

## THE RELATIONSHIP BETWEEN FINANCIAL LIBERALIZATION AND ECONOMIC GROWTH IN EMERGING ASIAN ECONOMIES

**1 Shahrin Saaid Shaharuddin, 2 Ali Fayyaz Munir, 3 Mohamed Sheikh  
Abu-Baker Al-Baity, 4 Izlin Ismail**

<sup>1</sup> Corresponding Author: Senior Lecturer, Department of Finance and Banking, Faculty of Business and Accountancy, University of Malaya, 50603 Lembah Pantai, Kuala Lumpur, Malaysia. Email: [shahrin@um.edu.my](mailto:shahrin@um.edu.my)

<sup>1</sup> Ph.D. Candidate, Department of Finance and Banking, Faculty of Business and Accountancy, University of Malaya, 50603 Lembah Pantai, Kuala Lumpur, Malaysia. Email: [muniralifayyaz@gmail.com](mailto:muniralifayyaz@gmail.com)

<sup>1</sup> Assistant Professor, College of Business Administration, Department of Finance & Economics, University of Sharjah, P.O. Box 27272 Sharjah, UAE. Email: [malbaity@sharjah.ac.ae](mailto:malbaity@sharjah.ac.ae)

<sup>1</sup> Associate Professor, Department of Finance and Banking, Faculty of Business and Accountancy, University of Malaya, 50603 Lembah Pantai, Kuala Lumpur, Malaysia Faculty of Business and Accountancy, University of Malaya. Email: [izlin@um.edu.my](mailto:izlin@um.edu.my)

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**Abstract:** The effect of financial liberalization on economic growth in eight emerging Asian countries are analyzed in this study using financial liberalization factors such as foreign equity liability (FEL), Edison & Warnock (EW) ratio as well as the Lane and Milesi-Ferretti (LMF) measure. Results of the study indicate that the financial liberalization factors on gross domestic product (GDP) do not Granger cause gross domestic product (GDP) in all countries except for South Korea. Also, it was found that the financial liberalization factors forecast an increase in GDP in most of the countries. The LMF factor is found to be affected by other financial liberalization factors. These findings also provide evidence that emerging countries can benefit from an increase in financial liberalization activities. Furthermore, policy makers and investors could use these evidences to guide them in devising economic policies and investment plans.

**Keywords:** Financial Market Liberalization, Economic Growth, Emerging Asian Economies, Causality.

**JEL Classification Code:** F6, F36, G1

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## 1. Introduction

Prior studies have shown that financial liberalization has been beneficial to the development of national economies (Chari & Henry, 2004; Moshirian, 2007; Erkisi & Ceyhan, 2019; Wasti & Zaidi, 2020). Moreover, it also enhances the ability of firms to generate funds for profitable projects which contributes to the overall development of the economy. It is evident that the developed economies benefit as a result of a more developed financial sector as compared to developing economies (Bekaert, Harvey, & Lundblad, 2005). Moreover, it is sometimes argued that foreign investor participation in developing economies leads to economic instability due to information asymmetry problem. Despite the significance of this topic, the evidence is scant and inconclusive in literature on the role of financial market liberalization on the economic growth of emerging Asian economies. Therefore, this paper examines the effects of financial liberalization on eight emerging economies in Asia using three proxies of financial liberalization including FEL, EW and LMF.

Financial liberalization can be defined as the process by which the authorities eliminate all limitations from the financial system to get access into the open market. Hence, a set of financial and operational reforms are made in a repressed financial system to accomplish this goal (Johnston & Sundararajan, 1999). Kwon (2004) on the other hand, argued that the financial liberalization can be defined as the easing of international financial transactions such as regulations on financial flows and the purchase and sale of financial or real assets.

Schmukler and Kaminsky (2003) have given a wider explanation to explain financial liberalization as the removal of restrictions invoked by the authorities on the local financial sector. Based on their argument, financial liberalization can be segregated into three portions, namely domestic, capital account and stock market liberalization. Furthermore, financial liberalization also includes the removal of regulation for the external capital account, internal financial market and the stock market segment, which is to be distinguished from local monetary flow.

Earlier literature by McKinnon (1973) and Shaw (1973) had also discussed the interdependency between financial development and economic growth in the context of developing countries. Financial liberalization has been argued to be fundamental in developing economies and foreign direct investment has an important role to play in economic growth of these economies (Yusoff & Nuh, 2015).

The McKinnon-Shaw notion, which subsequently led to the development of the financial repression model, soon became an idea which was used in order to develop policies for purposes of economic transformation in developing

countries. In a nutshell, the McKinnon-Shaw model is recommended for purposes of liberalizing the financial structures in relation to financial intermediaries in order to expand economic growth.

## 2. Literature Review

Financial liberalization policies in emerging Asian economies began in earnest in the 1980's through various government initiatives to liberalize interest rates, deregulation of the banking system and capital markets as well as macroeconomic policy changes to encourage inflows of foreign investments. Furthermore, the rate and extent of financial market liberalization between countries is different and is influenced by agreements with debt international bodies. For instance, in the case of Thailand, by agreeing to accept Article VIII of the Article of Agreement by the International Monetary Fund (IMF) in the 1990's, this led towards the relaxation of restrictions on payments and transfers of current account transactions as well as lifting of foreign exchange controls.

