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An Evaluation of Simultaneous Openness Hypothesis in the Context of Stock Market Development: Evidence from a Panel of Fifty Three Countries Based a GMM Study

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Abstract

This paper focuses on the impact of the concurrent liberalization of current and capital accounts and quality institutions on stock market development. Using annual data from 1996-2013 for a panel of fifty three (53) developed and developing countries and utilizing dynamic GMM estimators, the results show that banking sector development, economic growth, and the interaction term affect stock market development positively. The paper finds that capital account liberalization affects market development negatively, but the effect of capital account liberalization on market development is contingent on the level of economic growth and development. Further, the results revealed that the impact of trade openness on stock market development is mixed. The research finds negative impact of institutional factors on market development. Finally, the paper does not find support in favour of simultaneous openness hypothesis.

Keywords

Simultaneous Openness Hypothesis, Institutional Factors, Financial Sector Development, Principal Component, GMM

1. Background

One important issue at the centre of financial development and economic growth studies is that of the determinants of financial sector development. Factors such as financial and trade liberalization, quality institutional factors etc are argued to affect financial sector development [1] [2]. Specifically, studies on liberalization, espe-

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cially financial sector liberalization, are few and mixed [1] [3]. Rajan and Zingales [4] proposed the simultaneous openness hypothesis, where they argued for the concurrent opening of trade and capital account, in order to generate and realize the gains of liberalization on financial sector development and hence, economic growth.

While there is strong support for the positive impact of institutional factors on financial sector development, yet there are some contrary empirical findings [5]. Another factor of importance in openness-financial sector development nexus is the level/stage of economic development. Economic growth may exert influence on openness-finance relationship (Presbisch-Singer, 1950).

For instance, while trade between developed countries may be seen as trade between or among equal partners, trade between developing and developed countries may be seen as trade between unequal partners. Therefore, the gains of trade liberalization in these two cases may differ between and among countries [6] [7]. Therefore, it is important, while examining the relationship between liberalization and financial sector development to take into account countries' levels of economic development.

Finally, one major problem confronting studies on financial sector development is that of the choice of appropriate measures of financial sector development. There are several measures of financial sector development, with each having its merits and demerits. This study hopes to address this challenge by constructing principal component, from three measures each, of banking sector and stock market development.

This paper examines overall, the impact of liberalization and institutional quality on stock market development.

The rest of the paper is organized as follows: Section 2 is the literature review, Section 3 discusses the methodology of our work, Section 4 presents and analyses our results, finally, Section 5 concludes.

2. Empirical Literature

While there is strong support for the positive impact of institutional factors on financial sector development [8] [9], empirical results on liberalization on financial sector development are mixed and contentious [10] [11]. Below are some of the studies reviewed.

S/N	AUTHOR(S)	OBJECTIVE	METHODOLOGY	FINDINGS
1	Law (2008) [1]	Examined the role trade and capital openness on financial sector development in Malaysia	ARDL based on ECM	Rule of law, Trade and capital account openness positively affect banking sector development, but the interaction term is insignificant. Rule of law, Trade and Capital account openness are insignificant determinants of stock market development. In the short run however, openness to trade and Capital account negatively affect financial sector development while the interaction term promotes financial sector development.
2	Law and Shah Habibullah (2009) [8]	Investigate the role of institution, Trade and Financial liberalization on financial development	Using annual data from 1980-2001, in a panel of 27 countries. Using dynamic GMM and Pooled Mean Group	Institutional factors and trade openness are important determinants of both banking and stock market development. The impact of financial liberalization is mixed.
3	Chin and Ito (2003) [2]	Examined the impact of financial openness on financial development	Using annual data from 1980-2000 in a panel of 108 countries	Financial openness promotes stock market development. Legal development, trade openness, and banking sector development are pre-conditions for capital account openness. Certain threshold of legal development especially general laws is important to stock market development. Banking sector and stock market developments are complementary.
4	Ben-Naceau, Ghazouani, and Omran (2008) [11]	Probed the effect of stock market liberalization on economic growth	Using annual data from 1979-2005 among 11 MENA countries and employing System GMM and Non-Parametric methods.	Financial liberalization leads to improvement in the financial sector. Financial liberalization affects stock market development negative and positive in the short and long runs respectively. Stock market liberalization is insignificant to private investment. Developed stock market, trade openness, and less government intervention are prerequisite to stock market liberalization.
5	Demetriades and Luintel (2007) [3]	Investigate the cost of financial repression in India.	Using annual data from 1960-1991 and by means of VECM (DOLS and SOLS).	Repression has substantial negative impact on financial sector development, and economic growth.

