Effect of Stock Market Development on Financial Savings in Tanzania: An Empirical Investigation (1999-2023)

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ABSTRACT: The performance of the Dar es Salaam Stock Exchange (DSE) since its inception in 1998 followed liberalization of the financial sector in 1991 has been very positive and has also demonstrated that there is huge untapped potential financial capital within the country. For this reason, this study aimed at investigating the impact of stock market development on financial savings in Tanzania from 1999 to 2023 period using quarterly time series data. The study employs econometric analysis in which the error correction model (ECM) is applied to analyze the financial savings function. The overall significant determinants of financial savings included in the model were statistically significant. The results indicated that real GDP in both long run and short run estimation is relevant variable for explaining the variations in the financial savings in Tanzania whereas stock market in terms market capitalization is relevant variable both in the short-run and long run estimation. There is significant evidence that stock market development in Tanzania has negative effect and that it reduces financial savings function in both short run and long-run via market capitalization. The negative effect of stock market development on financial savings might poses problems to the conduct of monetary policy in Tanzania, by failing to correctly target monetary growth in the economy.

KEYWORDS: Financial Savings, Market Capitalization, Monetary Policy, Stock Market, Tanzania

INTRODUCTION

Many developing countries implemented financial sector liberalization and institutions reforms as part of a broader market oriented economic reforms since the late 1980s. In line with these reforms deregulation of interest rates, liquidity restrictions, stringent entry requirements, controls over sources of funds, special lending schemes were granted. The liberalization accelerated the entry of private banks, capital markets and Non-Bank Financial Intermediaries (NBFIs), stock markets, Savings and Loans Associations (SLAs), finance companies, insurance companies, pension funds and credit unions into the financial sector.

Capital Markets and Securities Authority (CMSA) was also established in 1994 as a result of this liberalization to develop rules, regulations and launch Tanzania's stock exchange market. Although the Dar es Salaam Stock Exchange was incorporated in 1996, it didn't open for business until March 1998 and began its first day of trading in 15th April 1998. Since then, performance of the Dar es Salaam Stock Exchange (DSE) has been very positive and has demonstrated that, there is much unutilized financial resources within the country.

The Dar es Salaam Stock Exchange (DSE) was established in 1996. It was officially opened for trading on April 12, 1998, providing a platform for companies to raise capital and investors to trade securities. Initially, the DSE had limited participation and traded only a few listed companies. Growth was gradual due to factors like limited investor awareness and regulatory frameworks.

Over time, regulatory frameworks improved to encourage market participation and protect investors' interests. The Capital Markets and Securities Authority (CMSA) was established to oversee and regulate the securities industry. The DSE experienced growth in the number of listed companies and market capitalization, driven by privatization initiatives and increasing interest from both local and foreign investors.

Various reforms were implemented to enhance market efficiency and transparency. Automation and technological advancements were introduced to streamline trading processes. Efforts were made to increase investor education and awareness about the benefits of investing in the stock market. Institutional investors like pension funds and insurance companies became significant players in the market.

The market saw the introduction of new financial instruments like corporate bonds and government securities. This diversification aimed to provide investors with more options and to deepen the capital market. The Tanzanian stock market faced challenges such

as liquidity constraints, limited public listings, and macroeconomic factors. Despite challenges, the market continued to evolve and adapt.

As of current date, the DSE continues to operate as the primary securities exchange in Tanzania. It lists a growing number of companies across various sectors, although efforts are ongoing to attract more listings and enhance liquidity.

The future of the Tanzanian stock market looks promising, with ongoing efforts to improve market infrastructure, regulatory frameworks, and investor participation. Potential areas for growth include increased listings, further product innovation, and enhanced investor education. The development of the stock market in Tanzania reflects broader economic trends and efforts to strengthen the country's financial markets. Ongoing reforms and initiatives will play a crucial role in shaping the future trajectory of the market and its contribution to Tanzania's economic development.

Although the market started with a listing of only one company, Tanzania Oxygen Limited (TOL), five years later, five more companies were listed, Tanzania Breweries (TBL), Tanzania Tea Packers Limited (TATEPA), Tanzania Cigarette Company (TCC), Tanga Cement Limited (SIMBA) and Dar es Salaam Airport Handling Company (DAHACO). Thus, at the end of 2003, the market had six listed companies, and the market capitalization rose as a result. Until July 2008, the DSE had ten listed companies indicating that the stock exchange is experiencing a modest growth in terms of listings, market capitalization and trading activities. The increase in market capitalization partly resulted from increase in stock prices (appreciation of stock values) and partly an increase in the number of shares traded.