Major structural reforms relating to the financial system were also seen in Malaysia, Indonesia, Philippines, Pakistan and India after the 1990's which were mainly centered around encouraging the development of the banking sector and capital market reforms to stimulate growth in the stock and bond market. However, the effectiveness of financial liberalization policies are most vividly presented in countries such as China and South Korea.

Prior to 1978, The People's Bank of China (PBC) operated as central and commercial bank. During the pre-financial liberalization era, a mono-bank financial system was implemented whereby the PBC was the sole player in the market. However, subsequent to this period, the Chinese government took a wider view of their economy which led towards the implementation of China's open-door policy permitted the trade expansion in the product market and entry of external fund in the capital market in 1998 (Liu & Li, 2001).

Borst and Lardy (2015) explained in a study that the Chinese Communist Party (CCP) circulated "A Decision on Major Issues Concerning Comprehensive and Far-Reaching reform" during third Plenum in November 2013, which outlined the agenda for financial reforms namely to operate more financial institutions; expand more capital markets; increase the interest rate liberalization; transforming to market-oriented exchange rate; encouraging capital account exchangeable; creation of deposit insurance structure; establishing a market-oriented exit method for financial institutions and practicing diversified ownership structure to allow state-owned enterprises to get funds from private sectors.

In the case of South Korea, the overall plan under the policy in the 1980's in South Korea is to create a more realistic and competitive interest rate for the economy. However, financial deregulation hampered the objective, which was later stabilized by the improving internal economy (Cho, 1988). The financial sector boomed in 1990's when the central bank deregulated interest rate into three phases. To maintain the resource segregation, compulsory funding for the manufacturing sectors was entirely wiped out and small and medium enterprise's (SME) were subjected to lesser funding. Capitalist oriented financial platform boosted financial liberalization in South Korea through the maintenance of proper resource segregation.

Despite being regarded as a developing country based on the United Nation's classification of developing countries (World Economic Situation Prospects 2018), South Korea has been regarded as a developed economy based on metrics such as GDP and Gross National Product (GNP) per capita. South Korea also boasts one of the largest stock markets in the world and has one of the world's most vibrant export economy. In 2009, the FTSE Russell index classified South Korea as a developed economy from its prior classification as a developing world economy (Taranukha, 2016). Suffice to say that development of the South Korean economy as a result of financial liberalization activities are at an advanced and progressive stage as compared to the seven other countries which are the subject of this study.

### ***2.1 Linkages between Financial Liberalization and Economic Growth in Emerging Asian Economies***

The linkages between financial liberalization and economic growth as measured by gross domestic product (GDP) in various emerging Asian countries have been identified in terms of studies relating to the use of cointegration methods and empirical analysis to gauge and predict the impact of salient factors financial liberalization factors which may have an impact on economic growth.

In the case of Malaysia, a study by Ang and McKibbin (2007) investigated whether financial development is promoting economic growth in Malaysia by employing time series data from 1960 to 2001. By using cointegration and causality tests to evaluate the nexus between finance and growth using the real interest rate and financial repression, it was found that financial deepening and economic growth are significantly related and shows that economic growth surge creates greater financial depth for longer periods.

In the case of Thailand, Vohra (2001) studied the nexus between export-growth in Asian countries including Thailand and its relationship with trade liberalization. This study also suggested that liberal market policies and strategies of export growth further encourages foreign investments. Similar findings was suggested for the Philippines. Consequently, Yusoff and Nuh (2015)

found that the Thailand economy is increasingly exposed to foreign trade and foreign direct investment (FDI).

In the case of Indonesia, Sabandi and Noviani (2015) on the other hand contended that the effect of trade liberalization and financial development on economic growth become a perpetual issue in Indonesia. Chakraborty (2010), studied that the effect of the progress in the financial sector on economic growth in India in the post-reform period. In this study, Chakraborty used the Mankiw, Romer, and Weil (1992) model to form a relationship between financial development and economic growth. The findings did not support the theoretical forecast that stock market development may play a vital role in increasing economic growth in India. Sehrawat and Giri (2015) formed a financial development index for the Indian economy and to investigate the impact of financial development index and trade openness on economic growth in India using annual data from 1982 to 2014. The results confirmed that there is a long-run relationship between financial development index, trade openness and economic growth in the Indian economy using the autoregressive distributed lag (ARDL) approach to co-integration.

Shabbir (2013) conducted a theoretical and empirical study on financial liberalization and economic growth for Pakistan. The study shows composite index of internal or local financial liberalization positively impacts economic growth. Furthermore, Ali and Abdullah (2015) examined the impact of trade openness policy to economic growth for Pakistan employing time series data for period of 1980 to 2010 with Johansen cointegration test proficiency level policy and Vector Error Correction Model (VECM). The empirical results indicated positive impact on trade liberalization policies on economy growth in the short run for Pakistan. However, trade liberalization negatively impact economic growth in the long term.