Continued

6	Bekeart, Harvey, and Lundbland (2005) [12]	Investigate the impact of stock market liberalization on financial development and economic growth.	Using annual data from 1980-1997 in a panel of 95 countries. Employing OLS, Unrestricted SUR, and GMM	The level of financial development affects stock market liberalization. Financial liberalization affects countries depending on their level of financial development. Stock market liberalization promotes economic growth.
7	Goh, Alias, and Olekalns (2003) [13]	Investigate the role of external factors and trade openness on interest rate determination	Using quarterly data from 1973Q1-1985Q3 and from 1991Q1-1998Q3 in Malaysia. Adopting Edward and Khan Model	Financial liberalization made domestic interest rate responsive to foreign rates.
8	Levine and Zervos (1998) [14]	Examined the effect of capital control liberalization on stock market development	In a sample of 6 emerging countries and using Unit root and Simple Comparism.	Stock market liquidity tends to increase liberalization of international capital control. Ease and accessibility of information is positively associated with stock market development. Countries with good accounting standards, investors' protection laws tend to have better and more developed stock markets.
9	Beck and Levine (2005) [5]	Examined the impact of legal institutions on financial development		Differences in legal tradition influence countries' attitudes on private property rights protection, support for private contractual arrangements, the enactment and enforcement of investors' protection laws. Institutions shape the willingness to save, invest, the effectiveness of the corporate governance, and the degree of financial market development
10	Gries, Kraft, and Meirerieks (2009) [15]	Examined the nexus financial deepening, trade openness, and economic growth	Using annual data from 1960-2004 in a sample of 16 Sub Saharan African countries. Utilizing Granger Causality based on Hsiao, Bi-Variate, and Tri-Variate VAR/VECM	Demand following relationship dominates. Only few cases points to supply leading relationship, while in few other cases, there is no significant relationship between financial deepening and economic growth.
11	Umutlu *et al.* (2010) [16]	Investigate the effect of financial liberalization on volatility of stock market returns	Using annual data from 1991-2005 in a sample of emerging markets	There is positive relationship between the degree of financial liberalization and global volatility. There is negative relationship between volatility and financial liberalization after controlling for stock market development, liquidity, countries effect, and crisis effect.
12	Ahmed and Suardi (2009) [17]	Investigated the effect of financial and trade liberalization on growth volatility of real output and consumption.	Using annual data from 1971-2005 in a sample of 25 Sub Saharan African countries and employing panel OLS and System GMM	Financial liberalization leads to lower volatility in output and consumption growth. Trade openness leads to economic instability. The effect of liberalization on volatility is contingent on the degree of financial development and institutional quality.
13	Kim *et al.* (2011) [18]	Probed the dynamic effect of trade openness on financial development	Using annual data from 1960-2005 in a panel of 88 countries and using Pooled Mean group	Trade openness affect financial development negatively in the short run but positively in the long run. The effect of trade openness is dependent on inflation rate and income level. There is negative short run but positive long run impact of trade openness on financial development in relatively low income and high inflation countries. There is insignificant short run but negative long run impact of trade openness on financial development in high income countries. The effect of trade openness on financial development is mixed in low inflation countries.
14	Baltagi *et al.* (2009) [9]	Examined the effect of openness on financial development	Using annual data from 1980-2003 in a panel of 42 and 34 developed and developing countries respectively and employing GMM	Openness and economic institutions are important determinant of financial sector development. There is mixed evidence for simultaneous openness hypothesis.

