ASEAN MONETARY UNION – A Possibility?
A comparison of ASEAN economic indicators with that of Euro Zone

Rashi Mittal
May 2004

Public Policy Department
Stanford University, Stanford CA 94309
Email: rashi30@stanford.edu
Advisor: Michael Kumhof

Abstract
After the 1997 East Asian Financial crisis, the need for a greater level of economic integration in the area has become evident. The crisis has also brought to the forefront the question of an appropriate exchange rate regime in the region and formation of a monetary union can be a viable option. This thesis examines whether or not the Association of South East Asian Nations (ASEAN) is economically prepared to form a single currency area. ASEAN’s economic preparedness is compared to that of EMU, prior to the adoption of euro. First, I develop an inter-temporal model, which demonstrates that in times of external shocks, countries with flexible exchange rates suffer less than the countries with fixed exchange rates. This implies that countries in a currency area will incur large costs in times of shocks because internally a currency union is a fixed exchange rate regime. However, suffering symmetric shocks and having a high level of intra-trade integration within the currency area can diminish the negative effects of the shocks. Therefore, as a second step, this paper examines the existing level of shocks and business cycles symmetry among the ASEAN countries and the level of intra-regional openness and trade integration in the area. ASEAN does fulfill many economic criteria needed to form an ASEAN monetary union (AMU), but it still has many obstacles to overcome.

Keywords: ASEAN monetary union, single currency area, currency union, currency area
Acknowledgement

I am thankful to everyone who has helped me along the way. I really appreciate the constant support and encouragement I received from many people throughout the process.

I would like to first thank my advisor, Professor Michael Kumhof for his tremendous help and support. I do not think that I would be able to create my own economic model, if it was not for his belief in me.

I would also like to sincerely thank professor Geoffrey Rothwell for always being very supportive and always having answers to all my problems.

I cannot thank Ms. Mary Sprague enough for guiding me through my thesis, and being supportive when I would lose all hope.
I would also like to extend my thanks to my teaching assistant, Ben Ho, who has really helped me with my model, and I might not have been able to create the model without his help.

I would also like to give my sincere thanks to Gabrielle Moyer, who edited my paper.

Overall support of all the staff in the public policy department has been incredible, and I would like to thank them too.

Last, but not the least, I would like to thank my family and friends who always believed in me, and have been there for me throughout this process.
1. Introduction

The 1997 East Asian financial crisis has not only increased a need for greater economic integration among the countries in the region, but it has also brought to the forefront the question of the appropriate exchange rate regimes in the area. Since the crisis, many economists and academics believe that these developing countries with open capital accounts only have two-corner solutions to the exchange rate dilemma: free float, a flexible exchange rate or hard peg, a fixed exchange rate (Fischer, 2001). This thesis offers a solution in between these solutions: namely that participating countries peg their currency between participants of a monetary union, but float their currency with the rest of the world. I specifically look at the possibility of forming a monetary union for the Association of Southeast Asian Nations (ASEAN).

In the years before the formation of the European Monetary Union (EMU), the ongoing debate was whether or not the countries of the EMU could form an optimum currency area. From this debate, it became obvious that the member countries of a monetary union need to have similar macroeconomic developments in order for such a union to succeed. ASEAN in some ways has started the path towards economic unity, and at the ASEAN summit in 1998, a proposal to conduct a study into the feasibility of establishing an ASEAN common currency and exchange rate system was endorsed under the Hanoi Plan of Action. No very definitive results have as yet been published however from this study. The need for an assessment of an ASEAN monetary union, then, is evident. My research will therefore enter into an arena of research that is still very small and the significance of this research for a successful ASEAN monetary union is large. It is also necessary to emphasize that no matter what path ASEAN takes towards economic
integration, it still has a long way to go. It should be noted that the formation of a monetary union in Europe was a last step in a sequence of policies towards economic integration in Europe. It has taken Europe over four decades to form a monetary union, and given the political and economic fragility of ASEAN countries it might take them much longer.

1.1 Purpose

In this thesis, I want to explore the option of forming an ASEAN Monetary Union (AMU), since ASEAN policy makers themselves have shown interest in this possibility. Most economic literature about the formation of monetary unions focuses on 4 inter-relations between the members of potential monetary unions. These include: 1) the extent of trade intensity; 2) symmetry between shocks and cycles; 3) mobility of labor between countries; and 4) the system of risk sharing. The greater the four relationships are, the more suitable the countries are for a monetary union, because it is more likely that the countries will suffer less by foregoing their independent monetary policy (which involves having flexible exchange rates, which can be revalued and devalued in times of shocks) and forming a single currency area.

In this thesis the conclusions will primarily be drawn on the basis of the first two criteria: the level of trade intensity between the countries and the symmetry of shocks and cycles among the ASEAN countries. The other two criteria have not been included in this thesis because if shock symmetry is present, the need for labor mobility and a system of risk sharing becomes less important. Moreover, these two criteria have been ignored partly because of the limitations of data available and partly because of the limitations of the length of this project.
1.2 Methodology

There is no absolute measure for deciding whether a given currency area is optimal or not. Therefore, in order to determine the optimality of AMU, a basis of comparison is needed. In this study, the relevant economic fundamentals of ASEAN are compared with the recently established EMU. Comparing a potential AMU to the EMU is most appropriate because most other monetary unions, such as the East Caribbean currency union, the rand zone, and the CFA franc zone, work more like a fixed exchange rate regime rather than a single currency area, the subject of this study. Also, the countries participating in these monetary unions are often much smaller in terms of GDP.

Moreover, historically, many other successful monetary unions, such as the Italian monetary union, the British monetary union between England & Scotland and the US Federal Reserve System, have been formed as a result of political unification, but the countries of ASEAN are not prepared for that type of unity. The euro has been adopted by 11 independent nations, which want to retain independent political control, so that makes EMU a more comparable model. Euro’s recent launch and its success also make it a more interesting parallel.