The Trend of the DSE Market Capitalization over 23 years.
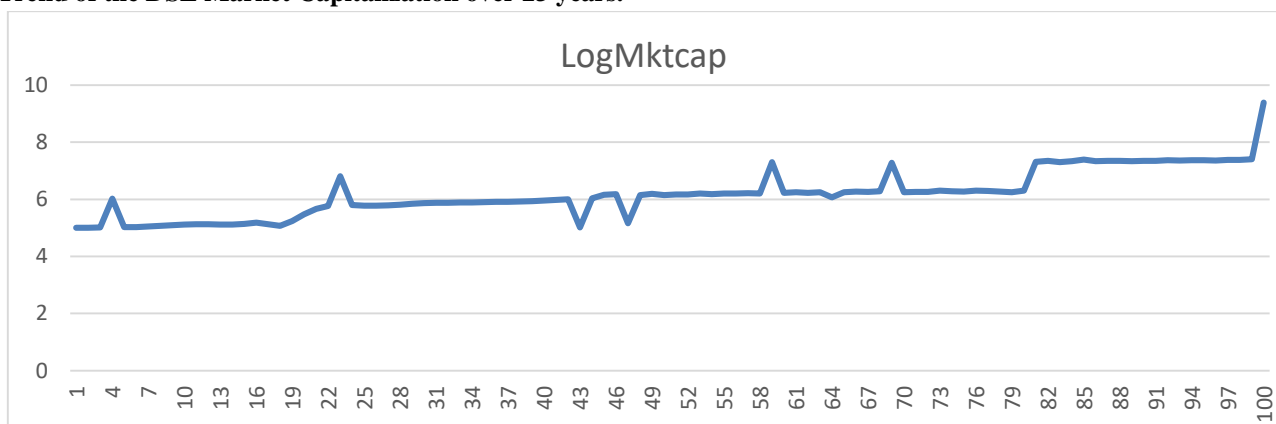
Apart from appreciation of stock prices, increase in market capitalization and increase in volume of shares traded, the stock market in Tanzania experienced a lot of achievements during the 2005/06 financial year. There were major changes in areas of market development, legal framework, and institutional development, infrastructure development, regional and international cooperation. Significant developments were upgrade of the Central Depository System (CDS) and the installation to automate the trading system (ATS), these changes slightly increased market capitalization from TShs 2,546.04 billion recorded in year 2005 to TShs 2,573.08 billion in year 2006.

In Tanzania, the benefits of allowing portfolio investment is long term and dependent on the number and quality of private companies that will list at the DSE. Capital market is already unfolding itselves as a competitor to commercial banks by giving savers a better opportunity for investment when companies issue corporate bonds. Over time, it is expected that private companies in Tanzania will be able to secure increased financial resources globally, and at a reduced cost, through the DSE, rather than through long term loans. The relaxation of restrictions to allow foreign investors to participate on the trading process in the DSE increased liquidity in the market and provides long-run financial capital that is vital for economic growth.

Foreign investors are allowed to invest in listed companies up to a maximum share of 60 per cent while the remaining 40 per cent is reserved for domestic investors. Under this arrangement, the 60 per cent ownership is a free float for both domestic and foreign investors while 40 per cent is exclusively for domestic investors. Double listing is only possible from approved territories while

cross listing is allowed for members of East African Securities Regulatory Authorities (EASRA) and the African Stock Exchanges Association (ASEA) (DSE, 2008).

Among others, the entry of the NBFIs, as a result of financial liberalization, the stock market in particular, provided to private sector an opportunity for portfolio diversification. Given innovations of the DSE, the private sector now got an opportunity of allocating income and/wealth in financial savings and/or stocks as competing assets, depending on the returns associated with the stocks relative to deposit rates offered by the banks. More explicitly, the private sector could now save in banks or invest in the stocks depending on current and expected returns. This implies existence of competition for business between banks and the stock market, because as stock price rise the volume of money demanded for transaction decrease and, due to substitution effect, more funds will be injected into the DSE market. On the other hand, the competition encourages banks to offer a broader range of products with higher returns so as to attract business to raise the volume of their deposits for lending and other investment options. The outcome would be a shift away from holding money balances for trading in the DSE in favor of holding bank deposits. This implies an existence of substitution effect between money balances and holding or trading of stocks (Friedman, 1988).

In view of the possible changes in portfolio behavior caused by the stock market in Tanzania, the financial savings function in Tanzania may have suffered a structural break. In this relation, the central bank may also have failed to achieve targeted growth rate of money supply mainly due to the substitution effect in saving behavior of households and firms in the economy. This is mainly because the investment in stocks reduces financial savings and consequently decreases credit expansion by the banking system. The vice versa applies. The monetary policy effect of the DSE has not empirically investigated with respect to financial saving in Tanzania. Therefore, the purpose of this study is to fill these two gaps by assessing empirically the impact of stock market development on financial savings and establish its implication on the conduct of monetary policy in Tanzania.

Because of its implication for development policies Tanzanians are interested in the relationship between stock market and financial savings, so that they can make informed choices about strengthening the financial system. Bank lending unfortunately suffers adverse selection and moral hazard effect to which the establishment and expansion of stock markets has been offered as a remedy. Currently, bank borrowing is expensive given the level of lending rates and the nature of the loans being mostly short term. Knowledge of the possible influence of stock market development on financial savings is useful for designing policies to encourage more capital inflows in the country. Understanding how financial market development affects financial savings, therefore, provides some insight into long run economic growth.

The effect of financial market activities on financial savings is not only an interesting and timely subject, but also has important implications for monetary policy (Barari, 1996).Specifically, the following question will be asked, how do developments of DSE impact upon financial saving in Tanzania?

After this section, the rest of the study is organized as follows: Section 2 reviews both theoretical and empirical literature related saving theories. Section 3 presents the methodology used in the study. Interpretation and discussion of the empirical findings is presented in chapter 4. Chapter six gives the conclusion with a general overview, summary of the major findings, and arising implications.

