Financial Dependency and Macroeconomic Analysis of Banking and Insurance Companies in ASEAN-5 Countries

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Regional co-operations increase economic dependencies amongst their member countries. The Association of Southeast Asian Nations (ASEAN) entered into a free trade agreement more than two decades ago and recently formed an economic community. It is crucial to understand if the escalated partnership will have an impact on each country's financial sector. This research is aimed at analyzing dependency amongst the five original ASEAN members and the effect of macroeconomics on financial fragility, which is proxied by their banking and insurance sectors. To analyze the dependence of banking and insurance companies in ASEAN-5 countries, this research used a quantitative approach, a distance-to-default model, and cross-sectional analysis applied to the data while analysis of macroeconomic effects used simple regression. The research findings show that dependency of financial sectors amongst the countries does not exist, with Singapore's banking and insurance sectors as the most prone to default. In general, the banking sector has a greater tendency toward financial fragility compared to the insurance sector. Macroeconomic variables influencing the financial fragility of the companies are influenced by variables such as GDP, LR, and PER for banks and IP and UE variables for insurance companies. It is necessary to conduct further research on the ASEAN Economy Community to analyze the financial fragility of all ASEAN member countries.

Keywords: *ASEAN, distance-to-default, financial fragility, international finance, macroeconomic variables*

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Introduction

The 2007 global economic crisis caused by the bursting of the subprime mortgage bubble had a massive impact on economies across the world. The aggravating condition of major financial institutions in America, Europe, and Japan affected the economy in Southeast Asia, including those of ASEAN (Association of Southeast Asia Nations) members. The impact was shown in plummeted stock prices. Overall stock market returns declined from 39.24% in 2007 to -47.58% in 2008 (MSCI 2016). Another impact of the crisis was the depreciation of the currency exchange rate towards the US dollar with currencies depreciated on average by 5.07% (Kho 2013). The most severe effect came in the form of falling gross domestic product (GDP) value and increasing inflation that led to economic instability (Pracoyo and Kunawangsih 2006).

The impact of the 2008-2009 crisis is closely linked to the financial sector's experience pressures from the crisis impacts such as credit risk and default risk, leading to possible financial fragility (Bernoth and Pick 2011). One of the important institutional concerns of such impacts is on the financial institutions that support the national economy, especially in the case of developing countries. Members of ASEAN are developing countries whose finances are supported by the banking system (Asian Development Bank 2013). The Morgan Stanley Capital International Index (MSCI) at 2016 showed that financial sector plays a dominant role in supporting the national economies of ASEAN members compares to other sectors. This indicates that the financial sector refers to banking and insurance companies, with insurance companies becoming one of the institutions that needs to be considered as the cause of financial fragility (Harada et.al. 2010). Other countries can learn from this phenomenon, especially the ASEAN-5 countries, which are Indonesia, Malaysia, Philippines, Singapore, and Thailand.

Financial fragility in the banking and insurance sectors can be measured with a distance-to-default model developed by Crosbie and Bohn (2003). The model is designed to measure default possibility of a company using stock returns, leverage, and volatility. It is considered an efficient model to measure default risk compared to equity price-based models (Vassalou and Xing 2004) and in contrast to other risk models, such as the financial distress model presented by Altman (1968). The difference between the two models is that the Altman Z-score model uses financial ratios to measure financial risk

potential that in turn leads to bankruptcy prediction. On the other hand, the Crosbie and Bohn model does not only use financial ratios, but also includes market-based indicators for risk measurement (Cihak). Therefore, the distance-to-default model is commonly used and relevant for the practice of financial stability analysis (Bernoth and Pick 2011).

Banking and insurance sectors operate within acceptable risk. These risks are influenced by macroeconomic variables. Macroeconomic variables that could affect the performance of companies, in particular those operating in banking and insurance sectors, are, among others, GDP, inflation rates, unemployment rates, credit levels, and interest rates (Bernoth and Pick 2011). These variables also pose risks to businesses, especially in cases where businesses show instability. Therefore, macroeconomic variables warrant future risks.