The rest of the thesis is organized as follows. The second chapter will provide a brief history of EMU and ASEAN. The third chapter will discuss traditional Optimum Currency Area theories (OCA is a word coined by Mundell (1967)) and the literature that has already been written about a potential monetary union in ASEAN. In the fourth chapter I create an inter-temporal model, which illustrates the effects of interest rate shocks and terms-of-trade shocks in fixed exchange rate regimes as opposed to flexible exchange rate regimes. This is important because it mathematically identifies the costs
and benefits of losing independent monetary policy when a country joins a monetary union. Chapter five and six assess the level of symmetry between shocks and cycles and the extent of trade intensity among countries, which are important criteria for determining the prospects of forming an AMU. More specifically, chapter five shows empirical results regarding interest rate shocks, terms-of-trade shocks and business cycle correlations. This chapter connects my model from chapter four to the data on ASEAN and EMU countries. Chapter six examines the level of trade integration and openness in ASEAN. Chapter seven discusses the political limitations of forming a monetary union in Asia. The eighth and final chapter concludes the thesis. I want to make a note that monetary union can be interchangeably used with currency union, single currency area and a common currency region. For simplicity, in this thesis I only use the term monetary union.
2. **Background Information on EMU and ASEAN**

2.1 **European Monetary Union**

The formation of a single currency area was not an easy and rapid process in Europe. In reality, the process started in 1958, when six European countries formed the European Economic Community (EEC) in order to create a free trade area and more importantly to avoid another war like World War II in the future. In time, EEC grew its membership to 15 countries and formed the European Union (EU). In 1992, 12 of the 15 EU countries signed the Maastricht treaty, which not only served as a blue print for the formation of a monetary union but also enabled the countries to politically commit to forego their independent monetary policies and join a monetary union. Finally, on January 1, 1999, the 11 countries of the European Union (EU) (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain) locked their exchange rates and adopted the euro as their common currency. Many economic studies of the European Union suggest that political commitment to form a monetary union in 1992 was important, because it enabled the 11 countries to economically integrate and converge and step in the direction of meeting the criteria of an “optimum currency area” before adopting the euro in 1999. If this claim is correct, then political commitment will be necessary before ASEAN can form an AMU, as will be subsequently discussed in greater detail.

2.2 **ASEAN**

The Association of South East Asian Nations was created as an anti-communist, political organization on August 8, 1967 in Bangkok. The formation of ASEAN was a bold step for the Asian countries because at that time the region was divided by
ideological conflicts and wars, and scarce resources were being wasted on defending themselves against each other. During the 1960s there had been a dispute between Malaysia and the Philippines (1962), a confrontation between Malaysia and Indonesia (1965), and the separation of Singapore from Malaysia (1965). Against all odds and in order to promote regional cooperation, ASEAN was founded and its original members included five countries: Indonesia, Malaysia, Philippines, Singapore and Thailand. ASEAN subsequently accepted five more members: Brunei in 1984, Vietnam in 1995, Laos and Myanmar in 1997, and Cambodia in 1999.

The ASEAN declaration had three main objectives:

i) To promote the economic, social and cultural development of the region

ii) To safeguard the political and economic stability of the region against power rivalry

iii) To serve as a forum for the resolution of the intra-regional differences

The ASEAN region covers a population of about 500 million, and a total area of 4.5 million square kilometers. Its total GDP in 2003 was US$737 billion (www.aseansec.org). The region embraces various religions, languages and political ideologies. Economically, the countries are varied as well. Some countries have very open financial markets, while others do not and are still struggling to survive. For example, Singapore is one of the most advanced countries in the world, while Vietnam is still at the beginning stages of establishing itself in the world economy. Moreover, in the past, the ASEAN countries were mostly closed economies, but recent formation of ASEAN Free Trade Area (AFTA) has resulted in an increase in the level of trade intensity in the region.
2.3 AFTA

In January 1992 at the fourth ASEAN summit, the ASEAN Free Trade Area (AFTA) was formed. The main objective of AFTA is to increase ASEAN’s competitive edge as a producer. It hopes to promote greater economic efficiency and competitiveness of the manufacturing sector by eliminating intra-ASEAN tariffs and non-tariff barriers.

AFTA presented a program of regional tariff reduction called, the Agreement on the Common Effective Preferential Tariff (CEPT) Scheme. The CEPT scheme commenced on January 1, 1993. The goal of the program is to reduce import tariffs levied on a wide range of products to at least five percent. It also seeks to eliminate other non-tariff barriers in the region. The original signatories of the program were Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand and they had to meet the requirements of CEPT agreement by 2003. In the light of their late accession to ASEAN and the CEPT agreement, Vietnam is supposed to meet the AFTA requirements by 2006, Laos and Myanmar by 2008, and Cambodia by 2010. This agreement to move towards a free trade area has shown some significant results by increasing trade among the countries of ASEAN.

2.4 ASEAN Exchange Rate Regime

While ASEAN was growing in membership, the entire East Asian region, including the ASEAN countries was experiencing miraculous economic growth. From the 1960s to 1996 East Asia’s growth averaged about 8% a year, which was higher than the growth experienced by most industrial, well developed countries during that period. This dynamic economic progress, often termed the “East Asian miracle,” collapsed however with the 1997 East Asian currency crisis. This crisis exposed the fragile nature
of the financial and banking systems of East Asia. Through the “contagion effect” the
currency crisis spread from Thailand to Indonesia, to Malaysia and to the Philippines.
Other ASEAN countries were also affected negatively.

In order to combat these effects of the crisis, economic integration became a
necessity in the ASEAN region. Before 1997 most East Asian countries had pegged their
currencies to the dollar or Yen, but during the crisis they were forced to float their
currencies. Since then, many economists have debated about the perfect exchange rate
regime for the East Asian countries. Floating the currency, pegging the currency to the
dollar, yen or euro, forming an internal basket peg, and even forming an ASEAN
monetary union are the many options that economists and policymakers are considering.
The last option is the one examined in this chapter. The next chapter discusses the
economics behind the formation of such a monetary union.
3. Theories and Literature

3.1 Optimum Currency Area

Robert Mundell is the father of the theory of optimal currency area, and even though his theory is not comprehensive by any means, it is a good starting point for analyzing ASEAN's readiness for forming an AMU. The question Mundell asks in his original article on optimum currency area (1961) is: "when is it advantageous for a number of regions to relinquish their monetary sovereignty in favor of a common currency?" His answer led to his theory of optimum currency area, which says that the major cost of joining a monetary union is a loss of independent monetary policy. When countries do not have separate national currencies, they cannot depend upon the exchange rate mechanism to make adjustments in times of crisis and shocks. Therefore, Mundell's optimum currency area is a geographical area that experiences symmetric supply and demand shocks and satisfies one of the following conditions: a) flexible wages and prices or b) high mobility of labor. Also, it helps if their budgetary process is centralized and monetary transfers from the budget surplus country to the budget deficit country can be established smoothly. He hypothesizes that generally these criteria are hard to meet; therefore, currency areas should be small and homogenous and not large and heterogeneous.

3.2 Criticisms

Mundell's theory has received much criticism, however, from other economists. Mundell(1961), McKinnon (1963) and Kenen (1969), the three pioneers of the theory of optimum currency area, have not agreed on the ideal model for a monetary union. McKinnon (2000, 2001) emphasizes two main flaws in Mundell's theory. First, that
Mundell’s model assumes that the financial markets are stationary so that in the face of aggregate supply and demand shocks, a country with flexible exchange rates can use independent monetary policy (the exchange rates) to “fine tune” the market expectations and combat the shocks. McKinnon believes that flexible (volatile) exchange rates themselves can be a source of macroeconomic instability and that in a highly integrated economy, major exchange rate variations could destabilize the economy, instead of bringing it back to the equilibrium.

