the correct sign and tell us that, when the influence of the variables investment in fixed deposits, investment in government securities are held constant, as investment in government securities increase by one unit, on average investment income of the LAPF in Dodoma will increase by 1234.84. The given results of the hypothesis portray positive relationship as expected in the model.

The positive relationship between the variable “members’ contribution” and “growth of investment income” is caused by increase in funds invested in government securities.

Hypothesis 2

H_0 : Members’ contributions don’t have any impact on the growth of investment income of the LAPF in Dodoma.

H_1 : Members’ contributions have a positive impact on the growth of LAPF investment income in Dodoma

According to various literature reviews above, we expected the co-efficient value of the variable members’ contribution to be positive (that means greater than zero)

which means that there is a positive relationship between the two variables. Therefore the null hypothesis was tested to prove the validity of it. According to the rules, specifically for observations above 30, normal distribution was used to test the hypotheses as shown below:-

If $Se(\beta_2) < \text{estimated } \beta_2/2$, we therefore reject H_0 ; but if the observed se (estimated $\beta_2) > \beta_2/2$, we accept H_0 :

In this study the calculated $Se(\text{estimated } \beta_2) = 0.0388717$ and estimated $\beta_2 = 0.2164262$, thus $0.0388717 < 0.108213$, Hence H_0 ; is rejected.

Therefore the null hypothesis $H_0 \leq \beta_2 = 0$ is rejected and alternative $H_1: \beta_2 \geq 0$, is not rejected. This implies that Members' contributions have an impact on the growth of LAPF investment income in Dodoma.

The fact is that 0.2164262 is the partial regression coefficient of the variable members' contribution which is statistically significant at 1%. The variable tell us that, when the influence of the variables investment in fixed deposits, investment in government securities are held constant, as members contributions increase by one unit, on average investment income of the LAPF in Dodoma will increase by 0.2164262. The given results of the hypothesis portray positive relationship as expected in the model.

The positive relationship between the variable "members' contribution" and "growth of investment income" is caused by increase in investible funds as contributing members of the LAPF pensions fund increases. It has been noted that, once contribution income form members increases also investible funds increases. On other hands an increase in investible funds leads to the increase in investment income.

Hypothesis 3

H0: Investments made in fixed deposits have no effect on the growth of investment income of the LAPF in Dodoma.

H1: Investments made in fixed deposits affects positively the growth of investment income of the LAPF in Dodoma.

Here it was expected that the co-efficient of the variable deposits to be greater than zero, thus the null hypothesis $H_0: \leq \beta_3 = 0$ was tested against alternative hypothesis $H_1 > \beta_3 = 0$.

As per literature review, it was expected a positive relationship between investment made in fixed deposits and growth of investment income of the LAPF, that is, the co-efficient of the variable “investment in fixed deposits” was expected to be greater than zero (positive); hence the null hypothesis $H_0: \leq \beta_3 = 0$ was tested against the alternative hypothesis $H_1: \beta_3 > 0$. According to the rule as cited from observations area above 30, normal distribution was also used to test the hypothesis as shown under.

If the standard error (Se) of the variable “fixed deposits” is less than the number obtained when its coefficient is divided by 2, then H0 is rejected, which means that the variable is significant, but the vice versa of it i.e. (Se) of estimated $(\beta_3) > \text{estimated } \beta_3/2$, then H0 is not rejected implying that the variable is insignificant.

In this study the calculated se of estimated $(\beta_3) = 0.0332326$ and estimated $\beta_3 = 0.1222343$, thus $0.0332326 < 0.061117$ hence H0: is rejected. Therefore the null hypothesis $H_0 \leq \beta_3 = 0$ is rejected in favor of the alternative $H_1: \beta_3 \geq 0$. This implies that investments made in fixed deposits do affect the growth of investment income of the LAPF in Dodoma. In other words there is positive correlation between

investment in fixed deposits and the growth of LAPF investment income in Dodoma. The estimate 0.1222343 statistically significant at 1%.