RELATED LITERATURE AND THEORETICAL LITERATURE

In Keynesian view of saving, the rate of interest is of little significance in determining the level of saving. Instead, savings are primarily a function of income. In this regard, the rate of savings is determined by disposable income such that, the higher the level of income the higher will be the level of savings.

Precautionary motive for savings

The precautionary saving motive exists due to the uncertainty of payments and receipts between the present and next planned purchase or sale of short-term assets. The theory asserts that, the precautionary savings arises because it is necessary to provide for emergences that might arise, for example, car or house repair, and unpredictable sources of expenditure such as invitation to weddings or weekends with friends who live several hundred miles away (Keynes, 1936).

Life-cycle hypothesis (LCH)

In the life cycle hypothesis (LCH), Ando and Modigliani (1963) assumes that income varies over people's life cycle such that saving allows consumers to smooth income over time. In LCH, the main motivation for saving is to accumulate resources for later

expenditure and in particular to support consumption at the habitual standard during retirement. According to the LCH, a person will first dissave when she/he is young and presumably unemployed, save and accumulate wealth during her/his working years, and then dissave and run down her/his savings during retirement. In its original formulation, the LCH presented a theory of saving behavior focusing on the individual.

The LCH analyzes the saving behavior of individuals who spread their lifetime consumption over their lives by accumulating savings during earning years and maintaining consumption levels during retirement. Individuals tend to dissave (or borrow) when they are young, because of relatively low levels of income and high expenditures related to household formation, and save in their middle years, with asset holdings reaching their maximum at retirement age. Individuals dissave again during retirement by drawing on their accumulated assets, which are entirely exhausted at death.

Permanent-income hypothesis (PIH)

Following the innovative work by Keynes, Friedman (1957) formulated the Permanent-Income Hypothesis (PIH).This hypothesis differentiates permanent income from and transitory income as two components of income. Permanent income is defined in terms of the long-term income expectations over a planned period and with a constant rate of consumption maintained over the lifetime given the present level of wealth. Therefore, permanent income is the level of income that households receive when temporary influences such as the seasonal or windfall gain or loss are not considered. On the other hand, transitory income is the difference between actual and permanent income. Individuals are assumed not to consume from transitory income, such that the marginal propensity to save from this income is one. Friedman made a distinction between income and wealth. He pointed that income or permanent income is different from wealth. To him wealth is composed of non-human and human wealth and wealth is the source of permanent income. He regarded permanent income as "the income flow resulting from an individual household's ownership of marketable assets, the skills and talents at its disposal, the nature of its occupation, its geographical location, and so on." He concluded that the difference between these two concepts is due to transitory income. Modigliani (1963; p47) explains: "…we can reach one conclusion fundamental for an understanding of individual savings behavior, namely that, the size of saving over a short period of time, like a year will be swung by the extent to which current income departs from average life resources." Friedman's PIH was the first major breakthrough in the research on the saving behavior of households due to the fact that, the positive fluctuation entails savings. Friedman's PIH is the starting point for a variety of specifications of the saving-income relationship.

Bequests

Regarding bequests, intergenerational links were found to be a significant determinant of savings behavior in developing countries, where these links are particularly strong due to the large sizes of families. The theory found that extended family links might lengthen the effective planning horizon over which households make saving decisions. Households in developing countries are larger than in industrialized countries and more likely to consist of several generations.

Therefore, understanding the determinants of intergenerational transfers is crucial for a wide range of economic issues. These are the determinants of savings and wealth, the equality of opportunity, the possible effects of fiscal policy, and the optimal design of tax systems. Intergenerational transfers are interrelated with savings and wealth and, strong transfer motives will affect savings behavior. These concerns saved amounts but also the timing of savings over the life cycle. Intergenerational transfers are also important when discussing the distribution of income and wealth. The extent to which wealth is carried over from one generation to the next affects how equal opportunities really are. Intergenerational transfers may also decrease the efficiency of public redistribution by counteracting the intended effects of public transfers.

However, allowing for uncertainty resolves the controversy over the importance of life-cycle and bequest saving by showing that these motives for saving are overlapping and cannot generally be distinguished. A saving today simultaneously serves both a precautionary life-cycle function (guarding against future contingencies such as health shocks or other emergencies) and a bequest function because, in the likely event that the saving is not absorbed by these contingencies, it will be available to bequeath to children or other worthy causes. Under this view, households have a bequest motive, but bequests are given (i.e., the motive is "operative") in only some states of the world, that is, intergenerational transfers.

Empirical literature

Various empirical studies have been done on the relationship between stock market development and financial savings mobilization in both developed and developing countries. According to the analysis by Dewenter and Bonser-Neal (1999) that examined the

relationship between financial market developments, as measured by the stock market and gross private savings rates, in 16 emerging markets. The study's findings indicated evidence of a significant positive relation between savings and stock market size and liquidity. This evidence was found to be driven primarily by a few countries with already relatively well-developed capital markets, suggesting that, a growing or deepening stock market will not necessarily be associated with higher saving rates. In addition, Kelly and Mavrotas (2003) investigated the determinants of private savings in Sri Lanka with a primary focus on the role of financial sector development. Findings of the study showed existence of a significant positive influence of financial sector development on savings, giving support to the hypothesized nexus between saving and financial sector development.