The second point that McKinnon critiques in Mundell’s argument is Mundell’s failure to acknowledge the idea of portfolio risk. By portfolio risk, McKinnon means that people only want to invest in countries that minimize the risk of the investments. Foreign nations do not want to invest in a country, which suffers many exchange rate changes; therefore, a fixed exchange rate, or a monetary union (extension of a fixed exchange rate) is more beneficial for most nations. This makes a strong case for fixed exchange rate regimes and even monetary unions. Even though McKinnon does not completely agree with Mundell’s theory of optimum currency, he does still believe that economic and trade integration are important factors when deciding the monetary policy of a country.

McKinnon also draws attention to a later paper of Mundell on currency unions, in which Mundell argues that if a country has a common currency, it can mitigate asymmetric shocks through portfolio diversification. “Under a common currency, a country can better share the loss with a trading partner because both countries hold claims on each other’s output” (Mundell, 1973, 115). In light of this paper, McKinnon (2003) argues that diverse regions, which potentially suffer asymmetric shocks and trade in
diversified goods, are actually better candidates for a monetary union, because then the negative effects of shocks are spread over a larger region.

Paul De Grauwe (2003) finds a middle ground between Mundell and McKinnon by explaining the discrepancy between Mundell's original and later papers. In the 1950s and 1960s when Mundell wrote his original paper "A theory of optimum currency areas", most industrial and developing nations had capital controls, i.e. outflow and inflow of capital in form of investment in assets was not allowed or feasible, and, therefore, international risk sharing was limited. When international risk sharing is minimal, portfolio diversification is not a possibility; hence, Mundell did not need to take portfolio diversification into account at the time of his original paper. As the countries started becoming more open to capital inflows and outflows, Mundell revised his argument for situations where capital controls did not exist.

Overall, there are many competing theories regarding the criteria for an optimum currency area, and I chose to pursue this thesis on the basis of Mundell's original theory of optimum currency area because it is a well-established theory, and mainstream economic literature agrees with the earlier theory of Mundell and uses it in the models. Partly, this may be because it is hard to make McKinnon's arguments very accurate and detailed because of the many complications involved and therefore, they are also hard to test.

Also, it is essential to remember that McKinnon's criteria for a monetary union only hold when the countries not only have open capital markets, but also when countries depend on open capital markets and traded and investment from foreign countries for existence. After the recent East Asian Crisis, for example, many ASEAN countries have
tightened their capital controls (though, Singapore has very open capital markets still) therefore, Mundell's original theory serves as a better model for assessing ASEAN's preparedness to form a monetary union. More importantly, most economists have used Mundell's original theory to assess Europe's preparedness to form a monetary union, and if we want to compare the AMU to EMU, then the same criteria should be used.

3.3 Benefits of a Monetary Union

Most OCA theories have emphasized the costs of forming a monetary union. However, it is also essential to highlight the benefits of forming a monetary union. As indicated above, the main cost of forming a monetary union is a reduction in policy independence. "The benefits of a common currency area include: reduced transaction costs, reduced exchange rate uncertainty, enhanced policy discipline and credibility, and improved functioning of the monetary mechanism." (Chamie, DeSerres, Lalonde, 1994, P. 3)

Tornell and Velasco (1995) in their paper argue that fixed exchange rates (as seen inside a monetary union) do not induce more policy discipline than a flexible exchange rate regime. Under fixed exchange rates bad fiscal policies eventually result in the exhaustion of foreign reserves, devaluation and overall collapse of fixed exchange rate regime. Under flexible exchange rate regimes, there are costs of bad fiscal policies, but they are manifested quickly by immediate change in exchange rates. The main idea is that bad fiscal policies will result in repercussions in both flexible and fixed exchange rate regimes, but because the repercussions are immediate in a flexible exchange rate regime, the bad fiscal policies will be identified at an early stage in a flexible exchange rate regime than in a fixed exchange rate regime. There is always an ongoing, conflicting
debate about the benefits and costs of fixing exchange rates as opposed to floating them, but this does not undermine the other benefits of a monetary union.

The foremost visible benefit of having a monetary union is the elimination of transaction costs of exchanging currencies. The public incurs the benefit, but the banks suffer losses, because exchanging currencies has been one of their primary profitable activities and bank's revenues from exchanging currencies disappears after the formation of a monetary union. This does not imply however that the gain for the public is completely offset by the loss of the banks. The formation of a monetary union changes the entire transactions technology. It makes certain transactions cheaper by eliminating some currency exchanges. This technology is therefore cheaper than the one provided by the banks. Additionally, “[T]he bank’s employees, previously engaged in exchanging money, will now be free to perform more useful tasks for society” (De Grauwe, 1994, 61). Hence, the losses of banks are usually not very detrimental for the economic welfare of the monetary union, while the public gains are high.

More importantly, the lack of transaction costs can eliminate price discrimination between national markets. For consumers who are used to evaluating prices in their own national currencies, it is often hard to compare prices in different currencies. This causes the domestic producers to monopolize the domestic markets. In addition, with separate currencies, the markets are still rather segmented and the transaction costs of buying goods from another country are rather high, hence the producers can employ price discrimination processes to diminish complete economic integration. One currency will certainly eliminate this price discrimination, which will lead to an increase in welfare for consumers and producers both. It can be further argued that fixed exchange rate results in
less uncertainty and this decrease in uncertainty helps decrease welfare loss. Welfare loss decreases because the world is full of risk-averse individuals and uncertainty about future exchange rates introduces uncertainty about future revenues of firms, which deters most of the individuals from investing in foreign and domestic firms (De Graauwe 1994, P.64). A common currency, however, would reduce risks related to this type of uncertainty and this would lead to an increase in investment. Higher investment means a higher capital stock, which would result in higher output. This is of course conditional on the fact that the risk premium will fall, because a lack of many currencies will eliminate the uncertainty about exchange rates. Of course, the counter argument is that a flexible exchange rate means smaller output fluctuations, as will be shown later through a model. In that case the level of uncertainty increases with fixed exchange rates rather than flexible exchange rates. Therefore, it is not clear if the argument of risk premium is viable.

Additionally, flexible exchange rates are not effective in countries where public and private sectors have large foreign currency denominated liabilities. In this situation exchange rate devaluations can worsen negative terms-of-trade shocks. Terms-of-trade is price of exports over price of imports and a country suffers a negative terms-of-trade shock when either the price of its exports decreases or the price of its imports increases. Currency depreciation as a result of an external shock will increase the value of debt expressed in domestic currency. This can result in bankruptcies, and reduce the rate of growth. Given this to be the case, this makes a case for fixed exchange rate. The next section looks at specific literature written on the possibility of forming a monetary union in ASEAN and East Asia.
3.4 Past Literature on Monetary Unions in East Asia

Even though many papers have been written about various exchange rate regimes proposed for East Asia, very little work has been done specifically on monetary unions in East Asia. Below I review the few papers that have been written on the topic.

