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Business Cycle Dynamics in ASEAN Countries and China: A Macroeconomic Study Using External Shock

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Abstract: Previous studies have shown that there are many pros and cons to the increased intensity of trade between countries that have both positive and negative influences on the synchronization of the business cycle in some ASEAN countries. The purpose of this study is to analyze whether the increase in China's trade gives an impact on the synchronization of the business cycle in these ASEAN countries. The samples taken are from five ASEAN countries, namely Indonesia, Malaysia, Singapore, Thailand, and the Philippines as well as China, an ASEAN partner. The method used in this study is VAR (vector auto-regression). The movement of the business cycle in this study is viewed in terms of trade, using the model of Frankel and Rose and the index used by Grubbel and Lloyd. The results show that the two variables of trade, namely trade intensity and intra-industrial trade, have a negative influence on the synchronization of the business cycle in ASEAN countries. This is due to the fact that the majority of ASEAN trade is still dominated by trade among the members.

JEL Classification: E32, E4, F13, F15, F44, F45

Key words: business cycle, ASEAN, external shock, China

I. INTRODUCTION

Global development is basically regarded as an opportunity as well as challenge. It is an opportunity since a country has a full opportunity to gain a profit through the opening of free trade, while it is a challenge since the country has to deal with developed countries with their high competitiveness. Globalization is believed to increase the chances of prosperity for developing countries with some conditions, among others: political and legal stability, minimal completeness of institutional and material infrastructure, as well as the initial capital of human resources in order to participate successfully in the globalization process. Without the support of these, it is difficult for developing countries to be able to compete in international markets (Lestari, 2004).

Fiess (2005) found a significant public component that controls the business cycle both in developing and developed countries. Most economic fluctuations experienced in a country are due to its exterior

impulse which may affect its economic mechanism. An important aspect of economic fluctuations is the length of the cycle and the tendency to reduce the determination of the intrinsic structure from the swinging system, in which the intensity of fluctuations is determined by external movement (Kindland, 1995). Therefore a question arises whether the business cycle is influenced by the exogenous shock or endogenous business cycle.

Business cycles at the international level need to be studied and their movement need to be observed because they have influence on world demand, and the economic development of developing countries. The world economy had once experienced a depression period (1920-1930) due to the First World War. Similar war events have resulted in an economic booming, such as during the Second World War (1940-1945) and the Korean War in the 1950s. In both cases, the demand for goods and services related to the outbreak of war usually stimulated the world's increased production, as well as the production of natural rubber, iron ore, and computer equipment. Gulf War as a reaction to the Iraqi invasion to Kuwait contributed its influence to the world economic recession.

Association of Southeast Asian Nations (ASEAN) is a geo-political and economic organization of the countries in Southeast Asia, which was founded by Indonesia, Malaysia, Philippines, Singapore, and Thailand in Bangkok, August 8, 1967 by the Declaration of Bangkok. The organization aims for economic growth, social progress and cultural development of its member countries, promoting peace and stability at regional level, as well as increasing opportunities to discuss peacefully the differences among members. Currently ASEAN comprises 10 countries, namely Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, Brunei, Cambodia and Laos. ASEAN cooperation has so far been able to increase the economic growth of its members (www.asean.org). The establishment of ASEAN economic integration is believed to be the driving factor of economic development in Asian region.

Two decades ago, many empirical studies analyzed the business cycle issues that affect economic growth of a country. Few studies particularly analyzed the movement of the macro-economic aggregates, experienced by a country that is economically integrated with other countries. There are three reasons why this analysis needs to be done. *First*, the shock encountered by a country generally will have an impact on other countries through trade and monetary market transactions. *Second*, when one of the countries, integrated within a group, suffers from a shock, it will cause similar effect to other countries in the group. *Third*, the shock that hits certain sectors may contribute to movements in output aggregate if the economic structure of each country is similar (see Loayza *et al*, 2001).

One of the things pertaining to the issue of economic integration is trading activity. The impact of the increase in trade integration and its correlation with business cycles between the two countries depend on the inter- and intra-industrial domination. The greater the inter-industrial trade, the lesser the correlation of business cycles between trading partners. While the increase in intra-industrial trade will tend to increase the correlation of business cycles (Zebregs, 2007).

