GLOBAL FINANCIAL CRISIS AND ECONOMIC GROWTH: ANALYSIS OF THE EAST ASIA ECONOMY

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Abstract

In line with the increasingly integrated economy in the midst of globalization, the financial crisis that occurred in one country can easily spread to other countries and become a global financial disaster in a short period of time. In such an event, strong economic fundamentals are essential to defend a country from the effects of a "contagious" crisis. As proof, due to fragile economic fundamentals and a lack of government credibility, the East Asian economy could be attacked easily by the crisis in 1997 once market confidence deteriorated. However, East Asia has learned a lot from the incident in 1997 so that it can prove its resilience in facing the global financial crisis that struck in 2008 by increasing its economic fundamentals and the credibility of policy makers. This paper starts with a theory about economic growth and the financial crisis. Next, empirically examine the extent of the financial crisis in 1997 and 2008 affecting the East Asian economy using econometric panel data. Evidence shows that, although the two crises had a negative impact on the East Asian economy, the 2008 crisis wave was relatively no worse than the 1997 crisis. Finally, this study also provides further explanation of how the East Asian economy has managed to minimize the impact of the global crisis in 2008.

Keywords*: Global Financial Crisis; East Asian Economy, Economic Growth, Financial Markets, Random and Fixed Effects*

A. INTRODUCTION

Since the era of globalization, financial crises have become more frequent than before. One of the main reasons is the progress in information technology, which, to a certain extent, enlarges the wave of the crisis and accelerates its spread to other regions or countries. Another reason is the rapid development of the financial sector. One example is the emergence of International Financial Integration (IFI). In this case, Edison et al. (2002) explain that IFI refers to "the extent to which an economy does not limit cross-border transactions" (page 1). Therefore, because of an integrated financial system, the emergence of domestic financial disruptions in one country can result in a domino effect by disrupting other integrated economies that lead to global financial chaos. In the last two decades, at least two major financial crises occurred, namely the 1997 East Asian Financial Crisis and the 2008 Global Financial Crisis. If the crisis in 1997 was caused by a lack of transparency and credibility of the government which caused structural and policy distortions (see the example of Corsetti et al., 1999), the 2008 economic turmoil was mainly triggered by rapid innovations in financial products such as securitization practices and "credit default swaps". This is

exacerbated by property speculation and inaccurate credit ratings. In both cases, the development of the crisis spread to other continents and, in a short time, became a global crisis because of its contagious effect amid a globally integrated financial system and rapid dissemination of information. Although the source of the crisis can vary, the consequences of the financial crisis are always associated with macroeconomic indicators, specifically economic growth. For example, during the East Asian crisis, East Asian economic growth fell from the fastest growing region in the world to a region where several member countries recorded negative revenue growth in 1998 such as Indonesia, Malaysia, Singapore, South Korea, the Philippines and Thailand (Asian Development Banks, 1999, Table A2). Furthermore, Indonesia, Thailand and South Korea must request a bailout loan program from the International Monetary Fund (IMF). On the other hand, during the 2008 crisis, although the source of the crisis was caused by the collapse of international financial institutions in the west, especially in the United States and Britain, several East Asian countries such as Malaysia, Singapore and Thailand were also dragged into the crisis with heavy financial burdens. However, statistics show that the impact of the 2008 crisis in East Asian countries was not as bad as in 1997. In addition, these countries recovered quickly. In this regard, many argue that the East Asian nation learned much in 1997 and succeeded in resisting the crisis in 2008 through strengthened economic fundamentals.

