Financial Deepening and Stock Market Returns: Panel Cointegration Analyses

Matiur Rahman*
Professor of Finance
McNeese State University
Lake Charles, LA 70609
E-Mail: mrahman@mcneese.edu

Muhammad Mustafa
Professor of Economics
South Carolina State University
Orangeburg, SC 29117
E-Mail: mmustafa@scsu.edu

*Contact author. Usual disclaimers are in order.

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Abstract

This paper analyzes the effects of stock market turnover and liquidity, as measures of financial deepening, on stock market returns in selected 19 developed and 21 developing countries over 1988-2013 by implementing Pedroni's panel cointegration methodology and panel vector error-correction models. Stock market turnover contributes more to stock market returns than stock market liquidity in both selected developed and developing economies. However, the results are much weaker for developing countries than for developed countries.

Key Words*:* Financial Deepening, Stock Market Returns, Stock Market Turnover, Stock Market Liquidity, Panel Cointegration

JEL Classifications: G10, G19, G30

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I. Introduction

Stock market is an important part of capital market and plays an important role spurring economic growth and development as a vehicle to mobilize liquidity, to channel medium and long-term capital for productive corporate investment, and to help price discovery, reductions in transactions costs and risk transfers (Gurley and Shaw, 1955; Goldsmith, 1969; and Hicks, 1969). Thus, a well-functioning stock market enhances economic efficiency, private investment and growth. In return, they unleash positive influences on stock market returns.

Financial deepening has been identified as one of those strategies whose implementation can quicken the pace, development and contributions of the market. Financial deepening is more concerned with the process of financial intermediation. Financial markets undertake this vital role of intermediation process by channeling funds from surplus units (savers) to deficit units (investors). When a country's financial intermediation is efficient and effective, the outcome is usually a well-developed and well-functioning financial sector with capacity to promote and support economic growth. In contrast, financial shallowness retards economic development (Goldsmith, 1969).

Financial deepening is a multi-faceted process in which institutions and financial markets: i) facilitate goods and services exchange (e.g., payment services), ii) mobilize and pool savings of a large number of investors, iii) acquire and process information about the companies and the potential investment projects and, therefore, allocating private savings to the most productive uses, iv) boost investments and exert corporate governance, and v) diversify and

reduce liquidity risk as well as inter-temporal risk (King and Levine, 1993). In other words, financial deepening can be understood as a process by which the range of products and players widens, deadlines extend and services play a role in risk coverage and diversification.

The commonly used measures of financial deepening includes i) stock market size as the ratio of market capitalization to GDP, and ii) stock market liquidity as the ratio of total value of shares traded to GDP. Stock market size is not a good predictor if economic growth, while greater stock price volatility does not necessarily predict poor economic performance. Empirically, it is not the size or volatility of the stock market that matters for growth but the ease with which shares can be traded.

Stock markets may affect economic activity through the creation of liquidity. Many profitable investments require a long-term commitment of capital, but investors are often reluctant to relinquish control of their savings for long periods. Liquid equity markets make investment less risky and more attractive because they allow savers to acquire an equity asset and to sell it quickly and cheaply if they need access to their savings or want to reshuffle their portfolios. At the same time, companies enjoy permanent access to capital raised through equity issues. By facilitating longer-term more profitable investments, liquid markets improve the allocation of capital and enhances prospects for long-term economic growth. Further, by making investment less risky and more profitable, stock market liquidity can also lead to more investment. To put succinctly, investors will come to equity market, if they can leave it at short notices.

There are alternative views about the effect of liquidity on long-term economic growth, however. Some analysts argue that very liquid markets encourage investor myopia since they

make it easy for dissatisfied investors to sell quickly. Liquid markets may weaken investors' commitment and reduce investors' incentives to exert corporate control by overseeing managers and monitoring firm performance and potential. According to this view, enhanced stock market liquidity may actually hurt economic growth (Levine, 1996).

