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Is ASEAN Ready for Banking Integration? Evidence from Interest Rate Convergence

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Convergence in prices or returns of assets with similar characteristics indicates that the financial market is integrated with regional markets. This paper is the first that test of the movements of interest rates in ASEAN banking sector for the period 1990 - 2012. The empirical analysis is based on a yearly panel of commercial bank interest rate data from 5 ASEAN countries, namely, Indonesia, Malaysia, Philippines, Singapore and Thailand. We assessed the degree and speed of interest rate convergence using beta and sigma convergence method. The findings show that the difference and the dispersion in the interbank rates have reduced since the Asian financial crisis and this trend has become stronger after the Global financial crisis. The findings of this study confirm that interest rates in the ASEAN banking sector are converging. This provides evidence that the ASEAN banking sector is ready for financial integration.

Keywords: *Financial economics; Emerging Markets; Banking Integration and Convergence Analysis*

JEL classification: G15; G21

Introduction

Over the years, the importance of cross-border trade among the 10 member countries of Association of Southeast Asian Nations (ASEAN) has increased steadily. In 2013 alone, trade within these countries surged by 26 percent to $323 billion. This trend is expected to continue especially with the formation of ASEAN Economic Community (AEC) by end of 2015. Rise in trade has been facilitated by the rise in cross-border financial services activities. Banks have particularly played a very important in this case. Realizing the importance of the banking sector as the key driver in the regional financial market, ASEAN Banking Integration Framework (ABIF) has been proposed to integrate the banking sector by 2020 for the ASEAN commercial banks. The integration is mainly aimed at capitalizing on economies of scale of a larger consumer base and creating cooperative transfers of technology and information. This will be done based on the principles of the ASEAN Single Market that permits equal access, equal treatment, and equal environment to the participants in the region[1].

During the Asian financial crisis, risk characteristics of the regional credit market were treated as homogenous by international investors. As a result, large amount of funds were

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[1] Banks originating from the ASEAN countries will be re-classified as a local bank instead of a foreign bank across the 10 ASEAN countries.

withdrawn from the region's banking sector. Indonesia, Malaysia, Philippines, and Thailand succumbed to banking crisis. This crisis thought the authorities in these countries the importance of regional cooperation in handling the crisis. Since then, initiatives have been taken to integrate the ASEAN financial system[2]. However, to date, financial sector integration in the region has progressed slowly compared to trade integration. Even though many of the ASEAN banks, such as DBS, OCBC, UOB, CIMB, and Maybank have regional presence, the level of cross-border banking in the region is three times lower than the Euro area (Unteroberdoerster & Pongsaparn, 2011). In line with this, ABIF aims to eliminate entry barriers against the foreign institutions, eliminate discriminations against foreign institutions, and achieve full regulatory harmonization of banking regulations in the region.

Banking integration helps in eliminating the discrimination faced by economic agents in accessing and investing their capital, especially based on their location. Equal market access facilitates greater cross-border financial transactions, which in turn, may increase cross-border holdings of financial assets. This can contribute to an enlargement of bank size through expansion of their customer base. This can potentially reduce arbitrage opportunity and lead to the convergence of asset prices and yields across the countries. Economic theory supports the notion of price convergence through the law of one price. This law states that prices should converge in a single market when the assets have similar cash flows and are exposed to same risk factors. Based on this law, the ASEAN banking sector should achieve a long-run equilibrium in prices as a result of the integration in the banking sector. This is expected to promote lowering of price for bank services, thus helping to foster an "inclusive growth" in the region.

Under ABIF, the ASEAN banking sector will be divided into two categories based on the stages of development. The first category consists of countries like Indonesia, Malaysia, Philippines, Singapore, and Thailand which have a more develop banking sector while the second category consists of countries like Brunei, Cambodia, Laos, Myanmar, and Vietnam which have less developed banking sector. Based on their development stages, the authorities have permitted the member countries to take different approach in terms of their time span and procedures in achieving integration[3].