The impact of macroeconomic variables on a company's fragility has been evidenced by previous studies (Van-der Zwet and Swank 2000). One study showed that changes in currencies and interest rates affect economic growth and inflation, which then leads to financial fragility. Similarly, research conducted by Bruneau et al. (2012) found that macroeconomic variables such as changes in exchange rates could lead to the emergence of financial fragility and potential bankruptcy in the banking and insurance sectors. From the results of research conducted by these researchers, the influence of macroeconomic variables on financial fragility is evident. Using ASEAN-5 countries, namely Indonesia, Malaysia, Philippines, Singapore, and Thailand, this research is aimed at analyzing potential financial fragility within period 2006 to 2015 using distance-to-default models in the banking and insurance sectors and analyzing the effects of macroeconomics on financial fragility in the ASEAN-5 nations. The research contributes to the scarce number of studies related to regional financial fragility in the Southeast Asia region.

The condition of banking in ASEAN-5 can be shown by two indicators, NPL (Non-Performing Loan) and CAR (Capital Adequacy Ratio). NPL is used to measure asset quality and CAR is used to measure capital risk (Cornett et al. 2005). According to World Bank Data (2016), the average ASEAN-5 NPL increased from 1.75% in 2013 to 1.87% in 2015, while the CAR average increased from 9.7% in 2013 to 10.61% in 2015.

The condition of insurance companies in ASEAN-5 has two indicators: claims paid and premium growth ratios. The claims paid indicator is able to show the company's liability in bearing the losses experienced such that it can affect the profitability of the company. A higher claimes paid rate will reduce

the company profit. The company's performance condition is also compared to the premium rate. The premium growth ratio is able to show the stability of the company's premiums so that the decrease of the premium rate can show the level of risks, especially risk of default (Zweifel and Eisen 2012). Based on data at each financial institution in ASEAN-5, the average claims paid rate increased from 56.62% in 2013 to 57.72% in 2015, while the premium growth ratio also increased from 7.82% in 2013 to 11.8% in 2015. Accordingly, the average performance of insurance companies in ASEAN-5 is improving.

It is important to conduct research on ASEAN member countries based on both of these conditions, especially for four ASEAN member countries: Indonesia, Malaysia, Philippines, Singapore and Thailand. This is because ASEAN is dominated by developing countries and the financial sector, especially banks and insurance companies, is the sector that provides the most funds to the country. Therefore, this research can contribute to risk prevention in the future.

In the next section, we discuss the theoretical review. Section 3 describes the research method used in this empirical study. Results are analyzed in section 4. Finally, section 5 concludes the research.

Theoretical Review

Financial Fragility

The concept of financial fragility was coined by Fisher (1933), and discussed by Davis (2001) in debt and financial fragility theory. The concept and theory explains that an economy follows a cycle consisting of positive and negative growth periods. With economic progress, debt and risk-taking activities would increase. This causes asset bubbles that leads to negative growth and causes financial losses to banks. It also indicates that fragility causes loss. Krugman (2011) stated that financial fragility is a condition that occurs in the financial system of a sector, especially in the banking sector, during financial crises.

Many researchers have tried to explain the concept of financial fragility. Allen and Gale (2004) explain the impact of financial fragility whereby it is able to produce small stocks that have a significant impact. The significance comes as it causes extrinsic uncertainty that leads to an increased price volatility until financial crisis occurs. Similarly, Kindleberger (1978), cited by

Allen and Gale (2004), states that financial fragility becomes a rapid occurrence in the financial system, especially in banks, as it causes by minor events such as a decline in the price of securities. When the price of securities decreases and decreases occur over a long term, it causes difficulty in liquidating and affects the financial system. Lagunoff and Schreff (2001) explain financial fragility in terms of macroeconomics, referring to the fragility of the financial sector at the time of a large-scale financial crisis caused by the occurrence of regular economic shocks.