To our knowledge, the empirical studies linking financial development to economic growth are numerous. However, studies on the financial deepening and stock market returns nexus are relatively scant. This study thus examines the effects of financial deepening on stock market returns for selected 19 developed and 21 developing countries over 1988-2013 to provide a comparative picture by invoking the panel cointegration methodology. The balance of the paper is structured as follows. Section II provides a survey of the related literature. Section III outlines the empirical methodology. Section IV reports results. Section V offers conclusions and implications.

II. Review of Related Literature

The main thesis of King and Levine (1993) is that financial intermediaries are likely to spur capital accumulation and economic factors' productivity growth, leading to economic growth. Subscribing to the belief that financial development is a key factor of economic growth, Levine (1997) notes that financial intermediaries improve risk management, financial transactions, savings mobilization and the exchange of goods and services. Ang (2008) finds that an efficient financial system positively contributes to economic growth. At the beginning of the 1990s, the endogenous growth literature stresses the significance of financial development for long-term economic growth. These studies seek to justify financial liberalization to ensure good functioning of the financial system, boost savings, encourage productive and profitable

investments, enhance technology growth and sustain economic growth. Furthermore, these studies point to the positive effect that development of banks and financial markets promote economic growth by allocating a large proportion of savings to investment. Galindo, et al (2007) highlight the positive role that financial liberalization may play in the development of banks by suppressing administrative fixation of interest rates and efficiently granting credits. Empirically, the positive relationship between financial development and growth is still scarce, and the causal link has not been resolved. A first wave of studies conducted by Spears (1992), Calderon and Lin (2003), De Gregorio and Guidotti (1995), Okedokun (1996), Habibullah and End (2006), Singh (2008) and Giuliano and Ruiz-Arranz (2009) note that financial system development is a condition for economic growth. These studies suggest that financial system liberalization is necessary to improve savings mobility, implement an efficient risk diversification, and to undertake an evaluation of investment projects. These advantages are visible only within a developed financial system which makes its positive influence on economic growth possible. However, other studies like those of Agbetsiafa (2003), Waqabaca (2004) and Odhiambo (2004) endorse a different stand and assume that economic growth does indeed lead to financial development. Fowowe (2010) favors the existence of a bidirectional relationship between finance and growth. It is worth noting that the results reported in these studies are often inconclusive. This paper contributes and improves upon the existing literature by using panel data cointegration and GMM system in OECD and MENA countries.

Beck, et al (2000) attempted to examine the finance-growth nexus by considering regressors simultaneity, yet they ignored the data's integration and cointegration features. Furthermore, their methodology did not consider the long-run and short-run relationships between variables. King and Levine (1993), studying a sample of 70 countries, introduced new

measures of financial development and examined the impact of financial development on economic growth, capital accumulation pace and economic factors' productivity. The obtained results show an empirical link between financial development indicators and growth. Worth noting is that the regressions indicate that level of financial development offers an accurate prediction of economic growth rates and economic efficiency improvement in the future. Accordingly, Levine and Zevros (1998) reached the conclusion that financial development is an accurate indicator of economic growth. However, these studies did not mention the causality thesis, pointing out that levels of bank development and incoming liquidity are significantly and positively correlated with economic growth and productivity future rates. They further mentioned statistically significant relationships between savings rates and financial development variables.

Spiegel (2001), examining the relationship between financial development indicators and economic growth, used panel data approach which allows for endogeneity of regressors and the optimum use of lagged dependent variables. The results indicate that financial development indicators are correlated with total productivity growth and physical and human capital accumulation. Rousseau and Wachtel (2000) conclude that exogenous components of bank and stock market development have a large economic effect on economic growth. With the same concerns, Demetriades and Hussein (1996), using the currency to GDP ratio as a measure of financial development, find out that causality is bidirectional, mainly for the developing countries.