The efforts towards integrating the ASEAN financial sector have been taken since after the Asian financial crisis. The important question, therefore, is whether the different financial systems in ASEAN have exhibited a tendency to converge over time. This question is valid given the fact that the integration proposed by the ASEAN Banking Integration Framework (ABIF) will take effect in a few years time. The main objective of this paper is to investigate the readiness of the ASEAN banking sector for the Single Market Initiatives of ABIF. This will be done by comparing the financial performance of the commercial banks and the banking sector interest rates of the five ASEAN countries that have more developed banking sector. Indicators based on econometric models will also be used in order to get deeper information about the degree and speed of integration in the ASEAN banking sector[4]. Convergence in prices will indicate that the banking sectors in these countries are ready for the integration. A study assessing the readiness of ASEAN banks for the integration is essential and timely given the fact that the ASEAN Banking Integration Framework (ABIF) is just around the corner.

The main contributions of the paper are twofold. Firstly, this paper contributes to the existing literature by focusing on banking sector integration in ASEAN. Even though the banking sector still dominates the ASEAN countries financial system, most of the existing studies

[2] The Roadmap for Monetary and Financial Integration (RIA-Fin) was endorsed at the 2003 ASEAN Finance Ministers Meeting (Shimizu, 2014).

[3] The authorities only aim to achieve a partial-integration in the banking sector by 2020.

[4] This paper will not be explaining the differences in the interest rate levels since supply and demand models for bank loans need to be constructed in order to do so.

on financial integration in ASEAN have mainly focused on the equity, bond, and money market. Secondly, this paper uses beta and sigma convergence method is analyzing the readiness of ASEAN banks to ABIF. This method is derived from the growth literature and has been used to study banking integration in Europe. To our knowledge, no other studies have used this method in analyzing banking integration in ASEAN.

The remainder of this paper is structured as follows. The next section reviews the existing literature on banking integration. Subsequently, the details of the methodology are discussed. This is followed by analysis section which includes commercial banks' financial performance analyses and banking sector interest rates movements and convergence analyses. The final section concludes and provides suggestions for future research.

Literature review

Financial integration in East Asia lags trade integration (Eichengreen & Park, 2003; Kim, Kim, & Wang, 2006; Kim & Lee, 2012; Park & Wyplosz, 2010). Existing literature provides mixed result on the degree of financial integration in Asia. Some studies confirm that markets in the region are less integrated, while others believe that financial integration in the region has increased. Studies by Danareksa Research Institute (2004) and Kim et al. (2006) find limited evidence of financial integration in East Asia. Using four types of indicators, Danareksa Research Institute (2004) find that financial integration in the region is still far behind that in Europe prior to its unification. Kim et al. (2006) analysis on consumption risk sharing among 10 East Asian countries finds that the degree of risk sharing is lower than OECD countries. However, they also find that the degree financial integration in East Asia has increased after the crisis period.

Since the Asian financial crisis, efforts toward the ASEAN financial integration have been mainly concentrated on the area of capital market as seen in the establishment of the Asian Bond Market Initiative (ABMI) and Chiang Mai Initiative (CMI) by the ASEAN plus Three (Japan, China, and Korea). In line with this, existing studies on financial integration in East Asia have mainly focused on the equity, bond and money market. Even though the banking sector still dominates the ASEAN countries financial system, to our knowledge, only Lee and Takagi (2013) has investigated the integration in this sector. Most of the existing studies that have looked at banking integration have mainly focused on European banks in line with the Single Market initiative for European Union financial sector that was launched in 1992 (Baele, Ferrando, Hördahl, Krylova, & Monnet, 2004; Gropp & Kashyap, 2009; Kleimeier & Sander, 2006; Rughoo & Sarantis, 2014; Vajanne, 2008). Aziakpono, Kleimeier, and Sander (2012) analyzed banking integration in Africa while Espinoza, Prasad, and Williams (2011) analyzed banking integration in the member countries of the Gulf Cooperation Council.

