

## How Stock Market Liquidity Impact Economic Growth in South Africa

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**ABSTRACT** A stock market is a financial establishment, which promotes competence in capital formation and allocation. It also enables the government and industries to finance new projects as well as growing and modernizing commercial or industrial concerns through raising long-term capital. The paper will examine the impact of stock market on economic growth in South Africa. Researchers employed the ordinary least squares regression (OLS) using the time series data from 1995-2010, together with Augmented Dickey Fuller (ADF) for testing stationary. The paper concludes that stock market liquidity impact growth in South Africa.

### 1. INTRODUCTION

A stock market can be defined as financial establishment, which promotes capital formation and competence in capital allocation. The stock markets also enable the government and private firms to finance its new projects as well as establishing, modernizing and expanding commercial or industrial concerns through raising long-term capital. Osinubi (2007) argues that capital resources should be provided to industries where such industries have the capacity and capability of increasing its production and productivity. Should the opposite happen the rate of expansion of the economy will suffer, thus clearly showing that stock market development is important to economic growth and is perceived to have a positive relationship with economic growth. Corporate entities benefit from the stock market in the form of provision of long-term debt financing and equity capital and a continuous source of capital for development and/or expansion and this has a positive impact on economic growth.

Levin and Zervos (2010) argue that liquid markets are of essential for growth. Many profitable investments are long term and require a long run obligation of capital. Savers are risk averse and they are not willing to renounce control of their wealth of saving for longer periods, hence; stock markets will attract more investors

since it will be providing assets which can be sold quickly and economically to savers. A liquid market encourages savers to invest in long-run projects and also enable them easy access to their wealth prior to the completion of the project and the distribution of the profits. This can be easily achieved through selling their claim in the stock market. This means that the more liquid the stock market, the lower the impediments to invest in the long-run projects. Stock market liquidity may also boost returns to savings, due to the feasibility and possibly cheaper financing of more investment projects.

Stock market plays a fundamental role on providing the secondary market for investors and financial institutions that will be willing to trade their securities. A liquid market can be characterized as a market where large transactions can be executed without or less impact on security prices (Brunnermeier et al. 2009). Along with other factors like market size and market capitalization, market liquidity is also considered as one of the best instrument measure efficiency of stock market. Market liquidity is a smoothly and obscure concept since it encourages a number of transactional properties of the market (Mockus 2012). According to Tehrani et al. (2011) Liquidity can be defined as the ability to make a transaction quickly and with less or no substantially moving prices and Lervine and Zervos (2010) defines market depth as the ability to make transactions at the ongoing market prices.

There are two theories that is demand following and supply leading hypothesis, which can bring light to the growing literature debate on which variable granger causes the other, that is, whether stock market development causes economic growth or the other way round. Al-Malkawi et al.(2012) argues that financial development encourages improvement of investment before persistent contemporary economic growth is progress and as current growth occurs, the supply leading force gradually becomes less and less essential as demand following financial response dominate. One industry may initially be encouraged financially on a supply leading basis and as it develops, have its financing shift to demand-following, while another may remain in the supply-leading phase (Levine 2005).

### **1.1. Relationship between Stock Market Liquidity and Growth**

Since stock market provides secondary market for investors and other financial institutes, the empirical literature also shows that the stock market boost growth. The cost of mobilizing savings can be lower if the stock market is large enough and hence facilitate investments in the most dynamic technologies (Nowbutsing et al. 2011).

The determined stock prices in the exchange and other available information to the public help investors to make a noble investment decisions and allocate his savings in better profitable investments. Liquid stock markets reduce the downside risk and cost of investing in the long-term commitment projects that takes long to payoff.

Yartey and Adjasi (2007) argue that liquid markets enable investors to be flexible with their savings in terms of accessibility and decisions. Investors do not necessarily have to wait for the completion of the project to access their funds. This enables investors to access their savings prior to the completion of the project by easily, quickly and cheaply selling their stake in the company on the secondary market. This will somehow encourage investment in long term and, usually profitable projects, thus improving capital allocation and increasing prospects for higher long term growth. However, it has also been argued that more liquid market can hurt growth by enabling counterproductive business takeovers.