Continued

15	Lim and Kim [18]	Investigate the link between trade openness and informational efficiency of stock market	Using monthly data from 1992Q1-2006Q12 in a sample of 23 developing countries and employing Fixed Effect Regression	De-factor trade openness is associated with high degree of informational efficiency in emerging markets but the positive effect does not hold when the De-jure measure of trade openness is used. There is no evidence for significant link between trade openness and stock market efficiency.
16	Bley and Saad (2011) [19]	Assesses the impact of equity market liberalization and capital account openness on individual firm's stock return volatility	Using annual data from 1998-2009 Gulf Cooperation Council markets for 602 stocks and utilizing pooled regression	Capital account openness significantly reduces volatility especially for stocks with low foreign ownership limits. The effect of capital account restrictions is stronger on capital inflow than outflow and on residents than non-residents

3. Methodology

3.1. Model Specification

Following Law and Shah Habibullah [8], we present our model as thus:

$$PCS_{it} = \beta_{0it} + \beta_1 PCS_{i,t-1} + \beta_2 PCB_{it} + \beta_3 Y_{it} + \beta_4 TO_{it} + \beta_5 CAO_{it} + \beta_6 INST_{it} + \mu_i \quad (1)$$

where *PCS, PCB, Y, TO, CAO, INST, and μ* denote principal component of stock market development, principal component of banking sector development, economic growth, trade openness, capital account openness, institutional factor, and the error term respectively. Economic growth is measured by real GDP per capita while institutional factor is represented by an index of institutional quality, constructed from four measures namely, corruption control, bureaucracy, voice and accountability, and government effectiveness, and assumes a value of less or equal to 40. Stock market development is measured by the principal component of stock market development, constructed from the ratios of stock market capitalization to GDP, total value traded to GDP, and the turnover ratio. Banking sector development is measured by the principal component of banking sector development, constructed from the ratios of liquid financial liability to GDP, credit to the private sector by the deposit money bank to GDP, and deposit money bank assets to the deposit plus central bank assets. Trade openness is proxied by the ratio of the sum of export plus import to GDP. Capital account openness is measured by the Capital Account Openness Index, adopted from Chinn and Ito [2].

Following the argument that financial liberalization may boost financial sector development and economic growth if accompanied by other economic and institutional reforms such as stable macroeconomic conditions, political and policy stability, trade liberalization, etc Rajan and Zingales [4] have in addition proposed the simultaneous openness hypothesis. Hence, to capture this, we interact our openness variables (trade and capital account) and therefore re-specify our model as thus below:

$$PCS_{it} = \beta_{0it} + \beta_1 PCS_{i,t-1} + \beta_2 PCB_{it} + \beta_3 Y_{it} + \beta_4 TO_{it} + \beta_5 CAO_{it} + \beta_6 INST_{it} + \beta_7 INT_{it} + \mu_{it} \quad (2)$$

where *INT* is the interaction term, all other variables are as defined above.

To measure the effect of financial openness on financial sector development after controlling for country's stage/level of development, we introduce dummies (d_1 and d_2) for developed and developing respectively and interacts the dummies with measure of capital account openness. Therefore, our new models after controlling for stage of development is specified as thus below:

$$PCS_{it} = \beta_{0it} + \beta_1 PCS_{i,t-1} + \beta_2 PCB_{it} + \beta_3 Y_{it} + \beta_4 TO_{it} + \beta_5 CAO_{it} + \beta_6 INST_{it} + \beta_7 INT_{it} + \beta_8 d_1 CAOit + \mu_{it} \quad (3)$$

$$PCS_{it} = \beta_{0it} + \beta_1 PCS_{i,t-1} + \beta_2 PCB_{it} + \beta_3 Y_{it} + \beta_4 TO_{it} + \beta_5 CAP_{it} + \beta_6 INST_{it} + \beta_7 INT_{it} + \beta_5 d_2 CAO_{it} + \mu_{it} \quad (4)$$

Principal Component

Principal component analysis is a mathematical method which recognises patterns in datasets in a way that highlight similarities and differences in the original datasets while retaining most of the information contained in the original datasets in the principal component (Smith, 2002). It is defined as a statistical method that simplifies complex datasets by reducing the dimension of their matrix, where the reduced data matrix accounts for most of

the variations in the original datasets/matrix while at the same time mutually uncorrelated and orthogonal (Raychaudhuri *et al.*, 2000).