Furthermore, 0.1222343 is the partial regression co-efficient of the variable “fixed deposits”, which takes the correct sign of the model. The partial regression coefficient above tells us that when the influence of the variables “investment in government securities” and “members’ contribution” are held constant, if investment in fixed deposits increases by one unit, on average, investment income of the LAPF pensions fund in Dodoma will increase by 0.1222343.

From the above hypotheses, it should be noted that all β s have been estimated from the true regression line.

4.14 Discussion

Regression results show that the variables have an influence on the growth of investment income as far as the overall test for significance is concerned (F- test).

The variable investment in government securities after being transformed to its natural logarithm was stationary (having no unit root). The regression results showed that, the variable takes the correct sign and it has a significant and positive contribution to the growth of investment income. Moreover, the variable indicates that investment in government securities is worthwhile undertaking and thus LAPF in Dodoma can continue placing more funds in this investment avenue because it is the safest financial asset. Moreover, the contribution of this variable is noted by a high estimated coefficient. This shows that investment in government securities highly contributes to the growth of investment income in LAPF pensions fund.

The regression results for the variable “members’ contribution” also show that the estimated coefficient takes the correct sign and it is statistically significant at 1% level. These findings show that an increase in members’ registration will result in an increase in LAPF investment income.

Furthermore, the regression results for the variable “fixed deposits” takes the correct sign and it is statistically significant at 1% level. However, the magnitude of its estimated coefficient is smaller than the magnitudes of the estimated coefficients of the other two variables. This may mean that prudent investment by LAPF pensions fund in Dodoma should take into account the magnitudes of estimated coefficients for the respective variables.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study aimed at assessing determinants of the growth of investment income of pensions fund using LAPF pension fund in Dodoma Municipality as case. The main objective of the study was to analyze the determinants of the growth of investment income of Pensions Funds in Tanzania.

Findings from this study indicate that the variable “growth of investment income” of the LAPF is affected by the variables “investment in government securities”, “members’ contribution,” and “investment in fixed deposits”. All variables were significant at one percent level except that of investment in government securities which was significant at five percent level.

It was hypothesized that all the variables “investment in government securities”, “members’ contributions” and “investment in fixed deposits” would have significant contribution to the growth of investment income of LAPF pensions in Dodoma. The findings are in line with what was expected since the test conducted has revealed that all variables are positively and significantly related to the growth of investment income. This also implies that, all variables take the correct sign as it was expected.

5.2 Policy Implication

The results obtained from this study indicate that the variables “investment in government securities”, “investment in fixed deposits” and “members’ contribution” should guide the decision makers of social security schemes to direct investment in those areas.

It is also envisaged that this study will be most useful to the relevant authority of LAPF Dodoma on providing guidance towards undertaking prudent decisions on investment activities.

Thus, the pension managers of LAPF will be guided to think on placing more investible funds in the leading portfolio such as investment in government securities.

Furthermore, the policy of LAPF pensions fund in Dodoma should increase efforts to increase members' contribution since this has shown a positive impact on the growth of investment income. The policy should ensure increased efforts on registration of new members which will lead to an increase in members' contributions.

5.3 Recommendations of the Study

On the basis of the study findings, the following recommendations are made for LAPF fund in Dodoma:-

5.3.1 Diversification of investment portfolios

It has been noted that 40 percent of the Fund investment portfolio has been concentrated on government securities because investment in government securities is considered to be the safest, it is recommended to maintain the same share of investible funds.

5.3.2 Increase effort in membership registration

Since membership contributions significant and positive affect the growth of investment income in LAPF Dodoma, it is recommended that efforts should be made to increase membership registrations.

5.3.3 Maintain investment in fixed deposits

The study findings showed that investment in fixed deposits is statistically significant and positively related to the growth of investment income in LAPF pensions fund, hence it is recommended to maintain the share of investment in this investment category.

5.3.4 Recommendation for further researches

It is further recommended that similar studies but different location and funds, different model specifications and different estimation techniques should be conducted in order to be able to generalize findings. As pointed out earlier, the quality of our study results may have been affected by data inaccuracy, model specification, and estimation techniques used. Hence the need for this recommendation.