An investor with a small portion in a certain project and knowingly that he/she can transact the stock quickly and cheaply is likely to be less committed in monitoring the project actively compared to the one who holds a large portion which is not easily and cheaply executed. This will as a result causes corporate problems which has unfavorable effect on economic growth. According to Levine (2003) Liquid markets shift the commitment of investors from corporate control to more flexible transacting of shares within the secondary market for profit reasons since it will be easy and cheap to transact. Thus liquid securities cause diffusion of ownership of projects. Yartey and Adjasi (2007) further argued corporate governance can be negatively affected by the stock market liquidity because very liquid markets may promote investor myopia.

Should income effect dominates substitution effect, any increase in returns to savings in a more liquid market will lead to a lower savings rates (Barth et al.2004). If savings drop satisfactorily, this will make it more difficult to mobilize capital for the project. Levine (2003) further argues that a liquid stock market can have a negative impact on economic growth as well as allocation of resources if it causes corporate control to be reduced significantly. Therefore, it brings theoretical ambiguity on the net effect of large stock market liquidity on the bases of the ability of an economy to project efficiency.

When investors frequently transact in the stock market, they will in turn to start to have some incentives to spend on some areas of the economy and as a result this might show the healthy activity to the economy. Stock market liquidity enhances growth through promoting savings and providing higher yield alternatives. This is possible because financial intermediaries and markets can accumulate expertise utilize economies of scale and make those available to public (Dalsenius 2007). Liquid markets provide savers with efficiently priced higher yield/risk alternatives to debt saving and should overall provide savers with higher utility and returns to savings. Whether or not this also leads to higher savings rates does, however, depend on whether the income or substitution effect, with respect to present and future consumption, dominates (Mukhopadhyay et al. 2011).

Liquid markets reduce information and transaction costs in the financial markets. This helps funneling capital between borrowers and lend-

ers more easily, but may also play a part in reducing the costs of asymmetric information between managers and stockholders within the same operation, (Dalsenius 2007). This is ambiguous, because while stock markets may reduce information costs and can be used as an instrument for keeping agency costs under control, they do the latter at a cost. The minimum agency costs occur where there is only one combined long term manager/owner. But the reduced observability in more diversified and short termed ownership structures, that are likely to occur in liquid stock markets, will cause the potential for more agency costs to increase (Nowbutsing et al. 2011). Hence it is far from certain that more liquid stock markets will lead to reduced agency costs. The idea here is that market capitalization of stocks, for instances through dividend policy, will provide all potential investors with more reliable information on the performance of the company thus established by the actions of large lenders and underwriters of stock, than might be obtained directly from managers.

According to Dalsenius (2007), "...one thing about stock markets is that, usually direct issuing of stock where a company sells its shares to a first-hand holder of stock stand for a very small percentage of the total trades that go there". Hence it might seem to a casual eye that the often speculative trading forth and back of stocks have little to do with any efficient allocation of resources that might promote growth. But equity is essentially an infinite stream of uncertain incomes and most investors have predetermined time horizons for their investments. The expected continuation of an efficient market where the investor can trade the equity off for an efficient price at the time of his choosing is therefore; extremely essential for how the investor will value the equity at the time of purchase. Only then will each holder of stock from the initial issuer and on be able to expect getting the optimal utility of the equity and therefore be willing to pay appropriately. If inefficiencies and high transaction costs can be expected further down the line, they will affect the price that the initial issuer of stocks can get for the equity (Barber et al. 2001).

So if a company wishes to use equity to finance its projects, then an efficient allocation of resources can occur only if the stock markets are efficient (liquid). But instead of issuing equi-

ty a company might choose to issue debt or a very frequently, a combination of the two. Both equity and debt financing are solutions to the problem of acquiring present funding in exchange for uncertain future income, even debt is uncertain, because there are, for instance, bankruptcy costs. But there are some important distinction between the two that suggest that the absence of efficient markets for equity will matter for the efficiency of acquiring present funding and so impact growth (Dalsenius 2007).

