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DOES FINANCIAL DEVELOPMENT LEADS ECONOMIC GROWTH? EVIDENCE FROM EMERGING ASIAN MARKETS

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ABSTRACT

The essential interlocks connecting financial development and economic growth improves financial progress and reduces transicition, knowledge and monitoring cost of financial business. The target of this manuscript is to assess the premise that "financial development leads economic growth". The analysis is conducted by employing Time series information for three emerging Asian states; Korea, Philippines and Thailand. Information is obtained from WDI for the era of 1976-2015. Unit root test, Cointegration test, forecast variance decomposition and impulse response function analysis are employed to investigate correlations among variables in the Vector Auto Regression (VAR) structure and, consequently, varies from the further standard Granger causality approach. The analysis provides the support to the hypothesis for Korea and Thailand that "financial development leads to economic growth". Financial development is not only a causative factor, but indeed, the main significant feature of economic growth. The financial sector gives benefit for the economic development as credit to non public sector to GDP ratio series are employed as the financial development indicator.

Contribution/ Originality: This study is one of the few studies which have found that whether financial development lead economic growth in emerging markets. This study first contributes to the hypothesis that financial development leads to economic growth by using selected Asian emerging markets of Korea, Thailand and Phillipines. Globally, these countries are growing fast economically. However, this study documents that financial sector development has a key role to promote economic activities in these countries.

1. INTRODUCTION

Economists have defined "*economic growth as the increase in the per capita gross domestic product or a rise in other measures of aggregate income*". In a modern financial system economic growth is pivoted by a proficient financial sector that pools native reserves and mobilizes overseas capital for prolific investment. The appraisal of the correlation connecting financial development and economic growth can be accomplished from different perceptual experiences. The essential interlocks connecting financial development and economic growth, improves financial progress and reduce commercial undertaking, knowledge and monitoring matters of financial business. A well executed financial market can smooth the progress of higher reserves and asset. The improved performing financial

sector permits an economic system to allocate resources proficiently and enhance the gross domestic output. The basic conjecture that interlocks financial development with economic growth is based on the proposal to facilitate the earlier reduces transaction, information and monitoring cost and performance of other pivotal functions enhance reserves, investment and national production. So, the universal concurrence is that an enhanced performing financial sector enables an economic system to allocate resources efficiently and increase the gross domestic output.

There is an esteemed convention in commerce with the complexity of financial development and economic growth. Fifty years on, development finance again engages an essential situation in development economics research and performance. Flourishement of financial liberalization in semi 1980s and commencement of 1990s and a rush of investment inflows of numerous blossoming states were followed by financial disaster in Latin America and East Asia. These incidents have endorsed apparent probing awareness of the use of fiscal intermediary in economic growth, and a review of the planning preferences for guaranteeing that the financial sector's involvement in economic growth and development is completely recognized. The early work on finance and development to where we are now, however, is not a straight one.

Financial sector crucially compiles of business which are a mediator between economic entities with excess treasury and economic entities with endowment arrears. The financial mediator and financial gadgets have established considerably the correspondence with industrial advancement and economic development over era. Furthermore it facilitates economic modules to circumvent beside diversified perils and to bland their intertemporal disbursements. Consequently, the financial sector has become an essential part of economies over time. However, economic progress depends on the standard of the nations whose financial sector varies remarkably. Usually Nations with strong economic progress have leading financial development. In current three decades majority of the Emerging Asian nations are among the rapid developing countries of the globe and they experienced significant economic growth rates, except at the time of 1997 Asian plight and the worldwide financial plight 2007-08. Prematurely in 1990s their financial sector also has broadened through the economic proliferation.

In the past decades the consequence of well-functioning financial organizations in economic evolution has been substantially conferred in the literature. Abdellhafidh (2013) scrutinizes the path of causation connecting finance and growth in North African states over the era 1970-2008. He differentiated among native reserves and overseas inflows, but also disaggregated the earlier into endowments, Foreign Direct Investment (FDI), assortment asset and credence. Trivariate VAR representations have been utilized to extricate the direct and indirect consequence of financial development on economic growth. The consequence reveals that economic growth Granger-causes native reserves. Bader and Qarn (2008) scrutinize the contributory correlation between financial development and economic growth in Egypt during the era 1960-2001 by employing a trivariate VAR structure. The manuscript manipulates four varied estimates of financial development (ratio of money to GDP, ratio of M2 minus currency to GDP, ratio of bank credit to the private sector to GDP, and the ratio of credit issued to private sector to total domestic credit). They suggested that there is two way causation. Additionally, they established the consequences of financial development on economic growth mutually through asset as well as efficacy.

Shan and Morris (2002) estimated VAR and Granger causality for OECD and Asian states. They establish the two way causation connecting finance and growth in numerous states and the one-way causality from growth to finance in further states. Shan (2005) used Quarterly time-series information from 1985 to 1998 for ten OECD states and China. He designed VAR representations to estimate the postulate that "*financial development 'leads' economic growt*h" and found weak support of the postulate. Luitel and Khan (1999) estimated VAR utilizing samples of 10 nations and established two way causation between financial development and economic growth.

Beck *et al.* (2004) looked at the association among stock markets, depositories and economic development by executing OLS and GMM evaluation for dynamic panels of 40 nations with 146 observations for the era of 1976-1998. Stock markets as well as depositories have constructive dominance on economic expansion. La Porta and Lopez (2002) applied the scale of communal sector possession of depositories in the vicinity of globe as a different

financial sector appraisal and they determine that a significant amount of common wealth possession is unconstructively connected with financial organization expansion and economic progress. Arestis and Demetriades (2001) implemented the time series investigation for five metropolitan economies for the era of 1972 to 1998 and established that the consequences of the depository-based financial strategies are more dominant than the capital-market-based counterparts in propping up long-term growth. Ghali (1999) investigated for the nation studies; the query about whether finance contributes to financially viable escalation in Tunisia. The manuscript has employed two gauges of financial development, the share of reservoir installment accountabilities to gross domestic production and the proportion of depository states in the non public sectors to nominal GDP. The vigorous association between finance as well as growth has been scrutinized by employing the Granger-causality analysis and the outcomes specify the existence of a lasting steady association linking sfinancial development and per capita real productivity where the inductment runs from finance to growth.

Gill (2012) squabbled that the economic and business relationship of Emerging Europe state has been assimilated not only to the Western European economies but to the remaining economies of the world. The financial states in transition era were left with a human capital stock in need of the innovative intelligence and proficiencies. Thus, revealed the necessity to reorganize the industrial sector and to re-establish many organizations that do not prevail in the centrally planned economies or were non-efficient. Demetriades and Luintel (1996) used panel data for 44 nations from 1986-1993 and found that progress of the stock market had an affirmative outcome on economic development. Bloch and Tang (2003) used time series investigation from 1960-1990 for 75 nations and established that the rejection occurred between the momentous relationship of economic growth and development of financial sector. Jeanneney *et al.* (2006) utilized the information of China from 1993-2001 by depleting the technique of Generalized Method of Moments (GMM) and established that the improvement of financial sector influenced efficiency proliferation optimistically. Backé *et al.* (2007) manipulated Panel co-integration for Central and Eastern Europe states from 1993-2006 and originated that development of financial sector influence economic growth constructively. Caporale *et al.* (2009) used data of Bulgaria, Czech. Rep., Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia from 1994-2007 and originate that depository sector boosted economic growth, but stock markets had comparatively minute influence on economic growth. On the further dispense, there prevailed one way causation from expansion of the financial stratum for economic growth.

The crucial target of this probe is to assess the premise that *"financial development 'leads' economic growth"* in Korea, Philippines and Thailand. Only three emerging markets are selected due to the non availability of data of some variables for the selected era. Time-series information is utilized to estimate Vector Auto Regression to estimate the effects of financial development and economic growth on inflation, interest rate, investment in addition to trade openness. This manuscript is systematized as follows: section 2 and 3 consists of methodology as well as model specification of VAR respectively; empirical outcomes are displayed in section 4. Conclusion and discussion are presented in final section.