Essentially, fragility of a nation's financial system can lead to financial crisis in two ways (Allen and Gale 2004). First, financial sector fragility occurs because the basic macroeconomic conditions are weakening. This is known as the fundamental equilibrium or business cycle view. Borrowers avoid transaction cost posed by banks and look for financing from the capital market. This creates a vicious cycle as it impacts the national economy (Van Order 2006). Second, the sector's fragility is caused by a vulnerable national economy. This is known as the self-fulfilling or sunspot equilibrium view. Diamond-Dybvig's model (1983) explains that fragility occurs in the financial system due to the inherent properties of the sector, especially the banking sector.

Distance-to-Default Model

The risk incurred by companies is classified as a systematic risk, which means that uncertainty is caused by external factors. One of the risks that arises within the banking sector is credit risk. It is a potential risk that arises from failure of meeting loan or interest payment obligations at maturity (Basyaib 2007). One model developed by Merton is the structural model, which is derived from the Black-Scholes model. The model is recommended by KMV Corporation and Moody's (Crosbie and Bohn 2003) and known as distance-to-default or default probability.

Distance-to-default is a market-based measurement of default risk (Duan and Wang 2012). The measurement is based on the evaluation of assets in the stock market by short-term book-values and diversification. This provides information about the stock market, supervisory ratings, bond spreads, and the national economy through statistical models (Arora et al. 2005). According to Gropp et al. (2006) and Chan-Lau et al. (2004), distance-to-default is a good performance predictor of the financial sector, especially banking. The model's strength is its capability to measure default probability through stock returns, leverage, and volatility. It is also an efficient indicator

to measure default risk compared to equity price-based models (Vassalou and Xing 2004). On the other hand, the Altman Z-score model for bankruptcy (1968) is well established. This multivariate discriminant analysis uses five financial ratios to predict a company's bankruptcy potential. This research uses the distance-to-default model as it is more frequently used and is considered more relevant for the practice of the financial stability analysis (Bernoth and Pick 2011).

Macroeconomic Variables

In this research, macroeconomic variables are used as suggested by Bernoth and Pick (2011). These variables are considered to have predictive power and could induce economic situations that result in financial fragility:

- **Long Term Interest Rate:** The rate of interest to be paid or returned to the bondholders over the long term of ten years in each country.
- **Industrial Production:** The level of production or industrial output as measured by the volume of production or the amount of output in the given period in each country.
- **Inflation:** The rate of change in prices of goods and services within a particular period as measured by the consumer price index.
- **Domestic Credit:** The rate of loan growth which the lender or creditor of domestic state.
- **Equity Return:** Profitability ratios which, seen from the side of capital (equity) of the company, are be able to measure a company's ability to generate profit from investments made by the shareholders of the company.
- **Real Effective Exchange Rate (REER):** The real exchange rate of one country compared to another country.
- **Unemployment Rate:** The number of people who do not have jobs with the total labor force in a given period.
- **Gross Domestic Product (GDP):** A measure that is used to view the economic activity of a country that is able to describe the growth of the economy based on production volume.
- **Price to Earnings Ratio (P / E Ratio):** Measurement of a company's stock price compared to the company's revenue.
- **Financial Openness:** Measurement by comparison of the level of exports and imports of products made by companies relative to the overall level of exports and imports of manufactured products.

- **KA - Open:** A measurement of the level of openness of the capital accounts in a country, often known as the Chinn-Ito Index.

Research Method

Analysis of Financial Dependency

In this study a quantitative approach using panel data is used. The research sample consists of conventional commercial banks that have published financial statements and are listed on the stock exchange in each of the ASEAN-5 countries during the period 2006-2015. The research was conducted specifically for the banking and insurance companies in ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) for the reason that ASEAN is dominated by developing countries. Therefore, the financial sectors become a foundation for economic growth in these countries. In addition, the study will be topped in the period 2006–2015 to produce renewable results, and can be a step in early prevention for developing countries at risk of default in the future. The data used is obtained from financial statements available from the stock exchange in each ASEAN-5 country.