Levine and Zervos (2010) argue that the impact of stock market liquidity on economic growth is independent of the level of banking development. Economies with both liquid stock markets and developed banking sector have faster economic growth compared to economies with less developed banking sector and illiquid stock markets. Despite the level of bank development the country with a higher liquid markets experience faster economic growth and on the other it also experience faster growth when it has a developed banking sector with illiquid stock markets. Therefore liquid stock markets impacts on economic growth irrespective of banking development.

Levine and Zervos (2010) further argued that, although countries with more liquid markets enjoys faster rate of capital growth and greater efficiency, liquid equity markets entail further investment, and it's not only financed through new equity sales. Retained earnings and bank loans plays a major role on most corporate capital creation. Albeit this incident is not wholly understood, if the corporate equity raise so does the market liquidity in developing countries. This is because the rise in capital raised through bank loans and bonds is highly linked to greater stock market liquidity. Stock markets tend to accompany not replaced bank and bond issues.

## 1. 2. Statement of the Problem

The study examines the impact of stock market liquidity and long run economic growth in South Africa. This is because most studies in several countries focus on the stock market development as a whole and not solely the stock market liquidity alone. There is also some evidence that stock market liquidity has a greater impact on the long run economic growth compared to market size, so we want to test if this also applies to South Africa. Again stock market liquidity is said to be strongly linked to econom-

ic growth though one or two studies fails to see its impact on growth, this study we will see in the context of South Africa whether or not there is a positive relationship between stock market liquidity and economic growth.

**1. 3. Significance of the Paper**

Since South Africa is an emerging economy it is important that the aspect of liquidity should be taken into great depth because this will enable many players that is , traders to prefer to trade at JSE if the market is liquid and this will increase the volume of trade and hence the reward to traders without any difficulty. The relationship between stock market development and economic growth is of vital since it examines the impact or contribution stock market is adding to the economic growth of South Africa.

**2. RESEARCH METHODOLOGY**

A quantitative research design was used. The research utilized this approach because, as noted by Creswell (2013), quantitative research design allows the researcher to answer questions about the relationships between measured variables with the purpose of explaining, predicting and controlling certain phenomena.

**2.1 Data sources and Collection**

Based on literature review and research objectives, secondary sources were used to collect data. The data for real GDP per capita are from Reserve Bank of South Africa website. The data on government consumption expenditure is from Statistics South Africa, this variable is shown as ratio government consumption expenditure to GDP (GOVY) this variable has been formulated by dividing the expenditure to GDP. The data on GDP is from Reserve Bank of South Africa as well as data on inflation (PI). Data on (TRDY) is extracted from Statistics South Africa this data was on this form but we combine exports and imports to get net exports the divide it to GDP to get the ratio (TRDY). Data on market capitalisation, total value of domestic shares and the turnover is from Johannesburg Stock Exchange website (JSE). Researchers analysis follows South Africa stock exchange over 15 years (1995-2010) and the data is in quarterly form.

Data on M2 is from the Reserve Bank Of South Africa website, South Africa uses M3 to measure the money supply but we use M2 because the period which is covered by the study, M2 was still effective than M3.

**2.2. Model Specification**

**2.2.1. Model**

The model used in this study was adopted from the studies of Levine (2003) and Dalsenius (2007), with some modifications.

$$GROWTH_t = \alpha X + \beta(TVT\_GDP) + \mu \dots \dots \dots (1)$$

Where X is a set of control variables,  $\alpha$  is a vector of coefficients on X,  $\beta$  is the estimated coefficient on the stock market liquidity indicator, TVT\_GDP, and  $\mu$  is an error term. The researchers used the country specific constants and assume a model of:

$$Y_t = \beta_1 * X1_t + \beta_2 * X2_t + \beta_3 * X3_t + \beta_4 * X4_t + \beta_5 * X5_t + v_t \dots \dots \dots (2)$$

Where  $Y_t$ = real per capita GDP 1995-2010,  $X1_t$  -  $X5_t$  are the independent variables: initial GDP level, the ratio of government consumption expenditure to GDP, Value Traded liquidity and Turnover ratio, the inflation and the ratio of rate respectively.  $\beta_1$ - $\beta_5$  is the slopes for each independent variable's correlation with the dependent variable.  $\mu_t$  is the error term.