By looking at this fact, a formal examination of the causes and consequences vis-à-visthe of the financial crisis becomes increasingly important to do, especially in the context of the East Asian region. Therefore, the purpose of this study is to measure the impact of. The Global Financial Crisis and Economic Growth: Analysis of the East Asian Economy any financial crisis on economic growth in the East Asian country. Furthermore, it is also important to analyze how the East Asian economy succeeded in minimizing the impact of the 2008 Global Financial Crisis. To date, although there has been much literature analyzing the effects of the 1997 East Asian Financial Crisis, most of this research uses a qualitative approach (for example, see Corsetti et al., 1999; Lloyd and MacLaren, 2000; Jomo, 2001). In addition, because it happened recently, studies examining the consequences of the 2008 Global Financial Crisis are also limited. Therefore, this paper aims to fill gaps in the literature by introducing quantitative methodologies and comparing the consequences of the two crises in the East Asian economy. The remainder of this paper is organized as follows: Section 2 provides a theoretical review related to economic growth and financial crises, Section 3 provides a methodology for measuring the impact of both financial crises on growth using econometric modeling, Section 4 presents empirical evidence and further discussion, and Section 6 concludes the paper.

B. DISCUSSION

Growth Theory

Because the purpose of this paper is to examine the impact of the financial crisis on economic growth, this paper needs to first describe the growth factors from a theoretical perspective. Thus, this section introduces several theories of economic growth that can be applied for methodological purposes. In the neoclassical view (for example Solow, 1956), growth is supported by capital accumulation with a "diminishing rate" in the long run. As a consequence, the state will achieve its "steady-state" in the long run, namely the stagnation of economic growth. One implication of this growth model is that underdeveloped countries with an open economy can eventually catch up with developed countries because capital flows from underdeveloped countries so that they can offer higher returns on investment, resulting in economic convergence (Todaro and Smith, 2006). On the other hand, what is called the "new growth theory" contradicts this theory by stating that the state does not always experience "steady-state" in the long run. For example, a study by Lucas (1988) that considers human resources as an endogenous variable of economic growth shows that there is no "diminishing return" on a combination of accumulation of human resources and capital goods. In other words there is growth in the long run. The result of "constant returns to cale" is due to the positive externality effect of knowledge, which affects the output of each company in the economy. Another theory was put forward by Romer (1986), who insisted on the importance of science and technology as engines of growth the economy.

He argues that there are capital "spillovers" made by companies, which, in turn, create knowledge. Knowledge triggers positive externalities and will prevent growth in the long run. In applications, human resources and "spillovers" knowledge can be obtained through FDI and, to some extent, trade. Within the scope of developing countries, Yao and Wei (2007) argue that FDI can act as a means of transferring factors from developed countries to developing countries because FDI accelerates the speed of "General Purpose Technology6 (GPT) and introduces advanced technology and science that does not exist in developing countries. Thus, developing countries will utilize these factors as assets in order to increase economic growth. It needs to be emphasized that some literature shows that FDI can distribute knowledge and knowledge efficiently to a country only if the country fulfills several conditions. For example, a hypothesis by Bhagwati (1994) shows that trade policy plays an important role in determining the effectiveness of FDI in distributing positive externalities in a country. In this case, he argues that export-oriented countries can capture the effects of FDI "spillovers" more efficiently and, as such, will have higher growth rates. In

short, this section shows that, based on neo-classical growth theory, initial income is an important factor of growth because countries with relatively low initial income will grow faster and catch up with countries with higher initial income. Furthermore, it also shows that capital accumulation acts as an engine of growth in the short term. Meanwhile, new growth theories state that variables such as FDI and trade are also important in creating long-term sustainable economic growth by creating positive externalities through knowledge transfer. Therefore, for methodological purposes, these variables are considered as the main determinants of growth. Before proceeding with the methodology, this paper will first investigate the typology of the financial crisis in the following section.