To analyze the financial fragility in the financial sector in each member state of ASEAN-5, the model of distance-to-default delivered by Crosbie and Bohn (2003) is used as follows:

$$DD = \frac{\ln\left(\frac{V_t}{B}\right) + \left(r - \frac{\sigma_v^2}{2}\right)(\tau)}{\sigma_v \sqrt{(\tau)}}$$

V_t: The total value of the company's assets
B: The value *of face value* (debt upfront)
r: *risk-free rate*
Σv: volatility of V_t
τ: Time to maturity

After performing the calculation of distance-to-default, we can conduct a cross-sectional dependence test. It shows the dependence of the banking and insurance sectors throughout the regions or countries that are the object of

this research. In this study we use the CCE estimator from Pesaran (2004). By using the estimator, we are able to measure the likelihood of errors in the dependent variables. The econometric model is:

$$Y_{i,T+h \mid T} = \hat{\alpha}_i \, d_T + \hat{\rho}_i \, Y_{i,T} + \hat{\beta}_i \, x_{i,T} + \hat{\gamma}_i \hat{f}_{T+h}$$

α, ρ, β, γ: parameter factor
d_T: vector of observed common factors
$Y_{i,T}$: distance-to-default
$x_{i,T}$: vector of individual specific regressors
$\hat{f}_{T+h}$: vector of unobserved common factors

If N is worth □ and T sufficiently large, the model explains that cross-sectional dependence does not exist (Bernoth and Pick, 2011).

Analysis of Macroeconomic Effects

The research used several macroeconomic variables to explain that the possibility of default risk would increase from outside the companies. According to Carling, et.al (2007), the macroeconomic variables are firmly able to explain influence risk for a company, especially default risk. Relatively speaking, the condition of macroeconomic variables describes the absolute default risk better than internal information. So, the macroeconomic variables are able to demonstrate the level of default risk for companies. Therefore, to measure the effect of macroeconomic variables in calculating distance-to-default through regression tests, OLS Regression was used as follows:

$$Y_t = \alpha + \beta_1 LR + \beta_2 IP + \beta_3 INFL + \beta_4 DC + \beta_5 ER + \beta_6 REER + \beta_7 UE + \beta_8 GDP + \beta_9 PER + \beta_{11} IE + \beta_{12} KAOPEN$$

Empirical Analysis

Result of Financial Dependency Analysis

This research is conducted using secondary data obtained from the stock exchanges of ASEAN-5 countries, among others, company financial statements from 2006 to 2015, and other sources that have been described in

the previous section as macroeconomic indicator data. The research object is divided into banks and insurance companies listed in the ASEAN-5 stock exchanges during the research period. The research population examined 132 objects, which consisted of 87 banks and 45 insurance companies. However, based on the research criteria, the research sample amounted to 88 objects, comprised of 54 banks and 34 insurance companies. The different number of research objects is due to the existence of sharia banks, incomplete financial reports, and that fact that there were some companies not listed in the stock exchange from 2006 until the research period.

First, the analysis aims to test the possibility of financial fragility in the financial sector of each country based on historical data of the banks and insurance companies. By using the distance-to-default model, the result generated the distance between the company's ability and the companies' default or default risk. Results indicated the acquired distance from the D2D companies towards zero point as the default point. Results of regional comparisons are as illustrated in Figure 1 and Figure 2.