Principal component analysis models the structure of the variations of a number of variables using their linear combinations known as the components, which can be used for further analysis. This approach is appropriate if we wish to develop a smaller number of artificial measures from a large number of observed measures that will account for most of the changes in the original observed variables. In addition, it addresses the problem of multi-collinearity in our study.

3.2. Method of Estimation

This paper uses Dynamic Panel Generalized Method of Moment estimators (hereafter GMM) as proposed by Holtz-Eakin *et al.* (1988) and later extended by Blundell and Bond [20]. These estimators are most applicable in a panel data with large cross sectional observations and small time series observations. Again, the strength of the estimators over other dynamic panel estimators, especially in addressing the problems of endogeneity, simultaneity, individual effect, the likelihood of obtaining a consistent parameter estimates etc. are other reasons for the selection of these estimators.

GMM is defined as the moment conditions formed under the assumptions that particular lagged levels of the dependent variables are uncorrelated to the difference disturbances [21], constructed from the further lags of the levels of the dependent variable and the first difference of the error and the explanatory variables, and that the disturbances are identically and independently distributed over the cross sectional units and time (Holt-Eakin, 1988). It weight the vector of the sample mean of the moment conditions by a positive definite matrix and if the matrix is the covariance matrix of the moment conditions, GMM estimators are said to be efficient estimators.

If we take the difference of the level equations so as to remove the unobserved individual effects, the resulting equation is known as the Difference GMM estimator, presented as below;

$$Y_{it} - Y_{i,t-1} = \alpha\left(Y_{i,t-1} - Y_{i,t-2}\right) + \beta\left(X_{it}^* - X_{i,t-1}^*\right) + \left(\varepsilon_{it} - \varepsilon_{i,t-1}\right) \tag{5}$$

where X^* are exogenous variables. Based on the condition above, the lagged levels of the explanatory variables are used as instruments for the difference equations [21]. Therefore, we set our first difference moment conditions as

$$E\left[\left(Y_{it-s}\right)*\left(\varepsilon_{it} - \varepsilon_{i,t-1}\right)\right] = 0, \text{ for } s \geq t, t = 3, \cdots, T \tag{6}$$

$$E\left[\left(X_{it-s}^*\right)*\left(\varepsilon_{it} - \varepsilon_{i,t-1}\right)\right] = 0, \text{ for } s \geq t, t = 3, \cdots, T \tag{7}$$

Arellano and Bover [22] proposed an alternative and more efficient GMM estimator that combines together both the difference and level equations, known as the System GMM. This estimator combines the moment conditions for the difference equations with that of the level equations and utilizes the assumptions about the initial conditions to generate a moment condition that is still informative even in the presence of persistence series (Blundell and Bond, 1998). The System GMM model is presented as thus below:

$$Y_{it} = \alpha_1 Y_{i,t-1} + \alpha_1 X_{i,t-1}^* + \left(\mu_i - \gamma_i\right) \tag{8}$$

where μ *and* γ are the individual specific effect which is invariant to time and the error term respectively. Following Arellano and Bover [22], we set our moment conditions for the System GMM as below;

$$E\left[\left(Y_{i,t-s} - Y_{i,t-s-1}\right)*\left(\mu_i - \varepsilon_{it}\right)\right] = 0, \text{ for } s = 1 \tag{9}$$

$$E\left[\left(X_{i,t-s}^* - X_{i,t-s-1}^*\right)*\left(\mu_i - \varepsilon_{it}\right)\right] = 0, \text{ for } s = 1 \tag{10}$$

3.3. Data

Annual data from 1996-2013 averaged over three (3) years (thus giving us time series data of 6 years) in a sample of fifty three countries was used. Data on measures of institutional quality is collected from World Bank Governance Indicator database. Data on measures of banking sector and stock market developments are collected from financial structure database. Data on economic growth and trade openness are collected from World

Bank Development Indicator database. Data on capital account openness is obtained from Chinn and Ito. Data on principal component of banking and stock market development are constructed from three measures of banking and stock market development each respectively.