Typology of a Financial Crisis

The Reserve Bank of Australia (2012) defines a stable financial system as a system in which every activity of transferring funds from lenders to borrowers is well accommodated by financial intermediaries, markets and market structures. Therefore, financial instability is a condition in which the financial system collapses because it disrupts these activities and triggers a financial crisis. Truly systemic risk always attached to every financial system, which according to Davis (2001) is closely related to the wealth and health of financial institutions. In other cases, failure of market liquidity and damage to market infrastructure can also initiate risk. In his paper, Davis (2001) also outlines several theoretical frameworks that explain financial instability, which include: 1) debt and financial fragility theory, 2) disaster myopia theory, and 3) bank runs theory. Debt and financial fragility theory argues that the economy follows a cycle consisting of periods of positive and negative growth (Fisher, 1933). With economic progress, debt and risk taking activities have increased. This creates an asset bubble that will lead to negative growth. Meanwhile, the theory of disaster myopia shows that financial instability can be caused by the competitive behavior of financial institutions which leads to a condition where the credibility of the borrower is ignored and the risk is reduced (Herring, 1999). On the other hand, bank runs theory explains the conditions in which panicked investors sell their assets or withdraw their funds for fear that economic conditions will worsen (Diamond and Dybvig, 1983, Davis, 1994). As a consequence, this will result in a sudden decline in asset prices and a liquidity crisis.

To the extent, these three theories can explain the 1997 East Asian Financial Crisis. Financial deregulation with inadequate regulatory oversight led to asset bubbles which resulted in negative economic growth in the East Asian economy. Meanwhile, rapid expansion can also cause a credit crunch because lending is channeled carelessly to bankrupt debtors in order to increase profitability. Last but not least, when investors realize that the situation is already bad, they withdraw their

funds, which causes a large capital outflow. In addition to these basic theories, some literature shows that financial instability can also be caused by the role of international capital flows through international transmission, such as trade patterns, exchange rate pressures and foreign investment, which cause "infectious effects" (see for example Chongvilaivan, 2010; Glock and Rose, 1998; Davis, 2001). For example, the Global Financial Crisis that occurred in 2008 was actually triggered by a "subprimemortgage" crisis that began in the United States. Although the crisis in the US can be explained by the theories above, its spread to other regions, including the East Asian region, is due to the contagious effect of the "subprimemortgage crisis"

RESEARCH METHODOLOGY

This section presents research methodologies in examining the effects of the 1998 and 2008 financial crises on the East Asian economy. This paper collects data sets from the World Bank's World Development Indicators (WDI) for the 1990-2010 period. Inside are various macroeconomic variables from the selected East Asian economy, including ASEAN-5 (Indonesia, Malaysia, the Philippines, Singapore and Thailand) and other East Asian economies such as China, Japan and South Korea. To examine the relationship between economic growth and the financial crisis, this paper needs to develop the determinants of growth first. By following previous studies (for example, see Barro, 2001, Chongvilaivan, 2010), growth is determined as a function of initial income, capital expenditure, investment, and trade. Then, the reference growth model is added to the crisis Dummy. As a result, this paper defines the empirical framework as follows:

where i, i = 1, 2, ..., N, and t, t = 1, 2, ..., T, denotes the economy i for a period of time t, respectively.

The dependent variable, Growth, is GDP per capita growth rate. The first explanatory variable, income, is a logarithmic form of GDP per capita. Furthermore, Capital is the formation of gross fixed capital as a percentage of GDP, which is included in order to see the level of productivity of a particular country (Siegel and Griliches, 1992, Siegel, 1997). The reason is, the higher share of capital accumulation leads to higher levels of productivity, thereby increasing revenue growth. FDI is net foreign direct investment as a percentage of GDP. To some extent, the role of FDI in contributing to growth can be similar to capital but not limited to that. The reason is because FDI also facilitates externalities and spillover effects, which further enhance the productivity efficiency of local companies (for example, see Lim, 2001; Yao and Wei, 2007). Trade represents openness in international trade, measured by the ratio of exports and imports to GDP. Chongvilaivan (2010) shows that this variable represents the impact of the global financial crisis on the economy in relation to commodity

markets. Finally, the crisis dummy variable is included in the model. This dummy is worth one during a crisis period, such as the 1998 East Asian Financial Crisis and the 2008 Global Financial Crisis, and zero otherwise. For more details about variables, please see the Appendix.