Ndanshau and Mkai (2008) on their study on saving mobilization in regulated and deregulated financial regimes in Tanzania found no evidence in support of the null hypothesis that the influence of real interest rate policy on financial saving during the period 1988-2005 was positive and statistically significant. The descriptive analysis suggested lack of strong correlation between real interest rate and financial savings. Also Maimbo and Mavrotas (2003) undertook a study on financial sector reforms and savings mobilization in Zambia. The findings of the study did not show that there was a nexus between financial sector reforms and savings mobilization for sub-Saharan African countries, particularly Zambia. This suggested that, the financial sector reforms of the 1990s had poor performance on savings in Zambia; and, new policies to strengthen savings mobilization should be implemented.

Amino *et al*. (2003) examined the potential for financial savings in rural Mozambican households by focusing on the determinants of savings behavior by using data in 113 rural households from Nampula province. The findings of the study showed, among others, that income, wealth, household size and years of schooling have influence on household saving behavior. The study also indicated that, due to lack of formal financial intermediaries households in Mozambique use grassroots associations as instruments to raise capital. In the same line of argument Edwards (1995), Prinsloo (2000) and Ramajo, Garcia and Ferre (2006) carried out similar study, the findings suggested that, income growth rate is the most significant determinant and has a positive effect on private savings. The study's findings entailed that government social security system affects private savings negatively and there is a trade-off between public and private savings. On the other hand, Nwachuku and Egwaikhide (2007) examined the determinants of private savings in Nigeria, the findings showed that, the saving rates rises with disposable income but falls with the rate of growth of disposable income and that, the interest rate on bank deposits has negative significant impact on savings.

Loayza, Schmidt-Hebbel and Serven (1999) on why do saving rates differ so widely across countries and the current state of knowledge on the determinants of savings rates found that, policy and non-policy factors are the key determinants of savings rates. The findings suggested the importance of the relationship between growth and savings and the impact of specific policy on savings rates. Carroll and Weil (2000) investigated saving and growth with habit formation and the study's results showed that, savings and growth are strongly positively correlated across countries. The empirical evidence suggests that, this correlation holds largely because higher savings is entirely a result of higher growth and not the other way around.

Kennickell and Lusardi (2001) assessed the importance of the precautionary saving motive, involving the survey of consumer finances from the 1995 and 1998. The findings suggested that, the precautionary saving motive exists and affects almost every type of household. This motive is particularly important for two groups: older households and business owners, but it also affects young and middle-age household that do not have businesses. Overall, we provide strong evidence that we need to take precautionary saving motive into account when modeling saving behavior.

Hong-mei and Xiao-feng (2008) carried out similar study to examine the relationship between precautionary motive of saving under future uncertainty, and savings of urban households in China over the period of 1987 to 2006. The study established that, precautionary motive resulting from future uncertainty indeed exists and is positively related to savings. However, the degree of correlation is lower than expected, that suggests the imbalances of distribution of savings between the upper, middle and lower groups in the urban China. Therefore, to curtail this, Chinese government should make some relevant policies to make urban households decrease the expectation of future uncertainty and reduce the imbalance in the distribution of income and savings. This can not only stimulate the potential consumption demands of middle and low income households but also slow the rapid increase of the savings of urban households in China

The theoretical and empirical literature presented on savings as well as stock market development support the views underscoring that, stock market development has an impact on financial savings and the conduct of monetary policy; and that there also exist a controversial on what actually determines savings this is a gap that requires solution. It is clear that, some theories and empirical studies have indicated limited success with bank deposits rate and stock market development on savings, but other studies have

strongly agreed on the most significant important of income in determining savings . This is because it is uncertain whether the whole economy benefits from stock market, for example, increased aggregate saving and investment. Moreover, some studies have supported the notion that stock market development accelerates saving and growth. This creates unfolded link that needs investigation. However there seem to be limited empirical literature on the impact of stock market development on financial in African countries particularly Tanzania.

METHODOLOGY OF THE STUDY

Estimation model

The theoretical literature of this analysis builds on, Keynes (1936) who pointed out that, individual savings depends on the level of income and disposable income and that, the higher the growth rate of income the higher will be the saving rate. Hence the estimation model for private financial saving function reads as:

$$s_t = f(y_t, \ g_t^y) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

where, s_t stands for private saving. y_t stands for disposable real income, and g_t^y, is the growth rate of real income. s_t is measured as the change in real money balances. Private, rather than national savings are used in order to focus on the private sector response of financial savings to stock market development and because private saving rates are closer to the concept of savings behavior included in many economic models (Dewenter and Bonser, 1999). According to saving theory the growth rate of income is not the major determinant of saving. Therefore, the variable is not included in the estimation model. y_t is measured as real income, CPI is consumer price index used to deflate the nominal variables.

However, following financial innovation that includes development of new financial institutions and capital markets as well as liberalization of interest rate, these developments are considered and modeled in the financial savings function. In particular, the development of the DSE in Tanzania was represented by market capitalization that provides an indication of overall market size; market size is one indication of market development. Countries with small market capitalization are likely to have few opportunities for raising capital through the stock market and also less ability to diversify risk. The liberalization interest rate was represented by interest rate proxied by saving deposit rate, sdr.