Wyplosz (2001) compares East Asia to the euro-area and examines the level of trade integration, capital mobility, existing financial and governmental institutions, and income levels, in order to establish the similarities and differences between both regions. He finds that trade integration is significant in Asia; nonetheless the region lacks a developed framework of trade agreements and other financial and governmental institutions which helped Europe along the pathway of forming a single currency area. However, he also believes that the European approach is not the only viable one for forming a successful monetary union. Nonetheless, whichever path Asia takes to form a monetary union it will certainly need political support from its governments to create one. Regional conferences and panels discussing the issues regarding economic unity and programs such as Hanoi Plan of action discussed above might be precursors to the formation of a monetary union.

Eichengreen and Bayoumi (1997) specifically look at the ASEAN countries to examine the economic viability of forming a monetary union there. They develop an “OCA index” which estimates exchange rate variability for Asian countries, where lower exchange rate variability implies greater ability to forego flexible exchange rates (which means it is easier to form a monetary union). Using 1995 data, they estimate that some of the larger ASEAN economies have 8-11% variability, which is itself low and not much
higher than the 6-9% variability in the intra-Euro region. This suggests that some ASEAN economies are close to fulfilling the criteria for forming a monetary union.

Bayoumi, Mauro, and Eichengreen (2000) have also studied political and economic factors to assess whether or not ASEAN can form a monetary union. They believe that economic integration among ASEAN countries is high. They argue though that some of the ASEAN economies have very different financial institutions and have huge disparities between their national income and productivity levels, which might hinder these economies from forming a monetary union. Nonetheless, they conclude that overall, economically, ASEAN economies have a strong case for the formation of an ASEAN monetary union. In the next chapter I present my model, which highlights differences between fixed and flexible exchange rate regimes in times of various external shocks.
4. Model of the effects of shocks under Floats vs. Pegs

In this chapter, I introduce an economic monetary model that identifies how the fixed exchange rate regimes are affected differently than the flexible exchange rate regimes, when a country suffers an external interest rate shock or an exogenous terms-of-trade shock. Macroeconomics textbooks often have inter-temporal models that explain the relationship between consumption, income and government spending. Other models explain the relationship between money supply and the exchange rate. In my model, I extend these approaches by combining money, exchange rate, consumption, income, interest rates, and exogenous shocks, all in one model. This model develops the complex relationship between these variables, in a simple two-period inter-temporal model. It is a simple model that makes a lot of assumptions as stated in the next section, and the reader should take these assumptions into account, when using this model.

The model establishes that a country with flexible exchange rates is better able to insulate its economy in times of external shocks, than a country with fixed exchange rates. This result is significant for a monetary union, because members of a monetary union internally fix their exchange rates, and cannot use their independent monetary policies to combat the shocks. Before providing my model, I discuss the relationship between external shocks and the two types of exchange rate regimes.

In the 1950s, Milton Friedman made a case for flexible exchange rates as opposed to fixed exchange rates by arguing that in a world where prices are sticky or resistant to change in the short-run, the nominal exchange rate can be used to insulate the economy from the effects of the real shocks. Many theories since then have supported the intuition behind Friedman’s argument that flexible exchange rates are better at coping with real
shocks. Two main examples of such shocks are: 1) foreign interest rate shocks, and 2) terms-of-trade shocks. Assuming that prices are sticky in the short run, they are slow to adjust to real shocks.

If a country suffers a negative real shock and domestic demand decreases, then as a result the exchange rate will depreciate. This happens because as the demand of the good and the output falls, the demand for money falls as well. A decrease in money demand decreases the nominal interest rate (keeping money market, i.e. the supply and demand of money in equilibrium), and the domestic currency depreciates against the foreign currency. This is only true under strictly flexible exchange rates, where the money supply is fixed. The depreciation of the currency, in turn, reduces the prices of the tradable goods at the same time, partially offsetting the effect of the negative shocks by stimulating domestic and foreign demand for export goods. Fixed exchange rate regimes, on the other hand, cannot use the exchange rate as an automatic stabilizer and have to rely on changes in domestic prices, which are usually slow to change when prices are sticky. This worsens the effects of the negative shocks.

Additionally, if there is a terms-of-trade shock where the price of the exports goes down, then the income of the exporters will reduce. This will lead to a decline in the activity and employment in the export industries. In a fixed exchange rate regime, employment changes one to one with the demand for labor because the wages are generally sticky. In flexible exchange rate regime, the depreciation of the currency can decrease the real wage when the demand for labor is low, thereby, reducing the effects of shock on the employment. The currency as a consequence will weaken. This indicates
that "floats have a smoother real GDP response to terms-of-trade shocks than do pegs" (Broda, 2002).

Even though research on this topic is sparse, Broda (2003) has done empirical research on the effect of terms-of-trade shocks in countries with different exchange rates. He uses 75 developing countries in his data set. His analysis validates Friedman's hypothesis that the contraction of GDP under a flexible exchange rate is significantly lower than the contraction of GDP of a country under a fixed exchange rate regime. As explained above, the difference arises from the fact that under a flexible exchange rate regime, depreciation of the currency helps maintain the competitiveness of exporters in the world. The terms-of-trade do get worse but the net effect is an increase in net export earnings, which offsets the negative effect of foreign shocks.

An open capital control (a situation where foreigners can easily purchase foreign assets and the country's residents can easily purchase foreign assets) makes a country very prone to external interest rate shocks. When a country has a negative net foreign asset position, an increase in world interest rates causes a negative income effect, because now the country has to pay a higher cost for holding the debt. The country also suffers a substitution effect, i.e. the consumption from one period to another becomes volatile. However, if a country has a flexible exchange rate, then the country can depreciate its currency, which would make the substitution effect smaller. Which means that the consumption of the non-traded goods can remain stable and more equalized from one period to another because the relative goods prices can change more easily under flexible exchange rates than fixed exchange rates. Stable consumption overtime is preferred;
hence, flexible exchange rates are desired for countries with negative foreign asset positions.

My two period inter – temporal model makes the relationship between the exogenous shocks and consumption of traded and non-traded goods explicit. The model also shows the effects of flexible and fixed exchange rate regimes, on the consumption of non-traded goods. According to this model, a flexible exchange rate is superior to a fixed exchange rate when a country is hit by external shocks.

4.1 The Model

Consider a small open economy that consists of households. A small country assumption is used so that these countries are price takers in the world market, and cannot effect the world prices. Households are identical and exist for three periods: period 0, 1 and 2. They consume non-traded goods $C_{t}^{NT}$ and traded goods $C_{t}^{T}$. They produce non-traded goods and traded goods. Their income from tradable goods is $Y_{t}^{T}$ and income from non-traded goods is $Y_{t}^{NT}$. The nominal price of traded goods is $P_{t}^{T}$ and is flexible. $E_{t}$ is the nominal exchange rate. Assume that purchasing power parity (PPP) holds, $P_{t}^{T} = E_{t} P_{t}^{*T}$ where $P_{t}^{*T}$ is the foreign price of traded goods. PPP asserts that price and exchange rates change in a way that preserves the ratio of each currency’s domestic and foreign purchasing powers. Using the purchasing power parity equation, if we normalize the foreign level price to one ($P_{t}^{*T} = 1$), then the domestic price of traded goods is equal to the nominal exchange rate ($P_{t}^{T} = E_{t}$). $P_{t}^{NT}$ is the price of non-traded goods and is sticky (does not change) between period 1 and period 2.