Banking integration can be measured using quantity based measures (e.g. commercial presence, cross-border bank flows, foreign bank asset to GDP ratio, and market share of foreign banks in domestic markets) and price based measures (e.g. retail interest rate convergence). Lee and Takagi (2013) used quantity based measures in analyzing the presence of branches and subsidiaries of selected global and regional banks in ASEAN. They find that no ASEAN-based commercial bank has either a branch or a subsidiary in all ASEAN countries. Global banks like Standard Chartered, Citibank, and HSBC have subsidiaries in more countries in ASEAN compared to regional banks like Maybank, Bangkok Bank, and UOB. Price based measurement has not been used to measure banking integration in ASEAN. This measurement method is backed by the law of one price. Under this law, prices should converge due to arbitrage once returns and risks are taken into account. In measuring integration, assets that have similar risk characteristics and generate identical cash flows need to be compared.

Various methods have been used in the existing literature to measure banking integration based on price. Studies by Kleimeier and Sander (2000) and Schuler and Heinemann (2003)

used bivariate cointegration analysis on interest rate spreads for lending and deposit rates in measuring banking integration. Others studies have used techniques such as the tests of coefficient equality and hierarchical cluster analysis to analyze banking sector integration (Affinito & Farabullini, 2009; Sørensen & Gutiérrez, 2006; Sørensen & Lichtenberger, 2007). Studies by Adam, Jappelli, Menichini, Padula, and Pagano (2002), Babetskii, Komárek, and Komárková (2008), Erdogan (2009), Espinoza et al. (2011), Murinde, Agung, and Mullineux (2004), and Vajanne (2008) have used convergence method to measure banking integration.

Convergence method is derived from the (neoclassical) growth theory and it is widely used in the empirical growth literature. Adam et al. (2002) was first to use this method in analyzing the degree of integration in the European interbank market, stock market and bond market. Babetskii et al. (2008) studied the stock markets integration in Czech Republic, Hungary, Poland, and Slovakia, while Erdogan (2009) studied the stock market integration in Germany, France, Netherlands, Ireland, and UK. Vajanne (2008) used this method to analyze integration in the European retail banking market for the between January 2003 to December 2006. Similar to these studies, this paper will use the convergence method to analyze the integration in the ASEAN banking sector.

Research Methods

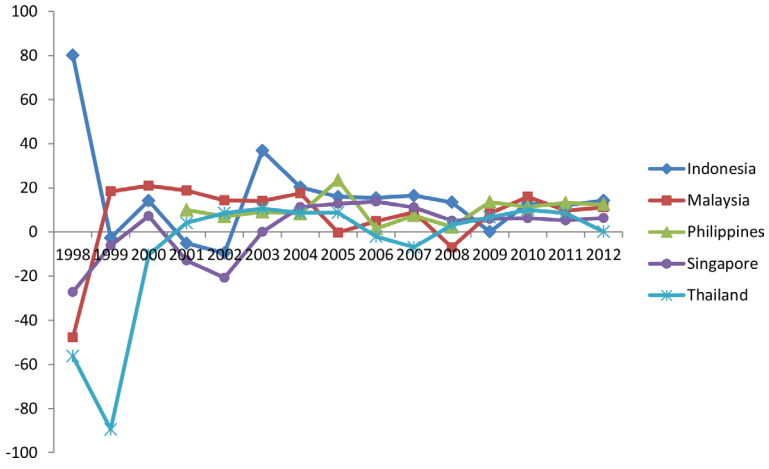
To analyze the readiness of ASEAN banking sector towards financial integration, we used indicators that can summarize the convergence or divergence of financial variables over time. Panel data analysis is used for this purpose. Data sampled at different points in time for each of the 5 ASEAN countries can be used to produce beta and sigma convergence measures. In a goods market, integration happens when price differentials for similar products are not persistent and price dispersion for these products is negligible or absent. We test for the degree of financial market integration by using similar concept on financial market prices. The findings of this study will enable us to find out if interest rates of the commercial banks in the five ASEAN countries are converging. If it already happening, at which speed does it take place?