4. Presentation and Discussion of Finding

Table 1 shows the result of the impact of openness and institutions on financial sector development. From the table, the results reveal that banking sector development, growth, trade openness, and the measure of the interaction term affect stock market development positively while capital account openness and institutional factors affect stock market development negatively.

Table 2 displays the result of the impact of capital account openness and institutional factor on stock market development in developed countries. From the table, the results show that banking sector development, economic growth and the interaction term positively impact on stock market development. On the other hand, capital account openness and institutional factor negatively affect stock market development. Trade openness is found to be insignificant to stock market development. Interestingly, the results show that capital account openness in developed countries has positive impact and hence, promote stock market development.

Table 3 depicts the results of openness and institutional factor on stock market development in developing countries. From the table, the results show that banking sector development, economic growth, and measure of simultaneous openness positively impact on stock market development. On the contrary, capital account openness and measure of institutional quality deter stock market development. Trade openness is insignificant to stock market development. The results further reveal that capital account liberalization in developing countries affects stock market development negatively.

Table 1. The result of two step dynamic panel GMM on the role of financial and trade openness on financial development (sample period: 1996-2013, averaged over 3 years).

	TWO STEP DIFFERENCE GMM	TWO STEP SYSTEM GMM
PCS_{t-1}	0.7714*** (0.115) [0.000]	0.5459*** (0.0687) [0.000]
PCB	0.0023*** (0.0005) [0.004]	0.0025*** (0.0003) [0.000]
LY	1.9301*** (0.203) [0.000]	1.621*** (0.1507) [0.000]
LTO	5.4322*** (1.102) [0.000]	4.2203*** (0.5491) [0.000]
LCAO	−8.0283 (5.8971) [0.201]	−8.9749** (4.0329) [0.002]
LINST	−7.3512*** (1.0032) [0.000]	−8.0331*** (1.0081) [0.000]
INT	2.2521 (1.1057) [0.046]	2.0414*** (0.6530) [0.004]
AR 2	−2.5461*** [0.0501]	−1.9861 [0.1079]
SARGAN TEST	9.4548 [0.1023]	16.2450 [0.0884]

NOTE; LY = log of real GDP per capita, PCB = principal component of banking sector development, PCS = principal component of stock market development, ltrade = log of trade openness, LCAO = log of capital account openness, LINST = log of institutional quality, LINT = simultaneous opening of trade and capital accounts. N = 53. Values in ( ) and [ ] denotes standard errors and p-values respectively. The sign *** and ** denotes significance at 1% and 5% respectively.

Table 2. The result of two step dynamic panel GMM on the role of financial and trade openness on financial development with a dummy for developed countries (sample period: 1996-2013, averaged over 3 years).

	TWO STEP DIFF GMM	TWO STEP SYSTEM GMM
PCS_{t-1}	0.298 (0.105) [0.0024]	0.2699 (0.1006) [0.008]
LY	2.254 (0.3412) [0.000]	1.7567 (0.3301) [0.000]
PCB	0.0197 (0.0004) [0.000]	0.0215 (0.000) [0.000]
LTO	−0.5746 (1.0074) [0.446]	−1.3397 (0.7116) [0.069]
LCAO	−15.3796 (3.789) [0.000]	−10.8811 (1.9028) [0.000]
INT	2.9098 (0.7417) [0.000]	2.0021 (0.5236) [0.000]
LINST	−1.6143 (0.4910) [0.000]	−1.6552 (0.3392) [0.000]
D1CAO	7.4897 (1.1245) [0.000]	2.0679 (0.4996) [0.000]
SARGAN TEST	19.9897 [0.0295]	23.5695 [0.5717]
AR 2	−0.8907 [0.4825]	−0.9904 [0.4433]

NOTE; LY = log of real GDP per capita, PCB = principal component of banking sector development, PCS = principal component of stock market development, LTO = log of trade openness, LCAO = log of capital account openness, LINST = log of institution, Int = simultaneous opening of trade and capital accounts, D1 = dummy for developing countries. N = 53. Values in ( ) and [ ] denotes standard errors and p-values respectively. ***, ** denotes significance at 1% and 5% respectively.