The modified private financial savings function reads as:

$$s_t = f(gdp, mktcap, sdr) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

A lagged savings rate (s_{t-1}) should, however be included in the model to capture inertia in private savings, such that the effects of change of many determinants of savings are full realized only after a number of years (Loayza, Schmidt-Hebbel and Serven, 2000). Thus, the private savings function in linear form is written as:

$$s_t = \alpha_0 + \alpha_1 gdp_t + \alpha_2 mktcap_t + \alpha_3 sdr_t + \alpha_4 s_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots$$
(3)

where, the variables are as defined before, and ε_t is the residual term, assumed to have white-noise properties.

Nevertheless, empirical issues may arise when estimating the equation. First, there is potential simultaneity problem in relating measures of current stock market development and other variables to current savings because causality may run in both directions. In particular, stock market development may affect the level of private savings, but it is also likely that the level of private savings affects stock market development. As a result, OLS coefficients may be inconsistent.

A second empirical issue is the serial correlation of the error terms. This serial correlation is the result of correlation in the savings series itself. Failure to correct this correlation will result in incorrect standard errors and misleading inferences. The lagged value of savings is included as one of the independent variables, the inclusion of lagged savings removes most of the serial correlation and reduces potential simultaneity problem. With this specification, these coefficient estimates should not reflect the effect of past savings.

The parameter of the model measures the sensitivity of private savings to its determinants. The sign of marginal propensity to save (α_1) should be positive to imply that; gross private savings rises with the level of disposable income but falls with the rate of growth

of disposable income (Nwuchuku and Egwaikhide, 2007). The argument is also positive with LCH that, at very low levels of income, the opportunities for savings (marginal propensity to save) are few (Ando and Modigliani, 1963). The sign of α_2, should be negative in relation to financial savings, if $\alpha_2 = 0$, this would exclude any role of the DSE market in financial saving. The sign of α_3 should be positive and thus, saving is expected to have positive relationship with interest rate. Likewise, McKinnon (1973) and Shaw (1973) have argued that the relationship between real interest rate and saving is positive for a developing economy. The sign of α_4 should be positive to suggest that past information influences current saving level. In theory, it is worth to note that the sign of dis-saving parameter α_0 should be negative signed.

Definition and measurement of variables

The fundamental measure of private financial savings in this study rests on the broad (M2) definition of money stock that included two components: the non-interest earning currency in circulation (CC) and demand deposit (DD), also referred to as narrow money (M1); and, the other, are the interest earning saving deposit (SD) and time deposit (TD) of the commercial banks, also referred to as quasi money.

Since M2 is a stock and national income is a flow concept, the relevant gross private saving to be used in the analysis is obtained by expressing the first difference of the measure of money stock. The first difference of financial saving will provide the lagged financial saving that is included in the estimation. Gross Domestic Product (GDP) is used as a proxy measure of national income since unrequited net transfer to Tanzania from abroad are assumed to be very small. Deflation of the GDP by the national consumer price index (CPI) gave the real GDP (y_t).

Since interest rate measures the opportunity cost of holding money, the interest employed in this study is the saving deposit rate which is under the average interest rate of commercial banks. Estimating the relation between stock market development and financial savings requires a measure of stock market development. The measure of stock market development employed in this is obtained as quarterly aggregate value of the DSE market capitalization and the real values were obtained by deflating the aggregate values by the CPI.

Data sources

This study has used quarterly time series data covering the period 1999:Q1 to 2023:Q4. The study covers this period because the stock market in Tanzania started its operation on April 1998, after the adoption and implementation of the reforms in the financial sector. Therefore, the period was chosen in order to trace how stock market impacted on financial saving since it opened doors for trading in 15th April 1998.The data were gathered from the Bank of Tanzania (BoT), the DSE quarterly reports covering the period under study, National Bureau of Statistics(NBS), International Financial Statistics (IFS), and various Tanzania Economic Surveys.

Testable hypotheses

In order to achieve the specific objectives, the study tests the following hypotheses that:
   (i)   development of the DSE has a negative impact on financial saving;
   (ii)   and, given (i) above monetary policy implication is impacted negatively.

Methods of data analysis

This study used econometrics technique, using Ordinary Least Square method OLS to analyze the data. The method was used because is fairly simple in computation compared to some other techniques. The analysis was complemented by descriptive analysis, including normality test, heteroscedasticity and autocorrelation.

Time series properties

Regression run by using ordinary least squares (OLS) requires the variables included in the model to be stationary. This requirement will ensure that the estimated regressions are not spurious. Thus, all variables in the model were tested to determine whether they are stationary or not. The standard Augmented Dickey-Fuller (Dickey and Fuller (1979) test for unit root was applied for each variable to test for stationarity.

Cointegration analysis

In econometric terms, two or more time series variables integrated of order one, I(1), are cointegrated if their linear combination is stationary. Cointegration analysis attempts to determine whether there is a long-run relationship between dependent and independent

variables. This procedure is important because of the following reasons: to know the plausibility of estimating ECM, which incorporates long run information lost by differencing the variables; and to know the speed of adjustments from disequilibrium.

Estimation of error correction model
On one occasion the determinants of the cointegrating relationship are determined, the next step is estimation of financial saving using error correction model (ECM).

