Stock market development and economic growth: Evidence from least developed countries

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Abstract

Purpose – The objective of this paper is to examine the impact of stock market development on economic growth for a sample of least developed countries.

Design/methodology/approach – A panel of 10 countries for the period 1995 to 2009 were used. Taking into account the possible existence of endogeneity in stock market-growth modelling, the study considers both static and dynamic panel data estimates. Econometric issues have been based on estimation of a dynamic panel model with GMM estimators which proved the presence of dynamism in the model.

Findings – The results shows an overall insignificant relationship between stock market development and economic growth for the least developed countries. However, the results show that banking development and education is the main factor contributing towards growth for these economies. In particular, these results can be explained by the fact that these economies are mostly banking oriented and these stock markets are relatively young.

Originality/value – Since the past few decades, the relationship between stock market development and economic growth has been of major concern among academics, policy makers and economists around the world. The importance of stock market development has extensively been empirically assessed but its contribution varied between different studies. The paper attempts to fill the research gap on the existing literature underlining the impacts of financial markets development on economic growth in least developed countries.

Keywords: Stock market development, economic growth, developed countries and developing countries.
1.0 Introduction
Since the past few decades, the relationship between stock market development and economic growth has been of major concern among academics, policy makers and economists around the world. The importance of stock market development has extensively been empirically assessed but its contribution varied between different studies.

Various studies (Demirguc-Kunt, 1996; Levine and Zervos, 1996; and Filer et al, 2000 amongst others) have supported the view that stock markets promote economic growth. Adjasi and Biekpe (2005) and Adamopoulos (2010) witnessed a significant positive impact of stock market development on economic growth in developed countries. Some studies, including Atje and Jovanovic (1998), showed a large impact of stock markets on economic growth but did not witness a significant link for banking development on economic growth. Nevertheless, some authors (Rousseau and Wachtel, 2000 and Beck and Levine, 2003) noted that not only stock market but also the banking sector contributes in boosting economic growth. Following the increasing role of stock markets in both developed and developing countries, existing studies are now modelling altogether stock markets, banks and economic growth in their empirical work. Beck and Levine (2002) have pointed out that “any examination of stock market effects on growth should simultaneously consider the impact of growing sophistication in the intermediating sector.” They further argued that not simultaneously considering a stock market variable does not provide for an accurate analysis of banks development and economic growth when controlling for stock market system. However, there have been some studies (Bencivenga and Smith 1996; Naceur and Gazouani, 2005; and Adjasi and Biekpe, 2005) that did not find the role of stock markets being significant to economic growth. Stiglitz (1985) and Bhide (1993) even viewed stock markets as being harmful to economic growth such that their increasing liquidity may negatively affect the growth since there may be a reduction in the savings rates because of externalities in capital accumulation. They furthermore added that the corporate ownership is dispersed and such dispersion may decrease the performance of firms, thereby not bringing in growth.
On the other hand, it is argued that well-developed domestic financial sectors in these advanced countries can significantly contribute to raising the savings rate, the investment rate and hence, lead to economic growth (Becsi and Wang, 1997). Thus, to improve the efficiency of their financial intermediaries and promote growth, many developing countries have reformed their economic and financial systems.

The significant contribution of the financial system in the growth of an economy has widely been confirmed by the existing growing literature (Levin and Zervos, 1998; Demirguc and Maksimovic, 1996b; Gerald, 2006; Seetanah, 2008 amongst others). By allocating funds in their best productive manner and allowing the market to be more liquid, the financial system induces firms to produce to their best output with less inefficiency. These studies state that the more a financial system is organised and managed, predominated by efficient banks and smoothly functioning stock markets, higher will be the pace of growth in such countries. As such, the objective of this paper is to examine the impact of stock market development on economic growth for a sample of least developed countries. The study considers the link based on a set of different variables of economic and stock market indicators and covers a period of 15 years (1995-2009).