Our empirical study is based on banking sector financial performance analysis, interest rate movement analysis and convergence analysis. Financial ratios of the commercial banks in the five ASEAN countries will be analyzed first to observe their performance trend. Price variables will be analyzed next by observing their movements. In this case, a number of interest rate variables and computed indicators such as interest rates spread and standard deviations of interest rates across the countries will be checked in order to assess the pattern of interest rate movements. Convergence analysis will be used next. Generally, the term 'convergence' suggests movement towards some common results. Since Barro, Sala-i-Martin, Blanchard, and Hall (1991), many empirical studies have studied the topic of economic convergence between countries. Barro and Sala-i-Martin (1992) describes two concepts of convergence. The first is known as beta-convergence. It measures the speed of adjustment of deviations of countries to the long-run benchmark value. The second is known as sigma convergence. It measures if countries tend to become more similar over time in terms of deviations from the benchmark. Even though these concepts have been originally developed in the growth literature, studies by Murinde et al. (2004), Babetskii et al. (2008), and Vajanne (2008) have adapted them for measuring financial market integration.

Beta Convergence

Most of the studies in the empirical growth literature analyses the relationship between the *average* growth rate of GDP and its *initial level.* A negative correlation between these variables is interpreted as a sign of convergence. The size of the beta coefficient indicates the speed of convergence.

We start by estimating the following basic version of the convergence equation



Data Source: BankScope

Figure 1. Return on Assets ratio of Commercial Banks

$$\Delta r_{ct} = \alpha_c + \beta r_{ct-1} + \sum_{j=1}^{L} \gamma_{cj} \Delta r_{ct-j} + \varepsilon_{ct} \quad (1)$$

where Δr_{ct} is the change in the spread of the interest rate and r is the spread of the interest rate in country c relative to some appropriate benchmark country's interest rate in time t; α_c is country dummy and ε is an error term. The parameter of interest is $\hat{\beta}$.

The null hypothesis of this test is that:
H_0 : β≥0 (no convergence)
H_a : β<0 (convergence)

The null hypothesis is β is equal to zero which implies no convergence. In this case, a shock to Y is permanent. Convergence implies a negative β. The size of β measures the speed of convergence in the overall market. A larger value indicates faster convergence.

Sigma convergence

Sigma (σ)-convergence occurs if the cross-sectional distribution of a variable decreases over time. Income per capita is often used as the variable of interest in the growth literature, while interest rate is often used in the financial integration literature. Based on the sigma-convergence method, the degree of financial integration increases when the cross-sectional standard deviation of the interest rate variable trends downward. A negative time-trend signals sigma-convergence. Full integration is achieved when the cross-sectional distribution of interest rate collapses to a single point, and the standard deviation converges to zero (Adam et al., 2002).

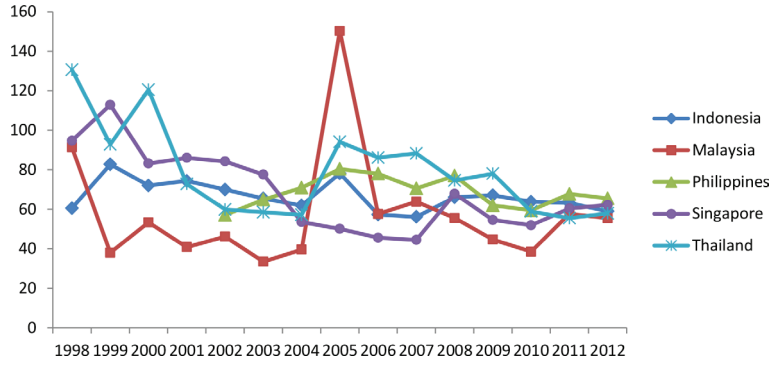
The measure of cross-sectional dispersion in interest rates (SD) for a country i at each point in time (t) is calculated as follows:

$$SD_{it} = a_i + \lambda_i * t + \varepsilon_{it} \quad (2)$$

where SD is the standard deviation of the interest rate i across countries and t is the time trend variable.