Figure 1 illustrates the comparative D2D results of the banking sector in ASEAN-5 countries. The figure also summarizes the quarterly average D2D of the banking sector in each country. Based on Figure 1, the quarterly D2D points highly fluctuated. The average D2D value for the banks is 4.754176 points in Thailand, 5.032061 points in Indonesia, 5.423925 points in Singapore, 5.687994 points in Philippines, and 6.021861 points in Malaysia. However, Indonesia scored the maximum value during Q3-2015 period at
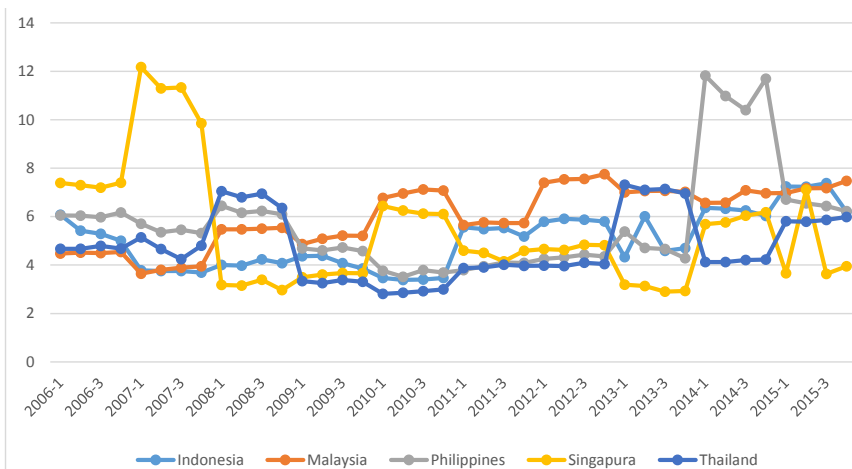

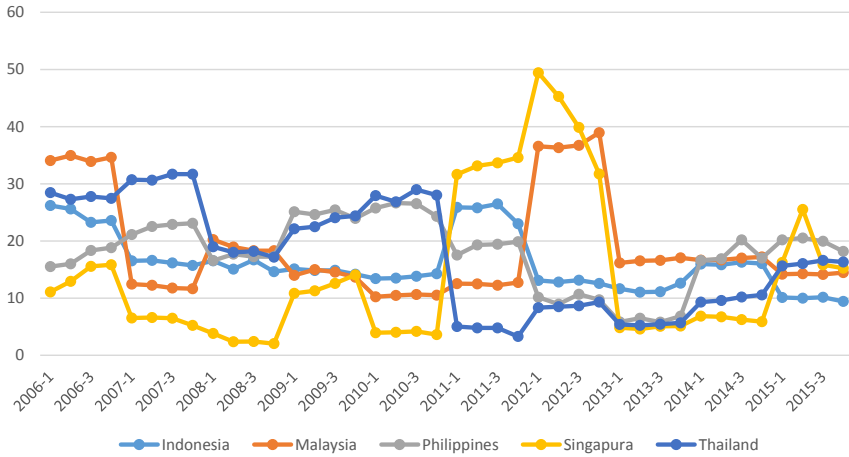**Fig. 1.**—Comparison of Bank's D2D in Each Country

Fig. 2.—Comparison of Insurance's D2D in Each Country

7.377343 points, the highest point for Malaysia occurred in the Q4-2012 period at 7.751791 points, Thailand booked 7.3141 points in Q1-2013, Philippines's highest point is 11.819788 in the Q1-2014 period, and Singapore hit the highest point at 12.17108 points in the Q1-2007 period, or as indicated by the line or default point. Furthermore, Singapore scored 2.902803 points in the Q3-2013 period, Thailand achieved 2.8104 points in Q1-2010 period, Indonesia booked the minimum value in the Q2-2010 period at 3.387863 points Philippines scored 3.51665 points in Q2-2010, and Malaysia recorded 3.644066 points in the Q1-2007 period, or as concluded by the line or default point.