Rousseau and Watchell (2000) applied time series tests on the variables of financial development and economic growth in 5 countries. Using measures of financial development which include banking and non-banking assets, Rousseau and Watchell (2000) find out that the

most dominant causality direction is financial development towards economic growth. The VAR approach allows the identification of long-term effects of financial development on growth and considers the dynamic interactions between the explanatory variables. Other authors like Xu (2000) reject the hypothesis that finance follows growth. Xu's analysis shows that financial development is crucial for long-term growth.

Financial deepening implies the ability of financial institutions to effectively mobilize savings for investment purposes. The growth of domestic savings provides the real structure for the creation of diversified financial claims. It also presupposes active operations of financial institutions in the financial markets which, in turn, entail the supply of quality financial instruments and financial services (Ndekwu, 1998). The above views conform to the conclusions of a study by Nnanna and Doga (1999) that financial deepening represents a system free from financial repression. Their findings in this study is that policies of financial repression aimed at encouraging domestic investments through suppressing interest rates produce negative results.

Nnenna (2010) studied the nexus between financial deepening and stock market development in Nigeria using the GARCH model, evaluating the variability between financial deepening variables and stock market returns for the period between 1980 and 2010. The paper found a significant relationship between financial deepening and stock market returns. The study also indicated that financial deepening reduces the level of risk (volatility) in the stock market.

Omole (1999) studied financial deepening and stock market development nexus in Nigeria. This study focused on the impact of financial liberalization on the development of the Nigerian stock market between 1970 and 1994. The proxies adopted were based on data predicted on the Nigerian stock market, money supply, interest rate and exchange rate. This

author utilized econometric multiple regression analysis to explain the impact of financial deepening on stock market development. The study showed that though financial deepening was still weak in Nigeria given the magnitude of overall economic activities, it had capacity to stimulate the development of the stock market.

Enisan and Olufisayo (2009) through autoregressive distributed lag (ARDL), evaluate the long-run relationship between stock market development and economic growth in seven of the Sub-Saharan African countries. The results indicate that stock market has a positive and significant impact on growth. Causality results indicate unidirectional causality from stock market development to economic growth for both South Africa and Egypt. While Cote D'Ivoire, Kenya, Morocco and Zimbabwe indicate bidirectional causality, Nigeria on the other hand shows weak evidence that growth causes finance.

Nnenna (2012) examines the relationship between financial deepening and stock market returns in Nigeria employing value of traded stocks as ratio of GDP and market capitalization as ratio of GDP. Empirical results show that the ratio of value of traded stocks to GDP has no effect on stock market while the ratio of market capitalization to GDP exerts positive influence on stock market. Alenoghena et al. (2014) study the impact of financial deepening on the performance of the Nigerian capital market and find that the impact is positive on the stock market of Nigeria using data from 1981 through 2012.

III. Empirical Methodology

Pooled time series and cross-section data, tend to exhibit a time trend. Therefore, the variables are non-stationary; i.e., the variables in question have means, variances, and covariances that are not time-invariant. Engle and Granger (1987) argue that the direct

application of OLS and GLS to non-stationary data produces regressions that are misspecified or spurious in nature. These regressions tend to produce performance statistics that are inflated in nature, such as high R^2's and t-statistics, which often leads investigators to commit a high frequency of Type-I errors (Granger and Newbold, 1974).

In recent years, a number of investigators, notably Levin, Lin and Chu (2002), Breitung (2000), Hadri (1999), and Im, Pesaran an Shin (2003) have developed panel-based unit root tests that are similar to tests carried out on a single series. Interestingly, these investigators have shown that panel unit root tests are more powerful (less likely to commit a Type II error) than standard unit root tests applied to individual series because the information in the time series is enhanced by that contained in the cross-section data. In addition, in contrast to individual unit root tests which have complicated limiting distributions, panel unit root tests lead to statistics with a normal distribution in the limit (Baltagi, 2001).

With the exception of the IPS test, all of the aforementioned tests assume that there is a common (identical) unit root process across the relevant cross-sections (referred to in the literature as pooling the residuals along within-dimension). The LLC and Breitung tests employ a null hypothesis of unit root using the basic Augmented Dickey Fuller (ADF) specification. On the evidence that the variables in question evolve as non-stationary processes, panel cointegration methodology is applicable.