2.0 Prior Research

The relationship between economic growth and stock market development has been the focus of intense theoretical and empirical studies. A growing literature argues that for an economy to function properly, there need to be an efficient stock market that moves funds from people who save to people who have productive investment opportunities. Therefore a sound stock market acts as a catalyst for sustainable economic growth. In addition, various studies (Schumpeter, 1912; and Wurgler, 2000 amongst others) argued that efficient stock markets enhance technological innovation by supporting entrepreneurs with the best opportunities of successfully introducing innovative products and production processes and thereby promoting growth.

The importance of stock market development in the growth process has been demonstrated through various channels. Indeed, stock market is likely to induce
economic growth by boosting the domestic savings and increasing the quantity and the quality of investment (Yartey, 2007). Stock market mobilises savings for investment by providing individuals with an additional financial instrument to suit their range of risk preferences and liquidity needs. Without access to capital, many production processes would be constrained to economically inefficient scales. Furthermore, through the mobilisation of capital, financial markets and institutions create small denomination instruments that provide opportunities for households to hold diversified portfolios, invest in firms, and increase their asset liquidity (Sirri and Tufano, 1995). They even argued that without pooling, households would have to buy and sell entire firms. Hence, by mobilising financial capital, households are able to enhance their risk diversification and liquidity, and promote the productive sector of the economy through the efficient allocation of resources. Stock market is a new and cheap way of raising capital for firms. This brings down the credit risk crisis since firms are expected to be less dependent on bank. Therefore, stock markets boost economic growth by both inducing savings amongst individuals and forming a new way of finance to firms.

Another way through which stock market development may influence economic growth is by mitigating the principal agent problem and consequently increasing productivity (Verrecchia, 1982; and Jensen and Murthy, 1990). In an efficient stock market, the stock price reflects a firm’s performance and its long term value. Having the manager’s compensation tied with the stock prices may imply a reduction in the incentives for improper corporate governance and thus an increase in the firm’s value, as shown in the study of Jensen and Meckling (1976).

Moreover, stock market provides for the possibility of takeover and this mechanism is expected to promote better corporate control and firm’s value. It is simply that there may be takeover of management if poorly controlled. Various studies (Kumar, 1984; Morck, Shleifer and Vishny, 1990a) showed that this threat of takeover for management of listed companies may lead to efficient management of resources. However, there have been some criticisms concerning the actual operation of the pricing and takeover mechanism such that these practices may lead to lower rate of long term investment in a well developed stock market. In the view of Binswanger (1999), such perverse incentive and compensation of the industry for short term
rewards, immediate profits and annual bonuses does not induce managers to perform effectively and that it undervalues long term investments, thus causing harm to the company in the long run. It has even been viewed that these incentives do not create new wealth and thus do not generate growth.

Stock market liquidity is expected to have a positive impact on the growth by reducing the downside risk and costs of investing in projects that do not long pay off period. By having a liquid market, Neusser and Kugler (1998) argue that investors do not lose access to their savings during the investment project period since the liquid market allows the savers to buy and sell quickly and cheaply their stake in the company when they wish to alter their portfolio. Without a market that promotes liquidity, savers would be reluctant to place their money in projects requiring long run capital commitment, and thus leading to less investment being made. Liquid stock market improves the allocation of capital and thereby enhancing prospects for long-term growth as pointed out by Levine (1991), and Bencivenga and Starr (1996). While on one side savers can hold liquid assets, the market on the other side can ease investment in long term, potentially more profitable projects. The positive side of liquidity has also been stressed by Holmstrom (1993) such that it improves corporate governance in firms in the way that liquidity encourages investors to acquire more information on firms and this will boost corporate managers to work harder in the best interests of shareholders. However, the theory is ambiguous about the exact impact of greater stock market liquidity on economic growth and thus it may reduce saving rates and consequently slowing growth, as shown by Demirguc-Kunt and Levine (1996b) through 3 channels.1

Stock markets provide a vehicle for diversifying risk (Saint Paul, 1992; Devereux and Smith, 1994; and Obstfeld, 1994). According to Obstfeld (2009), greater risk sharing through global diversification make high risk, high return domestic and international projects viable, and consequently allocate savings between investment opportunities more efficiently. The absence of efficiently run capital markets limits