The study assume with a constant it will become:

$$Y_t = C + \beta_1(GOVY)_t + \beta_2(TVT\_GDP)_t + \beta_3(MCAP\_GDP)_t + \beta_4(PI)_t + \beta_5(TRDY)_t + \beta_5(M2)_t + \mu_t \dots \dots \dots (3)$$

Where;

$Y_t$  = Real GDP/Capita growth

$(GOVY)_t$  = the ratio of government consumption expenditure to GDP

$(TVT\_GDP)_t$  = ratio of total value traded to GDP

$(MCAP\_GDP)_t$  = the ratio of market capitalisation: GDP

$(PI)_t$  = the inflation rate

$(M2)_t$  = Money Supply

The logarithm of initial real GDP is included because theoretically it has been suggested that there is an important link between long run growth and initial per capita levels of physical and human capital (King and Levine 2004). LRGDP we used as a proxy for the initial levels per capita human and physical capital. GOVY and PI are included because some evidence sug-

gest a positive connection between macroeconomic stability and economic activity (King and Levine 2004; Agénor and Montiel 2008). We use the ratio of export-imports divided by GDP, since openness to international trade may also affect long-run growth. Thus GOVY, PI, TRDY are included primarily to gauge the strength of partial correlation between stock market liquidity and long-run growth. A control for the size of stock market (MCAP\_GDP) is included since the expectations of future corporate profits will boost TVT\_GDP without implying a corresponding fall in transaction costs, MCAP\_GDP, is also liable to this price effect (Levine 2003). M2, economists differ on the effect of money supply on economic growth, while some agreed that variation in the quantity of money supply is the most important determinant of economic growth (Ogunmuyiwa and Ekone 2010).

### 2.3 Data analysis

All data was obtained from the secondary sources and was used in econometric analysis of the impact of stock market liquidity on economic growth.

### 2.4. Analytical techniques

The research firstly tested for unit root and test for stationary using the Augmented Dickey Fuller (ADF) model and then run the regression analysis using the Ordinary Least Squares (OLS).

#### 2.4.1. Unit Root Testing

##### 2.4.1.1 Stationarity

Analysing a non-stationary series has a general problem of usual standard tests of significance being invalid. Therefore a widely used Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests was performed. The null hypothesis of unit root was tested against the alternative hypothesis of stationary data. Testing for stationary was done to avoid analyzing inconsistent spurious relationships.

Testing for stationary is important because if the series is non-stationary, then all the typical results of the classical regression analysis are not valid (Box et al. 2013). Stationarity in time series is important because a model whose coefficients are non-stationary will exhibit the unfortunate property that previous values of the

error term will have a non-declining effect on the current value of  $y_t$  as time progresses.

There are several reasons why the concept of non-stationary is important and why it is essential that is non-stationary be treated differently from those that are stationary. The stationary or otherwise of a series can be strongly influence its behaviour and properties. Blanchard (2013) use the word shock to denote a change or unexpected change in a variable or perhaps simply the value of the error term during a particular time period. For a stationary series shocks to the system usually die away with time, that is has a smaller effect on the time series after a few periods, while this is in contrast with the case of non-stationary data, where the persistence of shocks will always be infinite, so that for a non-stationary series, the effect of a shock time ( $t$ ) will not have smaller effect over time.

The use of non-stationary data can lead to spurious regressions. If two stationary variables are generated as independent random series, when one of those variables is regressed on the other, the  $t$ -ratio on the slope coefficient would be expected not to be significantly different from zero, and the value of  $R^2$  would be expected to be very low (Blanchard 2013). This seems obvious, for the variables are not related to one another. He further argued that, if two variables are trending over time, a regression of one on the other could have a high  $R^2$  even if the two are totally unrelated. So, if standard regression techniques are applied to non-stationary data, the end result could be a regression that looks good under standard measures (significant coefficient estimates and a high  $R^2$ ), but which is really valueless. Such a model would be termed a spurious regression.

If the variables employed in a regression model are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. The most important criticism that has been levelled at unit root tests is that their power is low if the process is stationary but with a root close to the non-stationary boundary (Blanchard 2013).