Households maximize their lifetime utility, which depends on their consumption of homogenous tradable goods $C_{t}^{T}$ and non-traded goods $C_{t}^{NT}$, and utility from
\( m_t(\text{money}), m_0(\text{M}_0) \) are real(nominal) money balances with \( m_t = M_t / E_t \). It is important to keep in mind that the money balances are held for one period (from period 0 to period 1), and then they yield utility. This in essence is similar to a cash-in-advance constraint\(^1\), but the cash-in-advance constraint is better suited for infinite time series and introduces additional complications in a two period model, which I choose to avoid here. Given that money is held from one period to another, its real value is affected by the change in the exchange rate between the two periods. Equation (1) converts money balances into a formula that takes the change in exchange rate into consideration.

\[
\frac{(M_t / E_t) * (E_{t+1} / E_t)}{(m_t) / (1 + \varepsilon_{t+1})}
\]

Here \( \varepsilon_{t+1} \) is net nominal exchange rate depreciation. It is also important to take inflation into account. By the sticky price assumption, inflation for non-traded goods is zero because if prices don’t change, then there cannot be any inflation. Overall inflation is therefore just \( \varepsilon_{t+1} \) times the share of traded goods in overall consumption. This inflation is implicitly included in the model.

This model also assumes that the government balances its budget each period. Equation 2 and 3 are the assumed government budget constraints in period 1 and 2 respectively. The government’s budget constraint is in real terms:

\[
E_1 G_1 = M_1 - M_0
\]

\[
E_2 G_2 = -M_1
\]

Here \( G_t \) is a transfer back to the households, which will also appear in the household budget constraint. Government prints \( M_1 - M_0 \) amount of money in period 1 and gives it to the households and then it retires \( M_1 \) in period 2. Given that Government’s

---

\(^1\) Cash-in-advance constraint model maximizes: \( \alpha \ln C_t^T + (1-\alpha) \ln C_t^{NT} + (1/(1+\beta))(\alpha \ln C_{t+1}^T + (1-\alpha) \ln C_{t+1}^{NT}) \), subject to a cash in advance constraint and a budget constraint, but this model is better suited for infinite series rather than a two period model.
transfer is equivalent to the money balances of the household, the money terms
eventually cancel out and are not a part of the lifetime budget constraint.

The household maximizes the function given below:

\[
\text{Max } \alpha \ln C_1^T + (1-\alpha) \ln C_1^{NT} + \gamma \ln m_0 + \frac{1}{(1+\beta)}(\alpha \ln C_2^T + (1-\alpha) \ln C_2^{NT} + \gamma \ln m_1) \tag{4}
\]

Household's are subject to two budget constraints in Period 1 and Period 2. The
households have money from the last period, and also hold real discount bonds \( B_t \) from
period \( (t) \) to \( (t+1) \). The budget constraint in period 1 includes the income from tradable
and non-tradable goods, the bonds, and nominal money from the last period (period 0)
and the government transfer. All these are resources that can be used by the households.
The consumption of traded and non-traded goods is subtracted off from these resources
because it decreases these resources. In period 1 households invest in bonds \( (B_1) \) and
store money \( (M_1) \), and they get the returns from these bonds and money in period 2. Both
\( B_1 \) and \( M_1 \) are also subtracted from resources in period 1 because they are only available
to be used in period 2.

Period 2 budget constraint is similar to the budget constraint of period 1.

However, my model is only a two period model, and the assumption is that people die
after period 2. Therefore, they do not invest in any bonds or store any money, which
would reap benefits in period 3. Government also retires its money in period 2. The
budget constraints are given below.

**Period 1:**

\[
T E_1 Y_1^T + P_1^{NT} Y_1^{NT} - E_1 C_1^T - P_1^{NT} C_1^{NT} - E_1 (B_1/(1+\tau)) + E_1 B_0 + M_0 - M_1 + G_1 = 0 \tag{5}
\]

**Period 2:**

\[
T E_2 Y_2^T + P_2^{NT} Y_2^{NT} - E_2 C_2^T - P_2^{NT} C_2^{NT} + E_2 B_1 + M_1 + G_2 = 0 \tag{6}
\]
Here the exogenous, constant and positive real world (international) interest rate is \( r \). \( T= P_{exp}/P_{imp} \) is the terms-of-trade of the country. \( \beta \) is the discount rate for period 2. Initially \( \beta = r \), but an exogenous interest rate shock (and increase or decrease in \( r \)) can change that relationship.

Assuming numeraire is \( P_{imp} = P_T = E_t \) and \( P_t = P_{NT}/E_t \) the budget constraint in period 1 and period 2 from above is as given below. I assume numeraire to be \( E_t \) and express everything in terms of exchange rate to make further calculations easy.

**Period 1:**

\[
TY_1^T + (P_{1 NT} Y_1^{NT})/E_1 - C_1^T - (P_{1 NT} C_1^{NT})/E_1 - B_1/(1+r) + B_0 + G_1/E_1 + M_0/E_1 - M_1/E_1 = 0
\]

(7)

After simplifying the equation I get:

\[
\Rightarrow TY_1^T + (P_{1 NT} Y_1^{NT}) - C_1^T - P_1 C_1^{NT} - B_1/(1+r) = B_0 + G_1/E_1 + [(m_0)/(1+\epsilon_1)] - m_1 = 0
\]

(8)

**Period 2:**

\[
TY_2^T + (P_{2 NT} Y_2^{NT})/E_2 - C_2^T - (P_{2 NT} C_2^{NT})/E_2 + B_1 + G_2/E_2 + M_1/E_2 = 0
\]

(9)

After simplifying this equation I get:

\[
\Rightarrow TY_2^T + P_2 Y_2^{NT} - C_2^T - P_2 C_2^{NT} + B_1 + G_2/E_2 + (m_1)/(1+\epsilon_2) = 0
\]

(10)

Now, I write this equation in terms of \( B_1 \).

\[
B_1 = C_2^T + P_2 C_2^{NT} - T Y_2^T - P_2 Y_2^{NT} - G_2/E_2 - (m_1)/(1+\epsilon_2)
\]

(11)

Plugging \( B_1 \) into budget constraint of period 1 gives us one consolidated budget constraint as shown in equation (12).

\[
TY_1^T + (P_{1 NT} Y_1^{NT}) - C_1^T - P_1 C_1^{NT} + [(m_0)/(1+\epsilon_1)] - m_1 - \{1/(1+r)[C_2^T + P_2 C_2^{NT} - T Y_2^T - P_2 Y_2^{NT} - (m_1)/(1+\epsilon_2) - G_2/E_1]\} + B_0 + G_1/E_1
\]