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1 Firstly, it may bring a fall in the savings rate through income and substitution effect. Secondly, since the uncertainty linked with investment is reduced greater stock market liquidity may reduce the savings rate because of the ambiguous effects of uncertainty on savings. Thirdly, it induces investor myopia and as a result it may lead to bad corporate governance and thus slowing growth.
investors in diversifying their portfolios. Consequently, people may avoid investing in equity stakes since they are too risky. Hence raising equity capital becomes a headache for firms. Through stock markets, firm-specific risks can be diversified, thus making investment in firms more attractive. The work of Atje and Jovanic (1998) demonstrated that stock markets provide greater opportunity for risk spreading and risk pooling. Investors are able to suit their investment preference based on the level of risks.

Efficient stock markets may also play a prominent role in reducing the costs of information. This is possible through the creation and spreading of firm specific information that efficient stock prices reveal. Stock markets are said to be efficient when all available information has been reflected in the price. This results in minimising the costs of acquiring information on projects and helps in monitoring and evaluating their performance (Diamond, 1984). Such reduction in the costs of acquiring information is expected to facilitate and improve the acquisition of information about investment opportunities and thereby improves resource allocation. These publicly available stock prices and information may support investors to better take their investment decision which may lead to better allocation of funds among firms and thus having a higher growth rate (Grossman and Stiglitz, 1980).

In economic literature, some studies included the contribution of banking services while trying to link stock market development with economic growth. A first group of studies (Allen and Gale, 1999; Arestis and Demetriades, 1998; and Beck and Maksimovic, 2001 amongst others) argued that there has been no difference in the impact of both financial systems on economic growth. The focus is rather laid more on the overall level of financial development and the extent to which the legal system is efficient in protecting outside investor’s rights in terms of inducing a higher economic growth rate. However, another group of studies (Levine and Zervos, 1993; Levine and Zervos, 1998; and Beck and Levine, 2003) found that the impact on economic growth is not the same for the different services provided by these two financial markets. They concluded that both stock market liquidity and banking development are essential forecast indicators of economic growth. Bearing
this in mind, the present study considers not only stock market development but also banking development in examining the relationship with economic growth.

A large number of recent studies have favoured the fact that stock market development is a necessary ingredient to boost the economic growth. For instance, Caporale (2004) examined the causal linkage between stock market development, financial development and economic growth for a sample of seven countries. They concluded that an efficient stock market boosts economic growth. Among these recent studies, there include the work of Adjasi and Biekpe (2005) which found the relationship between stock market development and economic growth significant for 14 upper middle African countries. Similarly, positive correlation of these two above named variables have been found from Paudel (2005), Bahadur and Neupane (2006) and Siliverstovs and Duong (2006). In similar vein, Levine and Zervos (1996) found that stock market liquidity is positively and significantly correlated with current and future rates of economic growth, capital accumulation, and productivity growth and thus concluding the stock market as a robust predictor for economic growth using a sample of 49 countries from year 1976 to 1993. In addition, the banking development also was found to be significant in the regression. This result confirmed Bencivenga, Smith, and Starr’s (1995) theoretical predictions and showed that both stock market and bank development are important for determining economic growth.

Earlier panel studies suffered from various statistical weaknesses relating to endogeneity and causality. Thus, by considering these issues later studies, for instance Beck and Levine (2002) applied the GMM techniques developed for dynamic panels for overall financial development from 1976 to 1998. The results witnessed stock markets and banks to have a positive and significant influence on growth through the use of alternative conditioning information sets and alternative panel estimators. Thus the findings, after controlling for country specific effects conclude stock market and banking development to be among the key ingredients to economic growth. It is noteworthy to emphasise the work of Seetanah (2008), where a simultaneous examination of the banking sector development, stock market development and economic growth was carried out in a unified framework. The study used a panel VAR framework, estimated by GMM, for 27 developing
countries for the period 1991 to 2007 and concluded that stock market and banking development are complement to each other while inducing economic growth. Thus it shows the importance of both indicators in positively influencing growth in developing economies. This positive link between stock market development and economic growth has also been evidenced in these following developing countries; India (Deb and Mukherjee, 2008), Zimbabwe (Mutenheri and Green, 2003), Ghana (Bokpin and Isshaq, 2008) and Mauritius (Nowbutsing, 2009).