In the case of South Korea, Liu and Hsu (2006), examined the relationship between financial development and the source of growth in Taiwan, Korea, and Japan. They also focused on the role of financial development and structure, monetary, financial policies and the degree of international capital mobility in the economic growth employing generalized method of moments (GMM) and principal component analysis. The analysis found that the real export growth rate had contributed to South Korea. However, the finance aggregate behaved negatively for the Korean economy.

Laurenceson and Chai (2003) conducted a study which looks at the impact of financial liberalization and economic reforms which began in China in 1978. A guide of economic subjugation is assembled for this reason. In essence, financial repression and financial sternness programs in 1985, 1989-1991 and 1994, was argued to contribute towards stable deterioration in the economy. Subsequently,

this study also looked at whether financial liberalization has added to economic expansion as the based on the arguments advanced by McKinnon-Shaw.

### **3. Data and Methodology**

#### **3.1 Data**

The data for this study was taken from financial liberalization factors including EW, FEL and LMF as well as gross domestic product of eight (8) countries including Malaysia, China, India, Thailand, Philippines, Indonesia, South Korea and Pakistan which were chosen based on list of countries listed in on the Standard & Poor's Global BMI and Standard & Poor's/IFCI indices. The dataset consists of weekly data obtained from Thomson Reuters DataStream between January 1998 to December 2014. The financial liberalization factors were derived using methods proposed by Standard & Poor's methodology for developing the S&P Global BMI Index.

All trade liberalization variables are extracted from Thomson Reuters DataStream. Both LMF and FEL were obtained from the External Wealth of Nations Mark II database from the International Monetary Fund (IMF). GDP is extracted from the World Bank Database.

#### **3.2 Financial liberalization factors**

Three financial liberalization factors were used in order to proxy the degree of financial liberalization in each of the eight selected countries. The Lane and Milesi-Ferretti (2007), LMF factor is the sum of a country's assets and liabilities and foreign direct investment divided by GDP. This is a capital flow-based measure and provides a measure as to the extent at which a country restricts international flow of funds. The foreign equity liabilities (FEL) measures the degree in which foreign equity is invested in local stock markets and inadvertently suggests the degree of openness of the stock exchange to foreign investments.

Finally, the Edison and Warnock (2003), EW ratio measures the ratio of a country's SP/IFCI index to its SP Global BMI index. The EW ratio was derived by developing both the SP/IFCI and SP Global BMI index using the index construction methodologies as specified in the S&P Global BMI and S&P/IFCI Methodology brochure which is published by Standard & Poor's. The indices are created based on a list of emerging countries which were included in the index. For the purposes of this study, countries which were chosen for construction of the indices were specifically taken from emerging Asian countries. The index was developed on a daily basis from a base date beginning January 1997 to

December 2017. The index is reconstituted once a year and eligibility criteria requirements such as buffer rules and liquidity requirements were also followed.

The utilization of the EW index as a proxy for financial liberalization and its influence on economic growth has not been tested based on prior literature and this study seeks to provide some compelling evidence as to the efficacy of the EW ratio in predicting a countries economic development. The S&P Global BMI and S&P/IFCI has been lauded by Standard & Poor's as an index which provides investors with a proxy for performance of emerging countries with investable, liquid portfolios and includes South Korea as a subset of the indices. Together with the FEL and LMF financial liberalization factors, it is hoped that the combined series of variables would serve as evidence which can be used in future appraisals of the linkages between financial liberalization factors with economic growth.

The estimation methodology which shall be used for this study will be further explained in this section. The statistical methods which shall be employed includes the unit root tests and the Vector Autoregression (VAR) model.

### 3.3 Unit root tests

The unit root tests are used in order to determine that a time series is stationary and can then be used to select the appropriate cointegration method to be applied in this study. In combination with the autocorrelation function and the Ljung Box Q statistic, the unit root test is accepted as a reliable means to measure the stationarity of a time series. The tests that shall be used in this study to examine stationarity of a time series includes the Augmented Dickey-Fuller (ADF) test, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test and the Dickey-Fuller Generalized Least Squares (GLS) test.

### 3.4 Vector Autoregression (VAR) Model

The VAR (p) model is applied as an expansion of the univariate autoregression model in the case of a dynamic multiple time series model. In such cases where the k variables are not co-integrated, the VAR(p) model is as follows:

$$Y_t = C + \phi_1 Y_{t-1} + \phi_2 \Delta Y_{t-2} + \dots + \phi_p Y_{t-p} + \mu_t, (1)$$

The VAR (p) model is applied in cases where the short-run dynamics is examined where  $Y_t$  is defined as  $(Y_{1,t}, Y_{2,t}, Y_{k,t})$  of  $K \times 1$  vector of constant intercept, each  $A_i$  is a  $k \times k$  coefficient matrix and  $\epsilon_i$  is  $k \times 1$  error vector terms.

In constructing a VAR model, the first step is to determine the appropriate lag length,  $p$ . To determine the order lag length, a variety of methods can be used. However, choosing an optimal lag length is important because an incorrect lag length choice can have a serious adverse effect on empirical results.

The formula for multivariate information criteria are as follows:

$$\text{Multivariate AIC} = \ln|\hat{\Sigma}| + 2m/n \quad (2)$$

$$\text{Multivariate BIC} = \ln|\hat{\Sigma}| + m \left( \ln\left(\frac{m}{n}\right) \right) \quad (3)$$

where  $\hat{\Sigma}$  is the variance covariance matrix of the residuals,  $m (=k(kp+1))$  is the number of parameters, and  $n$  is the number of observations.