(12)

The Fischer parity condition holds and the real interest rate links the nominal interest rate (\( i \)) to inflation. The fisher parity condition implies that in equilibrium, the gross rates of
return on real and nominal bonds must be the same (Obstfeld and Rogoff, 1996). We use this relationship to come up with the equations below:

\[
\frac{1}{1+r_{t+1}} = \left[1/(1+\varepsilon_{t+1})\right]^* \left[1/(1+r)\right]
\]

\[
\left\{ (m_1)/(1+\varepsilon_2)(1+r) \right\} - m_1 = - m_1^*(i_2/1+i_2)
\]

Now, I plug in equation (14) back into equation (12) and get the lifetime budget constraint of the households (equation (15)).

\[
TY_1^T + (P_1 \ Y_1^{NT}) - C_1^T - P_1 \ C_1^{NT} + [(m_0)/(1+\varepsilon_1)] - m_1^*(i_2/1+i_2) - C_2^T/(1+r) - P_2 \ C_2^{NT}/(1+r)
+ T \ Y_2^T/(1+r) + P_2 \ Y_2^{NT}/(1+r) + B_0 + G_1/\ E_1 +1/(1+r)[G_2/E_1] = 0
\]

In order to get the first order conditions of consumption and money in period 1 and 2, I maximize the utility function given in equation (4) with respect to the lifetime budget constraint given in equation (15).

\[
\text{Max } U = \alpha \ln C_1^T + (1-\alpha)\ln C_1^{NT} + \gamma \ln m_0 + (1/(1+\beta))(\alpha \ln C_2^T + (1-\alpha)\ln C_2^{NT} + \gamma \ln m_1) + \\
\lambda(TY_1^T + (P_1 \ Y_1^{NT}) - C_1^T - P_1 \ C_1^{NT} + [(m_0)/(1+\varepsilon_1)] - m_1^*(i_2/1+i_2) - C_2^T/(1+r)
- P_2 \ C_2^{NT}/(1+r) + T \ Y_2^T/(1+r) + P_2 \ Y_2^{NT}/(1+r) + B_0 + G_1/\ E_1 +1/(1+r)[G_2/E_1])
\]

Our first order conditions are:

\[
C_1^T = \alpha/\lambda
\]

\[
C_1^{NT} = (1-\alpha)/P_1 \lambda
\]

\[
C_2^T = ((1+r) \alpha)/((1+\beta)\lambda)
\]

\[
C_2^{NT} = [(1-\alpha)(1+r)]/ [(1+\beta)\lambda \ P_1]
\]

One last step of this model is to get to the net budget constraint. In a two period model, by the end of the two periods the income of non-tradable goods is completely converted into the consumption of non-tradable goods and they cancel each other out. G cancels out with money terms because government retires the money at the end of period 2. Steps
given in equation (22) to equation (25) help us get from the lifetime budget constraint in equation (15) to the net budget constraint in equation (26).

\[ \frac{G_1}{E_1} = \frac{M_t}{E_1} - \frac{M_0}{E_1} \]  
\[ (22) \]

From the relationships given above, we can convert the nominal money terms into real money terms, as seen in equation (23).

\[ \frac{G_1}{E_1} = m_t - \frac{(m_0)}{(1+\varepsilon_1)}/ \]
\[ (23) \]

\[ \frac{1}{(1+r)][G_2/E_1] = \frac{1}{(1+r)[} - \frac{M_t}{E_2}] \]  
\[ (24) \]

Again, real money values are given below in equation (25)

\[ \frac{1}{(1+r)][G_2/E_1] = -\{m_t/[(1+\varepsilon_t)(1+r)]\} \]  
\[ (25) \]

We again use the fischer equation to get equation (26)

\[ m_t - \frac{[(m_t)/ (1+\varepsilon_2)(1+r)]} = m_t*(i_2/1+i_2) \]  
\[ (26) \]

After plugging in equation (23), equation (25) and equation (26) into the lifetime budget constraint from equation (15), we get:

\[ \frac{TY_1^T - C_1^T - C_2^T/(1+r) + T Y_2^T / (1+r) + B_0 + m_t*(i_2/1+i_2) - [(m_0)/ (1+\varepsilon_1)] + [(m_0)/ (1+\varepsilon_1)]} - m_t*(i_2/1+i_2) = 0 \]  
\[ (27) \]

The money terms cancel out after I plug in the money terms for G. Consumption and income of non-traded goods cancels each other out. Our final net budget constraint is shown below:

\[ \text{B.C: } \frac{TY_1^T - C_1^T - C_2^T/(1+r) + TY_2^T / (1+r) + B_0 = 0} \]  
\[ (28) \]

Solving for \( C_2^T \) we get equation (29).

\[ C_2^T = TY_1^T (1+r) + T Y_2^T + B_0 (1+r) - C_1^T (1+r) \]  
\[ (29) \]

This section just sets up my basic model. The next section illustrates the varying effects of the model on our small economy under different economic conditions.
4.2 Model Discussion

In this section I discuss the implications of this model for a fixed exchange rate regime as opposed to a flexible exchange rate regime. I examine the effect of interest rate shocks and terms-of-trade shocks on consumption of tradable and non-tradable goods.

4.2.1 Interest rate shocks

If a country has negative discount bond holdings \((B_t)\) before the shock hits then the country is a net borrower from the rest of the world. The net budget constraint in equation (28) demonstrates that the more negative the bond holdings in period 0\((B_0)\) are, the smaller the current income \((B_0 + TY_1^T)\) is relative to the future income \((TY_2^T / (1 + r))\).

This indicates that a larger share of people's income exists in the future. Now if there is an exogenous interest rate shock \((r\text{ increases})\), then the future income is relatively worth less than it was before the shock. As a result the country suffers a negative wealth/income effect, and now the country consumes less in both periods than it did before the shock.

Furthermore, from the first order conditions we have:

\[
C_1^T / C_2^T = (1 + \beta) / (1 + r)
\]

Solving for the consumption of traded goods \((C_1^T)\) in period 1 we get:

\[
C_1^T = [(1 + \beta) / (1 + r)] * C_2^T
\]

We use equation (30) to solve for consumption of traded goods in period 2 \((C_2^T)\) and plug it into the net budget constraint (equation (28)) and we get the equation below:

\[
TY_1^T - C_1^T - 1 / (1 + r) \{[(1 + r) / (1 + \beta)] C_1^T + T Y_2^T / (1 + r) + B_0 = 0
\]

Solving it further, we get:

\[
TY_1^T - C_1^T - [C_1^T / (1 + \beta)] + [T Y_2^T / (1 + r)] + B_0 = 0
\]

Solving for the consumption of tradable goods in the first period, we get:
Equation (35) shows that there will also be a substitution effect because as international interest rate (r) rises, consumption of traded goods in period 1 ($C_1^T$) will go down and consumption of traded goods in period 2 will be substituted for consumption of traded goods in period 1. Also, consumption of traded goods in period 2 will be bigger than the consumption of traded goods in period 1 ($C_2^T > C_1^T$).