However, there have been some studies which were unable to conclude a link between stock market development and economic growth. For instance, Singh (1997) gave prominence the role of the stock markets in the liberalisation process in developing countries in the 1980s and 1990s, and explored their impact on the growth. The paper concluded that these developments are not significant channels of attaining quicker industrialisation and faster long-term economic growth in most developed countries. Also, Sarkar (2007) examined the importance of stock market in India since mid 1970 and did not find any link between stock market development and economic growth both in the short run and long run. Similarly, no relationship has been found in the theoretical and empirical work of Rousseau and Xiao (2007) though the latter found the important role of the banking sector in the Chinese economy. Moreover, based on an unbalanced panel data set, Naceur and Ghazouani (2005) did not find a significant relationship between banking, stock market development and economic growth due to underdeveloped financial systems in the MENA region.

A review of the literature shows that empirical evidences from developed countries or developing countries group based on rigorous panel data analysis, have been very scarce and moreover mixed results exists in the existing literature research of stock market development and growth. Moreover very few studies, until some recent papers reported their results after having dealt with issues of causality and endogeneity. This paper thereby attempts to fill these research gaps.
3.0 Research Methodology

The objective of this paper is to find out the existence of relationship between stock market development, banking development and economic growth based on panel data set of least developed countries. Based on the classification of the International Monetary Fund, a sample of 10 least developed countries have been chosen. The sample period ranges from 1995 to 2009 and the data has been collected from the International Monetary Fund (IMF) and from the World Bank’s ‘World Development Indicators’.

Based on the principles of various previous studies (King and Levine, 1993; Ram, 1999; and Seetanah, 2008), the following model is used.

\[ Y = f (SMDEX, BANKGDP, CPI, EDUC, EXGDP) \]  

(1)

In the above equation, the proxy for the dependent variable, Y, is per capita growth rate. SMDEX refers to the stock market development index, where such index comprises of two measures, namely SIZE and LIQUIDITY. These measures of the index have been widely used in previous studies including (Levine, 1996; and Rousseau and Wachtel, 2000). SIZE comprises of the concentration ratio. Concentration ratio is measured by dividing market capitalisation over GDP. If a market is dominated by only few companies, there is likely to be manipulation in the price formation process. Highly concentrated markets are mostly found in poor economies. Thus market concentration is assumed to be negatively correlated with market size and market liquidity. The second measure LIQUIDITY includes trading value ratio and turnover ratio. The former, which equals the value of listed shares divided by GDP, is taken as the indicator for stock market development. This ratio measures the stock market size, and shows ability to mobilise the capital through diversification of risk. It represents organised trading of firm equity as a share of national output and therefore should positively reflect liquidity in the economy (Garcia, 1999). The turnover ratio, second component of liquidity, is measured as the volume of total shares traded divided by market capitalisation. As per Levine and Zervos (1996), the liquidity of the stock markets may impact on economic

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2 See Appendix for list of countries
activity such that investors are unwilling to relinquish control of their saving for long periods. This ratio measures the ability to trade economically significant positions on the stock market.

BANKGDP shows banking development and the proxy used, domestic credit provided by financial intermediaries to the private sector over GDP, has been followed from Beck and Levine (2003). This indicator has been popularly used since it excludes credit to the public sector and thereby measures more specifically the contribution of financial institution in funding private sector. The study of Boyd and Smith (1996) suggests that banks and stock markets may be complements rather than substitutes to each other, and that of Demirguc-Kunt and Levine (1996a) show that the degree of stock market development is positively related to bank development. Thus it is expected that there is a positive correlation between them and that they grow simultaneously.

