Management Science Letters 9 (2019) 851–864

Contents lists available at GrowingScience

Management Science Letters

homepage: www.GrowingScience.com/msl

Financial depth and economic growth: Empirical evidence from ASEAN+3 countries

Quoc Hoi Le[a*], Hoang Lan Ho[a] and Thuy Duong Vu[a]

[a]*National Economics University, 207 Giai Phong Road, Hanoi, Vietnam*

C H R O N I C L E

Article history:
Received: January 18, 2019
Received in revised format: February 29, 2019
Accepted: March 6, 2019
Available online:
March 6, 2019

Keywords:
Financial depth
Economic growth
ASEAN+3 countries

A B S T R A C T

Nexus between financial depth and economic growth has been studied for long time and still attracts great attention from policymakers. This research examines the relationship among ASEAN+3 countries from 2000 to 2014 based on Cobb-Douglas theoretical framework. The results show that financial depths measured by domestic credit to private sector, M3 and stock market capitalisation all have significant effects on economic growth. The paper also gives policy recommendations to promote financial development for purposes of long-term economic growth in ASEAN+3 countries.

© 2019 by the authors; licensee Growing Science, Canada

1. Introduction

Strategies to stimulate economic growth have always been a crucial question to which policymakers pay attention and it is also an ultimate purpose of all macroeconomic researches. Numerous models that found determinants of economic growth have been established. One of the most well-known models is Cobb-Douglas function including labour, capital and TFP. Nevertheless, labour and capital follow diminishing marginal productivity, thus, in order to stimulate growth, investing in these two factors is not as efficient as increasing TFP. TFP takes many different forms such as technology, education, etc. Among those, financial development plays an important role in promoting economic growth. There is a huge amount of studies on the relationship between financial development and economic growth. In 1911, Schumpeter, who found that finance caused growth, laid the first foundation for researches on this topic (King & Levine, 1993; Svirydzenka, 2016; Le & Chu, 2016). Afterwards, numerous theoretical and empirical frameworks have been implemented in various regions and timeframe. Debates on this controversial interconnection seem to continue as future researches.

Given the importance of financial development, particularly financial depth, and its controversial correlation with economic growth, this project aims at answering whether there is any relationship between financial depth and economic growth in ASEAN+3 countries from 2000 to 2014. Two reasons for choices

* Corresponding author.
E-mail address: hoilq@neu.edu.vn (Q. H. Le)

© 2019 by the authors; licensee Growing Science, Canada
doi: 10.5267/j.msl.2019.3.003

of area and time period are provided. First, ASEAN+3 countries were chosen, including 5 ASEAN countries such as Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, and China, Japan and Korea – 3 strategic partners of ASEAN over a 15-year period between 2000 and 2014. Brunei, Timor Leste, Cambodia, Laos and Myanmar are omitted due to serious lack of data. Importantly, ASEAN is not just an association but a comprehensive community including economic, socio-cultural and political-security pillars being gradually established. In 2015, establishment of ASEAN Economic Community (AEC) was a crucial movement that strengthens financial and economic integration among members (The ASEAN Secretariat, 2015). Obviously, ASEAN becomes a stronger, closer and more dynamic cross-border community in Asia. Thus, researches on nexus between financial depth and economic growth play an important role in policy recommendations to stimulate development of integrated economic community and further cooperation with 3 external partners. Second, a period from 2000 to 2014 is long enough to cover recent important events such as 2007 adoption of ASEAN legal charter initiating free-trade purposes, and GFC in 2008-2009. Analysis on nexus between financial and economic development during the time these special events happened might be useful to recognise their effects.

There are some research gaps which are expected to be filled by this study. First, among numerous researches on finance-growth topic, few studies have been accomplished in ASEAN region which experienced dynamic and rapid growth. This research will examine the relationships among ASEAN+3 countries. Second, the chosen period are not long enough to cover current serious events such as GFC. Studies of Zhang et al. (2012), Caporale et al. (2009), Bayar (2014), Samargandi et al. (2015), Cojocaru et al. (2015) all had time periods that ended before 2009. In other words, they excluded effect of GFC on finance-growth nexus. Thus, in this research, a period from 2000 to 2014 was chosen to cover GFC. Finally, exclusion of several important variables such as legal or institutional and financial repression indicators was mentioned in few studies such as that of Levine et al. (2000), Ang and McKibbin (2007). Effects of stock market were excluded from researches of Gregorio and Guidotti (1995), Levine et al. (2000), Ang and McKibbin (2007), Nguyen and Anwar (2009), Zhang et al. (2012), Dudian and Popa (2013) and Cojocaru et al. (2015). Therefore, this research will discuss impacts of not only direct finance (via stock market), indirect finance (via banking sector) but also governance elements.

The research is divided into 7 sections. Following Introduction, part 2 is Literature Review which presents different hypotheses in the field. Part 3 concentrates on an overview of financial system in ASEAN+3 nations. Methodology and data descriptions are provided in part 4. Empirical results and discussions are presented in parts 5 and 6. The last section is a conclusion of this research.

2. Literature review

As importance of financial development is recognised, causality between financial development and economic growth has been studied for such a long time. However, no uniform relationship was claimed. There are, at least, 5 hypotheses that have been found at both national and regional levels during different time periods.

2.1. Supply leading hypothesis

This hypothesis in which financial development leads to economic growth is the earliest and most popular causality. Those researches will be divided into sub-groups based on geographical distinction. First of all, numerous studies have been done worldwide. King and Levine (1993), De Gregorio and Guidotti (1995), Khan and Senhadji (2000) employed cross-sectional OLS or two-stage least-square regressions on samples during quite similar periods. Importantly, all 3 studies mentioned effects of banking system via domestic credit, banks' assets and loans variables, but only research of Khan and Senhadji (2000) included bond and stock market factors. Although there were differences in selected countries and variables, they found a significantly positive link and confirmed that financial depth was a prerequisite of economic growth. Besides, Levine et al. (2000) used GMM estimators and included legal variables in their model. They supported supply-leading hypothesis, however, they did not disapprove the opposite direction. Legal variables were found to be determinants of financial development and then contributed