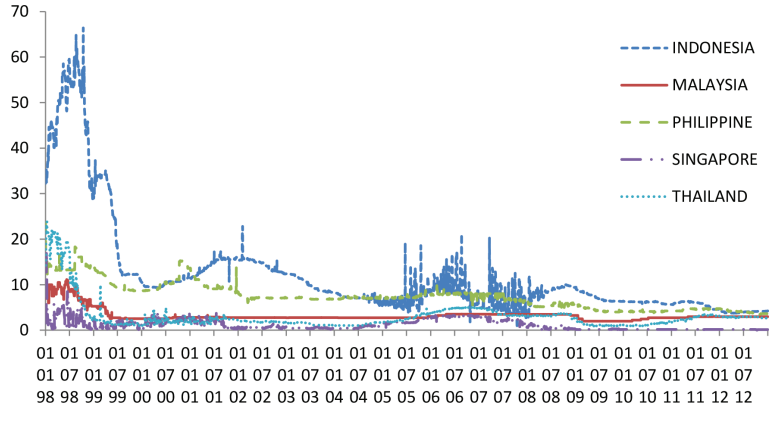
Data

Data on the commercial banks performance of the five ASEAN countries for the period from 1998 to 2012 are obtained from BankScope. Overnight and yearly interbank rates are obtained from Datastream. For the convergence analysis, we use interest rates for the five ASEAN countries, sourced from the International Monetary Fund, International Financial Statistics (IFS) data files. Country level interest rate data is used due to lack of availability of bank level interest rate data. Nevertheless, this data do capture the overall movements of interest rates in the five countries and are sufficient for analyzing beta and sigma-convergence. Yearly data spanning from 1990 to 2012 are used in the estimations. This allows us to capture the changes in interest rates for the period prior to Asian financial crisis until after the recent global financial crisis.



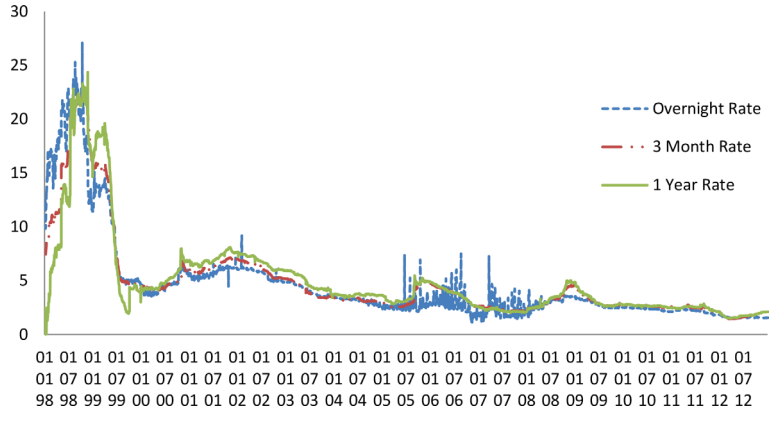
Data Source: BankScope

Figure 2. Costs for Income Ratio of Commercial Banks



Data Source: Datastream

Figure 3. Overnight Interbank Rate



Data Source: Datastream

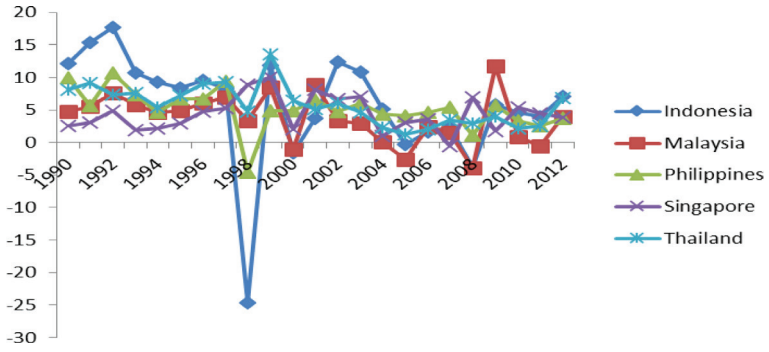
Figure 4. Standard Deviation of Interbank Rates