Econometricians will use VAR system in order to use the variables interpreted from the VAR model for purposes of interpreting the Granger Causality test, impulse response and forecast error variance decomposition. These analyses are more informative than the VAR coefficients of R2 statistics.

### 3.5 Granger Causality Test

The Granger Causality test can be conducted in two ways. The test can examine short-run dynamics where VAR( $p$ ) with  $k$  variables; estimate the unrestricted (full) model as below:

$$y_{1t} = a_0 + \sum_{i=1}^p a_{1i} y_{1t-i} + \sum_{i=1}^p a_{2i} y_{2t-i} + \dots + \sum_{i=1}^p a_{ki} y_{kt-i} + \varepsilon_{1t} \quad (4)$$

$$y_{2t} = b_0 + \sum_{i=1}^p b_{1i} y_{1t-i} + \sum_{i=1}^p b_{2i} y_{2t-i} + \dots + \sum_{i=1}^p b_{ki} y_{kt-i} + \varepsilon_{2t} \quad (5)$$

$$y_{kt} = e_0 + \sum_{i=1}^p e_{1i} y_{1t-i} + \sum_{i=1}^p e_{2i} y_{2t-i} + \dots + \sum_{i=1}^p e_{ki} y_{kt-i} + \varepsilon_{kt} \quad (6)$$

and the restricted (tested) model by testing  $H_0$ : There is no Granger Causality between the series against  $H_1$ : There is Granger causality between the series. The test statistics are as below:

$$F = \frac{(RSS_R - RSS_u)/p}{(RSS_u/(n - kp - 1))} \sim F\text{Distribution} \quad (7)$$

which is computed where  $RSS_R$  is the residual sum square of the restricted model while the  $RSS_u$  is the residual sum square of the unrestricted model;  $n$  represents number of observations and  $p$  is the order of the VAR model. Based on the hypotheses  $H_0$  is rejected if  $F > F_{\alpha, n-kp-1}$ . The possible outcomes of the

Granger Causality test are unidirectional causality, bidirectional causality or no causality (independence).

#### 4. Empirical Results and Discussion

##### 4.1 Descriptive Statistics

The descriptive statistics for the eight countries selected in this study will be explained in terms of statistical analysis. The results of the statistical analysis for all emerging countries is presented in Table 1 below:

**Table 1: Descriptive statistics for all countries**

	Variable	Mean	Median	Max.	Min.	Std. Dev.
<b>Malaysia</b>	GDP (USD)	189,159	168,087	338,118	77,573	87,783
	EW	0.87	0.91	0.95	0.56	0.1
	FEL	0.16	0.17	0.21	0.11	0.03
	LMF	0.96	0.87	1.32	0.67	0.25
<b>China</b>	GDP (USD)	4,133,145	2,755,692	10,407,700	1,029,071	3,113,266
	EW	0.73	0.69	0.95	0.33	0.17
	FEL	0.12	0.13	0.27	0.03	0.07
	LMF	0.31	0.3	0.41	0.22	0.07
<b>South Korea</b>	GDP (USD)	894521	907465	1412201	376423	305263
	EW	0.81	0.88	0.98	0.16	0.18
	FEL	0	0	0	0	0
	LMF	0.44	0.45	0.71	0.16	0.18
<b>Phillipines</b>	GDP (USD)	187389	181679	276029	128159	44698
	EW	0.92	0.92	0.99	0.77	0.05
	FEL	0.11	0.12	0.17	0.05	0.04
	LMF	0.32	0.29	0.51	0.2	0.09
<b>Pakistan</b>	GDP (USD)	243068	221962	420618	114335	108441
	EW	0.93	0.97	1	0.54	0.11
	FEL	0.25	0.25	0.3	0.2	0.02
	LMF	0.59	0.55	0.98	0.34	0.18

<b>India</b>	GDP					
	(USD)	1055883	891694	2000753	415993	558328
	EW	0.91	0.92	0.97	0.21	0.06
	FEL	0.01	0.01	0.01	0	0
<b>Indonesia</b>	LMF	0.23	0.28	0.4	0.07	0.11
	GDP					
	(USD)	475,830	396,390	919,233	115,912	289,975
	EW	0.86	0.87	1	0.27	0.13
<b>Thailand</b>	FEL	0.17	0.18	0.23	0.1	0.04
	LMF	0.26	0.3	0.42	0.07	0.11
	GDP					
	(USD)	139663	136318	248959	74791	56572
	EW	0.72	0.82	0.99	0.13	0.25
	FEL	0.07	0.07	0.17	0.03	0.03
	LMF	0.12	0.12	0.21	0.08	0.04

The results of the statistical analysis above indicate that China has the largest GDP among all eight selected countries and the lowest is the Philippines. The EW ratio indicate that Pakistan is the most financially liberalized country and the least liberalized is China. The FEL factor implies that Pakistan is the most liberalized economy while the least liberalized being the South Korea. The LMF factor on the other hand shows that Malaysia is the most liberalized and India is the least liberalized among all countries.