From this model, income is expected to have a negative sign. This reasoning is based on Swan Solow's neo-classical model, which shows that economies with lower income levels will grow faster and pursue economies with higher income levels, resulting in income convergence (for example, see Solow, 1956). Conversely, capital and FDI are expected to have a positive relationship with growth. While the Solow-Swan neo-classical model states that all types of capital have the same role in contributing to economic growth, "new growth theory" states the opposite. As mentioned earlier, through FDI, these externalities can be transferred from industrial countries to countries developing countries as important assets to further enhance economic growth (for example, see Yao and Wei, 2007). For this reason, this paper estimates the coefficient of FDI to be greater than capital because it has a greater role in contributing to economic growth. The relationship between trade openness and income growth can be more complex and depends on whether international trade causes trade creation or trade diversion. The first occurs when international trade increases the welfare of members of trade alliances without sacrificing non-members. On the contrary, that happens when trade alliances are formed at the expense of non-members and thus welfare decreases. In this case, the relationship between trade openness and income growth depends on which influence has a stronger effect. Finally, the crisis Dummy coefficient is expected to be negative because it is intuitive. However, the coefficient on the East Asian Financial Crisis in 1998 is expected to be greater than the coefficient on the 2008 Global Financial Crisis because, as mentioned earlier, East Asian countries had stronger fundamentals and better resilience during the 2008 Global Financial Crisis.

Due to the nature of the panel data, this paper uses the fixed effects and random effects methods for estimation purposes. By using fixed effects, the model controls unobserved heterogeneity by assuming that each country has its own effects which can influence the dependent variable. In this model, heterogeneity of each country is captured by intercept and is associated with independent variables. As such, the nature of fixed effects prevents heterogeneous biases in estimations and thus this model always provides consistent results. The existence of fixed effects can be tested by conducting an F-test. Fixed effects are significant when zero is significantly rejected. Another model is the random effects model which assumes that variations across countries are random and do not correlate with independent variables. Unlike the fixed effects model, the existence of random effects can be tested using the

Breusch-Pagan Lagrange Multiplier test. This section presents estimation results from equation (1). However, before proceeding to the results, it is necessary to justify the stationarity of the variables included in the model. As indicated earlier, this study uses data sets that cover a long period of time, which is 21 years. So some variables might contain unit roots. If the union root is present, these variables become non-stationary and cause tradional estimation (OLS) methods cannot be used because they can produce spurious regression. In this case, a test for cointegration is required for non-stationary variables. There are a number of unit root panel tests that can be performed such as Hadri (2000), Levin, and Lin Chu (2002) and Im, Pesar and Shin (2003). This paper uses Levin, Lin and Chu (2002) to test the presence of unit roots in variables. The results show that the stationarity of these variables is zero so that the presence of the root unit is significantly rejected at the 5% level for all variables (Appendix 4). Therefore there is no need to do a cointegration test. Thus, Equation (1) can be estimated using the fixed effects and random effects models. In addition, due to the nature of the data, serial correlations and / or heteroscedasticity can arise, which can lead to inconsistent and biased estimation results. Therefore, this paper corrects this problem by treating each country as a cluster to estimate the correct standard error with the Huber / White cluster-robust covariance estimator in all regressions.

Reference Growth Regression

The first column of Table 1 shows the results of the fixed effects estimation, while the second column shows the results of the random effects estimation. Overall, the results are consistent with economic theory and expectations. The first explanatory variable, income, is not significant in the first column, but is significant at 1% in the second column with a negative coefficient. Furthermore, capital is significant in both columns, although the coefficient is greater in random effects. Overall, despite the relatively higher magnitude, these results are consistent with previous studies (for example, see Chongvilaivan, 2010). Therefore, this proves that higher capital accumulation leads to higher productivity and increases revenue growth. In addition, FDI was also significant at 1% and positively correlated with revenue growth in both regressions. In the fixed effects model, according to estimates, the coefficient on FDI is greater than capital, which is also consistent with previous research (for example, see Stopford et al, 1991; Azman-Saini and Ahmad, 2010). However, contrary to the results in the fixed effects model, the random effects model shows that the capital coefficient is slightly higher than FDI.