To determine whether a cointegrating relationship exists, the recently developed methodology as proposed by Pedroni (1999, 2004) is employed. Basically, it employs four panel statistics and three group panel statistics to test the null hypothesis of no cointegration against the alternative hypothesis of cointegration. In the case of panel statistics, the first-order auto-

regressive term is assumed to be the same across all the cross sections. If the null is rejected in the panel case, then the variables are co-integrated. On the other hand, if the null is rejected in the group panel case, then cointegration among the relevant variables exists.

The panel cointegration tests proposed by Pedroni (2004) are residual-based tests for the null of no cointegration in heterogeneous panels. Two classes of statistics are considered in the context of Pedroni test. The first type is based on pooling the residuals of the regression along the within-dimension of the panel, whereas the second type is based on pooling the residuals of the regression along the between-dimension of the panel. For the first type, the test statistics are the panel *v*-statistic, the panel ρ-statistic, the panel PP-statistic, and the panel ADF-statistic. These statistics are constructed by taking the ratio of the sum of the numerators and the sum of the denominators of the analogous conventional time-series statistics across the individual members of the panel. The tests for the second type include the group ρ-statistic, the group PP-statistic, and the group ADF-statistic. They are simply the group mean statistics of the conventional individual time series statistics. All statistics have been standardized by the means and variances so that they are asymptotically distributed $N(0,1)$ under the null of no cointegration. As one-sided tests, large positive values of the panel ρ-statistic reject the null hypothesis of no cointegration. For the remaining statistics, large negative values reject the null hypothesis.

Assuming that the variables are co-integrated, there is a need to estimate the cointegrating coefficients to investigate the long-run relationship among them. Subsequently, the fully modified OLS (FMOLS) (Pedroni, 2000) is applied. The rationale for using FMOLS is that in the presence of unit root variables, the effect of super-consistency may not dominate the endogeneity effect of the regressors if OLS is employed (Lee, et al. 2008). Pedroni (2000)

showed that the FMOLS approach can be used to draw an inference about cointegration with heterogeneous dynamics. FMOLS takes care of endogeneity problem and provides unbiased estimates of the coefficients, which can be interpreted as long-run elasticities.

To test for the existence of long-run equilibrium relationship among variables, the following pooled regression is estimated in line with Pedroni (2000, 2001):

$y_{it} = \alpha_i + \beta_i X_{it} + \beta_j Z_{it} + \gamma_i D_{it} + e_{it}$ …….(1)

Where,

i=1,…., 19; t = 1988,...., 2013 for developed countries

For developing countries,

i=1,…., 21; t = 1988,...., 2013

y = log of stock market price index (LSP), X = ratio of value of traded stocks to market capitalization denoted as (VTS) and Z = ratio of value of traded stocks to GDP denoted as (SVG). In regression equation (1), α_i captures possible country-specific fixed effects while β_i and β_j allow for heterogeneous cointegrating vectors. γ_i represents time-dependent common shocks, captured by common-time dummies (D_{it}) that might simultaneously affect all countries included in the subsamples. In essence, VTS is stock market turnover showing how often shares change hands and SVG is a measure of stock market liquidity.

On the evidence of cointegration among the above variables, an estimating dynamic panel vector error-correction model (VECM) in line with Canning and Pedroni (2008) is specified as follows:

$$\Delta y_{it} = \pi_{it} + \lambda_{1i} e_{it-1} + \sum_{j=1}^{k} \lambda_{2ij} \Delta y_{it-j} + \sum_{j=1}^{k} \lambda_{3ij} \Delta x_{it-j} + \sum_{j=1}^{k} \lambda_{4ij} \Delta z_{it-j} + \varepsilon_{it} \quad \ldots\ldots(2)$$

Where, $\hat{e}_{it} = y_{it}$ - (α_i+ $\hat{\beta}_i X_{it}$+$\hat{\beta}_j Z_{it}$) is the disequilibrium term and it represents how far the variables are from the equilibrium relationship, and the error-correction mechanism estimates how this disequilibrium cause the variables to adjust towards equilibrium in order to keep the long-run relationship intact. The Engle and Granger (1987) representation implies that the adjustments coefficient λ_{1i} must be negative if a long-run relationship among the variables is to hold.