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APPENDICES

APPENDIX 1

Testing for multicollinearity

Variable	VIF	1/VIF
Natural logarithm of investment in investment in government Securities	2.43	0.411949
Members contribution	2.16	0.461978
Investment in Fixed Deposits	2.23	0.447660
Mean VIF	2.28	

Figure7: Regression Diagnostic Tests

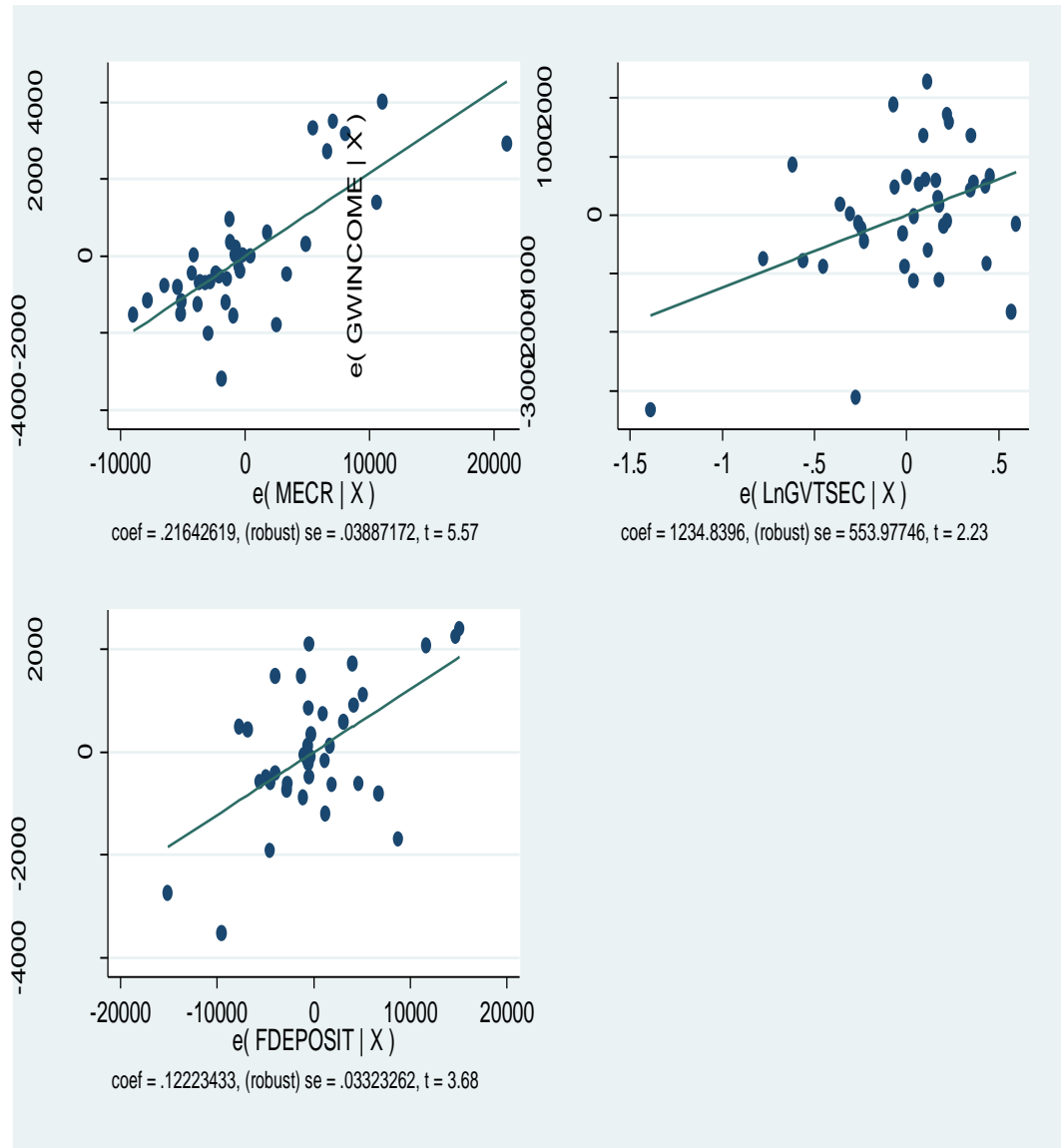


Figure 8: Scatter diagram for members contribution



Figure 9: Scatter Diagram for Natural Logarithm of Investment in Government Securities