1.1. Financial Development Indicators of Emerging Asian Countries

Table 1 presents the fundamental financial development indicators of Emerging Asian economies. In order to make comparison in this table, the financial development indicators from Developing and Developed Emerging Asian nations are provided. Broad Money, Domestic Credit provided by financial sector and banks has increased in all emerging markets. From 1990 to 2015 Broad money has increased sharply in all states; whereas in India and Singapore it has increased slowly in these states. Domestic credit provided by financial sector as well as banks has increased slowly in India whereas in rest of the states it has increased sharply. The stock traded value has increased in China and Thailand sharply but has declined in India, Philippines, Malaysia, Korea and Singapore.

Table-1. Financial Development Indicators of Selected Asian Countries

		Broad money (% of GDP)				
Country/Year	1990	1995	2000	2005	2010	2015
China	77.79	99.03	135.58	151.09	175.74	202.06
India	42.75	44.13	55.38	66.48	78.57	78.52
Korea	34.75	35.89	65.03	111.05	131.24	143.68
Malaysia	64.38	115.63	122.70	124.96	129.64	135.02
Philippines	34.25	51.85	57.68	54.28	61.40	74.23
Singapore	87.71	81.85	103.44	103.64	125.05	127.48
Thailand	76.16	84.34	111.21	104.12	108.99	128.38
	Domestic credit provided by financial sector (% of GDP)					
Country/Year	1990	1995	2000	2005	2010	2015
China	88.42959	86.92321	118.4004	132.5905	142.1988	193.4096
India	51.53674	44.19907	52.78882	60.18812	74.25675	76.10754
Korea	49.00778	46.67325	70.93974	125.4518	151.0408	165.9571
Malaysia	72.67381	126.7069	138.3722	117.6557	123.2913	144.7271
Philippines	23.23292	55.74031	58.33521	47.24666	49.23195	59.00766
Singapore	58.59961	59.11124	76.65038	61.16106	80.75218	119.3791
Thailand	94.08296	140.2728	134.2607	111.0179	133.419	171.6599
	Domestic credit to private sector by banks (% of GDP)					
Country/Year	1990	1995	2000	2005	2010	2015
China	84.04552	83.09731	111.0131	111.8073	126.2942	152.5412
India	25.25332	22.81512	28.7227	40.63665	51.13515	52.20809
Korea	47.71165	46.80732	71.98827	114.8188	135.9278	140.0733
Malaysia	69.41267	124.1602	126.7293	106.2929	107.0374	125.1081
Philippines	19.1748	37.53098	36.76903	29.07345	29.57852	41.76722
Singapore	79.1379	88.20769	96.2869	89.49612	96.21756	127.0253
Thailand	83.36905	138.7868	105.1217	93.8281	90.68254	116.0762
	Stocks traded, total value (% of GDP)					
Country/Year	1990	1995	2000	2005	2010	2015
China	..	10.55463	62.1278	17.16415	135.3591	355.4198
India	..	..	..	57.34444	65.25686	36.94008
Korea	26.71065	33.12656	88.20098	133.5784	148.904	133.3366
Malaysia	24.33127	67.78585	55.98862	31.10377	45.01248	37.60759
Philippines	6.892101	19.78791	9.10107	5.19342	11.14747	13.12208
Singapore	58.28055	72.76392	99.28957	91.52848	129.3438	66.7127
Thailand	18.43911	34.80287	15.29454	47.44386	65.20897	67.95922

Source: World Development Indicators (WDI)

Figure 1 shows GDP growth of Emerging Asian nations. In China and Singapore it has declined sharply. In China GDP growth has declined from 11.4% to 6.9%, whereas in Singapore it declined from 7.4% to 1.9%. GDP growth has increased in Philippines whereas it has slightly declined in Korea Republic, Malaysia, India, as well as in Thailand .

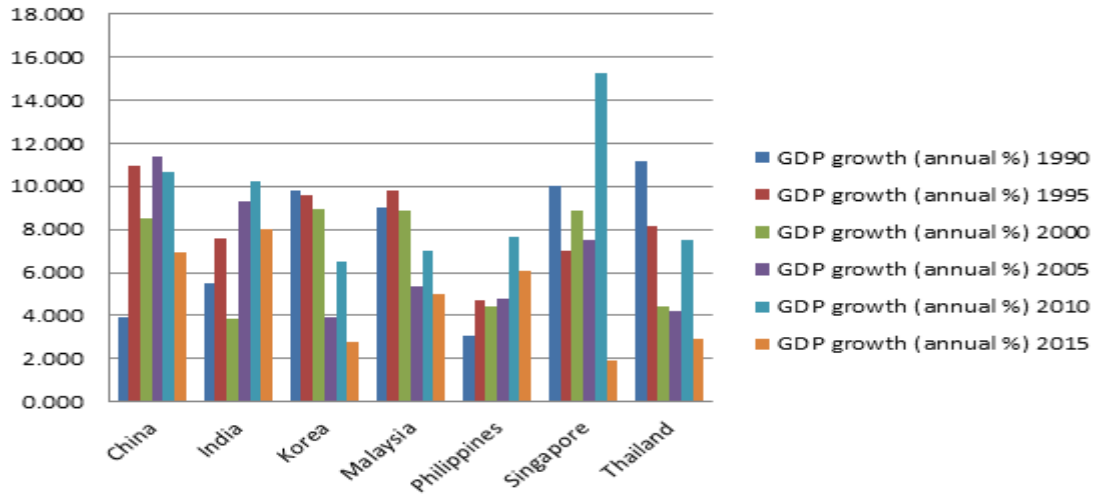

Figure-1. GDP Growth of Emerging Asian Markets

2. MODELING FRAMEWORK

In this research we designate a VAR representative that entails a set of variables characterized by the subsequent structure

$$X_t = \sum_{i=1}^{k} A_i X_{t-i} + \varepsilon_t \quad \text{(A)}$$

Where

$$X_t = \begin{bmatrix} CPI_t \\ EG_t \\ FD_t \\ INT_t \\ INV_t \\ TRD_t \end{bmatrix}, \quad A_{i=} \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} & a_{16} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} & a_{26} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} & a_{36} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} & a_{46} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} & a_{56} \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & a_{66} \end{bmatrix}, X_{t-i} = \begin{bmatrix} CPI_{t-i} \\ EG_{t-i} \\ FD_{t-i} \\ INT_{t-i} \\ INV_{t-i} \\ TRD_{t-i} \end{bmatrix}, \quad \varepsilon_t = \begin{bmatrix} \varepsilon_{CPI} \\ \varepsilon_{FD} \\ \varepsilon_{FD} \\ \varepsilon_{INT} \\ \varepsilon_{INV} \\ \varepsilon_{TRD} \end{bmatrix}$$

Where a vector of variables, six by six matrices of coefficients and a vector of error terms are specified as X_t, A_1- A_k and ε_t. CPI is inflation. Inflation is computed by consumer price index. It manifests *"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 specified intervals, such as yearly"*.

EG is Economic Growth. *"GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products"*. It is acquired as yearly % growth rate of GDP at market prices based on constant local currency.

FD is financial development. It is defined as *"Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of non equity securities, and trade credits and other accounts receivable, that establish a claim for repayment"*. It is proxied by Domestic credence to denationalized stratum by reservoirs as % of GDP.

INT is Interest rate spread (lending rate minus deposit rate, %). *"It is the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits"*. The tenures and clauses affixed to these rates vary by state, though, confining their comparability.

INV is Investment. *"Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements, plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings"*. Gross fixed capital formation (% of GDP) is manipulated as investment.

TRD is Trade openness. *"It is the sum of exports and imports of goods and services measured as a share of gross domestic product".*

We employ time series information over the era 1976 to 2015 for Korea, Philippines and Thailand. The information is acquired from WDI. The rationale behind this scrutiny is to probe the premise that *"financial development 'leads' economic growth"* for Emerging Asian markets. Our crucial target is to scrutinize that whether financial sector progress is obligatory to boost proliferation rates in emerging Asian economies.

3. METHDOLOGY

VAR is applied to address the issues of financial development and economic growth. While Impulse response function and forecast variance error decomposition are used to inspect vigorous relationships between the focus variables.

3.1. Vector Auto Regression Model

VAR representation was presented by Sims (1980). *"It is a standard econometric representation, which obtains the endogenous unstable in the system as the function of the lagged value of all the unstable in the system so as to promote the single variable auto regression model to the vector auto regression model expressed by multivariate time series variables".* This representation definitely deals with the scrutiny and prognosticating of numerous correlated economic indicators with ease.