Figure 4.1: Change in Consumption of Traded Goods when hit by external shocks

Figure 4.1 illustrates the income and substitution effect when the country is hit by an exogenous interest rate shock under a fixed exchange rate regime. When a country has a negative net foreign asset position (in this case, same as negative discount bond holdings ($B_0$)), then a rise in the world interest rate will cause the country to suffer a negative income effect. This income effect will force the budget constraint to move inwards and the country would consume at point C. The country will not only consume
less in both periods, but the country will also suffer a substitution effect, where it will substitute some if its period 1 consumption of traded goods with the consumption of traded goods in period 2. After the income effect, consumption is at point C and after the substitution the consumption is at point X. At point X the country's consumption in period 1 goes down substantially, and consumption of traded goods in period 2 is larger than the consumption of traded goods in period 1 ($C_2^T > C_1^T$). It is necessary to remember that in Figure 4.1, point D (the point where the initial and new budget constraint cross) is the endowment point and the budget constraint will rotate around point D.

The assumption so far has been that the exchange rate is fixed. Under a flexible exchange rate regime, a country with negative foreign assets would just depreciate its currency to combat the interest rate shock caused by an increase in world interest rates. In this case, the country's budget constraint would not move inwards, but the country might consume at a different point on the budget constraint (not point B). This new point would be determined by people's preferences. This is important because even after suffering from an external shock, people have the same level of income to consume, as they did before the shock. Furthermore, if the country has a positive net foreign asset position, then the country would appreciate its currency in response to an increase in the world interest rate, but would be able to consume at the same budget constraint. This implies that, under a fixed exchange rate regime, people lose in times of an interest rate shock because they are not able to consume at their original indifference curve. Their utility goes down, while under flexible exchange rate regime, the people are better off in times of interest rate shocks, and do not have to sacrifice their utility.
4.2.2 Terms-of-trade Shocks

A country suffers a terms-of-trade shock when the price of its exports or the price of its imports changes by a certain amount. Equation (35) illustrates that as the terms-of-trade (T) worsens (increase in the price of its imports or decrease in the price of its exports), the consumption of traded goods in the first period also worsens. As the relative price of exports fall, the country’s exports go down because the producers want to decrease the supply of exports at a lower price. Now the imports are relatively more expensive than the exports, and the country has to reduce its consumption of traded goods ($C_{1T}$). As the country suffers a negative income effect, the country’s budget constraint moves inward.

$$C_{1NT} = [(1-\alpha)/\alpha] C_{1T} [E_{1NT}/P_{1NT}]$$  \hspace{1cm} (35)

So far I have focused on the effect of exogenous shocks on the tradable goods sector in fixed and flexible exchange rate regime. The shocks also affect the non-tradable goods sector. The effect of the decrease in the consumption of traded goods (recession in traded goods) affects consumption of non-tradable goods differently in fixed and flexible exchange rate regime. As mentioned before, I assume non-tradable goods’ prices to be sticky in period one. I also assume that consumption of non traded goods in period 1 ($C_{1NT}$) before the shock is at full employment level, and under fully flexible prices it would stay at that level at all times. Therefore, when there is a negative terms-of-trade shock or an increase in the world interest rate ($r$), the consumption of traded goods ($C_{1T}$) in period 1 goes down. Equation (35) demonstrates the relationship between the consumption of traded and non-traded goods. The preferences of tradable and non-tradable goods are homothetic. If the prices of non-traded goods were flexible, then a
decrease in the consumption of traded goods would result in a decrease in the prices of the non-traded goods, so that the consumption of traded goods would remain unchanged. However, given our assumption of sticky prices, in order to maintain consumption of non-traded goods \((C_{t}^{NT})\) at full employment level the exchange rate has to adjust. If the consumption of traded goods goes down then the national currency will have to depreciate \((E_{1}^{NT} \text{ goes up})\), and if the consumption of traded goods increases then that currency will have to appreciate \((E_{1}^{NT} \text{ goes down})\).

![Diagram](image)

**Figure 4.2: Consumption of Traded and Non-Traded Goods when hit by external shocks**

If the exchange rate is fixed instead, then the exchange rate cannot appreciate or depreciate in response to an exogenous shock. Figure 4.2 depicts the circumstance where the prices are sticky and the exogenous shock, which decreases the consumption of tradable goods by a certain percentage (call it \(x\%\)), then the consumption of non-tradable goods and overall consumption decreases by the same percentage \((x\%)\). Figure 4.2 shows that utility goes down from \(U_{0}\) to \(U_{1}\). This
emphasizes that in the face of an exogenous shock, with sticky prices and homothetic preferences under a fixed exchange rate, consumption of non-traded goods ($C_{1}^{NT}$) cannot remain at a full employment level and the domestic economy contracts. If an exogenous shock causes a negative income effect, the consumers decrease their consumption of both traded and non-traded goods.

4.3 Implications

This model has some important implications for the formation of a single currency area. It is clear that a country cannot necessarily insulate itself from exogenous terms-of-trade and interest rate shocks, but if the country has a flexible exchange rate then it can largely insulate its domestic economy from the negative effects of these shocks. Also, flexible exchange rates are helpful in keeping consumption stable from one period to another in face of exogenous shocks, and people prefer stable consumption as opposed to volatile consumption.

It is important to reiterate here that by forming a single currency area, individual countries lose the power to use their own monetary policies because their exchange rates are fixed inside the currency area. This indicates that the member countries of a currency area suffer by having fixed exchange rate during the times of an exogenous shock. However, the monetary union itself has a flexible exchange rate because collectively it can change exchange rates in times of external shocks. This insinuates that if the countries in a currency union suffer symmetric exogenous shocks, then the countries can agree upon a single monetary policy to combat these shocks. For example, if the countries suffer interest rate shocks (these interest rate shocks usually come from the US), then the monetary union as a whole could devalue its currency as world interest
rates rise. However, if the member countries of the monetary union have very different net foreign asset positions, then the extent to which they would want to devalue the currency would differ. This suggests that only countries with similar net foreign asset positions should be placed in a monetary union together.

Similar theory is applied to terms-of-trade shocks. If the countries of a monetary union trade in very different type of goods, then the countries would not suffer terms-of-trade shocks at the same time. For example, in the face of an increase in oil prices, some countries that are primary consumers of oil would want to devalue their currencies, but countries such as Indonesia that are oil producers would not want to devalue their currencies. Therefore, countries that trade in very different goods (goods whose prices do not move together) are not good candidates for a single currency area.

Consequently, suffering symmetric shocks is an important criterion among the members of a currency union. The model above assumes that the prices are sticky in one period, but if the prices can adjust easily, then the use of monetary policy becomes less important. Therefore, if the countries suffer asymmetric shocks, then the countries should have very flexible prices and wages that adjust in times of shocks. The above model also makes it evident that under sticky price assumption, and fixed exchange rates, the consumption of non-traded goods decreases if the country suffers an external shock.