Data are collected from the World Development Indicators of the World Bank and the International Financial Statistics of the IMF.

IV. Results

To infer on nonstationarity of panel data for each variable (VTS, SVG and LSP), four panel unit root tests (LLC, Breitung, IPS and Hadri) are implemented. First, the computed test results for 19 selected developed countries are reported as follows:

Table 1: Panel Unit Root Test

(Austria, Australia, Belgium, Canada, Denmark, Finland, Ireland, Japan, France, Germany, Netherland, Norway, New Zealand, Portugal, Spain, Sweden, Singapore, UK, USA)

METHOD				
Variable (Level)	**LLC**	**Breitung**	**IPS**	**Hadri**
VTS (x_{it})	-3.2551 (0.0000)	-4.37862 (0.9949)	-14.3533 (0.0000)	2.83822* (0.0023)
SVG (z_{it})	-16.2919 (1.0000)	-5.28033 (0.0000)	-13.7370 (1.000)	1.73828** (0.0411)
LSP (y_{it})	-1.39894 (0.08092)	-6.15887 (0.0000)	-2.09355 (0.0181)	3.9565* (0.0000)
METHOD				
Variable (Difference)	**LLC**	**Breitung**	**IPS**	**Hadri**
VTS (Δx_{it})	-3.7267* (0.0000)	-5.01875* (0.0000)	-28.1156 (0.0000)*	24.9951 (0.0000)
SVG (Δz_{it})	-23.0411* (0.0000)	-5.67644* (0.0000)	-24.9593* (0.0000)	24.9401 (0.0000)
LSP (Δy_{it})	-10.0384* (0.0000)	-10.9875* (0.0000)	-8.17156* (0.0000)	3.3332 (0.0004)

Where; VTS = Stock traded, (total value) divided by market capitalization, and SVG = Value of traded stocks divided by GDP, and LSP = Log of Stock Market Price Indices.

Note: The statistics are asymptotically distributed as standard normal with a left hand side rejection area, except on the Hadri test, which is right sided, *, ** indicate the rejection of the null hypothesis of nonstationarity (LLC, Breitung, IPS) or Stationarity (Hadri) at the 1 and 5 percent level of significance, respectively.

As observed in Table 1, all the above tests confirm nonstationarity of pooled data on each variable and stationarity is induced in each variable on first-differencing of the pooled data in level. Subsequently, the Pedroni panel cointegration tests are applied by estimating regression equation (1). The cointegration tests pertaining to the Pedroni Panel Cointegration procedure are reported as follows:

Table 2: The Pedroni Panel Co-integration Test

Test	Constant Trend	Constant + Trend
Panel v-Statistic	0.216874 (0.4142)	-2.82345 (0.9993)
Panel rho- Statistic	-1.915843 (0.0049)**	-0.58917 (0.7221)
Panel PP- Statistic	-3.902894 (0.0000)*	-2.826030 90.0024)*
Panel ADF- Statistic	-4.1704798124 (0.00000*	-3.29985 (0.0005)*
Group rho-Statistic	0.483086 (0.6855)	2.617289 (0.9918)
Group PP-Statistic	-2.192524 (0.0142)**	-2.065831 (0.00140)*
Group ADF- Statistic	-2.66922 (0.0018)*	-1.558873 (0.0565)**

Note: P-values are reported within parentheses. All reported values are asymptotically distributed as standard normal. Probability Statistics are within parentheses. * and ** indicate the rejection of the null hypothesis of no co-integration at the 1% and 5% levels of significance, respectively.