4.1. Robust Tests

Robust tests were run to check the consistency of the findings. The measure of institutional quality was substituted with two other measures (government effectiveness and voice and accountability). The results of the robust tests are identical to those in **Tables 3-5**. The results of the robust tests are presented in **Table 4** and **Table 5**.

4.2. Analysis of Finding

The finding of a positive impact of economic growth on stock market development is expected. It is argued that as household income increases to certain level, there will be portfolio adjustment and their demand for financial and capital assets increases. This will lead to increase in the activities of the stock market and therefore, promotes stock market development. This finding is consistent with Chakraborty [23], Zang and Kim (2007).

The finding of a positive effect of banking sector development on stock market is equally expected. Banking sector performs certain functions that are important to stock market development such as the provision of margin loans to stock brokers. This therefore justifies the positive impact of banking sector development on stock market development. This result is in line with Chinn and Ito [2] and Mansor [24].

One area of our finding that is of great empirical contention is openness and stock market development. First, proponents of trade openness argued that it will increase investment, growth, and finally leads to stock market development. Opponents of trade openness on the other hand contest that it will lead to the collapse of infant firms, which will lower investment and growth, increase unemployment, and consequently deter stock market

Table 3. The result of two step dynamic panel GMM on the role of financial and trade openness on financial development with a dummy for developing countries (sample period: 1996-2013, averaged over 3 years).

	TWO STEP DIFF GMM	TWO STEP SYSTEM GMM
PCS_{t-1}	0.3980 (0.1142) [0.004]	0.3671 (0.1009) [0.001]
LY	2.5752 (0.4304) [0.000]	1.9871 (0.3445) [0.000]
PCB	0.1932 (0.0002) [0.000]	0.1084 (0.0002) [0.000]
LTO	−0.5976 (1.0005) [0.535]	−0.5232 (0.3652) [0.251]
LCAO	−8.5009 (2.7632) [0.000]	−9.2253 (2.2466) [0.000]
INT	2.6156 (0.5522) [0.000]	2.7318 (0.6013) [0.000]
LINST	−1.6001 (0.3219) [0.000]	−1.5307 (0.2102) [0.000]
D2CAO	−6.9879 (1.0319) [0.000]	−1.2146 (0.3408) [0.002]
SARGAN TEST	20.9101 [0.0305]	22.8437 [0.5301]
AR 2	−1.2472 [0.4632]	−1.8315 [0.3071]

NOTE; LY = log of real GDP per capita, PCB = principal component of banking sector development, PCS = principal component of stock market development, LTO = log of trade openness, LCAO = log of capital account openness, LINST = log of government effectiveness, INT = simultaneous opening of trade and capital accounts, D2 = dummy for developed countries. N = 53. Values in ( ) and [ ] denotes standard errors and p-values respectively. ***, ** denotes significance at 1% and 5% respectively.

Table 4. The result of two step dynamic panel GMM on the role of financial and trade openness on financial development (sample period: 1996-2013, averaged over 3 years).

	TWO STEP DIFF GMM	TWO STEP SYSTEM GMM
PCS_{t-1}	0.3162 (0.1026) [0.006]	0.2676 (0.1001) [0.003]
LY	2.3516 (0.3732) [0.000]	1.0908 (0.1901) [0.000]
PCB	0.1349 (0.0003) [0.000]	0.2016 (0.0001) [0.000]
LTO	0.8301 (1.1606) [0.51]	−0.1536 (0.4106) [0.97]
LCAO	−3.9917 (2.0103) [0.051]	−5.0295 (1.2131) [0.000]
INT	1.9067 (0.8407) [0.003]	2.3901 (0.3705) [0.000]

Continued

LGE	−1.7843 (0.4123) [0.000]	−1.5588 (0.3296) [0.000]
SARGAN TEST	21.0941 [0.033]	20.6732 [0.197]
AR 2	−1.5563 [0.4392]	−1.7681 [0.4807]

NOTE; LY = log of real GDP per capita, PCB = principal component of banking sector development, PCS = principal component of stock market development, LTO = log of trade openness, LCAO = log of capital account openness, LGE = log of government effectiveness, INT = simultaneous opening of trade and capital accounts. N = 53. Values in ( ) and [ ] denotes standard errors and p-values respectively. ***, ** denotes significance at 1% and 5% respectively.