#### 4.2 Unit Root Test Results

The unit root tests were initially performed before the cointegration methodology is chosen. The results of the unit root tests based on series of data including LMF, FEL, EW and GDP for all countries are summarized in Table 2 to Table 9 below:

**Table 2: Unit root test for Malaysia**

	Series	Constant	Constant and Trend
<b>ADF Level</b>	LGDP	-0.7623 (0)	-3.3573 (0)*
	ew	-1.8011 (0)	-1.6893 (0)
	fel	-0.8633 (0)	-2.4362 (0)
	lmf	-1.1518 (0)	-2.8654 (0)
<b>First Difference</b>	LGDP	-30.0205 (0)***	-30.0066 (0)***

<b>DF-GLS</b> <i>Level</i>	ew	-29.6186 (0)***	-29.6206 (0)***	
	fel	-29.7390 (0)***	-29.7381 (0)***	
	lmf	-29.7410 (0)***	-29.7254 (0)***	
	LGDP	2.0699(0)***	-3.2096(0)***	
	ew	-0.3195(0)	-1.5297(0)	
	fel	-0.3734(0)	-1.7722(0)*	
<i>First Difference</i>	lmf	-0.2656(0)	-2.3949(0)***	
	LGDP	-29.7629(0)***	-29.9395(0)***	
	ew	-2.2998(10)***	-6.2590(6)***	
	fel	-29.7346(0)***	-29.7693(0)***	
	lmf	-29.7348(0)***	-29.7560(0)***	
	<b>KPSS</b> <i>Level</i>	LGDP	3.7794 (23)***	0.2165 (23)***
ew		1.9368 (23)***	0.5527 (23)***	
fel		2.7190 (23)***	0.2036 (23)***	
lmf		3.2713 (23)***	0.3167 (23)***	
<i>First Difference</i>		LGDP	0.0418 (6)***	0.0340 (6)***
		ew	0.1310 (6)***	0.0487 (6)***
	fel	0.0954 (1)***	0.0597 (1)***	
	lmf	0.0450 (1)***	0.0395 (1)***	

**Table 3: Unit root test for China**

	Series	Constant	Constant and Trend
<b>ADF</b> <i>Level</i>	LGDP	-0.0710 (0)	-3.3573 (0)**
	ew	-1.0241 (0)	-3.2416 (0)**
	fel	-1.8111 (0)	-1.7456 (0)
	lmf	-1.1671 (0)	-2.7729 (0)
<i>First Difference</i>	LGDP	-30.1880 (0)***	-30.1757 (0)***
	ew	-29.3122 (0)***	-29.3001 (0)***
	fel	-29.7209 (0)***	-29.7184 (0)***
	lmf	-29.7600 (0)***	-29.7429 (0)***
<b>DF-GLS</b> <i>Level</i>	LGDP	2.2843(0)***	-1.4953(0)**
	ew	-0.3126 (0)	-2.2630 (0)**
	fel	-0.8754(0)	-1.7283(0)*

	lmf	0.1594(0)	-2.6590(0)***
<i>First Difference</i>	LGDP	-29.7793(0)***	-30.1235(0)***
	ew	-26.9415(0)***	-24.7442(0)***
	fel	-29.7209(0)***	-29.7184(0)***
	lmf	-29.7367(0)***	-29.7638(0)***
<b>KPSS</b> <i>Level</i>	LGDP	3.7996 (23)***	0.5623 (23)***
	ew	3.3016 (23)***	0.1625 (23)***
	fel	0.4809 (23)***	0.4807(23)***
	lmf	3.4079 (23)***	0.2259 (23)***
<i>First Difference</i>	LGDP	0.0867 (9)***	0.0664 (9)
	ew	0.0511 (7)	0.0460 (7)
	fel	0.1087 (0)	0.0566 (1)
	lmf	0.0382 (1)	0.0376 (1)

**Table 4: Unit root test for India**

	Series	Constant	Constant and Trend
<b>ADF</b> <i>Level</i>	LGDP	-0.4224 (0)	-2.6571 (0)
	ew	-5.5544 (8)***	-6.0238 (8)***
	fel	-1.4510 (0)	-1.5044 (0)
	lmf	-1.2002 (4)	-2.0728 (4)
<i>First Difference</i>	LGDP	-30.0509 (0)***	-30.0339 (0)***
	ew	-12.8485 (11)***	-12.8411 (11)***
	fel	-29.7156 (0)***	-29.7001 (0)***
	lmf	-13.3006 (4)***	-13.2972 (4)***
<b>DF-GLS</b> <i>Level</i>	LGDP	2.2370(0)*	-1.9528(0)*
	ew	-5.3419 (8)***	-5.9179 (8)***
	fel	-1.4542(0)	-1.4575(0)
	lmf	0.2790 (4)	-2.0978(4)*
<i>First Difference</i>	LGDP	-29.7659(0)***	-29.9860(0)***
	ew	-3.0170(18)***	-13.0642(7)***
	fel	-29.7322(0)***	-29.7333(0)***
	lmf	-13.2436(4)***	-13.2790 (4)***
<b>KPSS</b> <i>Level</i>	LGDP	3.7907 (23)***	0.3710 (23)***
	ew	1.3046 (19)***	0.3026 (19)***