An analysis on economic fluctuations movement gets more attention than some of economic integration since it will affect economic policies and institutions. Escait (2004), Jacobo (2000), and Christodoulakis *et al.* (1995) state that the existence of business cycles is likely to provide similar impact on member countries that embrace economic integration. The studies conducted by Ahmed (2003), Reyes Mejia (2003), Cerro and Pineda (2002), Loayza *et al.* (2001) conclude that business cycle has its own privileges

and affects the shock, experienced by a country in short term. On the contrary, Hecq (2003), and Engle and Isher (1993) find that most countries in Latin America experienced business cycle movement in long term and short term simultaneously. This finding is similar to results of empirical studies conducted by Shin and Wang (2003) and Cortinhas (2005). They find a positive relationship between intra-industrial trade and the business cycle. Meanwhile Gruben *et al.* (2002) and Fidrmuc (2004) also find that intra-industrial trade has a positive impact on the movement of GDP in OECD countries. This finding is in contrast with the results of empirical study conducted by Eric (2007), stating otherwise.

So far, many results of studies suggested that the increased intensity of trade between two countries will affect the business cycle improvement in these countries; nevertheless the study conducted by Eric states otherwise. The bilateral trade carried out by the two countries has a negative effect on the movement of GDP since it will lead to industrial specialization of the countries. Based on this background, this study tries to estimate whether the bilateral trade conducted by ASEAN countries and China will affect the co-movement business cycle.

2. LITERATURE REVIEW

Business cycle is also defined as the deviation of output against the trend. In this context there is a period of expansion and contraction of the economic activity. Business cycles have an impact on inflation, government spending, employment, sales, production and some economic aspects. Botha (2004), and Leslie (1993) state that business cycle is all about volatility or fluctuation of real output and employment. Business cycle consists of several different stages, namely the expansion phase, contraction phase, and recovery phase (Botha, 2004).

Expansion phase is the initial phase where the economy expands, exceeding the height of the previous cycle. In the expansion there are several periods, included in the increasing and decreasing period of economic growth, often called the growth cycle (Anon, 2001a). Expansion is a period where demand and production is increasing and consumer trust is also increasing, so that the number of sales also increases. Inflation and interest rates also increase during the period of expansion.

The second phase is the contraction phase. Business expansion thereafter increases to a peak followed by a contraction phase. During this phase a number of factors such as sales, prices, production, and employment begin to decline. This decrease will usually be followed by a decline in interest rates. If this occurs drastically and in the long term, there will be a recession. A recession is usually defined as a decline in GDP in two consecutive quarters. This happens usually less than one year, up to one year, and the impact on the contraction of some economic sectors. The recession begins at the peak of the business cycle and ends at the lowest point (trough) as shown in Figure 1.

The third phase is the recovery phase. In an economy, looping of demands and production increase sometimes occur. Recovery phase moves up to a new expansion period and the business cycle starts all over again. Recovery is a transitional phase starting from the lowest economic point or trough until the economy recovers and returns to the original level. In general, the strongest growth occurs in the recovery phase, yet the duration is shortest than the recession phase (Botha, 2004). According to the theory of business cycle, during an economic boom, the credit will be moving uncontrollably, moral hazard grows, so that prosperity period will turn into a crisis. According to Minsky, the root of instability is the stability itself. When the economy is going well, speculation culminated in instability will occur.