## 3. FINDINGS AND DISCUSSION

### 3.1. Measurements

Two different measurements of liquidity were used, Turnover ratio (the value of the trades of

domestic shares on domestic exchanges divided by the value of domestic shares) and the Value traded liquidity (the value of the trades of domestic shares on domestic exchanges divided by GDP). The reason of using Turnover ratio and Value traded liquidity as a measure of liquidity is that they measure different aspect of it (Dalsenius 2007). Theoretical models of stock market liquidity and economic growth (Alfaro et al. 2004) motivate the TVT-GDP proxy for stock market liquidity.

Turnover measures the level of trades of domestic shares on domestic stock exchanges divided by the value of listed domestic shares, thus providing a good measure of transaction costs in the domestic stock exchanges. Value traded on the other hand measures the value of the trades compared to the GDP of the economy as a whole, including non-listed firms and might thus give a better measurement of the transaction costs of equity trading (and issuing) in the economy as a whole (Naceur 2007). Value traded liquidity, however, does have a potential pitfall that; if markets anticipate large corporate profits, stock prices will rise today. This price rise would increase the value of stock transaction and therefore raise Value Traded. Problematically, liquidity indicator would rise without a rise in the number of transactions or a fall in transactions or a fall in transaction costs (Levine and Zervos 2010). However, Turnover is not affected by this price effect since it has stock prices both in the numerator and denominator.

Therefore, the relationship between Turnover and GDP economic growth can be utilized to check for inconsistencies between it and the relationship between Value Traded Liquidity and economic growth. Hence, checking for the possibility that the price effect might be dominating the relationship between value traded liquidity and economic growth. The price effect influences both indicators, but only the value traded

ratio is related directly to trading. Therefore, if TVT\_GDP is correlated significantly with economic growth when controlling for MCAP\_GDP, then the price is not dominating the relationship between TVT\_GDP and growth.

### 3.2 Augmented Dickey Fuller (ADF) Results

ADF at level series shows that both LRDGP and GOVY are non stationary at intercept and trend intercept and they are stationary at none with 1% significant level and 5% significant level respectively. TVT\_GDP and MCAP\_GDP are not significant at all the three test equation intercept, trend intercept and none. INFL is stationary at intercept and trend intercept at 5% significant level and non-stationary at none. TRDY and M2 are non stationary under intercept and trend intercept but stationary at 1% significant level under none (Table 1).

ADF test at 1<sup>st</sup> difference series shows that LRGDP is stationary under intercept, trend intercept and none at 1% significant level for the first two and 10% for the later. GOVY stationary at 1% significant level under all the three that is, intercept, trend intercept and none. TVT\_GDP stationary under intercept and none at 10% and 5% significant level respectively and non-stationary under trend intercept. MCAP\_GDP is stationary at 5% under intercept and trend intercept and 1% at none. Both INFL and TRDY are stationary at 1% under intercept, trend intercept and none. M2 is stationary at 1% under intercept and trend intercept and non-stationary under none (Table 2).

### 3.3. Ordinary Least Squares (OLS)

This is a method for estimating the unknown parameters in a linear regression model. This model minimizes the sum of squared vertical distances between the observed responses in the

**Table 1: Augmented Dickey Fuller (ADF) level series**

<i>Variable</i>	<i>Intercept</i>	<i>Trend intercept</i>	<i>None</i>
DLRGOVY	-1.720991	-1.432207	-2.007743**
TVT_GDP	-0.851352	-2.529573	0.538075
MCAP_GDP	0.439889	-1.012178	1.533946
PI	-3.807942**	-3.787325**	-0.925130
TRDY	-1.403525	-1.581707	-3.793721***
M2	1.767864	-1.328951	3.812530***

Stationary at 1% significant level \*\*\*, 5% significant level \*\*, 10% significant level\*

**Table 2: Augmented Dickey Fuller (ADF) 1st difference series**

<i>Variable</i>	<i>Intercept</i>	<i>Trend intercept</i>	<i>None</i>
GOVY	-23.76210***	-23.93198***	-23.23847***
TVT_GDP	-2.683040*	-2.654689	-2.284468**
MCAP_GDP	-3.454239**	-3.522429**	-3.305507***
INFL	-6.998253***	-6.932193***	-7.044976***
TRDY	-4.610894***	-4.785738***	-2.792181***
M2	-4.546646***	-5.175690***	-0.719104

Stationary at 1% significant level \*\*\*, 5% significant level \*\*, 10% significant level \*

dataset and the responses predicted by the linear approximation. The resulting estimator can be expressed by a simple formula, especially in the case of a single regressor on the right hand side. The OLS estimator is consistent when the regressor are exogenous and there is no multicollinearity, and optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated.