Thus, it is evident in Table 2 that Panel rho-statistic, Panel PP- statistic, panel ADF-statistic, Group PP-statistic and Group ADF-statistic with constant trend confirm nonstationarity of panel data either at 1% or 5% level of significance. Panel v-statistic and Group rho-statistic suggest, otherwise. Additionally, Panel PP-statistic, Panel ADF- statistic, Group PP-statistic and Group ADF-Statistic (with Constant + Trend) confirm nonstationarity either at 1% or 5% level of significance. The remaining tests provide evidence to the contrary. In short, evidences on cointegration are mixed. However, a majority of the aforementioned test statistics lend support in favor of cointegration.

Finally, the panel vector error-correction model (2) is estimated. The results are reported as follows;

$$\Delta LSPR_{it} = \underset{(1.0516)}{0.0168} - \underset{(-3.4138)}{0.0592}\hat{e}_{it-1} - \underset{(-3.6962)}{0.1856}\,\Delta LSPR_{it-1} - \underset{(-2.3702)}{0.1156}\Delta LSPR_{it-2}$$

$$+3.76E-06\Delta VTS_{it-1} \underset{(3.5189)}{} + 3.30E-06\Delta VTS_{it-2} \underset{(4.2497)}{} + 0.0013\Delta SVG_{it-1} \underset{(2.9698)}{}$$

$$-0.0001\Delta SVG_{it-2} \underset{(-0.2801)}{} \text{ ----- (2)'}$$

Associated t-values are reported within parentheses. Also, to report, $\overline{R}^2 = 0.1062$, $F = 7.7588$, and $AIC = 0.5511$.

The error-correction term ($\hat{e}_{it-1}$) has the expected negative sign and the associated t-value is highly significant showing long-run convergence and causal flow to the current stock market returns from two-period lagged changes in stock market turnover (VTS) and stock market liquidity (SVG). The short-run net effect of stock market turnover on stock market performance is positive and statistically significant in terms of the associated individual t-value. However, the net effect of stock market liquidity is also positive but statistically insignificant for the same reasoning. In short, stock market turnover matters much more pronouncedly than market liquidity for stock market returns in the short-run. $\overline{R}^2$ at 0.1062 is reasonable for this type of data analyses. The F-statistic at 7.7588 shows overall statistical significance of the model. AIC is used for optimum lag selection to mitigate over-parameterization of the model.

Next, the results of 21 selected developing countries for the same period are reported. The same four panel unit root tests result are reported as follows:

Table 3: Panel Unit Root Tests

(Argentina, Bangladesh, Brazil, Chile, Columbia, Egypt, Greece, Indonesia, India, Jamaica, Malaysia, Mexico, Pakistan. Peru, Philippines, Singapore, South Africa, Trinidad ,Togo, Thailand and Turkey)

METHOD				
Variable (Level)	**LLC**	**Breitung**	**IPS**	**Hadri**
VTS	-9.6529 (0.0000)	-1.1996 (0.1151)	-2.3356 (0.0097)	4.7219* (0.0000)
SVG	-4.7351 (0.0000)	-1.5487 (0.0000)	-1.5820 (0.5480)	5.6563 (0.0000)
LSP	-3.0821 (0.0010)	-0.09285 (0.4630)	-0.7853 (0.2161)	4.5078* (0.0000)
METHOD				
Variable (Differences)	**LLC**	**Breitung**	**IPS**	**Hadri**
VTS	-8.2595* (0.0000)	3.3934* (0.0000)	-3.1531 (0.0008)*	14.4825 (0.0000)
SVG	-6.6206* (0.0000)	-3.3346* (0.0000)	-2.0873* (0.0000)	7.73283 (0.0000)
LSP	-5.6862* (0.0000)	-5.7318* (0.0257)	-1.45676* (0.0257)	12.4298 (0.0000)

Where; VTS = Stock traded, (total value) divided by market capitalization, and SVG = Value of traded stocks divided by GDP, and LSP = Log Stock Market Price Indices.