to economic growth. Moreover, Graff (2001) and Samargandi et al. (2015) used PCA method to construct a single financial development indicator. According to Samargandi et al. (2015), there was a negative nexus in the short-run rather than long-run and a possibility of inverted U-shaped relationship between finance and growth. This research used ARDL model and 2 non-monotonic methodologies, then, concluded that financial development affected growth differently across countries. Graff (2001) also found the same result. Specifically, finance affects growth more in less developed economies. Secondly, there were several researches examining the relationship in Asian countries. At regional level, a comprehensively positive link from development of stock market, financial and banking system to real-GDP-per-capita growth has been established (Estrada et al., 2010). It was also suggested that institutional reforms in each country differently affected economic growth and those reforms benefited growth. This research made use of fixed-effect and random-effect regressions. Similarly, Bayar (2014) used the same methods and found financial development's positive influences on growth. The only difference between 2 studies is that the latter was implemented on smaller sample size during shorter time period and did not mention institutional effects. Pradhan et al. (2014), who employed PCA to construct banking sector as well as stock market indicators and causality tests to find the relationship, found the same results in ASEAN countries from 1961 to 2012. Furthermore, studies also were accomplished in some specific nations. Yang and Yi (2008) used super-exogeneity tests, then, found only unidirectional relationship in which finance determines growth in Korea between 1971 and 2002. Rather than national data, province-level or state-level data was examined in studies of Nguyen and Anwar (2009), Hasan et al. (2009), Zhang et al. (2012), Sehrawat and Giri (2015). Nguyen and Anwar (2009) performed a survey in Vietnam by using GMM whereas Sehrawat and Giri (2015) employed Fully Modified OLS to examine Indian data. However, they shared some common features such as exclusion of stock market effects and findings of unidirectional causality from banking sector development to economic growth. Meanwhile, in researches of Hasan et al. (2009) and Zhang et al. (2012), both OLS regressions and GMM were used to test causal nexus in China. Importantly, they emphasised the effects of financial reforms and claimed that institutional development was significantly correlated with growth. However, the results on causality between finance and growth were not constant. According to Hasan et al. (2009), only positive impacts of capital market on economic growth were observed while banking sector seemed to have insignificant or negative effects. In addition, new EU members considered as transition economies have been studied by Caporale et al.(2009), Dudian and Popa (2013), Cojocaru et al. (2015). They examined data of CEE and CIS countries over similar time periods. While Caporale et al. (2009) and Cojocaru et al. (2015) made use of GMM for panel data, Dudian and Popa (2013) implemented their research by using simple OLS, Fixed- and Random-effect regressions to test dependency of 4 scenarios. They concluded that bad loans, interest rate spread negatively affected growth but growth rates of private credit and money supply were significant determinants of growth. Using OLS for cross-sectional data and GMM for panel data, Caporale et al. (2009) observed only unidirectional nexus from finance to growth. They also found that income, lending rates, non-performing loans, inflation and reforms determined credit growth. Similarly, Cojocaru et al. (2015) supported a positive finance-led causality. Furthermore, Abu-Bader and Abu-Qarn (2008), Kouki (2013) and Abida et al. (2015) have done researches on Africa. Commonly, a strong relationship has been established. However, only Abu-Bader and Abu-Qarn (2008) using VECM, Toda-Yamamoto Modified Wald and Granger tests proved a strong unidirectional causality which follows supply-leading hypothesis. They also emphasised importance of financial reforms. To examine relatively similar samples, Kouki (2013) employed Fully-Modified OLS whereas Abida et al. (2015) used GMM. In Egypt, Morocco and Tunisia, finance enhanced growth; however, there was a negative relationship in Algeria (Kouki, 2013).

2.2. Demand leading hypothesis

The second hypothesis is that economic growth stimulates financial development. Robinson (1952, cited by Levine, 1997) claimed that finance follows growth. Liang and Teng (2006), Ang and McKibbin (2007) employed VAR framework, co-integration and causality tests to prove close and unidirectional demand-leading correlation. Although these studies examined the same period of time, the former was done in

China and the latter used data of Malaysia. Especially, Ang and McKibbin (2007) included effects of financial repression. Financial repression presented by required reserve ratio, liquidity ratio, lending and deposit rates was negatively related to financial depth and growth. In contrast, Gregorio and Guidotti (1995) observed a negative correlation between financial liberalisation and economic growth in Latin countries. Besides, findings of Rachdi and Mbarek (2011) were a combination of both unidirectional growth-led nexus in 4 MENA countries and bi-directional relationship in 6 OECD nations. They made use of GMM to confirm the strong relationship and ECM to find the direction of that relationship.

2.3. Bi-directional causality

In addition to unidirectional nexus, bi-directional causality was found in many studies. Demetriades and Hussein (1996), Hassan et al. (2011), Borlea et al. (2016) did researches on worldwide scale. Demetriades and Hussein (1996) covered only 16 countries and mainly used banking indicators to represent for financial development. Using VAR framework and ECM-based causality test, they found that on average, there was a bi-directional relationship. Hassan et al. (2011) also jumped to the same conclusions although they employed various approaches to examine larger sample. They used OLS, WLS regressions for panel models and VAR for time-series ones. Only savings, credit and money supply variables were included in these models. On the other hand, Borlea et al. (2016) did not mention the effects of financial institutions but used only financial market indicators such as market capitalisation, stocks traded and turnover to represent for financial development. Finance-led, growth-led and feedback relationships have been found in various regions. Biswas (2008), Jun (2012), Pradhan et al. (2013) examined finance-growth nexus in Asian countries. They included all money supply, banking sector and stock market indicators. Jun (2012) confirmed a significant 2-way relationship between finance and growth in 27 Asian nations after running CCR, Dynamic OLS and Fully-Modified OLS regressions. Biswas (2008) and Pradhan et al. (2013) used PCA for indicator construction and similar sets of related tests for causality findings. They also found a mixed result across countries and did not totally support any unidirectional hypotheses. Specifically, Pradhan et al. (2013) did a more comprehensive research and studied not only finance-growth nexus but also social-economic and social-financial relationships.

2.4. Other findings

Hye (2011) and Al-Malkawi et al. (2012) found negative finance-growth relationship. Hye (2011) examined Indian data from 1978 to 2002 by ARDL and rolling-window models. Financial development indicator was constructed from credit, money supply and stock market variables by PCA. Both short-run and long-run negative connections between financial development and growth have been found. Al-Malkawi et al. (2012) also used ARDL approach but they excluded stock market effects. This research showed a feedback but negative finance-growth relationship in United Arab Emirates. Lucas (1988, cited by Levine, 1997) stated that financial was overestimated in contribution to growth. Stern (1989) even did not include financial system when he did research on factors of economic growth. Al-Zubi et al. (2006) implemented an empirical research on 11 Arab countries between 1980 and 2001 by employing OLS, Least-squares Dummy variable and ECM approaches. As a result, no significantly strong nexus has been established.

3. Overview of financial Asean+3 countries

An overview of financial system in ASEAN+3 countries should be taken into consideration to recognise basic characteristics and differences of financial systems in selected nations. For the purposes of this article, only financial variables included in the model are discussed.