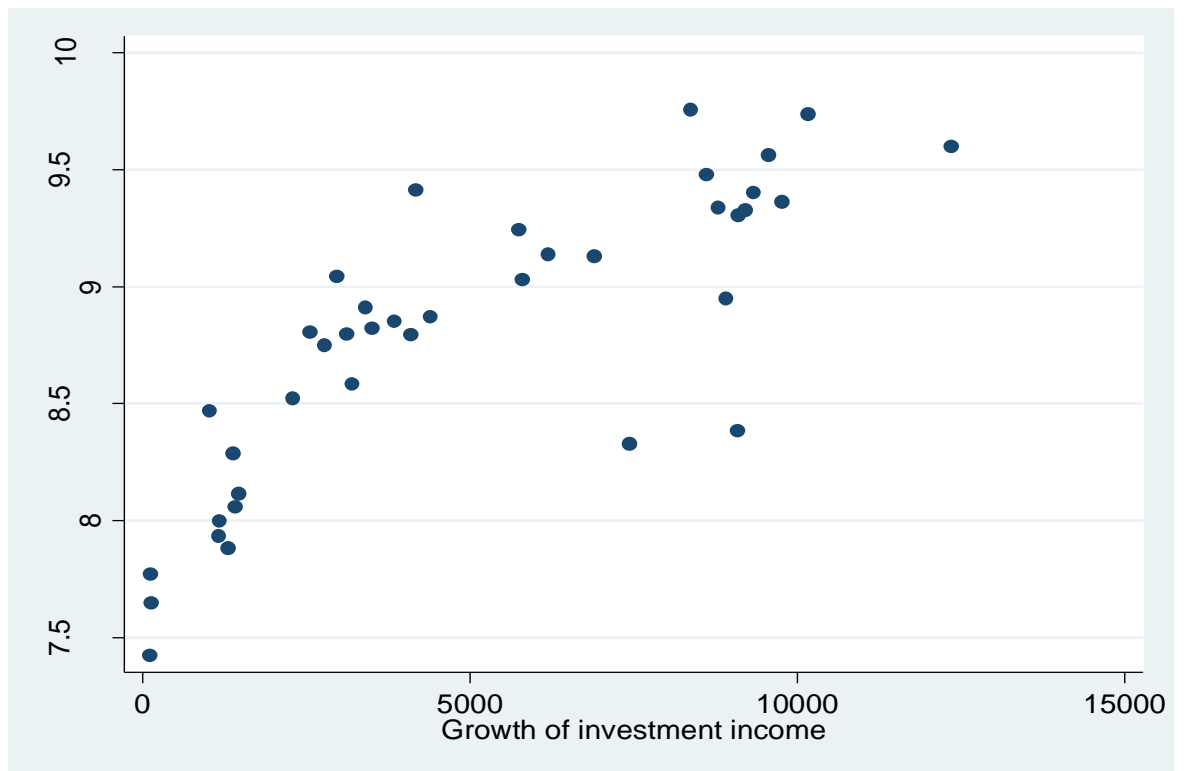


Figure 10: Scatter Diagram for Investment Made in Fixed Deposits

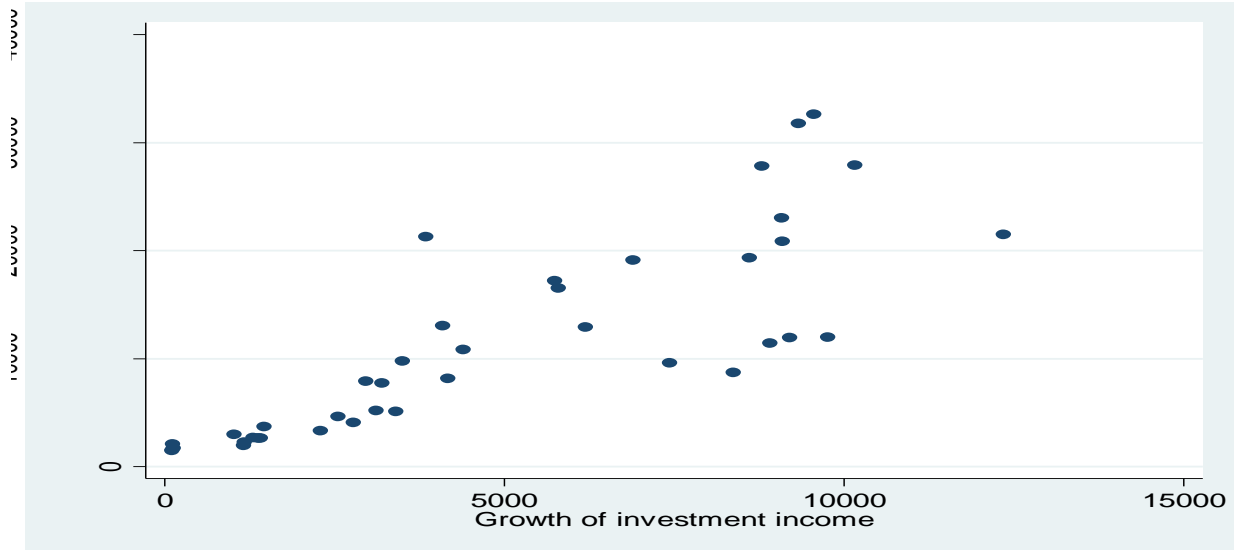