Inflation, proxy as the CPI, reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at particular time intervals. Various studies including Fischer (1993) and Barro (1996) concluded that inflation is not good for long term economic growth. Thus it is estimated to have a negative correlation between inflation and economic growth.

EDUC demonstrates the quality of human capital by having secondary enrolment ratio as the proxy. Secondary education aims at laying the basics for lifelong learning and human development, regardless of age. Higher education level is expected to bring in more skilled resources and thus better prospects to the country’s growth. EXGDP is the total of export divided by the GDP of the country. It has been used as the proxy for trade openness. This export amount includes the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. It is noted that this value does not consider compensation of employees and investment income (formerly called factor services) and transfer payments.
Based on the above explanations, a panel regression is specified as follows;

\[ y_{it} = \beta_0 + \beta_1 \text{smdex}_{it} + \beta_2 \text{bankgdp}_{it} + \beta_3 \text{cpi}_{it} + \beta_4 \text{educ}_{it} + \beta_5 \text{xgdp}_{it} + \varepsilon_{it} \]  \hspace{1cm} (2)

where \( i \) stands for the different countries in the sample, \( t \) denotes the time dimension and \( \mu \) is the error term. The small letters denotes the natural logarithm of the variables. The model used in this paper is a linear-logarithmic one and the available panel data set for the ten countries is balanced.

3.1 Static Panel

To overcome the limitations in the use of single-equation OLS cross sectional regression model and pooled OLS, Kennedy (2003) advises the use of panel data techniques. In this paper, there has been the use of panel data analysis which endows regression analysis with both a spatial (ten countries) and temporal dimension (fifteen years). Among the main types of panel data analytic models, it includes the fixed effect and random effect models which have been both considered.

The assumption made under the fixed effects estimates is that the individual specific effect is correlated with the independent variables, thereby confirming the existence of significant heterogeneity across countries. In other words, it will show that each country’s situation is different from each other. On the other hand, in case of random effects modelling there includes the presence of a random constant term in the regression. In particular, the deviation from the constant of the cross-sectional unit (country) has to be uncorrelated with the errors of the variables. The benefit of such model is that it allows for time-invariant variables to be included among the regressors.

The Hausman specification test is to determine whether to use the fixed or random effects model. The question lies to whether there is significant correlation between the unobserved person-specific random effects and the explanatory variables. In case
there is no such correlation, it will be most appropriate to use the random effects model. However, if there is such a correlation, the random effects model would be inconsistently estimated, and therefore the fixed effects model will be more powerful. The null hypothesis is that there is no correlation.

3.2 Dynamic Panel
Dynamic Panel Data Model is used for the analysis since the GDP per capita depends on its previous values. The idea behind the use of dynamic panel data is not only to control for unobserved cross country heterogeneity but also it allows the inspection of dynamic relations. To examine the relationship between stock market development, bank development and economic growth, the Generalised-Method-of-Moments (GMM) estimators developed for dynamic panel models by Arrellano and Bond (1991) has been used. The reason for the use of the GMM is that it, according to Green (1997), yields consistent and efficient estimates in the presence of arbitrary heteroskedasticity. Moreover, the estimates of the Ordinary Least Square (OLS) technique have not been considered because its methods are biased and even inconsistent (Gujarati, 2003).

The growth regression can be modelled as follows:

\[ y_{it} - y_{i,t-1} = \alpha y_{i,t-1} + \beta' X_{i,t} + \eta_i + \varepsilon_{it} \quad i = 1, \ldots, N ; \quad t = 1, \ldots, T_i , \]  

(3)

where \( y_{it} \) denotes the per capita real GDP rate; \( x_{it} \) represents the vector of explanatory variables, \( \alpha \) is the period specific intercept terms to capture changes common to all countries. \( \eta \) is an unobserved country-specific effect, \( \varepsilon \) is the error term, and the subscripts \( i \) and \( t \) represent country and time period, respectively.