Figure 2 describes comparative levels of D2D of insurance companies in ASEAN-5 countries. Comparisons were formulated based on the average number of insurance companies in each country in Q1-2006 until Q4-2015. The obtained average values are 16.08103 points for Indonesia, 14.31899 points for Singapore, 17.28267 points for Thailand, 17.98347 points for Philippines, and 18.74776 points for Malaysia. Meanwhile, the maximum D2D value for insurance companies obtained by Singapore was 49.43144 points in Q1-2012. Malaysia's D2D value was 38.94535 points in the Q4-2012 period, Thailand's D2D value was 31.69222 points in the Q3-2007 period, Philippines's D2D value was 26.63392 points in Q2-2010, and Indonesia's D2D value was 26.46069 points in the Q3-2011 period. The minimum D2D value for insurance companies with the level closest to the default point is Singapore, which booked 2.026577 points in the Q4-2008 period, followed by

TABLE 1
Cross Sectional Dependence Test Result

Region	Industry	Statistic	CD
	Bank	-0.182964	0.8548
All	Insurance	0.480103	0.6312
	Bank and Insurance	0.411878	0.6804

Note.—The significant level at 5%

Thailand with 3.274485 points in the Q4-2011 period, Philippines with 5.80038 points in the Q3-2013, Indonesia with 9.416211 points in the Q4-2015 period, and Malaysia with 10.23364 points in the Q1-2010 period.

After the D2D calculation for each country, the researcher found the importance of conducting cross-sectional dependence test. The dependent cross-sectional test shows either existence or absence of cross-sectional dependence in each country as the research object. The cross-sectional dependence test was done using Eviews 9 and Pesaran's cross-sectional dependence test, better known as Pesaran's CD Test (2004). Results of the cross-sectional dependence test are as the table 1.

Table 1 showed the result of the cross-sectional dependence test in four ASEAN member countries. The cross-sectional dependence test applied D2D average values obtained from the countries as the research objects. The result indicated that the total CD value for banks, insurance, and banks and insurance categories achieved a value higher than the statistical value of -0.182964 < 0.8548 for banks, 0.480103 < 0.6312 for insurance, and 0.411878 < 0.6804 for a combination of both. In addition, the significant level of Pesaran's CD test is 5%. Therefore, the result of the calculated Pesaran's CD Test on the three categories is higher than the significant level. Thus, from these results, the researchers concluded that the cross-sectional dependence test showed neither a cross-sectional dependence (correlation) on the residual variable nor dependence in each ASEAN-5 country.

Table 1 showed that the result of the cross-sectional dependence test for combination bank and insurance was negative, whereas the result for banking and insurance separately was positive. This is because the numbers of banking and insurance companies in the four countries were not comparable. However, it should be noted that the number of banking companies used in this research is significantly more than the number of insurance companies in ASEAN-5. Based on the data from each country, there were 69 banks in

total and 34 insurance companies in ASEAN-5 during the period of 2006 – 2015. For this study, the sample used 41 banks and 28 insurance companies that fit the criteria. This might skew the data although results are not affected since direct comparison is not performed. The ASEAN-5 countries, especially Indonesia, Malaysia and Singapore, have less developed national policies on insurance compared to those of developed countries such as the US and countries in Europe (Setiawan 2013). This might create a barrier for the insurance industry to be nurtured by ASEAN countries.

Results in Figure 1 and Figure 2 illustrate that both banks and insurance companies show similar trends in default risk occurrence. The default risk has a possibility of causing financial fragility in the company. However, each company's ability to maintain consistencies to prevent default risks are different. The cause of the high D2D default points between banks and insurance companies depends on the company's assets, equity, liabilities, volatility and effective interest rates. Debt-to-asset ratios demonstrated the company's ability to fulfill its obligations to the shareholders. Asset volatility showed the level of price fluctuations in the company's assets. Increasing asset volatility indicated an asset had high price at particular period, and vice versa. On the other hand, the risk-free rate showed the low-risk interest rate where the risk-free rate is able to demonstrate level of benefits to be obtained. This means that the higher free-rate comes with higher profits. Thus, it can be also concluded that the results obtained using D2D in the form of points indicated that a higher distance between the D2D point with a line level or default point is zero. Next, the results also explained whether or not a company is capable of dealing with the possible default risk. Accordingly, the comparison between banking and insurance companies based on calculated distance-to-default concluded that the performance of the insurance companies is better than that of banks.