<i>First Difference</i>	fel	1.3357 (23)***	0.6210(23)***
	lmf	3.2869 (23)***	0.4969 (23)***
	LGDP	0.0802 (7)***	0.0801 (7)
	ew	0.5000 (885)	0.5000 (885)
	fel	0.1282 (0)	0.1158 (0)
	lmf	0.0670 (1)	0.0535 (2)

**Table 5: Unit root test for Indonesia**

	Series	Constant	Constant and Trend
<b>ADF</b> <i>Level</i>	LGDP	-1.3572 (4)	-2.3150 (4)
	ew	-3.3816 (4)**	-3.3680 (4)*
	fel	-2.2291 (4)	-3.4153 (4)**
	lmf	-1.8491 (4)	-2.4080 (4)
<i>First Difference</i>	LGDP	-13.6551 (4)***	-13.6928 (4)***
	ew	-13.5161 (4)***	-13.5090 (4)***
	fel	-13.2546 (4)***	-13.2480 (4)***
	lmf	-13.2364 (4)***	-13.3107 (4)***
<b>DF-GLS</b> <i>Level</i>	LGDP	1.9236(4)*	-2.2864(4)*
	ew	-2.9275 (4)**	-3.2161 (4)***
	fel	-0.5124(4)	-3.2379(4)***
	lmf	-0.9418 (4)	-1.0203(4)
<i>First Difference</i>	LGDP	-13.2778(4)***	-13.5649(4)***
	ew	-13.0274(4)***	-13.3741(4)***
	fel	-13.2389(4)***	-13.2523(4)***
	lmf	-13.2371(4)***	-13.2852 (4)***
<b>KPSS</b> <i>Level</i>	LGDP	3.7728 (23)***	0.2921 (23)***
	ew	1.1661 (23)***	0.1570 (23)***
	fel	2.2259 (23)***	0.0888(23)***
	lmf	2.2657 (23)***	0.5466 (23)***
<i>First Difference</i>	LGDP	0.1187 (6)***	0.0442 (7)*
	ew	0.0246 (5)	0.0227 (5)
	fel	0.0255 (1)	0.0250 (1)
	lmf	0.2614 (0)	0.0747 (2)

**Table 6: Unit root test for Thailand**

	Series	Constant	Constant and Trend
<b>ADF</b> <i>Level</i>	LGDP	-0.5518 (0)	-2.2174 (0)
	ew	-2.1574 (0)	-2.7132 (0)
	fel	-2.5414 (0)	-2.7577 (0)
	lmf	-0.2465 (0)	-2.6990 (0)
<i>First Difference</i>	LGDP	-30.0151 (0)***	-29.9987 (0)***
	ew	-30.0505 (0)***	-30.0394 (0)***
	fel	-29.7158 (0)***	-29.7000 (0)***
	lmf	-29.8065 (0)***	-29.8110 (0)***
<b>DF-GLS</b> <i>Level</i>	LGDP	2.0251(0)**	-1.9074(0)*
	ew	-1.8168 (0)*	-1.8921 (0)*
	fel	-2.5378(0)**	-2.6306(0)***
	lmf	-1.0633 (0)	-2.2360(0)*
<i>First Difference</i>	LGDP	-29.7623(4)***	-29.9483(4)***
	ew	-29.8907(0)***	-30.0507(0)***
	fel	-29.7322(0)***	-29.7333(0)***
	lmf	-29.7414(0)***	-29.8403 (0)***
<b>KPSS</b> <i>Level</i>	LGDP	3.7791 (23)***	0.3519 (23)***
	ew	1.2614 (23)***	0.2172 (23)***
	fel	0.5354 (23)***	0.1417(23)***
	lmf	3.3364 (23)***	0.3816 (23)***
<i>First Difference</i>	LGDP	0.0887 (6)***	0.0881 (6)
	ew	0.0751 (1)	0.0668 (1)
	fel	0.0374 (0)	0.0361 (0)
	lmf	0.0863 (2)	0.0230 (3)

**Table 7: Unit root test for Philippines**

Series	Constant	Constant and
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			<b>Trend</b>
<b>ADF</b> <i>Level</i>	LGDP	0.08532 (0)	-4.8616 (0)***
	ew	-3.5888 (0)	-3.5734 (0)***
	fel	-0.8260 (0)	-2.0260 (0)
	lmf	-0.3464 (0)	-2.6316 (0)
<i>First Difference</i>	LGDP	-30.2067 (0)***	-30.1997 (0)***
	ew	-29.4695 (0)***	-29.4600 (0)***
	fel	-29.7558 (0)***	-29.7430 (0)***
	lmf	-29.7633 (0)***	-29.7817 (0)***
<b>DF-GLS</b> <i>Level</i>	LGDP	3.1319(0)***	-2.8868(0)***
	ew	-1.3627 (0)	-2.5951 (0)***
	fel	0.1061(0)	-1.7637(0)*
	lmf	-0.3623 (0)	-1.7016(0)*
<i>First Difference</i>	LGDP	-29.7812(0)***	-30.1560(0)***
	ew	-3.9889(8)***	-17.5168(1)***
	fel	-29.7363(0)***	-29.7734(0)***
	lmf	-29.7370(0)***	-29.8098 (0)***
<b>KPSS</b> <i>Level</i>	LGDP	3.7748 (23)***	0.3540 (23)***
	ew	0.3990 (23)***	0.2172 (23)***
	fel	2.8820 (23)***	0.2956(23)***
	lmf	3.3364 (23)***	0.3816 (23)***
<i>First Difference</i>	LGDP	0.0486 (9)***	0.0159 (10)
	ew	0.0426 (1)	0.0249 (1)
	fel	0.0837 (1)	0.0779 (1)
	lmf	0.1289 (1)	0.0332 (2)