According to Arrellano and Bond (1991), the equation (3) should be differenced such that it becomes as follows:

\[ (y_{it} - y_{i,t-1}) - (y_{i,t-1} - y_{i,t-2}) = \alpha (y_{i,t-1} - y_{i,t-2}) + \beta' (X_{i,t} - X_{i,t-1}) + (\varepsilon_{it} - \varepsilon_{i,t-1}) \]  

(4)

In this specification, the country specific effect is dropped out, but a new kind of bias arises since the new term \( (\varepsilon_{it} - \varepsilon_{i,t-1}) \) is correlated with the lagged dependent
variable, \( y_{i,t-1} - y_{i,t-2} \). Hence, Arellano and Bond (1991) proposed the following moment conditions:

\[
E \left[ y_{i,t-s} (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \right] = 0 \text{ for } s \geq 2; \ t = 3, \ldots, T \\
E \left[ x_{i,t-s} (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \right] = 0 \text{ for } s \geq 2; \ t = 3, \ldots, T
\]  

The equation (5) and (6) are based under the assumptions that the error term, \( \varepsilon \), is not serially correlated, and that the independent variables, \( X \), are weakly exogenous. Bearing these conditions in mind, Arellano and Bond (1991) propose a two-step GMM estimator. Firstly, the error terms are assumed to be independent and homoskedastic across countries and over time. Secondly, the residuals retained in the first step are used to construct a consistent estimate of the variance-covariance matrix, thereby relaxing the assumptions of independence and homoskedasticity. However, the first step GMM estimator will be used since it has demonstrated to yield to more reliable inferences. The asymptotic standards errors from the two step GMM estimator have been found to have a downward bias (Blundell and Bond 1998).

It is noteworthy that the above specification has not been estimated through the use of OLS since it might cause a problem of endogeneity if \( y_{t-1} \) is endogenous to the error terms through \( \varepsilon_{i,t-1} \).

3.2.1 Sargan test

For the GMM estimator to be consistent, both the instruments chosen from the lagged endogenous and explanatory variables and the assumption that the error terms do not exhibit serial correlation have to be valid. To address these issues, the Sargan specification test suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998) has been employed. It is a test of over-identifying restrictions such that it tests the overall validity of the instruments by analyzing the sample analogue of the moment conditions used in the estimation process. The Sargan test has the belief that the residuals should be uncorrelated with the set of exogenous variables if the instruments are truly exogenous.
3.2.2 Arellano-Bond autocorrelation test

It is obvious that Sargan test is testing more than just autocorrelation in the errors. Thus, no autocorrelation is necessary but not sufficient to pass this test with reasonable certainty. According to Arellano and Bond (1991), the Sargan test is not as sensitive to autocorrelation as is their autocorrelation test. This implies that the two tests sometimes disagree, with the Sargan test being sensitive to other types of violations of assumptions, but also being less sensitive to particular violations associated with autocorrelation. Pertaining to this, the Arellano-Bond autocorrelation test has been used to check for the presence of any residual autocorrelation. This autocorrelation test is valid under many forms of dynamic panel model estimation, even though it has been presented through a two-step robust estimation by Arellano and Bond.

4.0 Analysis and Results

In this section, the ability of stock market development to impact on economic growth in a panel analysis combining data for 10 countries is tested, and then it examines whether this relationship is influenced by a series of country-specific characteristics. To address this issue, the stock market development is interacted with these country-specific variables. The study analyses developed and developing economies together and also compares them separately. The use of STATA version 11 has been made to generate the results in the analysis part.

The econometric model to be examined is as follows:

\[ y_{it} = \beta_0 + \beta_1 \text{smdex}_{it} + \beta_2 \text{bankgdp}_{it} + \beta_3 \text{cpi}_{it} + \beta_4 \text{educ}_{it} + \beta_5 \text{xgdp}_{it} + \varepsilon_{it} \]  

Using the static panel data, the analysis considers both use of both random effects estimates and fixed effects estimates.