A time series OLS regression results are presented with different conditioning information sets that is different sets of X variables. DLRTVT\_GDP has a positive coefficient as we expected and its t- statistic shows that it has is significant to growth. So we can conclude that 1% increase in DLRTVT\_GDP causes a 0.62% increase in growth. The p-value of t-ratio of 0.0064 signifies that it has an explanatory power to the depended variable real per capita GDP. DLRCAP\_GDP also have a positive coefficient as we expected and also statistically insignificant on explaining our dependent variable per capita GDP (Table 3).

DLRTRDY has a negative co-efficient as we expected and its t-statistics shows that it does not significantly to explain the dependent variable. Also money supply has a negative co-efficient as we expected and its t-statistic of -1.44 shows that it is statistically insignificant in explaining the dependent variable. These findings

also tally with the one (Ogunmuyiwa and Ekone 2010) found on their study money supply and economic growth in Nigeria.

DLRGOVY and D(INFL) both have a positive coefficient to the dependent variable DLRGDP\_CAPITA but their t-statistic shows that they are statistically insignificant to explain the dependent variable and we can conclude that they both have no contribution to our depended variable according to our findings.

As shown by the results from OLS, stock market liquidity is strongly correlated with economic growth. DLRCAP\_GDP enters with a coefficient of 0.629081 and a P-value of 0.0064, which signifies a statistically significant impact at any convention significant level. The coefficient suggests that the association is economically large.

The Adjusted R-squared, is 0.385803 which means there is 38 percent of the dependent variable explained by the explanatory variables. The relatively low adjusted R-squared can be explained by the exclusion of other variables that affect real per capita GDP though the figure is in line with other studies on stock market liquidity and economic growth (Levine 2003)) and other study of the effect of stock market an liquidity (Dalsenius 2007). DW test shows how the independent variable explains the depended variable.

**Table 3: Ordinary least squares**

<i>Variable</i>	<i>Coefficient</i>	<i>t-statistics</i>	<i>P-value</i>
DLRGOVY	0.352374	0.036638	0.1328
DLRTVT_GDP	0.629081	2.361077	0.0064
DLRCAP_GDP	9.37	2.131522	0.0143
D(INFL)	0.031993	0.368581	0.7139
DLRTRDY	-134.3034	-1.249571	0.2167
DRLM2	-9.18	-1.443853	0.7139
C	-0.073714	-0.315845	0.7533
Observations	64		
Adjusted R-squared	0.385803		
DW-statistic	2.053340		

## 7. CONCLUSION

Legal, regulation, accounting, tax, and supervisory systems influence stock market liquidity. The efficiency of trading systems determines the ease and confidence with which investors can buy and sell their share and the macroeconomic and political environments affects market liquidity. Considering liberalizing international capital flows will result to a reduction in the restrictions of capital inflows and this can affect the emerging stock market functioning in a certain way. Firstly, it will enable the integration of the domestic market to that of the world and through completion from the foreign markets, prices of domestic securities will adjust itself to line with the world prices. Secondly, due both the interest of domestic firms to invest on foreign investments and foreign investors entry into the domestic stocks will force the information disclosure policies and accounting systems to be upgraded to world standards.

## 8. RECOMMENDATIONS

Despite the strong argument presented in this paper, there is also a need to address empirically the issue of causality, that is to see whether there is a causal relationship or not. Thus it is not simply simultaneous shocks to stock market activity and growth that are causing the strong positive association, and it is not simply that growth causes future increase in stock market liquidity. Thus future studies in this regard are of principal importance.

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