It is the simultaneous form of Autoregressive representation. The configuration of VAR representation is determined simply through the number of variables as well as the lag length. A VAR representation of bivariate structure is specified as

$$y_{1t} = c_{11} + \alpha_{11}\, y_{1,t-1} + \alpha_{12}\, y_{2,t-1} + \mu_{1t}$$

$$y_{2t} = c_{21} + \alpha_{21}\, y_{1,t-1} + \alpha_{22}\, y_{2,t-1} + \mu_{2t} \quad \text{_____ (1)}$$

This formula can be changed into matrix form, as

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} c_{11} \\ c_{21} \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix} \begin{bmatrix} y_{1,t-1} \\ y_{2,t-1} \end{bmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \end{bmatrix} \quad \text{_____ (2)}$$

Formula (2) can be inscribed as

$$Y_t = C + \pi Y_{t-1} + \mu_t \quad \text{_____ (3)}$$

Where

$$Y_t = \begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix}, C = \begin{bmatrix} c_{11} \\ c_{21} \end{bmatrix}, \pi = \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix}, Y_{t-1} = \begin{bmatrix} y_{1,t-1} \\ y_{2,t-1} \end{bmatrix}, \mu_t = \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \end{bmatrix}$$

It is the fundamental representation of VAR, as the procedure only has lagged endogenous variables, so that these lagged endogenous variable are asymptotically uncognated. Then we can apply OLS technique to evaluate each VAR procedure, and the parameter estimators that we acquire will be reliable.

VAR is valuable in anticipating structures of interconnectd time series and for scrutinizing the vigorous effects of random disturbances on the structure of variables. The VAR proposed representations of each endogenous variable as a function of lagged values of all the endogenous variables in the structure.

3.2. Unit Root Test

In an econometric time series the order of integration is verified by applying the unit root tests. There are various unit root test employed in the prose, however we apply two most common tests which are briefly conferred below. These tests are checked at level and 1st difference.

3.3. Augmented Dickey Fuller test (ADF)

Dickey and Fuller (1979) proposed *the "Dickey Fuller test" (DF test)*. It was remodeled by *"Augmented Dickey Fuller test"* which is the first unit root test. Regression equation of *"DF test"* is specified as

$$\Delta Y_t = \mu + \theta Y_{t-1} + \varepsilon_t \_\_\_\_\_ (4)$$

$\varepsilon_t \sim WN(0, \sigma^2_\varepsilon)$

In DF test the null proposition tested is the subsistence of unit root H_0: $\Theta=0$, against the alternative proposition of rejection of unit root H_1: $\Theta< 0$. This assessment is based on equation (4) which infers that error term ε_t proceeds a white noise process. ADF test, which permits serial correlation in the ε_t error term, is expanded. ADF tes, thus becomes

$$\Delta Y_t = \mu + \theta Y_{t-1} + \delta t + \sum_{i=1}^{p} \theta_i \Delta y_{t-i} + \varepsilon_t \_\_\_\_\_ (5)$$

Where δt is time trend. The ADF test also assesses for subsistence of unit root H_0: $\Theta=0$ against the alternative proposition of rejection of unit root H_1: $\Theta< 0$, like the DF test. Standard t-distribution is not followed by ADF test with or without trend; the critical values are derived by stimulation.

3.4. Phillips and Perron test

Phillips and Perron (1988) proposed a substitute unit root test that lead serial correlation in the error term. Unlike the ADF test, this assessment is based on a non augmented Dickey Fuller test equation that permits for auto correlated residuals.

$$\Delta Y_t = \mu + \theta Y_{t-1} + \varepsilon_t$$

Where ε_t are serially correlated. The tests generally provide the similar decision as the ADF tests, and the computation of the test statistics is complicated. The *"PP test"* t-statistics are calculated as

$$t = \sqrt{\frac{r_0}{h_0}} t_\theta - [[(h_0 - r_0)/2h_0\sigma]]\sigma\theta \_\_\_\_\_ (6)$$

Where one period differenced ($y_t - y_{t-1}$) variance is r_0, n-period differenced ($y_t - y_{t-n}$) variance is h_o. The t-statistics along with standard error of Θ are t_Θ and $\sigma\Theta$ respectively.

3.5. Cointegration Test

"In the context of non stationary data it is relatively feasible that there is a linear combination of integrated variables, i.e. stationary; such variables are said to be cointegrated" (Enders, 1995). In the cointegrated structure it is imperative to indicate that the order of integration of all the variables has to be the identical. The techniques for analyzing Cointegration which are well-liked in economic prose are Engle and Granger (1987) *technique* and Johansen and Juselius (1990) *technique*. Engle Granger is not appropriate here since it is applicable only on two variables. Therefore, we employ Johansen method.

n time series has the vector y_t, each of which is I (1). The vector can be articulated as

$$y_t = \prod_1 Y_{t-1} + \ldots + \prod_k Y_{t-k} + \varepsilon_t \quad (7)$$

NxN matrices of unidentified constants are Π_1. Multivariate normal distribution N (0, Σ) has the error term ε_t. Equation (7) can be transformed into the subsequent equation

$$\Delta y_t = \Gamma_1 \Delta y_{t-1} + \cdots + \Gamma_{k-1} \Delta y_{t-k+1} + \pi \Delta y_{t-k} + \varepsilon_t \quad (8)$$

The rank r of π in the equation (8) is identical to the number of cointegrating vectors in the system was shown by Johansen (1988) and Juselius (1990). Moreover, the π may be factorized as αβ′. The null proposition test of rejection of Cointegration of the number of cointegrating vectors 'r' is done by utilizing λmax and λtrace test derived from β. The null proposition for trace assessment is r_0=0 against the alternative proposition r_0>0; whereas the null proposition for max test is r= r_0 against the alternative r_0 = r_0+1. Johansen and Juselius (1990) presented the critical values of λmax and λtrace statistics.

3.6. Ganger Causality Test

Consider the augmented VAR representation

$$z_t = a_0 + a_1 t + \sum_{i=1}^{p} \varphi_i z_{t-i} + \Psi w_t + \mu_t \quad (9)$$

m x 1 vector of mutually determined (endogenous) variable is z_t, a linear time trend is t, q x 1 vector of exogenous variable is w_t furthermore m x 1 vector of unobserved disturbances is μ_t.

Let $z_t = (z'_{1t}, z'_{2t})'$, wherever z'_{1t} as well as z'_{2t} are m_1 x 1 and m_2 x 1 subsets of z_t, and m = m_1 + m_2. Now the block decomposition of (9) is specified as

$$z_{1t} = a_{10} + a_{11t} + \sum_{i=1}^{p} \varphi_{i,11} z_{1,t-i} + \sum_{i=1}^{p} \varphi_{i,12} z_{2,t-i} + \Psi_1 w_t + \mu_{1t} \quad (10)$$

$$z_{2t} = a_{20} + a_{21t} + \sum_{i=1}^{p} \varphi_{i,21} z_{1,t-i} + \sum_{i=1}^{p} \varphi_{i,22} z_{2,t-i} + \Psi_2 w_t + \mu_{2t} \quad (11)$$

The hypothesis that the subset z_{2t} does not 'Granger cause' z_{1t} is specified as

H_0: φ_{12}= 0 where $\varphi_{12} = (\varphi_{1,12}, \varphi_{2,12} \ldots \varphi_{1p,12})$

3.7. Impulse Response Function (IRF)

"The Impulse response function traces the impact of one standard error change in the exogenous variable on the endogenous variable". The time path of the causes of '*shocks*' of other variable restrained in the VAR on a specific variable are specified by Impulse response function evaluation. This proposition is devised to conclude *"how each variable responds over time to an earlier 'shock' in that variable and to 'shocks' in other variables"*.

3.8. Forecast Error Variance Decomposition (FEVD)

"*The FEVD decomposes variations in an endogenous variable into component shocks giving information about the relative importance of each random shock to the variable*". "*The FEVD informs us the proportion of movement in a sequence due to its own shocks versus the shocks due to other variables*" (Enders, 1995). The technique which disintegrates the variance of the forecast errors for every variable following a '*shock*' to a specified variable and it is feasible to recognize which variable are vigorously persuaded and those that are not.

Mutually these two techniques are termed innovation accounting and permit a spontaneous perception into the vigorous connection among the economic variables in a VAR.

4. EMPIRICAL EVIDENCE

The Unit root test is conducted at level as well as at 1st difference by employing "*ADF test*" and "*PP test*". Consequences of unit root test for Korea, Philippiness and Thailand are presented from table 2 to 4.