Note: LLC= Levine, Lin, Chu (2002), IPS = IM, Pesaran and Shin (2003). The statistics are asymptotically distributed as standard normal with a left hand side rejection area, except on the Hadri test, which is right sided, * and ** indicate the rejection of the null hypothesis of nonstationarity (LLC, Breitung, IPS) or Stationarity (Hadri) at the 1 and 5 percent levels of significance, respectively.

As shown above, LLC, Breitung and IPS tests fail to reject the null hypothesis of nonstationarity. Also, Hadri test rejects the null hypothesis of stationarity at 1% level of significance. Subsequently, panel cointegration tests results are reported as follows:

Table 4: The Pedroni Panel Co-integration Test

Test	Constant Trend	Constant + Trend
Panel v-Statistic	-1.256549 (0.8955)	-1.34652 (0.9993)
Panel rho- Statistic	-0.99798 (001591)	2.836912 (0.9977)
Panel PP- Statistic	-3.50680 (0.0000)*	-4.035132 (0.0000)*
Panel ADF- Statistic	0.890587 (0.8134)	-7.14361 (0.0000)*
Group rho-Statistic	3.706196 (0.9999)	4.03575 (1.0000)
Group PP-Statistic	-0.325518 (0.3724)	-1.653177 (0.0491)**
Group ADF- Statistic	2.192261 (0.0000)*	0.014260 (0.0565)

Note: All reported values are asymptotically distributed as standard normal. Probability Statistics are within parentheses. * and ** indicate rejection of the null hypothesis of no co-integration at 1% and 5% levels of significance, respectively.

In Table 4, it is observed that panel PP-statistic and group ADF-statistic with constant trend reject the null hypothesis of no cointegration at 1% level of significance. The remaining tests reveal, otherwise. With constant plus trend, panel PP-statistic, panel ADF-statistic and group PP-statistic reject the null hypothesis of no cointegration at 1% and 5% levels of significance, respectively. Other remaining tests suggest, otherwise.

Based on the above evidences, the panel vector error-correction model is estimated. The results are reported as follows:

$$\Delta LSPR_{it} = \underset{(5.1537)}{0.1803} - \underset{(-0.3172)}{0.0003}\hat{e}_{it-1} - \underset{(-5.4940)}{0.3607}\,\Delta LSPR_{it-1} - \underset{(-1.8414)}{0.1197}\Delta LSPR_{it-2}$$

$$+\underset{(0.2956)}{0.0011}\Delta VTS_{it-1} + \underset{(0.7321)}{0.0019}\Delta VTS_{it-2} + \underset{(0.7619)}{0.0037}\Delta SVG_{it-1}$$

$$-\underset{(-0.6081)}{0.0023}\Delta SVG_{it-2} \text{ ----- } (2)''$$

Associated t-values are reported within parentheses. $\overline{R}^2 = 0.0963,\ F = 4.7167,$ and $AIC = 1.4884$.

The coefficient of the error-correction term ($\hat{e}_{it-1}$)is negative, as expected. However, it is very low and statistically insignificant indicating very slow speed of adjustment toward long-run equilibrium. The net effect of the lagged ratios of value of traded stocks to market capitalization (market turnover) on the current stock market return is very low and statistically insignificant. Also, the net effect of the lagged ratios of value of traded stocks to GDP (liquidity) on the current change in stock market return is marginally positive in the short-run with statistical insignificance. $\overline{R}^2$ explains merely 9.6% of the current change in stock market return caused by the lagged changes in the regressors. As compared to the results for selected developed countries, the results for selected 21 developing countries are relatively very weak. This is a likely outcome of relatively lower market turnover and less liquidity in developing countries compared to those in developed countries.

V. Conclusions and Implications

In general, stock market turnover and liquidity exert positive influences on stock markets of both developed and developing countries. However, stock market turnover has greater effect than stock market liquidity. Relatively, the results for developing countries are much weaker than those for developed countries on account of low market turnover and less liquidity. As a result, additional efforts for furthering financial market liberalization are needed to improve stock market returns through advancing financial deepening.

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