Figure 11: Detection of Autocorrelation on Investment in Government Securities

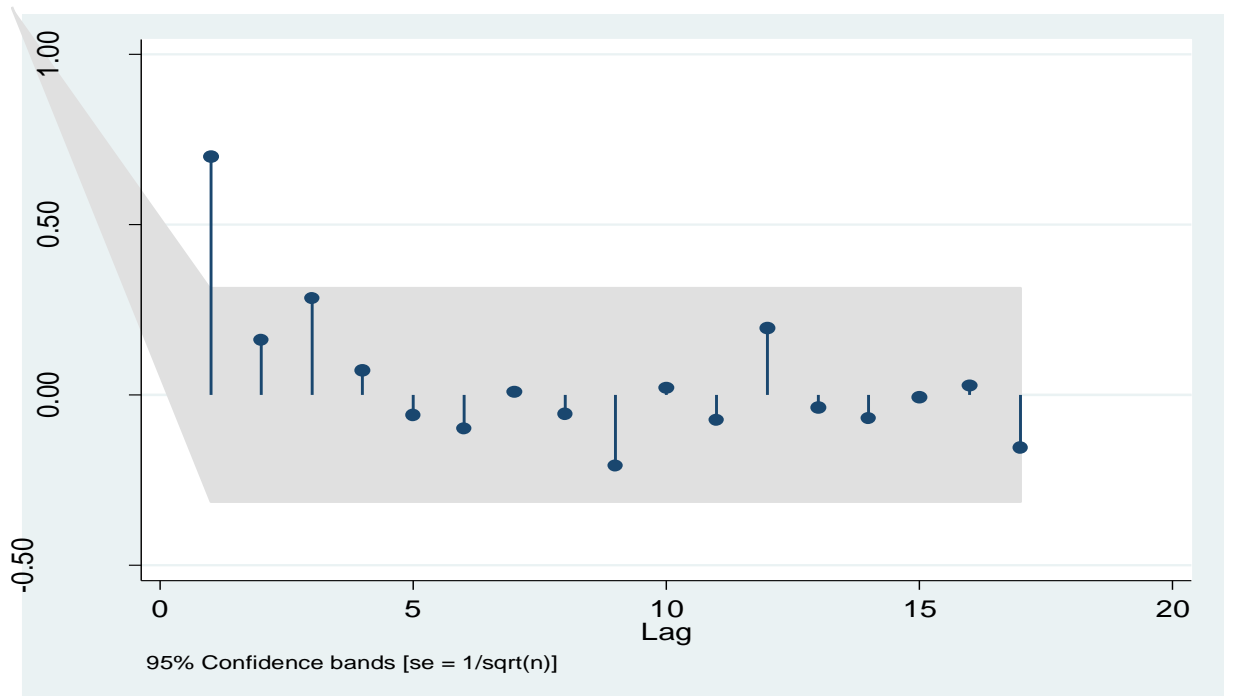