Table-2. Unit Root test for Korea

	ADF Test (Level)		ADF Test (1st Difference)		PP Test (Level)		PP Test (1st Difference)	
	Constant	Trend	Constant	Trend	Constant	Trend	Constant	Trend
CPI	0.0232**	0.0463**	0.0059*	0.0528*	0.0215**	0.0617	0.0000*	0.0000*
EG	0.020*	0.0019*	0.0000*	0.0001*	0.0022*	0.0001*	0.0001*	0.0000*
FD	0.9670	0.6077	0.0088*	0.0049*	0.9541	0.7371	0.011*	0.0068*
INT	0.0046*	0.016**	0.0000*	0.0001*	0.0030*	0.0113**	0.0000*	0.0000*
INV	0.4048	0.6924	0.0000*	0.0002*	0.1831	0.4618	0.0060*	0.0157*
TRD	0.6260	0.6638	0.0000*	0.0001*	0.5844	0.5715	0.0000*	0.0001*

Note: The critical values for 1% level are -3.646342 and -4.262735 without and with trend respectively. The values for 5% level are -2.954021 and -3.552973 without and with trend respectively. * And ** indicates that test is stationary at 1% and 5% respectively.

Table-3. Unit Root test for Philippines

	ADF Test (Level)		ADF Test (1st Difference)		PP Test (Level)		PP Test (1st Difference)	
	Constant	Trend	Constant	Trend	Constant	Trend	Constant	Trend
CPI	0.817	0.049	0.1033	0.292	0.033*	0.0000*	0.0000*	0.0000*
EG	0.0167**	0.0000*	0.0003*	0.147	0.0154**	0.0692	0.0000*	0.0000*
FD	0.2295	0.3302	0.0017*	0.0097*	0.4082	0.5084	0.0020*	0.0112**
INT	0.0172**	0.0610	0.0000*	0.0000*	0.0149**	0.0627	0.0000*	0.0000*
INV	0.0580	0.2046	0.0001*	0.0008*	0.2285	0.4080	0.0002*	0.0010*
TRD	06573	0.9787	0.0001*	0.0003*	0.589	0.9588	0.0001*	0.0003*

Note: The critical values for 1% level are -3.646342 and -4.262735 without and with trend respectively. The values for 5% level are -2.954021 and -3.552973 without and with trend respectively. * And ** indicates that test is stationary at 1% and 5% respectively.

Table-4. Unit Root test for Thailand

	ADF Test (Level)		ADF Test (1st Difference)		PP Test (Level)		PP Test (1st Difference)	
	Constant	Trend	Constant	Trend	Constant	Trend	Constant	Trend
CPI	0.0641	0.0415**	0.0000*	0.0000*	0.0577	0.0415**	0.0000*	0.0000*
EG	0.0209**	0.0208**	0.0000*	0.0000*	0.0209**	0.0208**	0.0000*	0.0000*
FD	0.3046	0.4416	0.0413**	0.1414	0.4266	0.7465	0.0312**	0.1108
INT	0.1385	0.1492	0.0000*	0.0000*	0.1778	0.1736	0.0000*	0.0000*
INV	0.1066	0.0008*	0.0050*	0.3590	0.7162	0.0102**	0.0519	0.7070
TRD	0.7070	0.7199	0.0000*	0.0000*	0.7102	0.7201	0.0000*	0.0000*

Note: The critical values for 1% level are -3.646342 and -4.262735 without and with trend respectively. The values for 5% level are -2.954021 and -3.552973 without and with trend respectively. * And ** indicates that test is stationary at 1% and 5% respectively.

The outcomes of the unit root tests for, Korea, Philippines as well as Thailand are specified in Tables 2 to 4. The sADF as well as PP tests are executed with trend and without a trend for each of the variables. The Akiake Information Criterion (AIC) is exploited to arbitrate the lag length. For Korea CPI, economic growth and interest rate are stationary at level and 1st difference whereas financial development, investment and trade are stationary at 1st difference. For Philippines CPI, economic growth and interest rate are stationary at level and 1st difference whereas financial development, investment and trade are stationary at 1st difference. For Thailand CPI, economic growth and investment are stationary at level and 1st difference whereas financial development, interest rate and trade are stationary at 1st difference.

4.1. Cointegration Test

Cointegration test outcomes are presented by employing Trace and Max Statistics. Cointegration test outcomes are mentioned from table 5 to 7 for Korea, Philippines and Thailand. For Korea and Thailand trace and

max test the result indicates 1 cointegration whereas for Philippines trace test indicates 1 cointegration and max test indicates no cointegration.

Table-5. Cointegration Test for Korea

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.803875	109.9839	83.93712	0.0002
At most 1	0.457115	52.96885	60.06141	0.1719
At most 2	0.396986	31.58881	40.17493	0.2771
At most 3	0.276298	13.88528	24.27596	0.5467
At most 4	0.069288	2.567151	12.32090	0.8981
At most 5	0.001541	0.053975	4.129906	0.8490
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.803875	57.01506	36.63019	0.0001
At most 1	0.457115	21.38004	30.43961	0.4278
At most 2	0.396986	17.70353	24.15921	0.2927
At most 3	0.276298	11.31813	17.79730	0.3567
At most 4	0.069288	2.513176	11.22480	0.8592
At most 5	0.001541	0.053975	4.129906	0.8490

Note: Trace and Max test indicates 1 cointegrating equations at the 0.05 level. * denotes the rejection of the hypothesis at the 0.05 level

Table-6. Cointegration Test for Philippines

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.650557	91.82817	83.93712	0.0119
At most 1	0.512662	50.82303	60.06141	0.2355
At most 2	0.323248	22.78994	40.17493	0.7728
At most 3	0.108604	7.562371	24.27596	0.9644
At most 4	0.072026	3.078683	12.32090	0.8378
At most 5	0.004180	0.163359	4.129906	0.7381
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.803875	57.01506	36.63019	0.0001
At most 1	0.457115	21.38004	30.43961	0.4278
At most 2	0.396986	17.70353	24.15921	0.2927
At most 3	0.276298	11.31813	17.79730	0.3567
At most 4	0.069288	2.513176	11.22480	0.8592
At most 5	0.001541	0.053975	4.129906	0.8490

Note: Trace and Max eigenvalue test indicates 1 cointegrating equations at the 0.05 level. * denotes the rejection of the hypothesis at the 0.05 level

Table-7. Cointegration Test for Thailand

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.554724	84.96792	83.93712	0.0420
At most 1	0.474587	54.22362	60.06141	0.1411
At most 2	0.336168	29.76796	40.17493	0.3667
At most 3	0.197453	14.19839	24.27596	0.5207
At most 4	0.141171	5.839700	12.32090	0.4558
At most 5	0.001490	0.056657	4.129906	0.8453
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None	0.554724	30.74430	36.63019	0.2070
At most 1	0.474587	24.45566	30.43961	0.2314
At most 2	0.336168	15.56957	24.15921	0.4583
At most 3	0.197453	8.358686	17.79730	0.6664
At most 4	0.141171	5.783043	11.22480	0.3750
At most 5	0.001490	0.056657	4.129906	0.8453

Note: Trace and Max eigenvalue test indicates 1 and no cointegrating equations at the 0.05 level respectively. * denotes the rejection of the hypothesis at the 0.05 level

4.2. Granger Causality Test

Granger Causality investigation outcomes are mentioned from table 8 to 10. For Korea economic growth does not cause financial development and interest rate whereas it causes investment, whereas financial development does not cause economic growth, interest rate and investment. For Philippines economic growth does not cause financial development and interest rate whereas it causes investment, whereas financial development does not cause economic growth, interest rate and investment. For Thailand economic growth does not cause financial development, interest rate and investment, financial development does not cause economic growth "and interest rate and causes investment.