3.1. Domestic credit to private sector

Financial institutions depth is captured by domestic-credit-to-private-sector. Japan remained the highest value at around 200% over 15 years. Between 2000 and 2008, domestic-credit-to-private-sector of Malaysia, Thailand, Singapore and China fluctuated around 100%, whereas Korea witnessed the increase by 75%-point. However, 5 countries had upward tendency to 150% from 2011 to 2014. There was a

downward trend in Philippines and Brunei, while Cambodia, Indonesia and Vietnam had upward tendency. Especially, this indicator in Vietnam significantly rose by 70%-point over 15 years. Dunn (2016) put this substantial credit growth in the context of slow economic activities and concluded that it would be a challenge rather than an achievement.

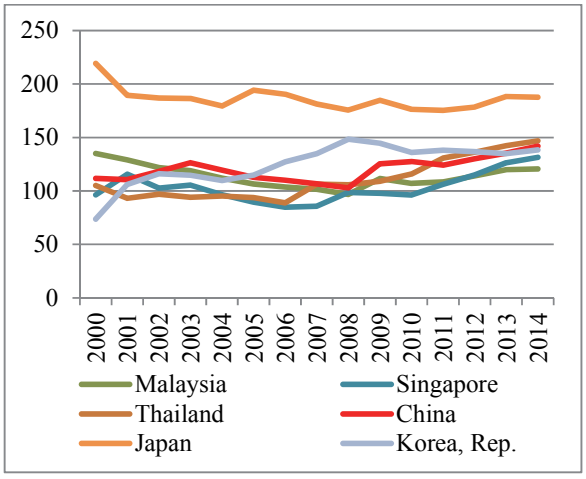

Fig. 1. Domestic credit to private sector in more developed financial systems (% of GDP)
Data source: World Bank Global Financial Development Database

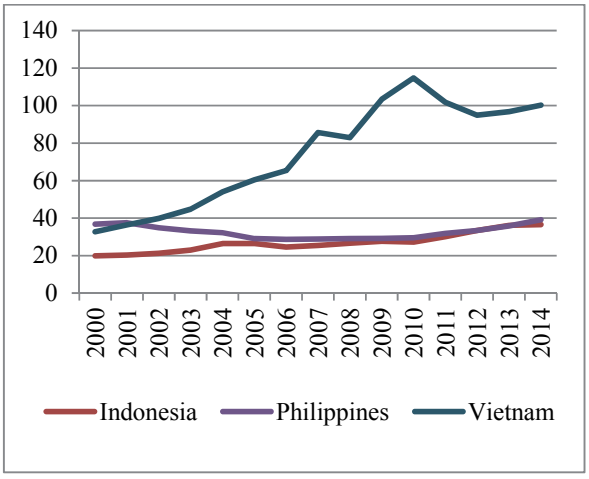

Fig. 2. Domestic credit to private sector in less developed financial systems (% of GDP)

3.2. Broad money (M3)

Another aspect of financial depth is liquid-liabilities-to-GDP, which is displayed in Fig. 3 and Fig. 4. Japan, again, held the first rank at around 200% over 19 years. During this period, there were slight changes in liquid liabilities of Malaysia, Singapore and Thailand which remained at 100%. Meanwhile, China witnessed a huge increase from 100% in 1996 to around 180% in 2014. Similarly, liquid liabilities in Vietnam and Korea rose sharply by 100%-point over 19 years. However, broad money of Brunei and Indonesia followed a downward trend. Especially, in Brunei, this indicator in 2014 was only half of it in 1996.

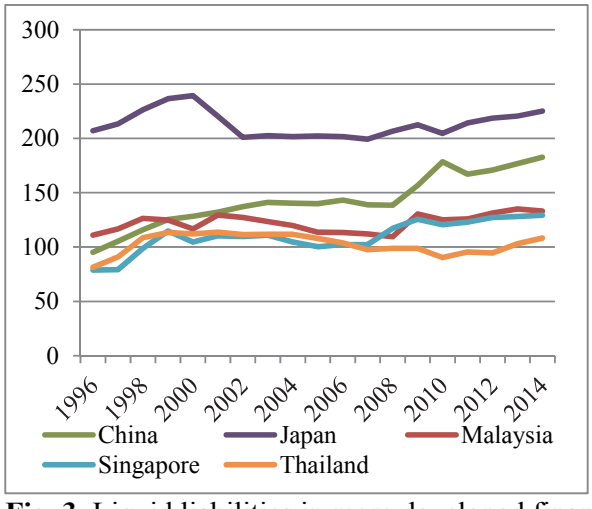

Fig. 3. Liquid liabilities in more developed financial systems (% of GDP)
Data source: World Bank Global Financial Development Database

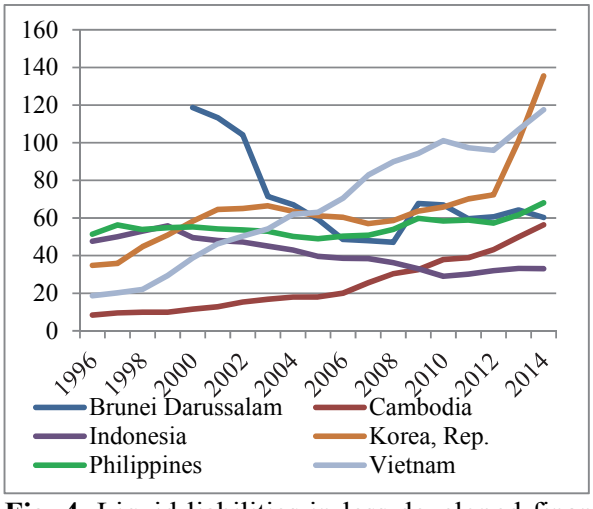

Fig. 4. Liquid liabilities in less developed financial systems (% of GDP)

3.3. Stock market capitalisation

The depth of financial markets is represented by stock market capitalisation. From 2004 to 2014, Singapore continuously possessed the highest share value. Singapore market capitalisation rose by 100%-point. Malaysian one ranked the second place over 11 years. Its market capitalisation fluctuated around 125%. Meanwhile, the value of other markets varied between 0% and 100%. Especially, the lowest market capitalisation belonged to Vietnam. It is commonly known that stock market in Vietnam has not yet developed (Nguyen, 2016). In 2004 and 2005, Vietnamese stock value was absolutely small at nearly 0% of GDP. Until now, it has only reached to the level of 23%.