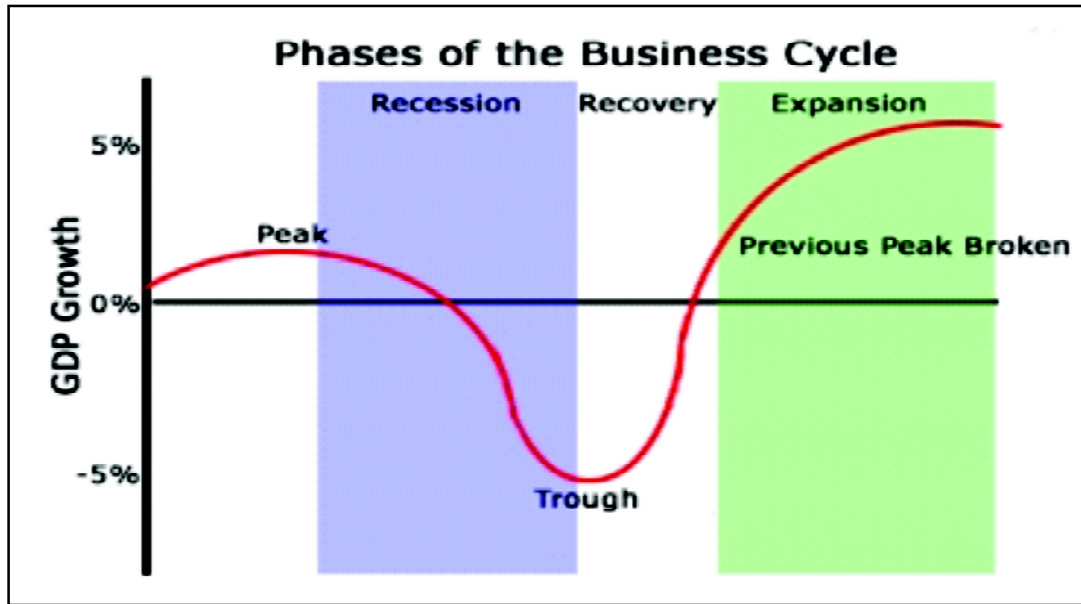


Figure 1: Business Cycle

Source: Investopedia, 2013

3. METHODOLOGY

The data used in this study include export data, import data, intra-industrial trade data. The data were obtained from the International Financial Statistics (IFS) published by the IMF, Bank of Indonesia Annual Report, World Bank, Economic and Financial Statistics of Indonesia and several publications of the Central Bureau of Statistics (BPS). The time period studied was from 2006 to 2014. The research samples were from five ASEAN countries, namely Indonesia, Malaysia, Thailand, Singapore, the Philippines, as well as China as a partner.

This study used panel data. There were three variables used, i.e. business cycle, intensity of trade and intra-industrial trade. Business cycle was obtained from the coefficient of bilateral GDP correlation using the method of five-year moving average. Intensity of trade is calculated using the formula of Frankel and Rose (1998), i.e. using terms of trade. The formula of Frankel and Rose is often used by researchers to calculate the intensity of trade. For further literature, please see Shin and Wang (2005), Rana (2007), Teng and Way (2005), Oktaviani *et al.* (2007), and Cortinhas (2007).

To see the role of bilateral trade intensity in each country, including the movement of the business cycle, there are three proxies (Frankel and Rose, 1998). The first proxy uses only the export data. The second proxy uses the import data, while the third proxy uses the combination of both. The variable of bilateral trade intensity is written as follows:

$$Wx_i(i, j) = \frac{x_{ijt}}{X_{it} + X_{jt}} \quad (1)$$

$$wm_i(i, j) = \frac{m_{ijt}}{M_{it} + M_{jt}} \quad (2)$$

$$wt_i(i, j) = \frac{x_{ijt} + m_{ijt}}{X_{it} + M_{it} + X_{jt} + M_{jt}} \quad (3)$$

where X_{ijt} = total exports of country i to country j at the time period t ; M_{ijt} = total imports of country i to country j at the time period t ; $X_{ij} + M_{ij}$ = the total exports and imports of country i (j) at the time period t .

In the meanwhile, the intra-industrial trade variable is calculated by adopting the formula suggested by Rana (2007), Frankel and Rose (1998), Shin and Wang (2004), Teng and Way (2005). The calculation of intra-industrial trade is derived by Grubel dan Lloyd Index (1975).

$$IIT = 1 - \frac{\sum_i |x_{ijt}^k - m_{ijt}^k|}{\sum_i (x_{ijt}^k + m_{ijt}^k)} \quad (4)$$

where :

- x_{ijt}^k = total exports of product k from country i to country j .
- m_{ijt}^k = total imports of product k from country i to country j .

From several variables above, we can make an equation model as follows:

$$BCi_{jt} = \alpha_0 + \alpha_1 TI_{jt} + \alpha_2 IIT_{jt} + \varepsilon_{it} \quad (5)$$

where BC is business cycles, TI is trade intensity, and IIT is intra-industrial trade. The models will be processed by using data processing program Eviews and Megastat.