Table-8. Causality Test for Korea

Cause	Effect	Test Statistics	Probability	Result
EG	CPI	0.680011	0.7118	EG does not cause CPI
EG	FD	7.882581	0.0194**	EG causes FD
EG	INT	1.585035	0.4527	EG does not cause INT
EG	INV	9.722828	0.0077*	EG causes INV
EG	TRD	0.600876	0.7405	EG does not cause TRD
FD	CPI	0.246225	0.8842	FD does not cause CPI
FD	EG	0.130858	0.9367	FD does not cause EG
FD	INT	0.215537	0.8978	FD does not cause INT
FD	INV	0.265705	0.8756	FD does not cause INV
FD	TRD	0.046854	0.9768	FD does not cause TRD

Note: ** indicates the test is significant at 5% level

Table-9. Causality Test for Philippines

Cause	Effect	Test Statistics	Probability	Result
EG	CPI	3.186792	0.2032	EG does not cause CPI
EG	FD	0.542106	0.7626	EG does not causes FD
EG	INT	1.929251	0.3811	EG does not cause INT
EG	INV	11.71634	0.0029**	EG causes INV
EG	TRD	0.738170	0.6914	EG does not cause TRD
FD	CPI	0.778955	0.6774	FD does not cause CPI
FD	EG	1.931233	0.3807	FD does not cause EG
FD	INT	2.609990	0.2712	FD does not cause INT
FD	INV	1.955185	0.3762	FD does not cause INV
FD	TRD	1.299975	0.5221	FD does not cause TRD

Note: ** indicates the test is significant at 5% level

Table-10. Causality Test for Thailand

Cause	Effect	Test Statistics	Probability	Result
EG	CPI	1.014902	0.6020	EG does not cause CPI
EG	FD	1.758209	0.4152	EG does not causes FD
EG	INT	2.155993	0.3403	EG does not cause INT
EG	INV	0.013502	0.9933	EG does not causes INV
EG	TRD	0.251009	0.8821	EG does not cause TRD
FD	CPI	4.012145	0.1345	FD does not cause CPI
FD	EG	2.188412	0.3348	FD does not cause EG
FD	INT	4.614694	0.0995	FD does not cause INT
FD	INV	11.34536	0.0034**	FD does not cause INV
FD	TRD	4.913776	0.0857	FD does not cause TRD

Note: ** indicates the test is significant at 5% level

4.3. Impulse Response Function

The crucial target of this scrutiny is to track out the influence of economic growth along with financial development *'shocks'* on interest rate, investment and trade openness by means of impulse response for Korea, Philippines and Thailand.

a. Korea

Figure 2 and 3 display *"Impulse response function of each variable to a positive one unit standard deviation shock to economic growth and financial development"*. Initially unconstructive response of inflation to economic growth *"shock* "has been observed. It reaches its maximum at 3.5 years and after 6 years it dies out. Initially financial development has an insignificant influence on economic growth; after 1 year and 6 months it starts decreasing and becomes stagnant for last 4 years. In response to the *"shock"* of economic growth, interest rate spread is initially insignificant, it reaches at maximum around 5.5 years, after 7 years and 6 months it starts declining. Initially investment is insignificant following the economic growth *"shock"*; it reaches its maximum at 2 years and after 2 years it starts declining. Initially trade openness is insignificant following the economic growth *"shock"*; it reaches its maximum around 6 years and dies out in last 3 years. In response to financial development *"shock"*, inflation dies out after 2 years and 6 months. Initially negative response of economic growth to financial development is observed, it remains stagnant for last 4 years. Initially interest rate spread has an insignificant influence on financial development *"shock"*; it reaches its maximum around 5.5 years and becomes stagnant for last 4 years. In response to financial development *"shock"*, initially investment is insignificant; it starts decreasing after 2 years and becomes stagnant after 6 years and 6 months. In response to financial development *"shock"*, initially trade openness is insignificant and after 3 years it dies out.

b. Philippines

Figure 4 and 5 display *"IRF of each variable to a positive one unit standard deviation shock to economic growth and financial development*". In response to economic growth *"shock"*, inflation reaches maximum around 3 years and becomes stagnant after 6.5 years. In response to economic growth *"shock"* initially financial development is insignificant; it reaches its maximum around 6 years and becomes stagnant for last 3 years. In response to economic growth *"shock"* initially interest rate spread is insignificant it reaches its maximum around 5.5 years and dies out for last three years. In response to economic growth *"shock"*, investment is initially insignificant. It starts declining after 2 years and becomes stagnant for last 4 years. In response to economic growth *"shock"*, trade openness is initially insignificant; it starts increasing around three years and six months, after 5.5 years it dies out. In response to financial development *"shock"*, inflation is initially negative after 5.5 years it starts increasing and becomes stagnant after 7 years. In response to financial development *"shock"*, economic growth reaches its maximum around 2 years it declines after 4.5 years and dies out in 9th and 10th year. In response to financial development *"shock"* initially interest rate spread is insignificant; it starts decreasing after two years and dies out stagnant in last three years. In response to financial development *"shock"* investment is initially insignificant. After 2 year it starts declining. Initially trade openness has an insignificant impact on financial development *"shock* "and dies out in last 4 years.

c. Thailand

Figure 6 and 7 display *"IRF of each variable to a positive one unit standard deviation shock to economic growth and financial development"*. In response to *"economic growth shock"*, inflation is initially negative. It starts increasing after 4.5 years, and remains stagnant over 6 to 10 years. In response to economic growth *"shock"* financial development is insignificant; it starts declining after 2 years and dies out after 5 years. Initially interest rate has an insignificant influence on economic growth *"shock"*. It starts declining after 2 years and dies out after 5 years. In response to economic growth *"shock"*, investment is initially insignificant; it dies out after 1.5 years. Initially trade openness has an insignificant impact on economic growth *"shock"*. It reaches its maximum around 3 years and completely dies out after 6th year. In response to financial development *"shock"*, inflation is initially negative and it declines throughout the period. In response to financial development *"shock"*, economic growth reaches its maximum around 5 years and declines after 7 years. Initially interest rate has an insignificant impact on financial development *"shock"*. It reaches

its maximum around 3 years and declines after 4.5 years. In response to financial development *"shock"*, investment is insignificant. It reaches its maximum around 4 years and becomes stagnant after 6 years it. In response to financial development *"shock"*, initially trade openness is insignificant; it starts increasing after 5.5 years and becomes stagnant for last three years.

4.4. Forecast Error Variance Decomposition

The consequences of FEVD over a 10 year horizon for economic growth *"shocks"* and financial development *"shocks"* for Korea, Philippines and Thailand are reported from tables A1 to A3.

a. Korea

It is observed from Table A1 that the contribution of economic growth *"shock"* to inflation is 15.4% in 2 year horizon and it decreases to 11.7% after 4 years and declines to 11.2% after 4 year horizon. The impact of economic growth *"shock"* to financial development is 19.4% in 7 years and it increased to 23.2% after 3 years. The contribution of economic growth *"shock"* to interest rate spread is 1.4% in 6th year and it is reached to 1.68% in 10th year. The results recommend that the contribution of investment and trade openness is negligible. It is observed from Table A1 that the contribution of financial development *"shock"* to inflation is negligible. The impact of financial development *"shock"* to economic growth is 7.5% in 5 year horizon. It increases to 8.15% after 5 years. The impact of financial development *"shock"* to interest rate spread is 1.37% over the period of 6 years. It increases to 2.07% after 4 years. The contribution of financial development *"shock"* on trade openness is negligible.

b. Philippines

The results of FEVD over a 10 year horizon for economic growth *"shocks"* along with financial development *"shocks"* are conferred in Table A2. It is observed from the Table A2 that the contribution of economic growth *"shock"* to inflation is 29.06% in 2 years horizon and decreases to 22.9% in 6th year horizon and remains stagnant for last 4 years. The impact of economic growth *"shock"* to financial development is 1.08% and 6.2% between 2 to 10 years horizon. The impact of economic growth *"shock"* to interest rate spread is 20.3% in 3 year horizon and increases to 30.4% in 5th year horizon but decrease to 27.6% after 5 years. The contribution of economic growth *"shock"* to investment is 7.63% in 5th year and it increases to 9.5% after 2 years and remains stagnant for last three years. The outcomes urge that the contribution of trade openness is negligible. As observed from table A2 the contribution of financial development *"shock"* to inflation is 46.3% in 1st year horizon and it decreases to 42.6% in 6th year and remains stagnant for last four years. The impact of financial development *"shock"* to economic growth is 6.7% in 2 year horizon and it increases to 8.24% after 4 years and decreases to 7.9% in 10th year horizon. The impact of financial development *"shock"* to interest rate spread is 1.4% in 2 year horizon and it increases to 4.3% in 5 year horizon and decreases to 3.9% after 5 years. The contribution of financial development *"shock"* to investment is 6.6% in 3rd year and increases to 12.11% in 8th year. It remains stagnant for last 2 years. The financial development *"shock"* explains decrease in trade openness from 2.06% to 1.84% between 2 year and 10 year horizon. The outcome suggests contribution of trade openness is negligible.