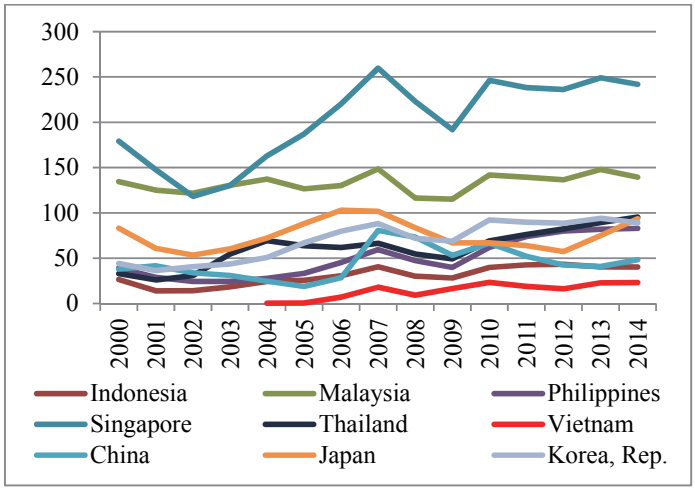

Fig. 5. Stock market capitalisation to GDP (%)
Data source: World Bank Database, BIS Debt Securities Statistics

3.4. Net interest margin (NIM)

Financial institutions efficiency is represented by Net Interest Margin (NIM). NIM in developed systems is smaller than other systems. Japan possessed the lowest and relatively stable NIM at 1%. Meanwhile, other countries witnessed sudden changes in this indicator. In terms of developed systems, 2 large fluctuations in NIM happened from 2004 to 2007 and from 2009 to 2011. After GFC, more risks appeared as numerous corporations went bankrupt, which explained for rising NIM. However, developing and less developed systems did not witness large changes during the crisis and post-crisis periods. Between 2006 and 2013, NIM in Thailand, Vietnam and Philippines was around 3.5% and had tendency to fall, whereas this indicator in Indonesia was quite high at about 6%. From 1998 to 2002, while Indonesia faced with substantial rise in NIM, there was a large fall in Philippines.

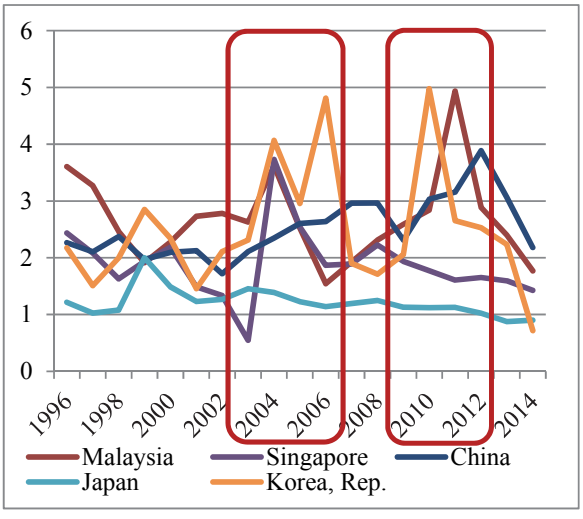

Fig. 6. Net interest margin in more developed systems (%)

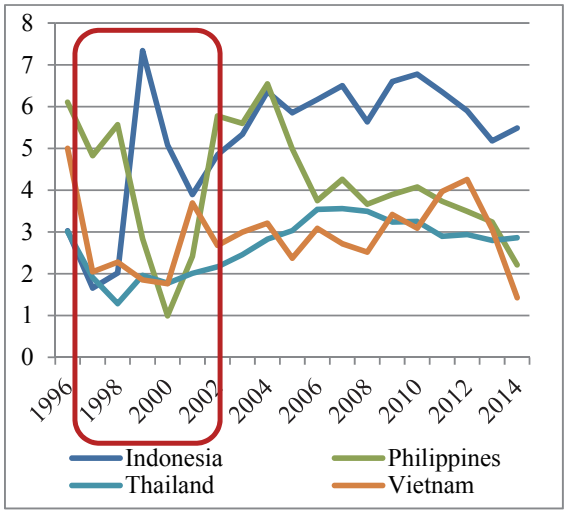

Fig. 7. Net interest margin in less developed systems (%)

Data source: World Bank Global Financial Development Database

4. Data and methodology

4.1. Theoretical framework

This research aims at examining supply-leading hypothesis by employing quantitative methods to establish a nexus between financial development and economic growth in ASEAN+3 countries from 2000 to 2014. Financial development might be considered as an element of TFP. Thus, Cobb-Douglas function has been employed as a theoretical framework.

$$Y = AxL^{\alpha}xK^{1-\alpha}, \tag{1}$$

where Y is GDP; A stands for *TFP*, or Financial development in particular; K stands for Capital and L represents for Labour. This equation can be rewritten as follow.

$$\ln(Y) = \alpha_0 + \alpha_1 \ln(A) + \alpha_2 \ln(L) + \alpha_3 \ln(K). \tag{2}$$

Starting from theoretical framework, basic equation can be demonstrated as follow.

$$GROWTH_{i,t} = \beta_0 + \beta_1 FINANCE_{i,t} + \beta_2 CONDITIONING_{i,t} + \varepsilon_{i,t}, \tag{3}$$

where *GROWTH* is economic growth rate; *FINANCE* consists of financial development variables; *CONDITIONING* includes a set of other determinants of growth.

4.2. Data collection

Data was chosen from ASEAN+3 countries including Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, China, Japan and Korea over a 15-year period between 2000 and 2014. Brunei, Cambodia, Laos and Myanmar are omitted due to serious lack of data. Data was drawn from World Bank Database including World Development Indicators (WDI), Global Financial Development (GFD) and Worldwide Governance Indicators (WGI). Real-GDP-per-capita growth rate is the best proxy for dependent variable denoted by GROWTH. It measures growth of actual output and is useful to make comparison among different countries. This variable is directly drawn from WDI. In terms of FINANCE, there are 4 indicators representing for depth and efficiency of financial institutions and markets. Firstly, ratio of domestic-credit-to-private-sector to GDP measures depth of financial intermediaries. The higher the ratio, the more developed the financial system. Levine et al. (2000) claimed that this indicator was better than 'Gross-credit-to-private-sector divided by GDP' or 'Private-credit-by-deposit-money-banks to GDP', since it did not include credit for authorities, public firms as well as credit provided by central banks but it did include credit by non-bank institutions. Secondly, ratio of broad money to GDP represents for monetisation. It includes activities of all central banks, financial and non-financial institutions. Thirdly, stock market capitalisation to GDP is a proxy for financial market depth. Last but not least, net interest margin (NIM) is a useful efficiency measure of financial institutions. NIM, which is spread between deposit and lending interest rates, reflects costs required by banks and market competition. CONDITIONING is a set of other factors that affect growth. Since capital and labour are important determinants of growth, the model uses gross-capital-formation to GDP ratio and labour-force to population ratio as proxies. Importantly, to observe institutional effects, regulatory quality indicator measuring government's ability to ensure soundness and stimulate private sector development is another variable. A summary of all variables is given in Appendix.