However, the cross-section did not exist if analyzed from the results outlined for possible financial fragility in the financial sector with D2D models in each ASEAN-5 country. Thus, the four countries have neither relationship nor influence on one to another in the ASEAN. If one of the companies in a country experiences decreasing performance, this condition will not affect the companies in other countries. These results are different from previous studies where Bernoth and Pick (2011) found a cross-sectional dependence in each regional sector. Location or region of the research covered the US, European countries, Canada and several other developed countries. The research is also related to regional economic integration conducted by the countries. ASEAN had successfully initiated cooperation in

the economic sector through economic integration, especially in trade via AFTA (ASEAN Free Trade Area), which was established in 1992. Different conditions in the four countries led to some difficulties in the implementation of economic integration, for example, the different inflation rate in each country (Bank Indonesia, 2008). When Indonesia experienced an economic crisis due to high-level inflation, the crisis did not affect other ASEAN countries. However, the condition still triggered increasing product prices, leading to both more expensive exports and imports in every country. Furthermore, the condition reduced trade profits. It also decreased competitiveness of local companies. Meanwhile, integration in the region remained weak.

In this research, currency conversion to USD was not performed. All financial data were expressed in their own currency. The reason for not converting these numbers to a common currency such as US dollar is to avoid the conversion effect. ASEAN itself does not have one common currency, regardless of the positive impact of having one currency within the region. The condition is one reason to implement a currency union. A currency union would able to increase currency stability in each country in ASEAN especially ASEAN-5 (Kusuma et al. 2013). Mundel (1961) as cited by Kusuma et al. (2013) stated that currency integration is beneficial in generating economic growth among its members by way of economics of scale. Countries that have fluctuating or deteriorating economic conditions could benefit from developing trade and economic relationships with more stable economies using the same currency. Ogawa and Himizu (2006) proposed four indicators for ASEAN should the members choose to integrate their currencies, namely trading volume, which is based on export and import activities in each country, GDP nominal, a GDP rate based on purchasing power parity (PPP), and international reserves as a comparison of financial aspects. Provided the different value of the abovementioned indicators for each ASEAN-5 country, the need to implement one common currency remains a challenge.

Result of Macroeconomic Effects Analysis

The analysis aims to examine the relationship between dependent and independent variables. The dependent variable applied in the regression analysis covered results of the previous distance-to-default test. Meanwhile, the independent variable included macroeconomic indicators such as LR, IP, INFL, DC, ER, REER, EU, GDP, PER, IE, and KAOPEN. The

macroeconomic factors regression analysis was based on the country's data individually as the research object. The data panel with OLS Regression was applied as the regression data. However, there were two variables with high correlation that influenced results of the regression model results as seen in the KAOPEN and IE variables. Therefore, these two variables were eliminated. The results of regression model test are as the table 2.

In table 2 above, the bank's regression test on D2D macroeconomic factors indicated that of the nine macroeconomic factors functioning as independent variables, three independent variables had significant values. These variables included GDP (gross domestic product) with a coefficient of 0.253407 and a significance was below 1%, IP (industrial production) with a coefficient of -0,06587 and significance below 10%, and PER (price earnings ratio) with a coefficient of 0.114667 and significance below 5%. These different results also occurred in the insurance companies where two variables had significant value in D2D_INSURANCE value. The ER (equity return) variable had a coefficient of -0.027381, or a significance level below 5%, and the IP variable had a coefficient of 0.212976 at a significance level below 10%.