Results and Discussions

Descriptive analysis

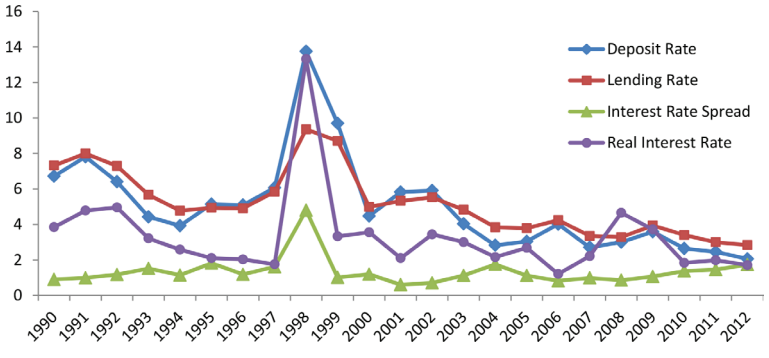
Commercial Banks Performance

Initially, we analyzed the five countries commercial banks data to observe the trends. Differences in banks financial performance as shown by the Return on Assets (ROA) and Return on Earnings (ROE) have reduced since the Asian financial crisis (Figure 1). Nevertheless, banks in these countries differ in terms of their efficiency as shown in Figure 2. Generally, banks in Singapore and Malaysia are more efficient (i.e. lower CIR) than the rests. Differences also exist in terms of the liquidity ratio of the commercial banks with banks in Singapore emerging as being the more liquid ones.



Data Source: World Development Indicator, IMF

Figure 5. Real Interest Rate



Data Source: World Development Indicator, IMF

Figure 6. Standard Deviations of Interest Rates

Interest Rate Movements

We also analyzed the movements of the overnight interbank rates for the five countries. The findings shown in Figure 3 illustrate that the differences in the rates have reduced after the Asian financial crisis. Figure 4 shows that the standard deviations of the interbank rates have particularly reduced since the Global Financial Crisis.

Interest rate paid by commercial banks or similar banks for demand, time, or savings deposits are analyzed next. Large differences that existed in these rates have reduced over the years. Similarly, differences that existed in the lending rates that banks charge the private sector on their short- and medium-term financing needs have also reduced since the Asian financial crisis. Interest rate spread is the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits. Figure 5 shows that difference in the spread exists among these countries when it is adjusted for inflation[5]. Figure 6 shows that the dispersion in all the interest rates has narrowed particularly after the Global financial crisis.

Convergence Analysis

Beta Convergence

Four interest rate variables are tested, with an intercept and an intercept with trend. Convergence test for Deposit Interest Rate (DIR), Loan Interest Rate (LIR), Interest Rate Spread (IRS), and Real Interest Rate (RIR) are shown in Table 1.

Results in Table 1 suggest convergence of spread among the countries under study. The estimated coefficient on the lagged spread is negative and significant in or four models. The Breusch-Pagan test reveals that P-value < 0.05 for the case of DIR, LIR, and RIR, leading us to conclude that the random effect model is more appropriate the OLS (Pooled model). In other words, there are country-specific effects in the

[5] Adjustment is made using the GDP deflator.