4.3. Estimation method

This research takes advantages of quantitative approaches. To solve endogenous issues, GMM and Two-stage least squares estimations are widely used. However, GMM is advantageous because it runs 2 stages simultaneously and it allows not only exogenous variables but also lags of endogenous ones to be instruments. Thus, GMM is employed. For the purpose of this research, GMM is applied on Eq. (4). GMM

uses lag of financial indicators as instruments. Exogenous instruments are natural logarithm of Real-GDP-per-capita and time. The following original model is estimated (King & Levine, 1993).

$$GRGDPpc_{i,t} = \beta_0 + \beta_1 DOMCRE_{i,t} + \beta_2 M3TOGDP_{i,t} + \beta_3 MARCAP_{i,t} + \beta_4 NIM_{i,t} + \beta_5 CAPFOR_{i,t} + \beta_6 LABOUR_{i,t} + \beta_7 Requa_{i,t} + \varepsilon_{i,t}. \quad (4)$$

5. Empirical results

GMM results are given in Table 1. This model includes lagged elements, which reflects both immediate and long-run effects.

Table 1
Results of GMM model

	Coefficient	Standard Error	P-value
DOMCRE	-0.099***	0.026	0.000
L1.DOMCRE	0.070***	0.027	0.011
M3TOGDP	-0.089***	0.024	0.000
L1.M3TOGDP	0.093***	0.024	0.000
MARCAP	0.110***	0.011	0.000
L1.MARCAP	-0.103***	0.010	0.000
NIM	-0.698***	0.170	0.000
CAPFOR	0.301***	0.110	0.006
L1.CAPFOR	0.017	0.113	0.878
LABOUR	0.072	0.212	0.734
L1.LABOUR	-0.064	0.215	0.766
Requa	-1.340***	0.469	0.004
Constant	-0.541	1.720	0.753
Tests		**Statistics**	**P-value**
Overall significance test		341.00	0.000
Arellano-Bond test for AR(2)		-0.81	0.420
Sargan test of over-identification restrictions		127.57	0.051
GMM instruments for levels			
Sargan test excluding group		62.85	0.123
Sargan test for GMM element		1.46	0.692
Sargan test for IV element		119.67	0.014

***,**,*: 1%, 5%, 10% significant level
Note: L1.DOMCRE is significant at 5% (In one-sided t-test: p-value/2 < 0.01 then reject H_0)

In this research, significance level is at 1%. In Sargan tests for endogeneity and autocorrelation tests, model has no specification errors as its p-values are all above significance level. Regulatory quality is statistically significant in GMM models. Ceteris paribus, an additional unit of regulatory quality index reduces economic growth rate by 1.3408%-point. Besides, capital variable except for its lag is significant at 1%. When gross-fixed-capital-formation-to-GDP rises by 1%-point, there is a 0.3013%-point increase in this-year growth rate, ceteris paribus. However, labour-force-to-population and its 1-period lag are insignificant at all level. With regard to financial development, all indicators are statistically significant at 1% level. First of all, both DOMCRE and its 1-period lag have impacts on GRGDPpc. Ceteris paribus, 1%-point increase in this-year domestic-credit-to-private-sector-to-GDP leads to 0.0703%-point rise in next-year economic growth rate; however, adversely, when this indicator goes up by 1%-point, growth rate of the same year will fall by 0.0995%-point. After 2 years, increase in domestic-credit-to-private sector is offset and results in 0.0292%-point decline in growth rate. Secondly, holding other things equal, 2-year effect of 1%-point rise in M3-to-GDP is 0.0045%-point climb in Real-GDP-per-capita growth rate. When M3-to-GDP in each period is considered, they follow similar trends of Domestic-credit-to-private-sector. Ceteris paribus, if M3-to-GDP increases by 1%-point this year, economic growth rate of this year will decrease by 0.0894%-point and that of next year will rise by 0.0939%-point. The third financial variable is Stock-market-capitalisation-to-GDP. It is in contrast to 2 previous variables. Ceteris paribus, 1%-point increase in this-year stock-market-capitalisation-to-GDP results in 0.1100%-point rise in this-year growth rate and 0.1033%-point decline in next-year one. In total, 2-year effect is 0.0067%-point fall in economic growth rate. Finally, NIM is also a statistically significant financial indicator. When NIM increases by 1%-point this year, economic growth rate of same year will go down by

0.6980%, ceteris paribus. It is worth noting that increases in variables whose coefficients are negative will not lower economic output. It can be easily observed in dataset that Real-GDP-per-capita of each nation followed a continuously increasing trend. Thus, negative effects of explanatory variables only involve decrease in growth rate.

6. Discussion and policy recommendations

Empirical results presented in this research generally support existing literature of finance-led growth hypothesis. Interestingly, inclusion of lags helps illustrate time effects of financial factors. Some indicators are found to have immediate influences on economic growth whereas others are actually put into effects after some lagged periods.

6.1. Discussions

Domestic credit to private sector

Domestic credit to private sector provided by banks and other institutions includes all kinds of loans such as direct lending, supply of trade credits and receivables, investment in non-equity securities including corporate bonds. Increase in this variable can be considered as not only improvement of financial system but also rise in GDP's investment component. Much investment creates more funds and opportunities for private enterprises to expand their operations, provide more goods and services, which in turn stimulates growth. Thus, financial capital is an important source of economic development. Its positive nexus was proved by researches of Levine et al. (2000), Abida et al. (2015), Cojocaru et al. (2015). In this research, this theory is not totally applied. Positive effects of domestic credit to private sector are lagged after 1 year, whereas its immediate impacts are negative. There is a possibility that firms where investment flows in requires at least 1 year to transform funds into real outcome such as large quantity and high quality of products. In the same year, increase in domestic credit still helps generate more output but speed of output growth is lower. This finding does not contradict to above positive-nexus theory. However, descending growth rate can be explained by existence of external factors. DOMCRE only mentions quantity of loans rather than lending quality and usefulness. These reasons above are also used by other researchers to explain for negative coefficients of credit indicators. Gregorio and Guidotti (1995) emphasised the lack of appropriate regulation in financial systems. In addition to regulatory and supervisory element, Kouki (2013) found that effects of credit variable varied in different countries due to inefficient use of credit and occurrence of corruption. Dudian and Popa (2013) confirmed a significantly negative impact of domestic credit to private sectors; meanwhile, Caporale et al. (2009) found its insignificantly positive influence. They suggested that NPLs causing banking crises lead to lower growth rates.