The ECM for estimation reads as follows:

$$\Delta s_t = \alpha_0 + \alpha_1 \sum_{i=0}^{k} \Delta gdp_{t-i} + \alpha_2 \sum_{i=0}^{k} \Delta mktcap_{t-i} + \alpha_3 \sum_{i=0}^{k} \Delta sdr_{t-i} + \alpha_4 \sum_{i=1}^{k} \Delta s_{t-i} + \alpha_5 ect_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (4)$$

Equation (4) presents the ECM for financial saving function with the market capitalization variable as the measure of stock market. On the equation, Δ indicates the first difference operator, ect_{t-1} is the error correction term (lagged one period) of the long run model, ε_t is a white noise error term.

The dynamics affecting the financial saving are captured by the differenced variables and one period lagged error term (ec_{t-1}) captures long run dynamics. The coefficient of ec_{t-1} estimated in equations (4) should have a negative sign not larger than one. Basically, the coefficient of ec_{t-1} provides information on the speed of adjustment to long run solution that enters to influence short run movements in financial saving. So long as equation (4) is correctly specified, α_5 carries negative sign that is less than unity.

EMPIRICAL RESULTS AND DISCUSSION
Time series properties of the data
Exploratory data analysis
Before estimating the model for the investigation of the effect of stock market development on financial savings in Tanzania, a descriptive analysis of the data was undertaken for variables in level to establish normality properties. Table 1 summarizes the descriptive statistics for the series in levels variables.

Table 1: Descriptive statistics of variables, 1999:1-2023:4 period

Variable	LogSaving	LogGDP	LogSdr	LogMaktcap	LogSaving_1
Mean	1.960862	6.890674	.3540032	6.183829	1.935356
Median	2.517522	6.625945	.3224695	6.173892	2.304176
Variance	1.585701	.2887839	.2026533	.6663747	1.568211
Maximum	6.173838	7.98579	4.497021	9.382033	6.173838
Minimum	.001659	6.231474	.017551	4.999721	.001659
Std. Dev.	1.259246	.5373862	.4501703	.8163177	1.252282
Skewness	.4517419	.1540128	7.903074	.7185365	.5239485
Kurtosis	3.307881	1.254543	73.27054	3.973414	3.386854
Jarq-Bera	4.20**	8.51**	60.16	14.38**	4.39**
Obser.	100	100	100	100	100

Note: LogSaving=Financial saving, LogSaving_1=Lagged saving, LogGDP=Real GDP, LogSdr=Deposit rate and LogMarket capitalization.

Unit root test

Most macroeconomic variables are found to be non-stationery such that, their estimation leads to spurious regression. The result of a regression analysis using non-stationary data does not make sense even when diagnostic test statistics look very promising. To avoid this problem, the study conducted a unit root test in order to examine whether the variables were stationary or not. This section discusses the results of the stationarity tests. The standard Augmented Dickey Fuller (ADF) test for the presence of unit root was performed for each variable and the results are presented in Table 2. Most of the variables are non-stationary in levels, except for GDP and Sdr. Due to this reason, GDP and Sdr were subjected to standard ADF test with trends, and all were non-stationary. By differencing all variables and carrying out unit root test by using standard ADF, all variables were stationary. However, the GDP and Mktcap were stationary with no constant and dsdr with a trend. Table 2 summarizes these results.

Table 2: Unit Root test results for level and transformed Variable

Variable	Augmented Dickey Fuller Test		Phillip-Perron Test		Integration
	At Level	At First Difference	At Leve	At First Difference	Order of Integration
LogMktcap	-1.378	-13.462**	-1.033	-121.456**	I(1)
LogGdp	-2.103	-16.643**	-4.547	-130.377**	I(1)
LogSdr	-8.394**	-17.023**	-90.183	-126.039**	
					I(1)
LogSaving	-3.200**	-10.985**	-13.661	-86.053**	I(1)
LogSaving_1	-3.185**	-11.124**	-13.657	-87.150**	I(1)

Note: (i) ADF denotes Augmented Dickey Fuller.

(ii) Asterisk ** indicate significance at 5% significance level.

(iii) The variables are as earlier defined

Cointegration test

Following examination of the stationarity properties of the data, the cointegration test was carried out on financial savings by using equation (3). Engle and Grangers (1987) two step procedure was employed in this analysis. Equation (3) was estimated and the results are presented in Table 3. The null-hypothesis of no contegration was rejected at 5% and it was found that the residual was a stationarity process. The existence of cointegration necessitated the formulation of Error Correction Model (ECM) to predict the effect of stock market development on financial saving in Tanzania.

Table 3 Regression results of level variables in level

reg saving saving_1 mktcap sdr gdp

Source	SS	Df	MS	Number of obs = 100
Model	146.35	4	36.59	Prob > F = 0.01
Residual	269.11	39	6.90	R-squared = 0.35
Total	415.46	43	9.66	Adj R-squared = 0.29
				Root MSE = 2.63

Saving		Coef.	Std. Err.	t	P>|t|	[95%	Conf. Interval]
Saving_1		.623	.0828	7.52	0.000	-.058	.6090651
Mktcap		-.091	0.138	-0.66	0.511	-8.56	1.24
Sdr	0.008	0.159	0.06	0.956	-1.73	2.95	
Gdp	.765	0.241	3.18	0.002	1.21	8.39	
_cons	-3.96	1.22	-3.24	0.002	-13.90	1.49	

Note: Variables are as defined before

In the static model estimated, the coefficients of the variables included in all the equations for all financial saving and carry the expected signs. This implies the consistent of the results presented with the theory and hypotheses. Looking at the results for the financial saving, it can be seen that the real GDP is positively related to financial saving. The estimated coefficients of GDP suggests that a 1 unit change in real GDP leads to about 4.8 increase in financial saving. The implication is that, real GDP has a role and is the main determining financial saving in Tanzania.