c. Thailand

The results of FEVD over a 10 year horizon for *"economic growth shocks"* and *"financial development shocks"* are reported in Table A3. As observed from Table A3 that the contribution of economic growth *"shock"* to inflation is 4.7% in 3rd year horizon, it increases to 6.23% in 10th year horizon. The contribution of economic growth *"shock"* to financial development is 3.7% and 7.1% between 2 to 5 years; it decreases to 6.8% after 2 years and remains stagnant for last three years. The impact of economic growth *"shock"* to interest rate spread is 5.3% in 3rd year horizon and increases to 5.6% in 10th year horizon. The results recommend that contribution of interest rate spread

is negligible. The contribution of economic growth *"shock"* to investment and trade openness is negligible. The contribution of financial development *"shock"* on rest of the variables can be observed from table A3. The impact of financial development *"shock"* to inflation is 8.5% in 2 year horizon and increases to 11.3% in 6th year horizon. It remains stagnant for last 4 years. Persuade of financial development *"shock"* on economic growth shows large part of fluctuations. It is 14.9% in 2 year horizon and increases to 62.3% in 7th year horizon; it declines to 60.4% in 10th year horizon. The contribution of *"financial development shock"* on interest rate spread is 5.16% in 2nd year and decreases to 4.14% in 10th year. The contribution of financial development *"shock"* on investment is 3.7% in 2 year horizon, increases to 11.2% 10th year horizons. The impact of financial development *"shock"* to trade openness is 3.06% in 2nd year horizon and it decreases to 2.9% in 10th year horizon. The result suggests contribution of trade openness is negligible.

5. CONCLUSION AND DISCUSSION

This research employs the VAR techniques of forecast error variance decomposition and impulse response function evaluation to scrutinize the interdependence between financial development and economic growth for Korea, Philippines along with Thailand using time series information over the era of 1976 to 2015.

ADF as well as PP test specifies that CPI, economic growth and interest rate are stationary at level; whereas financial development, investment and trade openness are stationary at 1st difference for the selected emerging Asian markets. Trace and Max test indicates 1 cointegration for Korea and Thailand whereas for Philippines trace and max test gives 1 and no cointegration respectively. From Granger Causality test we found that "financial development does not cause economic growth"; but "economic growth causes financial development" only for Korea**.** Impulse response function analysis suggests that in the context of Korea economic growth *"shock"* affect financial development. On the other hand financial development *"shocks"* affect economic growth, interest rate and investment. Forecast error variance decomposition results suggest that economic growth *"shock"* affect financial development; whereas financial development *"shocks"* affect economic growth, interest rate and investment. In the case of Philippines impulse response function analysis suggests that *economic growth "shock"* affect financial development. On the other part financial development *"shock"* affect investment. For the case of Thailand, impulse response function analysis recommends that economic growth *"shock"* affect inflation. On the other hand financial development *"shock"* affects economic growth, interest rate and investment. Forecast error variance decomposition evaluation also fosters the decisions based on impulse response function for all Emerging Asian Markets.

Therefore, from impulse response and variance decomposition we found that *"financial development leads economic growth"* except Philippines. To the limited extent some support for the hypothesis that *"financial development 'lead' economic growth"* was established for this research on Asian emerging markets. It is obvious that financial development is not merely a contributing factor, but definitely the most important factor of GDP growth. An unconstructive shock in financial development does not induce harmful economic growth, the reverse is powerfully supported. However, the financial sector presents support for the economic growth. This becomes more evident when credence to denationalize sector to GDP ratio series are utilized as the financial development indicator.

It is obvious that whatever causality may exist, it is not uniform in direction or strength, and emphasizes the incompatibility of cross-sectional evaluation for methodological perception; the proposition that *"financial development leads economic growth"* is not usually supported by time-series investigation, at least not from the evidence of Asian emerging markets. Our results are similar to the study of Shan (2006) in the case of China.

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REFERENCES

Abdellhafidh, 2013. Potenatial financing source of investment and economic growth in North African countries: A causality analysis. Journal of Policy Modelling, 35(1): 150-169. *View at Google Scholar | View at Publisher*

Arestis, P. and P. Demetriades, 2001. Financial development and economic growth: The role of stock market. Journal Of Money Credit and Banking, 33(1): 16-41.

Backé, P., B. Égert and Z. Walko, 2007. Credit growth in central and Eastern Europe revisited. Focus on European Integration, 2(7): 69-77. *View at Google Scholar*

Bader and Qarn, 2008. Financial development and economic growth: Empirical evidence from MENA countires. Review of Development Economics, 12(4): 803-817. *View at Google Scholar*

Beck, T.A., K. Demirgtic and R. Levine, 2004. Stock market, banks and growth: Panel evidence. Journal of Banking and Finance, 28(3): 423-442.

Bloch, H. and S.H. Tang, 2003. The role of financial development in economic growth. Progress in Development Studies, 3(3): 243-251. *View at Google Scholar*

Caporale, M.G., C. Rault and R. Sova, 2009. Financial development and economic growth: Evidence from 10 new EU members. Economic And Financial Working Paper Series No.940: 9-37.

Demetriades, P.O. and K.B. Luintel, 1996. Financial development, economic growth and banking sector controls: Evidence from India. Economic Journal, 106(435): 359-374. *View at Google Scholar | View at Publisher*

Dickey, D.A. and W.A. Fuller, 1979. Distributions of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74(366a): 427-431. *View at Google Scholar | View at Publisher*

Enders, W., 1995. Applied econometric time series. New York: Wiley.

Engle and Granger, 1987. Cointegration and error correction:Representation, estimation and testing. Econometrica, 55(2): 251-276. *View at Google Scholar | View at Publisher*

Ghali, K.H., 1999. Financial development and economic growth: The Tunisian experience. Review of Development Economies, 3(3): 310-322. *View at Google Scholar | View at Publisher*

Gill, R.M., 2012. Golden growth, restoring the lusture of European growth model. World Bank Report.

Jeanneney, S.G., P. Hua and Z. Liang, 2006. Fiancial development, economic efficiency and productivity growth: Evidence from China. Developing Economies, 44(1): 27-52. *View at Google Scholar | View at Publisher*

Johansen, 1988. Statistical analysis of cointegraion vectors. Journal of Economic Dynamics and Control, 12(2-3): 231-254. *View at Google Scholar*

Johansen, S. and K. Juselius, 1990. Maximum likelihood estimation and inference on cointegration with applications to the demand for money. Bulletin of Economics and Statistics, 52 (2): 169-210. *View at Google Scholar | View at Publisher*

Juselius, 1990. Maximum likelihood estimation and inference on cointegration with applications to the demand for money. Oxford Bulletin of Economics and Statistics, 52(2): 169-210.

La Porta, R. and F. Lopez, 2002. Government ownership of commercial banks. Journal of Finance, 57(1): 265-301.

Luitel, K. and M. Khan, 1999. A quantitative reassement of financial growth nexus: Evidence from multivariate VAR. Journal of Development Economics, 60(2): 381-405. *View at Google Scholar | View at Publisher*

Phillips, A. and P. Perron, 1988. Testing for a unit root in time series regression. Biometrika, 75(2): 335-346. *View at Google Scholar | View at Publisher*

Shan, J., 2005. Does financial development lead economic growth? A vector auto-regression appraisal. Applied Economics, 37(12): 1353-1367. *View at Google Scholar | View at Publisher*

Shan, J.Z. and A. Morris, 2002. Does financial development lead economic growth ?. International Review of Applied Economics, 16(2): 153-168. *View at Google Scholar | View at Publisher*

Sims, 1980. Macroeconomics and reality. Econometrica: Journal of the Econometric Society, 48(1): 1-48. *View at Google Scholar*

BIBLIOGRAPHY

Akaike, 1973. Information theory and an extension of the maximum likelihood principle. In B.Petrov and F.Csaki (eds). 2nd International Symposium On Information Theory, Academiai Kiado, Budapest. pp: 267-281.

Granger, C.J., 1969. Investigating causal relationships by econometrics models and cross spectral methods. Econometrica, 37(3): 424-435.