Based on these results, different impacts occurred between macro-economic factors as independent variables and distance-to-default points as dependent variables for the banks and insurance companies. If compared with previous studies, the value per variable showed positive results in LR, EU, and the GDP variables while the IP, ER, and REER variables indicated

TABLE 2
GOODNESS OF FIT TEST RESULT

Variables	Bank		Insurance	
	Coefficient	Prob.	Coefficient	Prob.
C	2.911876	0.0193	23.20399	0.0059
DC	-0.000815	0.9606	-0.122995	0.2278
ER	-0.003588	0.2170	-0.027381	0.0456
GDP	0.253407	0.0039	-0.533702	0.2282
INFL	-1.73E-05	0.9909	-0.007495	0.4508
IP	-0.06587	0.0683	0.212976	0.0648
LR	0.093763	0.1839	-0.285812	0.4109
REER	-0.025254	0.3329	0.088338	0.6131
UE	-0.095627	0.6880	0.371370	0.8158
PER	0.114667	0.0153	-0.119517	0.6204

negative results for the second sector. Although the research indicated a positive relation in GDP, LR, and PER for banks and in IP and UE for insurance companies, the negative relation occurred in INFL, DC and REER for both sectors. Thus, it can be concluded that this research is different from previous studies.

There are several assumptions which lead to different results between this research and other previous studies. The previous research indicated a significant correlation between banks and insurance companies with macroeconomic factors as possibly connected to distance-to-default financial fragility. The conclusion summarized that significant macroeconomic factors are more prevalent in the banking sector. However, the insurance company only has one influential macroeconomic factor on the D2D level. Based on this comparison, according to the research conducted by Yaldiz and Bazzana (2010) and Ruiz-Porras (2008), the studies explained that financial fragility is related to a company's internal competition and stability. Accordingly, financial fragility may occur due to the financial condition of the company.

Analysis of the research is also supported by the previous study, "Rough Sets and The Role of Monetary Policy in The Financial Stability (Macroeconomic Problem) and The Prediction of Insolvency in Insurance Sector (Microeconomic Problem)" in 1981–1990 by Sanchis et al. (2007). The research was conducted using two different approaches to analyze two research objects: banking with a macro-economic approach and insurance companies with a micro-economic approach. The different approaches were applied due to the different conditions experienced in the two sectors where it was not possible to draw a single conclusion. The banks central to the financial sector functioned to maintain financial stability and were influenced by macroeconomic factors, while the insurance companies were part of modern economy with a less significant role, affecting occurrences of fragility.

Research conducted by Sanchis, et.al on banks and insurance companies applied the Rough Sets Theory. The results indicated that significant dependence happened in stabilizing the banks during the financial situation in the 1981–1999 period triggered by monetary policy and the possibility of insurance company bankruptcy caused by micro-economic factors. In insurance companies invparticular, bankruptcy occurred due to micro-economic factors such as liquidity, profitability, and solvency issues. The liquidity issue in the insurance companies occurred when the company had to liquidate its assets due to inversion of productive activity as an implication of advance premium payments prior to the claim. In addition, the

profitability issue occurred due to the difference between cash flow with the revenue that caused many insurance companies to manipulate their financial statements. The last issue was solvency, aconsideration of risk exposure to real financial support to guarantee the financial viability of the insurance companies. Therefore, the answer to the second hypothesis is the possibility of financial fragility caused by macroeconomic factors function as predictors of distance-to-default in the banking sector and insurance companies.

Conclusion

The level of fragility in the financial sector in each country of the ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, and Thailand) during 2006 to 2015 is independent and not related. The banking sector of each of the country has a tendency to be exposed to higher default risk compared to the insurance sector. This implies that banking is a more risk-sensitive industry. ASEAN-5 is better advised to nurture their insurance sector to provide a stronger fundamental financial system. Other than that, the financial fragility of companies is influenced by macroeconomic such as GDP, LR, and PER variables for bank and IP and UE variables for insurance companies. The result of the macroeconomic analysis showed that macroeconomic variables exerted a stronger influence on the banks than on insurance companies. So, in light of the ASEAN Economic Community, these countries should consider strengthening their banking sectors since the integration of the financial system will take place in 2020. For further research, we will extend the research to all ASEAN members.

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