Broad money

Broad money (M3) also known as liquid liabilities includes currency in circulation and reserves in Central banks (M0); electronic currency and transferable deposits (M1); time deposits, repo and certificates of deposit (M2); traveller cheques and mutual funds' securities. M3 is also considered as money supply. Increase in M3 results from both residents and authorities. If people decide to hold more cash or deposits or central banks implement loose monetary policies under circumstances of recession, M3 will rise. As a result of increase in money supply, interest rates fall in the whole economies. It then stimulates investment and economic growth. Thus, M3-to-GDP and growth rate should be positively correlated, which were also found by King and Levine (1993), Levine et al.(2000), Nguyen and Anwar (2009), Caporale et al. (2009), Dorrucci et al. (2009), Estrada et al.(2010), Dudian and Popa (2013), Bayar (2014), Abida et al.(2015). In this research, M3/GDP is similar to DOMCRE as their positive effects are lagged after 1 year. Increase in M3 does not immediately result in higher growth rate. When expansionary monetary policies associated with larger money supply are implemented, interest rates decline and people expect that economies will soon get out of recessions. Then, they start withdrawing their savings to consume and invest. It takes at least 1 year for increase in consumption and investment to effectively improve economic growth rate. Rise in this-year M3 negatively influences this-year growth rate possibly due to crowding-out effects. Governments also benefit from lower interest rates derived from larger money

supply. When governments overwhelmingly borrow, there are no longer opportunities for private sector to borrow at low rates. Private businesses do not have enough capital to expand their operations, which in turn adversely affects growth rate. Recently, Vietnamese authority has made large government bond issuances, which may result in crowding-out phenomenon. According to Ministry of Finance, in 2015, 256,223 billion VND was mobilised in government bond market and it is planned to issue new government bonds which are equivalent to 183,300 billion VND in 2017. Particularly, between 2000 and 2014, claims-on-government-to-GDP rose steadily from 0% to over 15%[1]. Furthermore, increase in M3 do not guarantee for ascending growth rate. As discussed above, when M3 rises, interest rates are expected to decline. However, in fact, interest rates do not response to rising M3. This phenomenon is known as liquidity trap in which money demand curve is flat rather than downward sloping. In fact, Japan has recently suffered from liquidity trap. Bank of Japan implemented loose monetary policy by increasing money supply to lower interest rates but individuals and firms are too risk averse that they do not want to consume and invest. Thus, their demand for money does not rise as expectation of central bank.

Stock market capitalisation

In contrast to fixed-income securities, equity investment involves forward-looking expectations, which means investors believe in better economic conditions along with increasing stock prices in the future. Stock market capitalisation calculated from stock prices and number of outstanding shares is able to anticipate economic growth. Damodaran (2015) proved that long-term stock growth is equal to economic growth rate. When market-capitalisation-to-GDP goes up, there are 2 possibilities that prices are higher or number of stocks increase. They all indicate rise in market capitalisation will improve economic performance. Assume that stocks are fairly priced. Higher prices refer to higher valuation investors place on potential stocks with good performance. Investors want to buy those stocks more, which then continuously raises prices. Simultaneously, more stock issuances may indicate that firms call for more funds to finance their potential projects. As a result, firms have more chances to develop their businesses which certainly boost economies. Positive relationship between stock market capitalisation and economic growth is empirically found by Khan and Senhadji (2000), Caporale et al. (2009), Estrada et al. (2010), Kouki (2013) and Bayar (2014). The empirical result partially matches with existing literature as increase in market capitalisation only enhances economic growth rate this year rather than next year. Perhaps, if stock returns of this year are not as high as expected, people are not willing to invest more in stocks. They maintain or even lower their investment levels. This adjustment might negatively affect growth rate. In other words, while other factors are constant, 1%-point increase in this year market capitalisation is not enough to maintain long-term upward growth rate. Nevertheless, immediate effects of stock market capitalisation are already positive. It indicates that no time lag exists, which is different from 2 previous indicators.

Net interest margin

Net interest margin or interest rate spread is the difference between lending and deposit interest rates. Normally, banks prefer high lending rates and low saving rates to earn high profit from broad spreads. However, high lending rates resulting in high NIM prevent firms borrowing from banks. Firms which are short of funds are not able to enlarge their businesses, which lowers economic growth rate. Thus, the narrow NIM is, the more efficient banking systems are and the higher growth rate is. This negative nexus has been found in not only this research but also other studies of Caporale et al.(2009), Dudian and Popa (2013), Cojocaru et al.(2015).

6.2. Policy recommendations

Plausible policies to stimulate capital and labour are so important to further encourage economic growth. However, this research only focuses on policies for financial development. They aim at creating a sound and business-friendly environment for development of financial institutions and markets to boost economic growth.

---

[1] Data is extracted from World Bank World Development Indicators Database

6.3. Implication for ASEAN+3 countries

Firstly, domestic credit to private sector that has positive effects on economic growth after one-year lag should be taken into great consideration. A better mechanism for efficient capital allocation and time-lag removal is required. Thus, infrastructure improvement including appropriate legal framework is to ensure stable credit supply and demand. Entrepreneurs and SMEs should be encouraged to access the official credit provided by financial institutions. Lending procedures should be shortened to eliminate excessive bureaucracy. Favourable policies such as low-interest-rate and long-term loans, reduction in overcollateralization and establishment of credit guarantors are needed. However, post-lending supervision should be done regularly by financial institutions to early recognise signals of underperformance and support borrowers timely. This might help decline occurrence of new NPLs. NPLs in ASEAN+3 countries gradually decreased and maintained at stable level, which shows great effort of authorities to improve credit quality. Secondly, policymakers should pay much attention to stock market as its market capitalisation immediately influences growth rate. In some developing financial systems such as Vietnam, regulation that limits investment from foreign stock investors should be eased. Policies to develop physical facilities such as electronic payment systems and exchanges might help investors make orders and transact quickly. Thirdly, as ASEAN has been establishing a common community, special legal framework is required to facilitate ASEAN financial integration. A credit rating system should be established to assess sovereign and regional risks. It helps develop a commonly financial market for country-specific and regional products. Besides, difference in accounting standards creates cross-border restrictions, so common accounting policies is needed. However, common monetary policies for ASEAN countries seem to be impossible as there are huge gaps among members' economic development and political issues.