Gujarati, D.N., 2004. Basic econometrics. 4th Edn., New Delhi: Tata Mc-Graw-Hill Publishing Company Limited.

Lutkephol, 2004. Applied time series econometrics. New York: Camabridge University Press. pp: 54-56.

APPENDIX

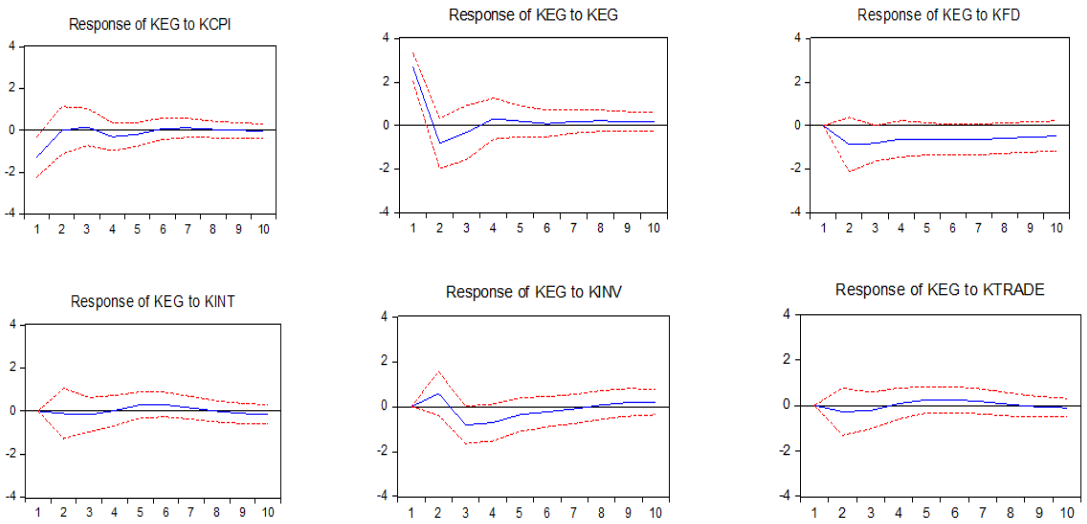

Figure-2. Impulse response of one SD Shock to Economic Growth (Korea)

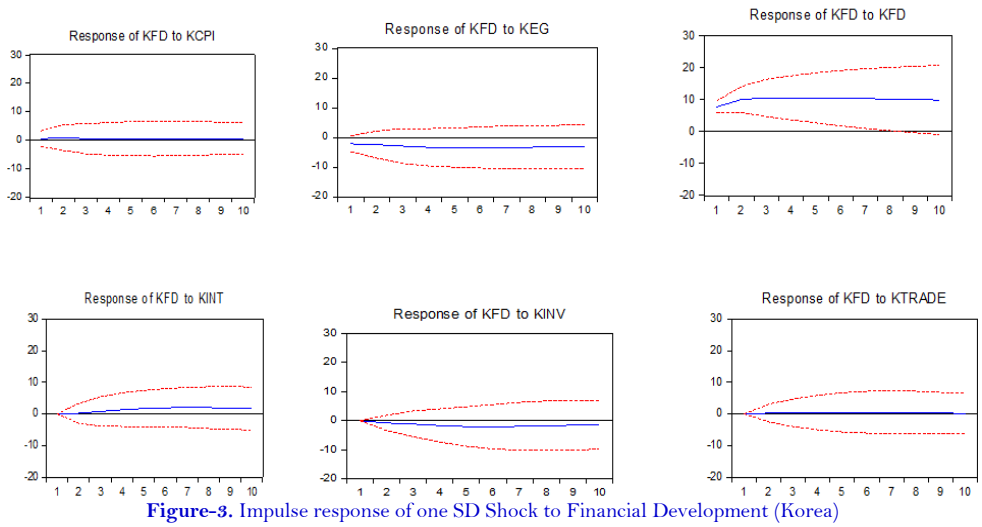

Figure-3. Impulse response of one SD Shock to Financial Development (Korea)

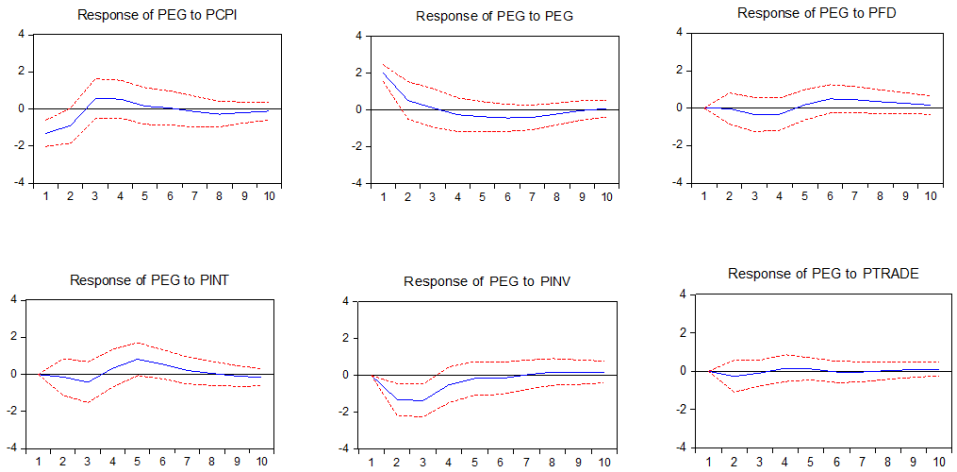

Figure-4. Impulse response of one SD Shock to Economic Growth (Philippines)

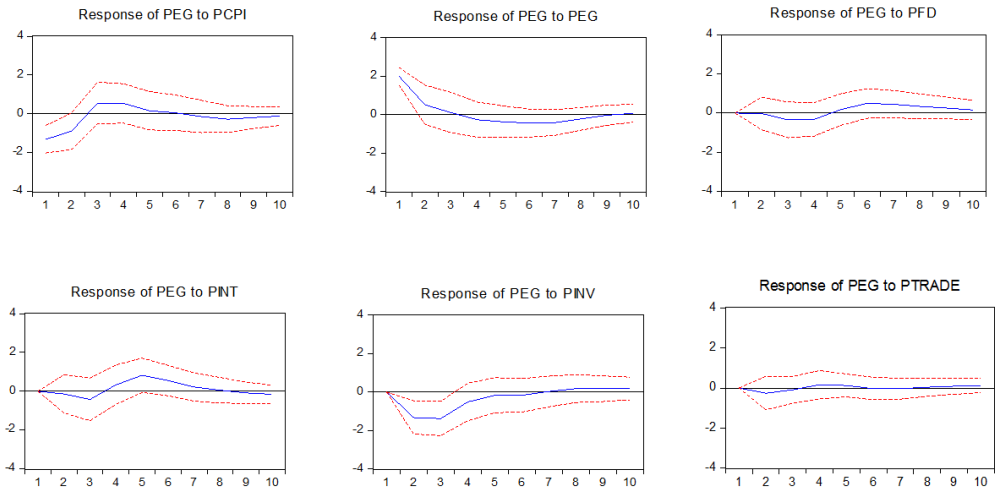

Figure-5. Impulse response of one SD Shock to Financial Development (Philippines)

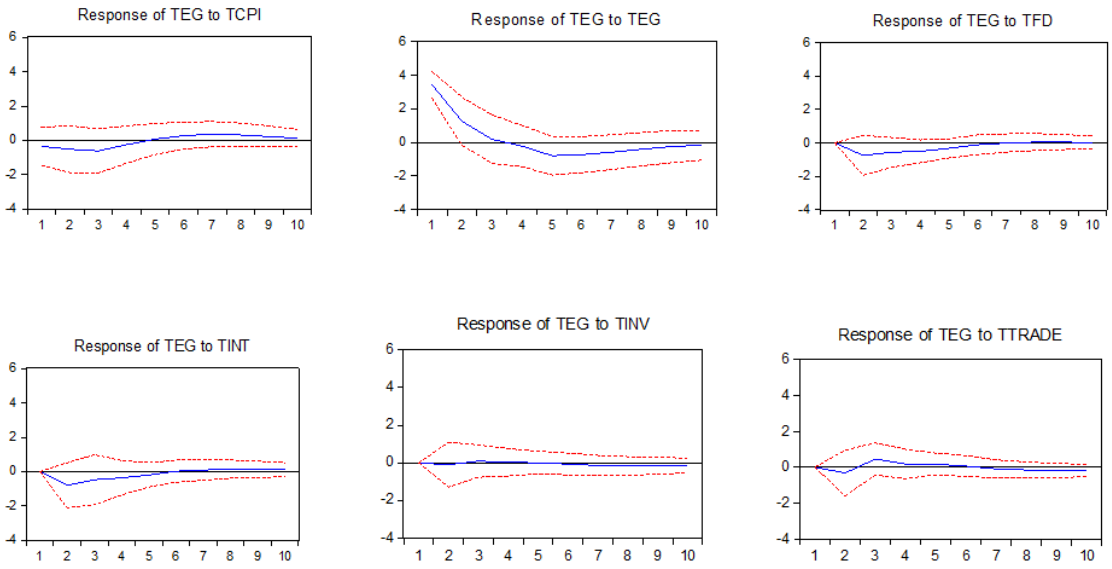

Figure-6. Impulse response of one SD Shock to Economic Growth (Thailand)