Table 1. Beta Convergence

Variable	Pool OLS	Fixed Effect	Random Effect
Panel A: DIR			
DIR_{t-1}	-0.1296**	-0.3634***	-0.1201**
ΔDIR_{t-1}	-0.0308	0.0928	-0.0351
ΔDIR_{t-2}	-0.3284***	-0.2833**	-0.3666***
Constant	0.2923	1.8998**	0.2105
Observation	100	100	100
R-Squared	0.2114	0.5810	0.2353
Breusch Pagan P-value	0.0000		
Hausman LM P-value			0.9200
Panel B: IRS			
IRS_{t-1}	-0.3479***	-0.3481***	-0.3479***
ΔIRS_{t-1}	-0.0864	-0.0622	-0.0828
ΔIRS_{t-2}	-0.2424**	-0.2488**	-0.2433**
Constant	1.4154***	1.4151***	1.4152***
Observation	100	100	100
R-Squared	0.2683	0.4189	0.2681
Breusch Pagan P-value	0.0900		
Hausman LM P-value			0.9600
Panel C: LIR			
LIR_{t-1}	-0.0858**	-0.0755**	-0.0780***
ΔLIR_{t-1}	0.1332	0.1484	0.1425
ΔLIR_{t-2}	-0.3345***	-0.3950***	-0.3752***
Constant	0.4592	0.3352	0.3663
Observation	100	100	100
R-Squared	0.2135	0.6073	0.2466
Breusch Pagan P-value	0.0000		
Hausman LM P-value			0.9300
Panel D: RIR			
RIR_{t-1}	-0.7520***	-0.7496***	-0.7528***
ΔRIR_{t-1}	-0.3215**	-0.2363*	-0.2771**
ΔRIR_{t-2}	-0.1542	-0.1419	-0.1453
Constant	3.1423***	3.1556***	3.1592***
Observation	100	100	100
R-Squared	0.5680	0.7294	0.5385
Breusch Pagan P-value	0.0000		
Hausman LM P-value			0.7400

Data Source: World Development Indicator, IMF

data. However, for the case of IRS, P-value > 0.05 which means that the OLS pooled model is more appropriate than random effect. The Hausman test , P-value is > 0.05 in all models which indicates the fixed effect model is not appropriate and that the random effects specification is to be preferred.

Sigma convergence

Panel data regression with fixed effect is used for the analysis. Table 2 reveals that the trend coefficient is negative and statistically significant indicating increased degree of integration. The existence of only heteroscedasticity problem has been fixed the corrected standard error without changing the coefficients.

Conclusions

The ASEAN banking integration is scheduled to take place in a few years' time. Efforts toward integrating the financial sector have been ongoing since after the Asian financial crisis. This paper analyzed the readiness of ASEAN banking sector for this integration. This is

Table 2. Fixed Effect Panel Data Analysis

Dependent Variable	SD	
	Fixed effect	Regression after Fixing Serial Heteroscedasticity
Constant	6.1043***	6.1043***
	(14.2800)	(9.580)
Trend	-0.1656 ***	-0.1656 *
	(-5.3100)	(-3.120)
Multicollinearity (Vif)	1	
Heteroscedasticity (Chi)	30.9	
Serial Correlation (F)	0.000	
Observation	92	

Notes: *and *** indicate the 1% and 10% significance level respectively. Figures in the parenthesis are t- statistics.
Data Source: World Development Indicator, IMF

done by comparing commercial banks performance, interest rate movements, and interest rate convergence in five ASEAN countries that have a more developed banking sector namely Indonesia, Thailand, Malaysia, Philippines, and Singapore. Bank level financial data indicates that banks in these countries differ in terms of their efficiency and liquidity but differences in performance have reduced since the Asian financial crisis. Interest rates difference in the five countries has also reduced over the years particularly after the global financial crisis.

The law of one price in financial markets implies that in fully integrated markets arbitrage equalizes the price or return of similar assets. Convergence in prices or returns of assets with similar characteristics indicates that the financial market is integrated with regional markets. The findings of this study confirm that interest rate in the 5 countries has converged and the degree of convergence has increased over the years. This suggests that the commercial banks in these countries are ready for integration. Given that the severity of the recent global financial crisis somewhat highlights the negative effects of financial integration, policy maker in the ASEAN region need to ensure that adequate regulatory and supervisory framework is in place in handling the event of a crisis (Stiglitz, 2010). Failure to do so can be very costly as shown in the case of the recent Europe debt crisis.

Since studies by Eichengreen & Park (2003), Kim & Lee (2012), and Kim et al. (2006) find that the financial markets in East Asia are integrated relatively more with global markets than with each other, future research can address this issue. The scope of this paper is also not that extensive to capture the impacts of regional and global shocks on ASEAN banking sector. Future research also may explore different sources of shocks on bank sector returns and their effects on convergence.

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