Figure 12: Detection of Autocorrelation on Members' Contributions

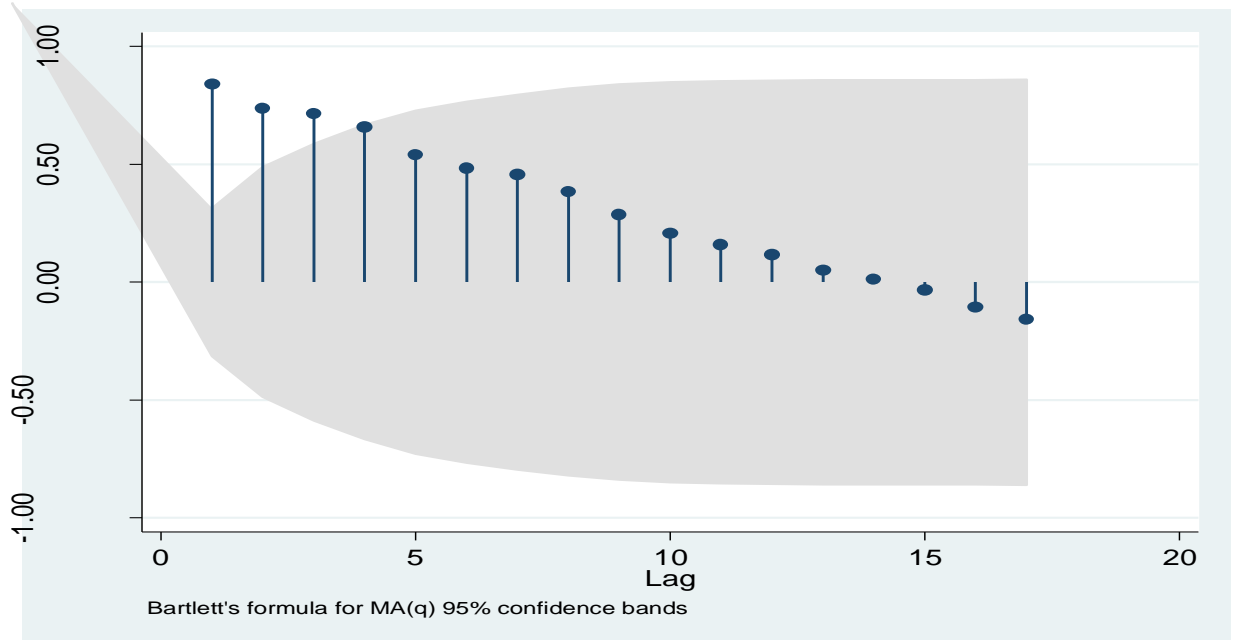
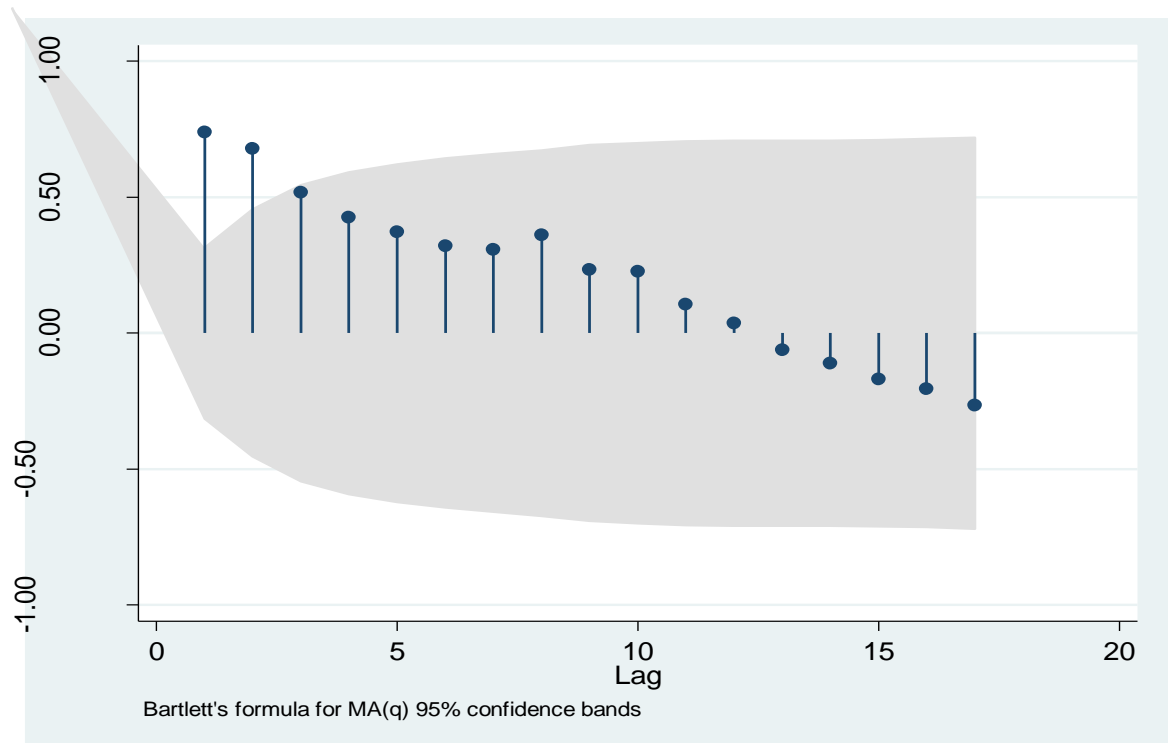