Finally, trade has a negative sign and is only significant on random effects. The weak evidence of the relationship between trade openness and income growth might be aimed at the existence of creation and trade transfer (Viner, 1950). If the effect of

trade diversion in an area is greater than its creation, trade openness will not result in the development of output.

Tabel 1.

Reference Growth Regression

Variabel	Fixed effects	Random effects
Constant	-14.575 (6.982)	-1.206 (2.158)
Income	3.098 (2.141)	-1.274*** (0.417)
Capital	0.216** (0.068)	0.310*** (0.050)
FDI	0.417*** (0.100)	0.202*** (0.054)
Trading	-0.084 (0.069)	-0.009** (0.032)
Tes *F*	44.65	
Tes *LM*		0.22
R^2 *in*	0.24	
R^2 *between*	0.05	
R^2 *Whole*	0.11	
The number of obs.	168	168
Number of Countries	8	8

***,

The F test on fixed effects clearly rejects zero, equating the correlation between explanatory variables and heterogeneous effects on errors. In other words, the estimation on fixed effects presents a clear and consistent estimator. In contrast, the Breusch-Pagan Lagrange Multiplier test used in random effects is not significant at the 10% level and in rejecting the absence of equal individual effects. This shows the

absence of random effects. As a result, the estimation of random effects is biased and inconsistent.

Economic Growth and Financial Crisis

Furthermore, the discussion in this paper continues to impact the financial crisis on economic growth in the East Asian economy. As the methodology shows, this paper uses the dummy crisis method to measure the impact of the financial crisis on the economy in East Asia. The first dummy crisis was carried out during the 1997 East Asian Financial Crisis. In this case, although the crisis occurred in 1997, the dummy variable used a value of one in 1997-1998 by considering the lagging effect on the crisis. The second dummy crisis was carried out during the 2008 Global Financial Crisis. Due to the lagging effect, an artificial crisis was also applied when the crisis occurred and in subsequent years, for example 2008-2009. Table 2 shows the reference growth model developed by incorporating dummy crises. In the first two columns, this model was developed with the 1997 East Asian Financial Crisis. In general, the relationship between determinants of growth and income growth is consistent with the initial standard regression. Furthermore, as predicted, the dummy crisis played a significant role in both models with relatively similar values. Based on estimates, under ceteris paribus, the existence of the East Asian Financial Crisis caused the East Asian economy to experience negative revenue growth, around 6%. Once again, this paper examines which of these estimation methods provide better estimates by looking at the F test (for fixed effects) and LM tests (for random effects). In line with the output of the reference regression, the F test significantly rejects the zero value at the 1% level, whereas the LM test fails to reject the zero value at the 10% level. Thus, in the East Asian Financial Crisis, the estimation of fixed effects is a better model because of the consistent and clear estimators in it.

Discussion and Advanced Analysis

In addition to the coefficients for income and trade, the estimation results in this model are in line with expectations and consistent with previous studies. The purpose of this section is to show discussion and further analysis of the estimation results. First, the income coefficient on the reference model and the model that was added to the 1997 East Asian Crisis dummy showed insignificant results with signs that were not in line with expectations. However, the estimation results from the model developed by the 2008 Global Financial Crisis dummy are significant at the 10% level and are the same as the previous case. These results indicate that the growth

model used in this paper slightly supports Solow's (1956) non-classical growth theory, especially as it relates to economic convergence.Second, the coefficients estimated for all capital are significant and positive as predicted. This shows that capital accumulation does have a positive effect on economic growth. However, the estimation results for FDI, which are more significant than the capital estimation results, show the transfer of knowledge from more advanced economies to less advanced economies through FDI. These results support studies conducted by Lim (2001) and Yao and Wei (2007), which state that FDI supports externalities and indirect effects that will increase the efficiency of local company productivity. So, this will support economic growth. Third, the coefficients estimated for trade are all insignificant and show opposite signs. This shows that this model presents insufficient signs for us to draw conclusions about the correlation between trade openness and income growth. Nonetheless, these results indicate that the data used in this paper support a study conducted by Chongvilaivan (2010), in which the paper proposes that trade variables are not significant as a result of trade creation and trade diversion. Therefore, the effect of trade on income growth depends on whether the welfare of members of the trade alliance increases on non-member expenditure or not.