4.1 Random Effects and Fixed Effects estimates

The Hausman specification test, as shown in table 1 has been used to determine whether to use fixed effects model or random effects model.
Table 1 Results from Hausman test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Least Developing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prob &gt; chi2*</td>
<td>0.0002</td>
</tr>
<tr>
<td>Difference in coefficient*</td>
<td>smdex</td>
</tr>
</tbody>
</table>

*indicates significance at 5% level.

Table 1 shows that the Prob>chi2 is significant at 5% level of significance for the groups under the study. Since they are significant, that is being less than 0.05, this demonstrates that a fixed effects model is the most appropriate one to be used. Moreover, the table indicates significant differences in the coefficients, and thus it is preferable to make use of the fixed effects model. Based on the Hausman specification observations, the fixed effects model has been applied and its results are shown in table 2.

Table 2 Robust Fixed Effects estimates 1995-2009

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Fixed Effects</th>
<th>Least Developing Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smdex</td>
<td>0.21</td>
<td></td>
</tr>
<tr>
<td>P Value</td>
<td>(.567)</td>
<td></td>
</tr>
<tr>
<td>Bankgdp</td>
<td>0.35*</td>
<td></td>
</tr>
<tr>
<td>P Value</td>
<td>(0.067)</td>
<td></td>
</tr>
<tr>
<td>Cpi</td>
<td>-3.47**</td>
<td></td>
</tr>
<tr>
<td>P Value</td>
<td>(0.026)</td>
<td></td>
</tr>
<tr>
<td>Educ</td>
<td>2.27**</td>
<td></td>
</tr>
<tr>
<td>P Value</td>
<td>(0.045)</td>
<td></td>
</tr>
<tr>
<td>Exgdp</td>
<td>1.35**</td>
<td></td>
</tr>
<tr>
<td>P Value</td>
<td>(0.032)</td>
<td></td>
</tr>
<tr>
<td>Number of observations</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Number of Countries</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 5% level; * Significant at 10% level
The results from the above table show that there is no significant relationship between stock market development and economic growth for the sample of the least developed countries. In particular, these results are inconsistent with a number of previous studies\(^3\). However, there have been some studies (Bencivenga and Smith 1996; Naceur and Gazouani, 2005; and Adjasi and Biekpe, 2005) that did not find the role of stock markets being significant to economic growth. In particular, insignificant role of stock markets in contributing towards economic growth may be due that the specific structures of the financial sectors of least developed countries which are most banking oriented. As such, as per the results above, there seems to be significant positive contribution of banking development towards economic growth. In effect, the stock markets in least developed countries are relatively young since most of them have been setup in the early 1990s and as such, do not have a sophisticated trading system as in developed markets. Also, the trading volume on these markets are significantly lower compared to developing and developed countries in that there are fewer participants. In effect, the limited number of participants is due the low financial literacy rate among the population. In deed, most individuals channel their investments and savings through banks rather than the stock markets. In effect, the authorities need to set up appropriate awareness campaigns on the role and functions of stock markets to inform the population at large on the investment opportunities available to them. In contrast, developing and developed stock markets have relatively a larger number of participants who understand the opportunities offered to them. To this effect, the role of stock markets in developed or emerging markets are much significant than in least developed countries.

As far the other variables are concerned, there seems to be a significant negative relationship between economic growth and inflation, consistent with the studies of Fischer (1993) and Barro (1996). In deed, inflation reduces the competitiveness of a given country and is as such a long term obstacle to economic growth. On the other hand, the results show that human capital development through higher education and trade openness contributes positively to economic growth.