Figure 13: Detection of autocorrelation on investment in fixed deposits



APPENDIX 111

Data Used for Regression Results

YEAR	QUARTER	GWINCOME	MECR	GVTSECUR	LnGVTSECUR	FDEPOSIT	BENPAY
2003	1 st Qt	110	1140	1674	7.422971	1483.13	
	2 nd Qt	130	1230	2092.5	7.646115	1680.88	
	3 rd Qt	120	1320	2371.5	7.771278	2076.38	
	4 th Qt	1300	1440	2650.5	7.882504	2669.63	
2004	1 st Qt	1160	1990	2790	7.933797	1970	
	2 nd Qt	1170	2420	2976	7.998335	2237.63	
	3 rd Qt	1410	3510	3162	8.05896	2632.5	
	4 th Qt	1460	3920	3348	8.116118	3700	550
2005	1 st Qt	1380	3720	3969.75	8.286458	2628.75	1300
	2 nd Qt	1020	1280	4763.7	8.46878	2979.25	1900
	3 rd Qt	2290	4540	5028.35	8.522847	3329.75	1800
	4 th Qt	3410	6360	7410	8.910586	5100	1980
2006	1 st Qt	2780	4920	6313.5	8.750446	4081.88	1400
	2 nd Qt	2550	3980	6669	8.805225	4626.13	1600
	3 rd Qt	3110	6080	6612	8.796642	5170.38	1800
	4 th Qt	2960	8730	8467	9.043932	7910	1700
2007	1 st Qt	3200	6600	5343.75	8.583683	7726.88	1990
	2 ND Qt	3500	7100	6768.75	8.820072	9787.38	2170
	3 rd Qt	4400	8700	7125	8.871365	10817.6	2480
	4 th Qt	6200	9800	9300	9.13777	12910	2650
	1 st Qt	4100	10210	6592.5	8.793688	13038.8	2350
2008	2 nd Qt	5800	8940	8350.5	9.030077	16515.8	2730