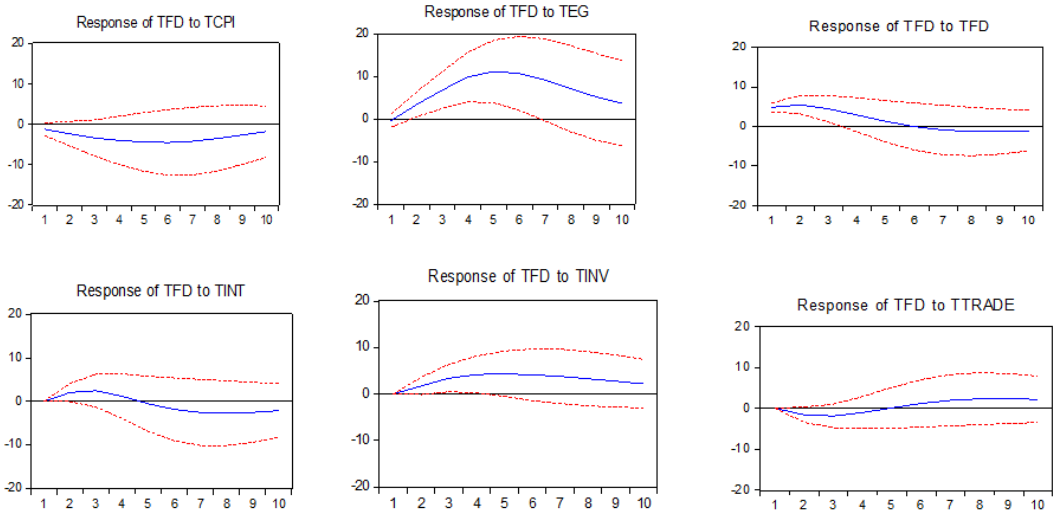

Figure-7. Impulse response of one SD Shock to Financial Development (Thailand)

Table-A1.

Forecast Error Variance Decompositions of Economic Growth (Korea)							
Period	S.E.	KCPI	KEG	KFD	KINT	KINV	KTRADE
1	2.981	18.605	81.394	0.000	0.000	0.000	0.0000
2	3.273	15.430	73.639	6.947	0.119	3.152	0.711
3	3.498	13.696	65.247	11.442	0.337	8.225	1.0506
4	3.648	13.331	60.759	13.230	0.316	11.345	1.018
5	3.746	12.912	57.954	15.156	0.891	11.669	1.415
6	3.832	12.384	55.457	17.373	1.458	11.512	1.814
7	3.897	12.054	53.839	19.412	1.552	11.202	1.939
8	3.947	11.764	52.826	21.036	1.513	10.959	1.901
9	3.991	11.503	51.880	22.239	1.558	10.935	1.883
10	4.032	11.273	50.975	23.176	1.689	10.973	1.913
Forecast Error Variance Decompositions of Financial Development							
Period	S.E.	KCPI	KEG	KFD	KINT	KINV	KTRADE
1	8.117	0.625	7.066	92.308	0.000	0.000	0.000
2	13.256	0.873	5.991	92.725	0.0317	0.335	0.042
3	17.273	0.653	6.383	92.044	0.231	0.615	0.073
4	20.661	0.529	7.041	90.679	0.584	1.069	0.095
5	23.626	0.470	7.487	89.384	0.989	1.546	0.123
6	26.247	0.442	7.7185	88.441	1.373	1.875	0.149
7	28.577	0.435	7.869	87.814	1.681	2.0376	0.164
8	30.660	0.438	7.986	87.435	1.887	2.091	0.163
9	32.538	0.439	8.079	87.236	2.006	2.086	0.153
10	34.245	0.437	8.157	87.139	2.069	2.056	0.141

Table-A2.

Forecast Error Variance Decompositions of Economic Growth (Philippines)							
Period	S.E.	PCPI	PEG	PFD	PINT	PINV	PTRADE
1	2.392	29.975	70.024	0.0000	0.000	0.000	0.000
2	2.934	29.060	49.634	0.004	0.213	20.332	0.757
3	3.335	25.347	38.517	1.080	1.735	32.662	0.658
4	3.462	25.962	36.307	1.857	2.552	32.483	0.838
5	3.593	24.322	34.778	1.972	7.632	30.394	0.900
6	3.698	22.9729	34.199	3.645	9.437	28.889	0.856
7	3.757	22.395	34.307	4.973	9.479	28.006	0.839
8	3.793	22.474	33.974	5.693	9.321	27.703	0.834
9	3.813	22.487	33.632	6.091	9.276	27.634	0.878
10	3.828	22.394	33.399	6.218	9.373	27.650	0.964
Forecast Error Variance Decompositions of Financial Development							
Period	S.E.	PCPI	PEG	PFD	PINT	PINV	PTRADE
1	4.233	46.291	3.374	50.334	0.000	0.000	0.000
2	7.271	42.134	6.698	44.667	1.419	3.743	1.338
3	9.200	43.589	6.564	37.868	3.241	6.667	2.068
4	10.236	44.176	7.170	33.806	4.097	8.663	2.087
5	10.736	43.272	7.923	32.056	4.317	10.438	1.992

6	10.975	42.627	8.246	31.480	4.226	11.496	1.922
7	11.118	42.407	8.242	31.418	4.122	11.934	1.876
8	11.222	42.254	8.137	31.589	4.064	12.112	1.841
9	11.294	42.144	8.043	31.838	4.016	12.140	1.819
10	11.343	42.102	7.976	32.053	3.982	12.074	1.812

Table-A3.

Forecast Error Variance Decompositions of Economic Growth (Thailand)							
Period	S.E.	TCPI	TEG	TFD	TINT	TINV	TTRADE
1	3.441	0.957	99.042	0.000	0.000	0.000	0.000
2	3.871	2.565	88.697	3.734	4.267	0.064	0.673
3	4.020	4.719	82.441	5.457	5.338	0.112	1.931
4	4.086	4.915	80.107	6.812	5.978	0.115	2.073
5	4.183	4.726	79.982	7.109	5.910	0.110	2.162
6	4.257	4.997	80.110	6.939	5.709	0.131	2.113
7	4.317	5.553	79.757	6.753	5.607	0.228	2.101
8	4.356	5.970	79.223	6.644	5.616	0.365	2.181
9	4.377	6.171	78.736	6.589	5.658	0.503	2.341
10	4.390	6.232	78.424	6.553	5.685	0.609	2.496
Forecast Error Variance Decompositions of Financial Development							
Period	S.E.	TCPI	TEG	TFD	TINT	TINV	TTRADE
1	5.0356	6.254	0.443	93.303	0.000	0.000	0.000
2	9.129	8.526	14.853	64.701	5.161	3.690	3.068
3	13.540	10.162	32.529	40.253	5.678	8.102	3.276
4	18.091	10.596	48.430	25.155	3.613	10.040	2.165
5	22.218	10.929	57.652	17.016	2.451	10.513	1.438
6	25.542	11.383	61.459	12.876	2.362	10.610	1.308
7	27.933	11.776	62.264	10.867	2.795	10.716	1.581
8	29.485	11.991	61.781	9.940	3.348	10.889	2.049
9	30.415	12.028	61.019	9.519	3.819	11.074	2.541
10	30.942	11.965	60.401	9.316	4.147	11.220	2.949