Implication for Vietnam

Policy recommendations for Vietnam are derived from implications for ASEAN+3 nations but are modified to match with current issues in Vietnam. Asian Development Bank (2017) recorded that Vietnam's GDP growth in 2016 was down to 6.2% due to underperformance of agricultural sector, despite rapid development of service and industrial sectors. They recommended improvement in agriculture as well as investment and also optimistically predicted that growth rate would rise to 6.5% in 2017 and 6.7% in 2018. Domestic credit to private sector is put into high priority, which can be regarded as strategies to stimulate investment. Policies to encourage credit supply and demand are considered. Firstly, credit suppliers that are banks and other financial institutions should change their client structures. In lieu of lending state-owned enterprises whose businesses are less efficient, they should provide credit to private entrepreneurs and SMEs. Particularly, due to unexpected weather and environmental issues, firms operating in agriculture, forestry and fishery need credit supports from low-interest-rate loan packages. Secondly, policies to encourage access to financial products are necessary. In remote areas, few bank branches and ATMs are built, so residents rarely use even simple financial products such as deposits and bank loans. It creates chances for illegal lending in black markets to happen. To increase both quantity and quality of credit to private sector, financial institutions should be encouraged to expand their businesses and operate in wide range of regions. Thirdly, government should ensure credit supply by creating a sound and competitive financial system. Malaysia is an exemplary country for Vietnam to learn from its financial reforms. Malaysia has liberalised its interest rates for long time. Setting ceiling and floor interest rates does not help Vietnamese authority to control rates in the economy, because unofficial activities will go booming. Indeed, borrowers still suffer from high interest rates. Interest rates are recommended to be liberalised, which increases competition in banking sector and provides customers more opportunities to access to low-cost capital. Thus, domestic credit to private sector will rise. Fourthly, NPLs affecting credit quality is also taken into considerations. Vietnam Asset Management Company was established to purchase bad debts, but it is not efficient as it just moves NPLs from one sector to another rather than resolve them. Thus, thorough pre-lending monitoring and post-lending supervisory procedures are highly required to reduce new NPLs. Furthermore, policymakers should consider NIM which is found to negatively affect economic growth. Lending interest rates should be lowered to stimulate borrowing from private sector. Lower interest rates involve reduction in systematic and firm-specific

risks. To ensure soundness and reduce risks in banking system, Circular 36 included restructuring plans. Banks are now highly secured by government; however, in the future, government may let banks go bankrupt. It is argued that there will be a huge shock to public at first but this solid solution will be beneficial in long run. I believe that if one bank is let to file bankruptcy, contagious effects will be extremely large due to sophisticated cross-ownership among banks and high interconnectedness. Consequently, people will lose their confidence to put money in banks. No more credit is available for firms. Thus, this decision should be reassessed and taken into great considerations.

Finally, as discussed above, market capitalisation affects economic growth more quickly because there is no time lag. Foreign investors are now facing with numerous barriers to invest in Vietnamese stock market, so these bureaucratic barriers should be removed. Merge of HNX and HOSE exchanges is gradually implemented, which is expected to reduce transaction costs. However, a comprehensively legal guidance to unify 2 exchanges is required. Additionally, policy orientation is to stimulate financial markets by diversifying financial products. Debt and derivatives markets in Vietnam are underdeveloped. Market development for bonds and derivatives is needed for hedging purposes and maintenance of stability. Derivatives have just been traded but it is essential to develop a concrete legal framework. Clear policy with exact time frame should be launched.

7. Conclusion

This paper has examined the relationship between financial depth and economic growth in ASEAN+3 countries to determine whether impacts on financial systems are able to boost economy. In existing literature, several finance-growth hypotheses have been found. However, this research focused on supply-leading theory and utilised Cobb-Douglas function as theoretical framework. Data of 9 countries between 2000 and 2014 was collected from World Bank databases and GMM was applied to solve endogeneity. Empirical results show that the model passed specification tests at 1% significance level and all financial indicators associated with their lags are found to be statistically significant. Domestic credit to private enterprises and M3 positively boost growth rate after 1-year lag while their immediate impacts were negative. On the contrary, stock market capitalisation immediately has had positive effects. Capital element significantly positively influences economic growth rate; meanwhile, there is no effect of labour. Regulatory quality is not as expected since its coefficient is negative. In short, this research confirmed a finance-led relationship. Some policies are suggested at not only regional but also national levels to encourage financial development for purposes of long-term economic growth. Nevertheless, there are several limitations in this research that should be taken into considerations in future research. Firstly, sample size is not large enough. Thus, it is not easy to run separate models of developed and developing countries and there are many instruments compared to number of observations. Secondly, lags of explanatory variables are added in the model; however, number of lags to illustrate time effects is not clearly determined. Thirdly, relevant indicators such as labour quality are excluded from the model. They should be considered in further studies to examine whether there is any direct relationship.

References

Abida, Z., Sghaier, I. M., & Zghidi, N. (2015). Financial development and economic growth: evidence from North African countries. *Economic Alternatives*, *2*, 17-33.

Abu-Bader, S., & Abu-Qarn, A. S. (2008). Financial development and economic growth: empirical evidence from six MENA countries. *Review of Development Economics*, *12*(4), 803-817.

Asian Development Bank. (2017). *Asian Development Outlook 2017: Transcending the Middle-Income Challenges*.

Al-Malkawi, H. A. N., Marashdeh, H. A., & Abdullah, N. (2012). Financial development and economic growth in the UAE: Empirical assessment using ARDL approach to co-integration. *International Journal of Economics and Finance*, *4*(5), 105-115.

Al-Zubi, K., Al-Rjoub, S., & Abu-Mhareb, E. (2006). Financial Development and Economic Growth: A New Empirical Evidence from the MENA countries, 1989 - 2001. *Applied Econometrics and International Development*, *6*(3), 137-150.

Ang, J., & McKibbin, W. (2007). Financial liberalization, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics*, *84*(1), 215-233.

Anwar, S., & Nguyen, L. (2009). Financial development and economic growth in Vietnam. *Journal of Economics and Finance*, *35*(3), 348-360.

Bayar, Y. (2014). Financial development and economic growth in emerging Asian countries. *Asian Social Science*, 10(9).

Bis.org. (n.d.). *Debt securities statistics*. [online] Available at: http://www.bis.org/statistics/secstats.htm [Accessed 26 Dec. 2016].

Biswas, J. (2008). Does finance lead to economic growth? An empirical assessment of 12 Asian economies. *Margin: The Journal of Applied Economic Research*, *2*(3), 229-246.

Borlea, S. N., Mare, C., Achim, M. V., & Puscas, A. (2016). Direction of causality between financial development and economic growth. Evidence for developing countries. *Studia Universitatis Vasile Goldis Arad–Economics Series*, *26*(2), 1-22.