The savings deposit rate (sdr), possessed the expected sign, that is, positive. The saving deposit rate indicated that, a 1 unit change in saving deposit rate would impact positively on financial saving with an increase of about 0.61 units and therefore, is a significant variable in determining financial saving in Tanzania. Accordingly in theory, McKinnon (1973) and Shaw (1973), the increase in interest rate will lead to increase in financial saving in developing countries likewise in Tanzanian context. The reason for this might be the fact that in most developing economies like Tanzania, apart from poverty, most people have perfect information regarding the banking industry and this is consistent with wealth effect (Friedman, 1988). Market capitalization (mktcap) was found to bear an insignificant effect on financial saving and carry the expected negative sign (Table 3). The size of the coefficient of market capitalization indicated that, a 1 unit change in market capitalization would reduce financial saving by 3.66 units. The one period lagged financial saving included in financial saving regression to capture inertia, was found to bear a statistically significant influence on financial saving. In particular, the coefficient of lagged savings indicated that, a 1 unit change in the lagged saving would increase financial saving by 0.28 units.

Error correction model (ECM)

In the estimation an error correction model (ECM) the residual from the estimation of equations (3) was subjected to standard ADF unit root test. The null-hypothesis of no cointegration was rejected. The residual was a stationary process. This implied the presence of long-run equilibrium or inherent tendency to move together in the long-run. The one period lagged error term was included in the ECM to capture possible potential departure effect of the model's variables from the long-run equilibria. The error correction model includes the lag of the residues derived from the static regression as an error correction term. The error correction model estimated is therefore specified as follows;

$$\Delta s_t = \alpha_0 + \alpha_1 \sum_{i=0}^{k} \Delta\, gdp_{t-i} + \alpha_2 \sum_{i=0}^{k} \Delta mktcap_{t-i} + \alpha_3 \sum_{i=0}^{k} \Delta\, sdr_{t-i} + \alpha_4 \sum_{i=1}^{k} \Delta\, s_{t-i} + ect_{t-1} \dots\dots\dots\dots\dots\dots\dots\dots\dots. (5)$$

Estimation of ECM started with an over-parameterized model in which maximum of three lags (k) of each variable were included in the estimation. The number of lags was selected after being proved that there is no problem of autocorrelation as well as partial correlation as shown in the Auto-Correlation Function (ACF). Also the economic justification for the inclusion of lags of the explanatory variables in the model rests on the argument that, there is usually a considerable time lag in the adjustment processes in the economy. In this case, there is time lag for the explanatory variables to affect financial saving. The inclusion of lag of the dependent variable is done to allow the possibility that the financial saving is partly dependent on its own past performance. Akaike Information Criteria (AIC) was used as a guide to reduce the model by eliminating highly insignificant lags and variables in each turn of the repeated OLS estimation while maintaining the model that best fitted the data. The results from the estimation of the parsimonious models are presented in Table 4.

Table 4: Estimation results for parsimonious model of Δs_t equation

reg dsavind L2.dsaving_1 L3.dsdr L3.dgdp L3.dmktcap L1.res

Source	SS	df	MS			Number of obs =	40
						F(5, 34) =	4.10
Model	145.55	5	29.11			Prob > F =	0.01
Residual	241.44	34	7.10			R-squared =	0.38
						Adj R-squared =	0.28
Total	386.99	39	9.92			Root MSE =	2.67
dsavind	Coef.		Std. Err.	t	P>|t|	[95% Conf. Interval]	
dsaving_1							

L2. dsdr	.05	.14	0.37	0.71	-.24	.35
L3. dGdp	5.98	5.03	1.19	0.24	-4.25	16.21
L3. dMktcap	5.97	.00	0.15	0.88	-.00	.00
L3. res	-1.58	.00	-0.01	0.98	-.00	.00
L1.	-.66	.19	-3.39	0.00	-1.07	-.27
_cons	.18	1.68	0.11	0.91	-3.24	3.60

Note: Variables are as earlier defined

Models evaluation and diagnostic tests

In order to judge the goodness of the chosen model, a battery of most common diagnostic tests were utilized. These were the RESET test adopted to examine the model specification error, Jarque-Bera, used for normality test, Durbin-Watson (DW) test applied to test the presence of autocorrelation, HET test used to test heteroscedasticity and Breusch-Pagan used to test serial correlation. The results are summarized below.

Prior to the interpretation of the results for both models of financial saving functions, diagnostic tests were performed. The diagnostic tests indicate that all models estimated conformed to theory. The calculated F-statistics for the financial saving function was 5.30 significant at 5 percent level. The F-statistics of the ECM is 4.10 and significant at 5 percent. This indicates that the models estimated were powerful.