**Table 8: Unit root test for Pakistan**

		<b>Constant</b>	<b>Constant and Trend</b>
<b>ADF</b> <i>Level</i>	LGDP	-0.0184 (0)	-3.2771 (0)*
	ew	-1.4092 (0)	-2.3707 (0)
	fel	-2.7015 (0)*	-2.8553 (0)
	lmf	-1.6873 (0)	-2.1387 (0)

<i>First Difference</i>	LGDP	-30.0299 (0)***	-30.0298 (0)***
	ew	-30.6133 (0)***	-30.5984 (0)***
	fel	-29.7153 (0)***	-29.7024 (0)***
	lmf	-29.7289 (0)***	-29.7122 (0)***
<b>DF-GLS Level</b>	LGDP	2.3695(0)**	-1.8666(0)*
	ew	-1.4019 (0)	-1.6158 (0)
	fel	-2.4150(0)**	-2.5086(0)**
	lmf	-0.7189 (0)	-2.1415(0)**
<i>First Difference</i>	LGDP	-29.7665(0)***	-30.0186(0)***
	ew	-30.6206(0)***	-30.6316(0)***
	fel	-29.7321(0)***	-29.7333(0)***
	lmf	-29.7335(0)***	-29.7415 (0)***
<b>KPSS Level</b>	LGDP	3.7667 (23)***	0.3540 (23)***
	ew	2.3092 (23)***	0.5243 (23)***
	fel	0.5399 (23)***	0.2612(23)***
	lmf	1.8582 (23)***	0.3429 (23)***
<i>First Difference</i>	LGDP	0.0854 (7)***	0.0597 (7)
	ew	0.1098 (3)	0.1146 (3)
	fel	0.0441 (0)	0.0313 (0)
	lmf	0.0550 (0)	0.0536 (0)

**Table 9: Unit root test for South Korea**

	Series	Constant	Constant and Trend
<b>ADF Level</b>	LGDP	-1.6198 (0)	-2.4849 (0)
	ew	-3.3068 (0)***	-3.4667 (0)**
	fel	-2.0031 (0)**	-1.9793 (0)
	lmf	-1.2919 (0)	-3.5263 (0)
<i>First Difference</i>	LGDP	-29.9428 (0)***	-29.9563 (0)***
	ew	-29.6846 (0)***	-29.6706 (0)***
	fel	-29.7797 (0)***	-29.7907 (0)***
	lmf	-29.7712 (0)***	-29.7556 (0)***

<b>DF-GLS</b> <i>Level</i>	LGDP	1.5797(0)	-1.6861(0)*
	ew	-3.1719 (0)***	-3.2053 (0)***
	fel	0.3757(0)	-1.3462(0)
	lmf	0.3413 (0)	-3.5262(0)***
<i>First Difference</i>	LGDP	-29.7551(0)***	-29.8505(0)***
	ew	-18.4324(8)***	-29.0759(0)***
	fel	-29.7387(0)***	-29.7576(0)***
	lmf	-29.7378(0)***	-29.7682 (0)***
<b>KPSS</b> <i>Level</i>	LGDP	3.5187 (23)***	0.5763 (23)***
	ew	0.5452 (23)***	0.2896 (23)***
	fel	2.2089 (23)***	0.6193(23)***
	lmf	3.3364 (23)***	0.3816 (23)***
<i>First Difference</i>	LGDP	0.1266 (5)***	0.0298 (6)**
	ew	0.0273 (2)	0.0183 (2)
	fel	0.1596 (2)	0.0632 (2)
	lmf	0.0252 (2)	0.0223 (2)

Results from the unit root test for all countries indicate that all the variables are non-stationary in level form. However, the series is stationary after taking first difference. Hence, the vector autoregression model is proposed for this selection of variables. Furthermore, after having performed the lag order selection test, it was determined that the VAR(1) model is most suitable for this study when it comes to all countries except for India. The VAR(5) model is proposed for India. Also, the R-square and adjusted R-squared for the model is very high in all countries, implying that the model is reliable for purposes of analysis.

The results from the robustness tests seem to indicate that there is evidence of autocorrelation when it comes to Indonesia, Thailand, Philippines and South Korea. The AR Roots polynomial test on the other hand indicates that all countries are appropriate for purposes of analysis. The heteroscedasticity test furthermore provides evidence that there is issues relating to heteroscedasticity in Malaysia, China, Thailand, South Korea and Pakistan.