	3 rd Qt	6900	11600	9229.5	9.13016	19123.5	3510
	4 th Qt	9100	16300	11000	9.305651	20862	6300
2009	1 st Qt	3850	12900	6980	8.850804	21277.5	3230
	2 nd Qt	8800	13520	11370	9.338734	27802.6	4060
	3 rd Qt	9330	13810	12100	9.400961	31774.4	7520
	4 th Qt	9560	14010	14230	9.563108	32625.5	7700
2010	1 st Qt	4170	16620	12230	9.411647	8150.63	3020
	2 nd Qt	8910	19330	7710	8.950274	11410.9	7100
	3 rd Qt	9210	21440	11260	9.329012	11954.3	9130
	4 th Qt	9770	23110	11660	9.36392	11960	7260
2011	1 st Qt	5740	15054	10325.6	9.242384	17196	4820
	2 nd Qt	8610	23046	13079.1	9.478773	19345.5	7090
	3 rd Qt	12350	25060	14731.2	9.597725	21495	11080
	4 th Qt	10160	25900	16934	9.73708	27910	15100
2012	1 st Qt	7440	18710	4140	8.328451	9580	10730
	2 nd Qt	9090	33440	4370	8.382518	23040	16170
	3 rd Qt	8380	27070	17280	9.757305	8690	17100

CURRICULUM VITAE**A: PERSONAL PARTICULARS:**

Surname:	Shola
First name:	Eliya
Gender:	Male
Marital status:	Married
Nationality:	Tanzanian
Place of birth:	Songea
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B: EDUCATION BACKGROUND	
Institution/College	Award(s)
The University of Mzumbe, Tanzania (2003 – 2007)	Bachelor of Science in Economics(Project Planning and Management)
Mbalizi High School (2001-2003) Mbeya, Tanzania.	Advanced Certificate of Secondary School Education (ACSSE)
Selous Secondary School, Mbeya (1997 – 2000)	Ordinary Certificate of Secondary School Education (CSSE)

C. WORK EXPERIENCE.			
DATE	SPECIALIZATION	INSTITUTION	RESPONSIBILITIES
March 2008 to August 2008.	Economist II	Manyoni District Council-Singida	<ul style="list-style-type: none"> ➤ Prepare periodic reports ➤ Prepare annual budget for the District Council ➤ Monitoring and evaluation of the development

			projects
September,2008 to date	Planning and Investment Officer I	LAPF Pensions Fund	<ul style="list-style-type: none"> ➤ To prepare periodic reports ➤ To recommend new areas of investments ➤ To prepare and maintain investment register of the Fund ➤ To conduct feasibility study analysis

D:TRAINING/ WORKSHOPS ATTENDED

Year	Event, organizer (s) and place	Award(s)
December, 2010	Attended the course for the advanced project feasibility studies using COMFAR III Software organised by Institute of Caribbean and Pacific Management in Swaziland	Certificate of attendance
15 th - 19 th Sept. 2008	Attended securities course organised by Securities Industries Training Institute(SITI) in Dar es Salaam	Certificate of attendance
18 th Sept-18 th Oct, 2013	Attended the course of Private-Public Partnerships projects organised by the university of Queensland- Brisbane, Australia	Certificate of attendance

E COMPUTER SKILLS AND EXPERIENCE.

- High skills in the use of Microsoft office such as Microsoft- word, Excel and Power point.
- Data analysis using SPSS and STATA(For econometric models)
- The use of computer systems including e-mail accessing.

F: LANGUAGE

Good communication skills

Fluent English (written & spoken),

Fluent Swahili (written & spoken)

G: HOBBIES

- Reading books and news papers
- Watching TV and movies
- Swimming
- Internet browsing
- Listening to radio
- Exchanging ideas

H:REFEREES

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Declaration

I, Shola, Eliya hereby declare that the information provided above is true to the best of my knowledge.

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Signature

Date