Table 5. The result of two step dynamic panel GMM on the role of financial and trade openness on financial development (sample period: 1996-2013, averaged over 3 years).

	TWO STEP DIFF GMM	TWO STEP SYSTEM GMM
PCS_{t-1}	0.6198 (0.1091) [0.004]	0.4291 (0.0537) [0.000]
LY	1.9797 (0.3027) [0.000]	1.4516 (0.1134) [0.000]
PCB	0.0027 (0.0003) [0.000]	0.0019 (0.0002) [0.000]
LTO	0.1528 (1.0721) [0.978]	0.1997 (0.4039) [0.625]
LCAO	−5.0056 (2.372) [0.034]	−4.2913 (1.3078) [0.000]
INT	2.0636 (0.7655) [0.002]	1.9816 (0.3610) [0.000]
LVA	−1.4388 (0.4539) [0.000]	−1.4212 (0.3137) [0.000]
SARGAN TEST	20.2317 [0.045]	22.5459 [0.269]
AR 2	−1.4068 [0.4733]	−1.1509 [0.6670]

NOTE; LY = log of real GDP per capita, PCB = principal component of banking sector development, PCS = principal component of stock market development, LTO = log of trade openness, LCAO = log of capital account openness, LVA = log of voice and accountability, INT = simultaneous opening of trade and capital accounts. N = 53. Values in ( ) and [ ] denotes standard errors and p-values respectively. ***, ** denotes significance at 1% and 5% respectively.

development. The result is similar to Law and Shah Habibullah [8].

Like trade openness, the expected impact of capital account openness on financial sector development and hence economic growth, is contentious. Supporters of capital account liberalization argue that it will lead to financial sector efficiency and development, while critiques of financial liberalization contest that it promotes financial instability and underdevelopment. The result buttresses the result of Diaz-Alejandro [10], and Eichen-Green [7].

One finding that beats popular expectation is the effect of institutions on stock market development. The finding of a negative impact of institutions on stock market development does not appeal to common sense nor theoretical expectation. This however may be explained thus: better institutions may be associated with red-tapism and bureaucratic bottle-necks while weak institutions may speed up the process. Our finding is how-

ever contrary to Baltagi *et al.* [9].

Interestingly, the finding of uneven impact of financial liberalization on stock market development is not surprising. Developed countries may stand to gain from capital account opening while developing countries may suffer from financial liberalization. The reasons for these are that the stock market is the major source of financing businesses in developed countries. Again, stock markets in developed countries are characterized by almost perfect information, which means that firms will not take undue advantage of market information asymmetry to generate undue gains and create volatility in the market. Also, there is conducive playing ground for all market participants.

On the other hand, stock markets in developing countries are highly volatile and investors are usually after short term profit. Again, the markets are highly imperfect and there are limited mechanisms to check the activities and excesses such as insider trading etc of the market participants. Further, economic and political together with policy inconsistencies lead to stock market under development.

Lastly, the results do not find support for the Simultaneous openness hypothesis. The results in **Tables 1-5** reject the Rajan and Zingales [4] simultaneous openness hypothesis. They proposed that capital account and trade openness will be detrimental to financial sector development unless concurrently liberalized. The results in **Tables 1-5** show that while the expected sign and impact of capital account and the interaction term are in line with Rajan and Zingales' proposition [4], trade openness is found to be inconsistent with. Therefore, this study rejects the Rajan and Zingales' simultaneous openness hypothesis.

5. Conclusions

While the role of financial development in the economic growth process has been widely acknowledged, there is contention as to the factors affecting financial sector development. One area of empirical divergence among scholars is on the area of liberalization and more specifically, financial liberalization. This paper investigates the impact of openness and institutional quality on stock market development.

Using annual data from 1996-2013 averaged over 3 years period in a sample of 53 countries and employing Dynamic GMM estimators, the results show that economic growth, banking sector development, and the interaction term affect stock market development positively while capital account openness and institutional quality negatively impact on stock market development. The effect of trade openness is mixed. The results do not find evidence in support Rajan and Zingales' proposition of simultaneous openness hypothesis [4].

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