#### 4.3 Granger causality test results

The results of the Granger causality tests for all countries are presented in Table 10. In the case of Malaysia, the results of the Granger causality tests seem to

indicate that GDP and LMF Granger causes the EW financial liberalization factor. This would imply that financial liberalization factors do not have any predictive ability in order to predict the level of GDP in Malaysia. For China, the results of the Granger causality tests seem to indicate that GDP factor Granger causes the EW financial liberalization factor. It was also found that GDP Granger causes LMF. This would imply that the EW financial liberalization factor does not have predictive qualities and cannot predict the level of GDP in China.

In India, the results of the Granger causality tests seems to indicate all the variables chosen in this study do not have any short-run dynamic linkages. Hence, this would imply that the financial liberalization factors do not have predictive ability when it comes to predicting GDP in India. In the case of Indonesia, the results of the Granger causality tests seem to indicate that GDP Granger causes the FEL and LMF financial liberalization factor. Also, there are short-run dynamics between FEL and LMF where FEL Granger causes LMF in the short-run. This would imply that financial liberalization factors does not have any predictive ability in order to predict the level of GDP in Indonesia.

When it comes to Thailand, the results of the Granger causality tests seem to indicate that FEL Granger causes EW and vice versa. This bi-directional short-term relationship would imply that these financial liberalization factors have strong relationships with one another and predicts each other's performance. However, the financial liberalization factors do not have any predictive qualities in order to predict the level of GDP in Malaysia.

The results of the Granger causality tests in the Philippines seem to indicate that GDP Granger causes the FEL and LMF financial liberalization factors. However, the results indicate that financial liberalization factors do not have any predictive ability in order to predict the level of GDP in Malaysia. For South Korea, the results of the Granger causality tests seem to indicate that LMF Granger causes the GDP. LMF also Granger causes EW. GDP on the other hand Granger causes LMF. This would imply that financial liberalization factors does have any predictive qualities and can be used to predict the level of GDP in South Korea.

Finally, in the case of Pakistan, the results of the Granger causality tests seem to indicate that GDP and LMF Granger causes the EW financial liberalization factor. This would imply that financial liberalization factors do not have any predictive ability here as well to predict the level of GDP in Pakistan.

**Table 10: Granger Causality Test Results**

Dependant Variable	EW					
	LGDP→EW	LGDP→FEL	LGDP→LMF	EW→LGDP	EW→FEL	EW→LMF
China	3.4257*	1.1435	1.2614	1.8035	0.4695	1.5066

India	1.7754	0.2699	2.0265	0.1836	0.1306	0.4397
Indonesia	0.0025	0.1010	0.4027	0.0026	0.9574	2.6128
Malaysia	1.0387	0.3742	2.0996	2.9271*	0.3084	1.7236
Pakistan	3.9785**	0.1374	0.8095	2.4157	3.2919*	0.9439
Phillipines South	0.0008	0.1335	0.0166	3.8620	0.4949	0.8956
Korea	0.3143	0.9090	2.7076*	1.9642	0.2593	5.4887**
Thailand	2.5026	0.0205	0.1772	0.5235	5.2452**	0.0913
Dependant Variable	FEL			LMF		
	FEL→LGDP	FEL→EW	FEL→LMF	LMF→LGDP	LMF→EW	LMF→FEL
China	0.2040	0.5066	1.7380	3.5865*	0.3609	3.8738**
India	1.2853	1.7882	1.4222	3.3731	1.6118	1.6957
Indonesia	4.1511	0.2675	0.9291	8.4313	1.7082	3.0631
Malaysia	2.6981	1.3815	1.8610	3.3730*	0.6435	0.0654
Pakistan	1.1971	1.5922	1.8646	0.1531	1.0370	1.0706
Phillipines South	0.0013**	2.0272	1.1006	6.6722***	0.0001	0.2412
Korea	0.9590	0.0990	0.7641	4.8176**	0.0018	1.3544
Thailand	0.1364	2.7639*	0.1999	2.0779	0.2735	2.3394

This Table presents the log-likelihood statistics of the causality tests distributed  $X^2$ .

\*\*\*Represent significance at 1% level.

\*\*Represent significance at 5% level.

\*Represent significance at 10% level.

## 5. Conclusion

Results of the study seem to indicate that financial liberalization factors do not have any predictive abilities in predicting GDP in Malaysia, China, India, Indonesia, Thailand, Philippines and Pakistan. However, the only exception is in the case of South Korea where it was found that the LMF factor Granger causes GDP. Bi-directional causality was found in the case of Thailand (FEL and EW) and South Korea (LMF and GDP). Results from the impulse response function indicate the financial liberalization factors predicts an increase in GDP in the future for countries such as Malaysia, China, India and Thailand. Impulse response in Indonesia and Philippines does not indicate that financial liberalization factors will result in any changes to GDP even though GDP remains positive.

The results are mixed when it comes to South Korea where the LMF factor predicts an increase in GDP while the EW ratio predicts a decrease in GDP. In

the case of Pakistan, the EW factor predicts an increase in GDP while the FEL factor predicts a decrease in GDP.

The results of the study would indicate that financial liberalization factors are most useful in predicting economic growth in countries which are classified as developed countries such as South Korea. The opposite can be said when it comes to the other emerging economies in this study where the financial system is still in the process of being liberalized and financial market regulations and foreign investor participation in the markets can be improved.

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