From the results of the estimated ECM, the R^2 is 0.38 for financial saving (s_t). This accordingly, suggests that the explanatory variables in the model explained about 40 percent of the variation in financial saving (Table 4). The normality test for the residuals of the estimated financial saving function was conducted using Shapiro-Wilk W test. The probability obtained is 0.84 greater than 0.1 indicating presence of normality for the data used.

The Durbin-Watson (DW) statistics which is 2.12 does not indicate presence of autocorrelation in the estimated function. Also, the F-statistic and probability test results using Breusch-Godfrey indicated no serial correlation among variables in the models estimated.

Variable Inflation Factor (VIF) test on financial saving was conducted to test for multicollineality and the results indicated that, there was no problem of collineality between any variables in the model. This was shown by a small value (1.25) that did not show any influence of dropping a variable.

The Ramsey RESET test for specification model was applied to all models. The results for the test show that there is no significant evidence of misspecification of the models. The estimated F-statistics were 0.66 with a probability of 0.59 for financial saving. In addition, the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity gives chi2 (1) values of 2.76 and a probability value of 0.10. This implies that the assumption of residuals stability is not rejected.

Since the diagnostic tests reveal that, all the requirements have been adequately met, it can be concluded that the results for the financial saving are reliable. In this regard, the economic interpretation of the results from Table 4, therefore, can be made. Table 4 shows the estimated results of the relationship between financial saving and its determinants. As required, the estimated equation is a valid cointegrated equation; the error correction term in the model is correctly signed and less than unity in absolute terms.

The coefficient of the error correction term (ect_{t-1}) are statistically significant at 5 percent level. Its magnitude is 0.67, suggesting that; the coefficient adjusts by 0.67 once the system happens to be in disequilibrium. Since quarterly data was used the coefficient suggests that in each quarter the level of financial saving function (s_t) adjust by 67 percent of the gap between the current level and the long run equilibrium level.

The financial saving function estimated shows that, the three coefficients of three period lagged GDP is statistically significant at 5 percent. Its coefficient is 0.97, indeed is correctly signed as the theory predicts but unexplainably very large (Table 4). In theory, saving deposit rate is positive related and influences financial saving function. The coefficient of saving deposit rate is positive and

significant at 5 percent. The three periods lagged deposit rate has also a significant coefficient. According to the results a 1 unit increase in savings deposit rate leads to 6 unit increase in financial saving.

With regard to the above estimated function for financial saving, the coefficients of Mktcap in level and lagged by three periods bears a negative signs. This suggests that a 1 unit increase in Mktcap reduces financial saving by 1.58 and this might affect the monetary policy. The theory suggests that Mktcap has negative impact on financial saving; this is also true for Tanzania because the Mktcap has negative sign in the short-run and long-run. The findings suggests that financial market though is not well developed it has exerted negative effects on financial saving in Tanzania banking system.

Also the result suggests that, financial saving inertia (saving_1) exerts a statistically significant positive influence financial saving. Additionally, the dis-saving coefficient in the estimated function for financial saving is significant but positive signed a result contrary to the hypothesis.

In this section, the effect of stock market development on the financial savings in Tanzania was estimated using a linear regression model (OLS). Stationary test for variables included in the model was performed using the standard Augmented Dickey Fuller (ADF) and Phillip-Perron (PP). Most of the variables were stationary at level, except market capitalization and the GDP. All variables became stationary after differencing once. Therefore, all variables were integrated of the same order, I(1) (Table 2). Cointegration test was conducted on the residual and variables had long-run equilibrium.

The Error correction models was estimated after it was proved that all the variables were cointegrated so as to incorporate the long run information lost by differencing the variables as well as to know the speed of adjustments to equilibrium. Despite the nature of Tanzania's financial sector, such as infancy stock market, most of the results obtained in this study were similar to theory and majority of other studies outside Tanzania. Results for the impact of real GDP on the static long run model and impact of the lagged market capitalization (Mktcap) were consistent with theory. Since market capitalization (Mktcap) has a significant influence and carries the expected negative sign in the estimated financial savings function for Tanzania, it can be concluded that Mktcap have negative and significantly reduces financial saving in Tanzania.

THEORETICAL IMPLICATIONS

The result from the study carry the following policy implications: the development of Dar es Salaam stock market in Tanzania has a negative impact on financial saving function in Tanzania, as there is long run relationship between financial saving and explanatory variables included in the study. This finding suggest that, the monetary policy needs to be monitored frequently as Dar es Salaam Stock Exchange continues to develop, if a monetary targeting regime proposed by the Bank of Tanzania is to be feasible. Second, the strong and positive effect of income (real GDP) on financial saving reveal in importance of augmenting savings by fighting poverty.

CONCLUSION

The empirical findings in this study have shown that, real GDP, deposit rate and stock market are relevant variables for explaining the variations in financial saving in Tanzania. There is evidence that, stock market development in Tanzania has reduced financial saving in both short -run and lagged period. Despite the limitation of the data used in this study, a long-run relationship is found to exist between financial saving, real GDP, market capitalization, saving deposit rate and the lagged financial saving. The findings for all variables savings deposit rate, market capitalization, real GDP and the lagged financial saving in the model estimation carried signs consistent with theory and previous empirical evidences.

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