\(^3\) Levine (1992), Adjasi and Biekpe (2005), Adamopoulos (2010) amongst others.
4.2 Dynamic Panel Data Estimation

The generalised Moments Method (GMM) dynamic panel estimator, introduced by Arellano and Bond (1991) has been used in the same way as Beck and Levine (2002). The latter applied the GMM to address the statistical problems characterising pure cross-sectional studies. Since the endogenous variable in the model has been lagged among the set of explanatory variables this may weaken the efficiency of estimators. In relation to this issue the GMM has been used since, it deals with problems relating to bias of simultaneity, reverse causality and omitted variables. To incorporate dynamics into the model, it can be reformed into an AR (1) model which is as follows:

\[ y_{i,t} - y_{i,t-1} = \alpha y_{i,t-1} + \beta'X_{i,t} + \eta_i + \varepsilon_{it} \]  

(8)

Table 3 Results from Dynamic Panel Data Estimation (First Step GMM estimator) 1995-2009

<table>
<thead>
<tr>
<th>Variables</th>
<th>Least developing</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gdp t-1</td>
<td>0.24**</td>
<td>0.017</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smdex</td>
<td>0.13</td>
<td>0.531</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bankgdp</td>
<td>0.25*</td>
<td>0.065</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cpi</td>
<td>-2.556**</td>
<td>0.044</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educ</td>
<td>0.21**</td>
<td>0.024</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exgdp</td>
<td>0.17</td>
<td>0.38</td>
</tr>
<tr>
<td>P-Value</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of Observations 150

Number of Countries 10

** Significant at 5% level; * Significant at 10% level
The results from the dynamic panel analysis validate the hypothesis that stock market development is not growth conducive in the sample of countries even in the short run. It is observed that the coefficient of GDP$_{yt-1}$ from the table is positive and significant for the least developing countries. The result concludes that lagged growth of the country contributes positively towards the current level of economic growth confirming the existence of dynamism and endogeneity in the studied model. It is consistent with studies done by Li and Liu (2005) and Seetanah (2007). Interestingly, most of the other explanatory variables noted to have lower coefficient meaning that short run effects are weaker and maybe that these explanatory factors take time to spread their whole effect. Therefore, it proves the presence of dynamism in the model. The results are consistent with the previous table except for trade openness which is insignificant.

4.3 Sargan test and Arellano-Bond autocorrelation test

Table 4 Diagnosis tests

<table>
<thead>
<tr>
<th>Diagnosis tests</th>
<th>Prob &gt; Chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sargan test</td>
<td>0.0001</td>
</tr>
<tr>
<td>Arellano-Bond test of 2nd order autocorrelation</td>
<td>0.233</td>
</tr>
</tbody>
</table>

As it is observed in table 4, the Sargan test confirms for the whole specifications no correlation between the used instruments and the residuals and thereby concluding that the overidentifying restrictions are valid. The test for auto-correlation confirms no second order autocorrelation for the specifications in the sample data since the prob>chi2 is greater than 5 percent. Therefore, we do not reject the null hypothesis of validity of lagged variables in level and in difference as instruments and the hypothesis of absence of autocorrelation of the second order. Thus, the error terms do not exhibit second order serial autocorrelation and it can be argued that the specification kept in the model and the validity of all the used instruments is accepted.
5.0 Conclusion

This paper examines the relationship between stock market development and economic growth for the case of 10 countries comprising of least developed countries, over the period 1995-2009 and it uses both static and dynamic panel data analysis. The results from the static analysis show a positive but insignificant effect of stock market development on the level of economic growth for the least developed countries. This finding is inconsistent with the theoretical literature. The authors argue that given that the structure of the financial sectors in least developed countries are mostly banking-oriented, the contribution of stock market development towards economic growth is relatively lower when compared to developed or developing countries. To deal with key problems like omitted variable bias and simultaneity bias, the GMM system dynamic panel estimator has been put in place and again this proved the stock market development and growth rate are not related.

Moreover, the impact of bank development on growth is tested and a significant impact on the growth is reported. Similarly, the study shows that inflation and education are also key elements towards economic growth. The study calls for new policies to be implemented in least developed countries to encourage more participants to increase the dynamism of the local stock markets. In particular, policies should be geared towards more local and foreign investors’ participation as well as the increase in the number of listing companies.

6.0 References


APPENDIX

Appendix 1 List of countries under each economic group

10 countries 1995-2009

Bangladesh
Sudan
Uganda
Zambia
Nepal
Tanzania
Senegal
Cambodia
Lesotho

Malawi