4. RESULTS AND DISCUSSION

The Results of Unit Root Test

From the results of the unit root tests for the variable of business cycle, it was found that all countries have been stationary except for Indonesia. Thus, for Indonesia, the test of integration degree 1 was conducted; the result was that it has been stationary at a significant level of 1 percent. The opposite occurred for the test of trade intensity variable: only Indonesia passed in the level unit root test; while Malaysia, Thailand, Singapore, China and the Philippines did not require an integration degree test.

In the meanwhile, the result of calculation for intra-industrial trade states that only China passed the unit root test, while Indonesia, Thailand, the Philippines and Singapore did not require the test of integration degree 1. Meanwhile, Malaysia had not passed the test of the degree of integration 1, thus the degree of integration 2 was tested. As a result, Malaysia passed the test of the integration degree 2. These results allow us to declare that the entire set of variables is valid, thus allowing us to conduct inference.

Results of Panel Data Calculation

From the result of the regression analysis for the variable of trade intensity, it is known that both trade intensity and intra-industrial trade variables have a positive and significant impact on the synchronization

Table 1
The Result of Integration Degree Test

| Variable | Country | Result of Unit Root Test | | |
|------------------------|-----------------|--------------------------|----------------------|----------------------|
| | | Level | Integration Degree 1 | Integration Degree 2 |
| Business cycles | Indonesia | -2.212966 | -3.752111 | |
| | Malaysia | -3.106704 | | |
| | Thailand | -3.133851 | | |
| | The Philippines | -3.047715 | | |
| | Singapore | -3.246827 | | |
| | China | -3.844043 | | |
| Trade intensity | Indonesia | -2.662363 | | |
| | Malaysia | -1.541524 | -4.950792 | |
| | Thailand | -2.233281 | -3.903700 | |
| | The Philippines | -0.320843 | -4.971138 | |
| | Singapore | -1.974594 | -4.495647 | |
| | China | -0.875562 | -4.325881 | |
| Intra-industrial trade | Indonesia | 1.760500 | -7.680202 | |
| | Malaysia | -2.119446 | -6.510402 | |
| | Thailand | -1.180034 | -1.952938 | -4.682595 |
| | The Philippines | -1.663082 | -6.149000 | |
| | Singapore | -1.015515 | -4.920497 | |
| | China | -4.691535 | | |

Source: Calculation result using EViews

of the business cycle. The calculation result for the trade intensity variable states that this variable has a positive and significant relationship to the business cycle synchronization. The result indicates that the role of China as a trading partner in ASEAN is very important. The higher the trade intensity, the greater the synchronization of the business cycle.

Table 2
The Result of PLS Calculation

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|------------------------|-------------|-----------------------|-------------|-----------|
| Trade intensity | 2.952725 | 0.266596 | 11.07565 | 0.000 |
| Intra-industrial trade | 0.890378 | 0.091170 | 9.766116 | 0.000 |
| R-squared | -8.864432 | Mean dependent var | | 0.920 |
| Adjusted R-squared | -8.921784 | S.D. dependent var | | 0.105 |
| S.E. of regression | 0.330001 | Akaike info criterion | | 0.631988 |
| Sum squared resid | 18.73096 | Schwarz criterion | | 0.668299 |
| Log likelihood | -52.98294 | F-statistic | | -154.5636 |
| Durbin-Watson stat | 0.091230 | Prob(F-statistic) | | 1.000000 |

When viewed in retrospect, the continual development of AFTA which initiated an agreement to let China in as a trading partner in the ASEAN region established the ASEAN-China Free Trade Area (ACFTA). ACFTA was preceded by mutual agreement of the participants of the ASEAN-China Summit in Brunei Darussalam in November 2001. This was followed by the signing of the Framework Agreement on Comprehensive Economic Cooperation by the participants of the ASEAN-China Summit in Phnom Penh in November 2002, where the manuscript became the foundation for the establishment of ACFTA. Then, in November 2004, the ASEAN-China Summit participants signed the Framework Agreement on Trade in Goods, applicable on July 1, 2005.