Finally, although both estimation results for the dummy crisis show negative signs, the 1997 East Asian Crisis dummy shows a higher value than the 2008 Global Financial Crisis dummy. This is in line with expectations because the 1997 East Asian Crisis occurred in the East Asian region and is the result of a cause internal causes, including:

1) lack of policy credibility and 2) inadequate financial infrastructure, which coincides with financial deregulation. The first reason, as stated by Rraisah (2001), is that this crisis was initially driven by the misuse of state intervention and ineffective industrial policies in the region. Whereas the second reason, financial deregulation, inadequate financial infrastructure, and weak banking supervision encourage risky investment without sufficient risk assessment resulting in bubbles on credit and collapse in the financial sector (for example, see Radelet and Sachs, 2000). This important weak economic factor points to "financial misunderstanding" as a major issue in the East Asian economy, which caused a crisis in 1997 and struck the economy in the region very badly (see Appendix 5 for statistics on macroeconomic variables during the two financial crises). Furthermore, this crisis is deepened due to the expansion that took place in the real sector, which befell borrower businesses and large capital flows.

On the other hand, the crisis in 2008 resulted in a smaller impact on the region's economy because the region only experienced the "contagious effect" of the crisis

which actually originated from an advanced economy. In some cases, these results support this paper, which shows that divergence may be related to externalities in the 2008 global financial crisis. The crisis is also much aimed at multidimensional reforms that followed the 1997 East Asian Financial Crisis. More clearly, Goldstein and Xie (2009) shows that the size of foreign ownership, increased financial structure, high contribution from regional trade, and the rational "countercyclical" and fiscal monetary policies will help the region to deal with the negative effects of the crisis.

C. CONCULSION

The world financial system, supported by developments in information technology, has strengthened financial integration between countries in the world. In addition to its usefulness in these circumstances, financial integration has also caused the financial crisis to spread easier and faster and damage the connected economy. For this reason, studies of the financial crisis have become more important than ever before. In this case, the purpose of this study is to better understand the causes and consequences of the current financial crisis by providing a comprehensive analysis to avoid the occurrence, or at least minimize the impact of the financial crisis in the future. This study has revealed important findings regarding the main impact of the financial crisis on the East Asian economy. First, this study has investigated the effects of the 1997 East Asian Financial Crisis and the 2008 Global Financial Crisis using a quantitative approach, such as panel regression. The results show that although the two crises had the opposite effect on the economies in the region, the East Asian economy had become stronger during the crisis in 2008 than the crisis in 1997. Furthermore, this paper found that the reduced impact of the 2008 crisis was due to, besides the nature externalities of the crisis, most economies in East Asia have learned lessons after the 1997 East Asian Financial Crisis by strengthening economic fundamentals, supported by government credibility and better accountability.

Integrated efforts to restructure the banking and financial sector by the East Asian government after the 1997 East Asian Financial Crisis have increased resilience to the economic crisis. Better oversight of the sector was incorporated into reforms, in contrast to previous periods of deregulation and suspension and the incorporation of financially problematic institutions. Capital is also involved to help with liquidity problems. In addition to reforms in the banking and financial sectors, higher requirements for company transparency are also needed to increase credibility in the private sector. Together, these reforms have strengthened economic fundamentals in East Asian countries. Another important thing that has improved the readiness of East Asian countries in facing the 2008 Global Financial Crisis is an increase in the country's foreign exchange, which helps the government in maintaining economic conditions during the crisis. In addition to its findings, the scope of this study is limited to data

and analysis at the country level. Therefore, further studies should focus more on analysis at the industry level and should be facilitated by data at the industry level to examine the sensitivity of each industry in anticipating the financial crisis. In addition, the estimation results in this study can be improved by adding interaction variables between crisis and other independent variables as well as introducing GMM estimates in estimating the model to obtain simultaneous equations in the model.

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