Caporale, G., Rault, C., Sova, R., & Sova, A. (2009). Financial development and economic growth: Evidence from ten new EU members. *DIW Berlin Discussion Papers*.

Cojocaru, L., Falaris, E. M., Hoffman, S. D., & Miller, J. B. (2016). Financial system development and economic growth in transition economies: New empirical evidence from the CEE and CIS countries. *Emerging Markets Finance and Trade*, *52*(1), 223-236.

Data.worldbank.org. (n.d.). *World Development Indicators | Data*. [online] Available at: http://data.worldbank.org/data-catalog/world-development-indicators [Accessed 9 Feb. 2017].

Damodaran, A. (2015). *Growth Rates and Terminal Value*.

De Gregorio, J., & Guidotti, P. (1995). Financial development and economic growth. *World Development*, *23*(3), 433-448.

Demetriades, P., & Hussein, K. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, *51*(2), 387-411.

Dorrucci, E., Meyer-Cirkel, A., & Santabárbara, D. (2009). Domestic financial development in emerging economies: Evidence and implications. *European Central Bank Occasional Paper Series*, *102*, 1-63.

Dudian, M., & Popa, R. A. (2013). Financial development and economic growth in Central and Eastern Europe. *Theoretical and Applied Economics*, *20*(8), 59-68.

Dunn, J. (2016). *Vietnam: Macroeconomic Developments and Outlook, and the Financial Sector*.

Estrada, G., Park, D., & Ramayandi, A. (2010). Financial development and economic growth in developing Asia. *ADB Economics Working Paper Series*, 233.

Graff, M. (2001). Financial development and economic growth in corporatist and liberal market economies. *SSRN Electronic Journal*.

Hasan, I., Wachtel, P., & Zhou, M. (2009). Institutional development, financial deepening and economic growth: Evidence from China. *Journal of Banking & Finance*, *33*(1), 157-170.

Hassan, K., Yu, J., & Sanchez, B. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance*, *51*, 88-104.

International Monetary Fund. (2006). *Financial Soundness Indicators: Compilation Guide*. Washington, D.C: International Monetary Fund, 11-15.

Jun, S. (2012). Financial development and output growth: A panel study for Asian countries. *Journal of East Asian Economic Integration*, *16*(1), 97-115.

Khan, M., & Senhadji, A. (2000). Financial Development and Economic Growth: An Overview. *IMF Working Papers*, 00(209), 1-23.

King, R., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, *108*(3), 717-737.

Kouki, I. (2013). Financial development and economic growth in the North African region. *African Development Review*, *25*(4), 551-562.

Le, Q.H., & Chu, M.H. (2016), Credit market depth and income inequality in Vietnam: A panel-data analysis. *Journal of Economics and Development, 18*(2), 5-18.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, *35*(2), 688-726.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, *46*(1), 31-77.

Liang, Q., & Teng, J. (2006). Financial development and economic growth: Evidence from China. *China Economic Review*, *17*(4), 395-411.

Muhammad Adnan Hye, Q. (2011). Financial development index and economic growth: empirical evidence from India. *The Journal of Risk Finance*, *12*(2), 98-111.

OECD (2013). *Economic Outlook for Southeast Asia, China and India 2014: Beyond The Middle-Income Trap*.

Pradhan, R. P., Mukhopadhyay, B., Gunashekar, A., Samadhan, B., & Pandey, S. (2013). Financial development, social development, and economic growth: The causal nexus in Asia. *Decision*, *40*(1-2), 69-83.

Pradhan, R., Arvin, M., Hall, J., & Bahmani, S. (2014). Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables: The case of ASEAN countries. *Review of Financial Economics*, *23*(4), 155-173.

Rachdi, H., & Mbarek, H. (2011). The causality between financial development and economic growth: Panel data cointegration and GMM system approaches. *International Journal of Economics and Finance*, *3*(1), 143-151.

Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? Evidence from a sample of middle-income countries. *World Development*, *68*, 66-81.

Sehrawat, M., & Giri, A. (2015). The role of financial development in economic growth: empirical evidence from Indian states. *International Journal of Emerging Markets*, *10*(4), 765-780.

Stern, N. (1989). The economics of development: A survey. *The Economic Journal*, *99*(397), 597-685.

Svirydzenka, K. (2016). Introducing a new broad-based index of financial development. *IMF Working Papers*, *16*(05), 1-43.

The ASEAN Secretariat, (2015). *ASEAN Economic Community Blueprint 2025*.

World Bank. (n.d.). *Financial Development*. [online] Available at: http://www.worldbank.org/en/publication/gfdr/background/financial-development [Accessed 14 Apr. 2017].

World Economic Forum, (2009). *The Financial Development Report 2009*.

Yang, Y., & Yi, M. (2008). Does financial development cause economic growth? Implication for policy in Korea. *Journal of Policy Modeling*, *30*(5), 827-840.

Zhang, J., Wang, L. and Wang, S. (2012). Financial development and economic growth: Recent evidence from China. *Journal of Comparative Economics*, *40*(3), 393-412.

Appendix

Table 2
Summary of variables

Code	Variable	Proxy for	Unit	Source
GRGDPpc	Real-GDP-per-capita growth rate	Economic growth rate	%	WDI
DOMCRE	Domestic-credit-to-private-sector to GDP	Domestic credit to private sector (Financial Depth)	%	GFD
M3TOGDP	Broad-money to GDP	M3 (Financial Depth)	%	GFD
MARCAP	Stock-market-capitalisation to GDP	Stock market capitalisation (Financial Depth)	%	GFD
NIM	Net interest margin	Financial Institution Efficiency	%	GFD
CAPFOR	Gross-fixed-capital-formation to GDP	Capital (K)	%	WDI
LABOUR	Labour-force to population (labour force divided by population)	Labour (L)	%	Labour force and population from WDI
Requa	Regulatory quality	Legal factor	-	WGI

Table 3
Data Description

Variable	Observations	Mean	SD	Min	Max
GRGDPpc (%)	135	4.054	3.153	-5.405	13.636
DOMCRE (%)	135	99.221	48.819	19.908	219.282
M3TOGDP (%)	135	105.266	52.212	29.054	239.266
MARCAP (%)	135	75.272	59.298	0.28	259.609
NIM (%)	135	2.926	1.470	0.546	6.77605
CAPFOR (%)	135	27.3	6.319	18.739	45.514
LABOUR(%)	135	51.184	5.988	40.065	60.783
Requa	135	0.367	0.775	-0.781	2.230

© 2019 by the authors; licensee Growing Science, Canada. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (http://creativecommons.org/licenses/by/4.0/).