The objectives of ACFTA Framework Agreement are to: (a) strengthen and enhance economic cooperation, trade and investment between the two parties; (b) liberalize trade in goods, services and investments; (c) seek new areas and develop mutual economic cooperation between both parties; (d) facilitate the more effective economic integration with the new ASEAN member countries, and bridge the gap existing on both sides. Moreover, they agreed to strengthen and enhance economic cooperation through: a) the elimination of tariff and non-tariff barriers of trade in goods; b) the progressive liberalization of trade in services; c) build a competitive and open investment regime within the framework of ASEAN-China FTA. Based on the agreement of ASEAN-5 (Indonesia, Thailand, Singapore, Philippines, Malaysia) and China there is an agreement to eliminate almost all tariffs of commodities in 2010. The free trade came into force on January 1, 2010 with the elimination of tariffs on products of export and import in accordance with the agreement.

The interest of ASEAN countries to include China as a trading partner in the ACFTA is based on the consideration that China has a great market potential. China is a developing country in Asia whose economic development is quite fast and capable to sustain high growth compared to other countries; therefore China's position is quite important in the current global economy. China, with a high population of 1.4 billion is a great and potential market. Thus it would be mutually beneficial to have co-operation with China in various economic sectors; since apart from having high investment ability, China also requires raw materials and capital goods to move its industrial sector. The enactment of the free market will make it easier to import products from ASEAN and China into the domestic market. In addition the price of these products will also become cheaper due to the reduction or elimination of tariffs.

The calculation result for the variable of intra-industrial trade shows that intra-industrial trade positively and significantly affects the synchronization of business cycle at a one-percent degree of confidence. This finding indicates that the increase in intra-industrial trade tends to increase the synchronization of the business cycle. The result also demonstrates that intra-industrial trade is an important factor that drives the synchronization of business cycle. The finding demonstrates the fact that the existence of ASEAN-5 countries as trading partners of China, Japan, Korea and India is very important. The existence of ASEAN trading partners provides a strong impetus for mutually beneficial trade. The result confirms the empirical study conducted by Teng and Way (2005) and Rana (2007).

This positive result is also supported by empirical studies conducted by Yuniarti (2007), who found that intra-industrial trade among ASEAN countries has a market share of 96 percent. This condition is driven by a number of multinational companies investing in ASEAN countries. She states that the majority of world trades, especially among industrial countries are intra-industrial trades. These conditions need to be improved by the presence of product differentiation, industrial scale, and increased market competition (Lestari, 2011).

5. CONCLUSIONS AND RECOMMENDATIONS

From the results of these calculations, it can be concluded that the two variables, i.e., intra-industrial trade and trade intensity positively related to the synchronization of business cycle. These results indicate that the presence of China as a trading partner has a positive influence on trading activities in ASEAN. This is reinforced by the implementation of the ASEAN Free Trade Area (AC-FTA) in ASEAN started in 2010. The inclusion of zero import duty is expected to increase the trade intensity.

These results support the studies that have been done by Teng and Way (2005), Rana (2006), Shin and Wang (2004) and Lestari (2012). Nevertheless, the conducted trading activity should be supervised closely by government authorities of ASEAN countries in order to avoid over quotas on imports. China is known to have a comparative advantage in international trade so there are fears that it will overwhelm domestic producers. Therefore, in addition to encouraging domestic production, governments must also provide a conducive environment to increase the presence of small industries in order to compete globally.

The enactment of the AC-FTA, apart from being advantageous since it allows market penetration, also causes harm, particularly for countries whose economies are less powerful. Therefore a strategy to strengthen domestic trade is required. The strategy to increase exports by the governments in ASEAN countries is basically divided into two interrelated systemic programs, namely domestic and overseas programs. In the individual countries, it is necessary to provide industrial supervision so that industries have the capacity to produce as well as to increase and diversify both the quality and the types of products offered. Another effort is needed to increase the product competitiveness through programs of trademark image improvement, product diversification, and development of products and services. In addition, there is also export-actor coaching; in addition to mastering international trade techniques, it is also deemed necessary to provide knowledge on international trade.

In regard to overseas programs, the strategy is to provide access to the market through negotiations at multilateral, regional, and bilateral levels, promoting exports and domestic trades, and market diversification to non-traditional markets while still maintaining traditional markets. From the government side, policies and strategies for market penetration need to be implemented comprehensively through four steps: (1) perform institutional/bilateral stabilization through agreements and mechanisms, (2) encourage export promotion activities abroad, (3) pursue export facilities, and (4) establish a policy of industrial development and a healthy business climate.

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