Given that the consumption of non-traded goods occurred at a full employment level, the decrease in the consumption of these goods contracts the domestic economy and the export sector. This contraction results in many firms going out of business and thereby an increase in unemployment. If the labor is mobile, however, then the unemployed workers can move from the country suffering recession to a country that is enjoying a boom. It is
not clear if the countries in ASEAN have highly flexible prices, or highly mobile labor, and it is beyond the scope of this thesis to assess those factors. Nonetheless, as will be clear in chapter seven, high trade integration and openness among the members of a monetary union can diminish the effect of asymmetric shocks, which works well for the members of a monetary union, in the face of exogenous shocks. The next chapter examines ASEAN country's net foreign asset position, correlations among their terms-of-trade, and business cycle correlations to measure the level of symmetry of shocks among these countries.
5. **Empirical studies on Symmetry of Cycles and Shocks**

5.1 **Net Foreign Assets**

In this section I examine the net foreign asset positions (NFA) of the members of ASEAN and the 11 countries that initially adopted the euro. The level of net foreign assets affects open economies’ growth and business cycles because it represents a country’s “external sustainability” (2000, Lane and Feretti). The net foreign asset position can also determine a country’s vulnerability in times of external shocks.

The model in the last chapter makes it explicit that in times of external shocks; a country with a flexible exchange rate is much better off than a country with a fixed exchange rate. This implies that a country’s power to exercise an independent monetary policy is very important in times of exogenous shocks, unless a group of countries suffer symmetric shocks and can use one monetary policy to combat these shocks. It was also clear from the last chapter that different net foreign asset positions elicit different responses from the economies in times of shocks. Therefore, it is important to examine whether or not the potential members of ASEAN have similar net foreign asset positions. If the net foreign asset positions of the members of ASEAN have exhibited similar trends over time, then they are better suited to form a currency union than if they had very different net foreign asset positions.

5.1.1 **Sources of Data**

Differences in foreign asset positions affect the vulnerability of a country to interest rate shocks and results in income effects. In order to examine the net foreign asset position of ASEAN and euro-zone countries, I use the dataset of Lane and Feretti (2000). The data they have collected comes from many sources, and they use a complex
procedure to construct the estimate of net foreign assets. They prepare two similar estimates of net foreign asset positions, and I use the estimate based on adjusted cumulative current account (ACUMCA), because that is the only estimate available for both developing and industrialized countries.

Their dataset is only until 1998. In order to get the data for the years 1998–2001, I added yearly current account data to the last year’s net foreign asset position. This data on current accounts comes from International Foreign Statistics (IFS). Due to the limitations of the data, I could not use Lane and Ferreti’s procedure to calculate the data for those years. Even though the data after 1998 is only a rough approximation, it is still sufficient for this thesis because the exact numbers are not as important as the general trend of the data. The Lane and Ferreti data is only available for five of the ten ASEAN countries and hence it incurs a limitation on this analysis. I look at the Net Foreign Assets as a percentage of GDP between 1989 and 2001 for ASEAN countries and between 1980 and 1998 for EMU countries.

5.1.2 Data Analysis

Graph 5.1 portrays net foreign asset position as a percentage of GDP of the ASEAN countries between 1989 and 2001. It is evident that the four countries: Indonesia, Malaysia, Philippines, and Thailand all have negative net foreign asset positions (NFA) throughout the ten year period, but they are all also very similar. Singapore has a growing positive net foreign asset position, and exhibits a very different NFA over time than the other four ASEAN countries. As shown in the model in the last chapter, countries with different NFA positions need to use different monetary policies in times of shock. For example if a country has no real discount bonds \( B_0 = 0 \) and consumption of traded
goods is equal to the income for traded goods \((C_1^T = TY_1^T)\), then an increase in the interest rate results in a negligible income effect. If there is a negligible income effect then

![ASEAN Net Foreign Asset position (1989 - 2001)](image)

**Graph 5.1**
Source: International Financial Services (IFS), and Lane and Milesi Ferretti, (2000).

the country needs to change the exchange rate by a very small amount. If on the other hand the level of real discount bonds are positive \((B_0 > 0\), positive NFA) then the country would want to appreciate the currency and if the level of real discount bonds is negative \((B_0 < 0\), negative NFA) then the country would want to depreciate the currency. This implies that countries with similar net foreign asset positions can use the same monetary policy to diminish the negative effects of exogenous shocks.
Just on the basis of NFA, all five ASEAN countries are equally vulnerable to external shocks, however, only four ASEAN countries (Indonesia, Malaysia, Philippines, and Thailand) can use the same mechanism to combat an external shock. Singapore’s optimal change in exchange rate will be different than the other four countries; therefore, forming a monetary union with all five countries together can be costly. I also do not have data for the other five countries, so nothing definitive can be said about their membership in the AMU.

Graph 5.2 illustrates the euro-region’s NFA in the years before they formed a monetary union. Only Germany and the Netherlands consistently had positive NFA. More importantly, over time the NFA of the 11 European countries does not portray a very synchronized trend. A comparison of EMU and ASEAN data indicates that, at least
as far as vulnerability to foreign interest rate shocks is concerned, the four ASEAN
countries might be even more prepared to form a currency union than the euro region was
in 1998.

5.2 Terms-of-trade

In this section, I analyze the level of terms-of-trade correlation between ASEAN
countries and the members of the EMU. The model in chapter four proved that in face of
exogenous terms-of-trade shocks, a country with a flexible exchange rate is better off
than a country with a fixed exchange rate. Given that a monetary union is internally a
fixed exchange rate regime, the member countries suffer more in times of terms-of-trade
shocks than they would if they had flexible exchange rates. This is true because if only
one of the member countries suffers a negative terms-of-trade shock, it cannot change its
exchange rate to diminish the negative effects of the shock. The monetary union would
have to collectively change its exchange rate, and this is only possible if the countries
suffer symmetric shocks and there is only one optimal monetary response (depreciate or
appreciate currency) to the shock.

A country’s terms-of-trade is the price of its exports relative to the price of its
imports. If a country exports machinery and imports wheat, then the increase in the price
of wheat or a decrease in the price of machinery will lead to a negative terms-of-trade
shock because a country will pay relatively more for its imports than for its exports.
Conversely, an increase in the price of machinery or a decrease in the price of wheat will
improve the country’s terms-of-trade because now the country will pay relatively less for
its imports than for its exports.
Some studies indicate that terms-of-trade shocks occur in developing nations more, than in the developed countries. A comparison of table 5.1 and table 5.2 shows that terms-of-trade are more volatile among ASEAN countries than among EMU countries. All six ASEAN countries included in the analysis have experienced higher variation in their terms-of-trade in the given 20 years than the variation of most of the European countries in the EMU. The average standard deviation of the six ASEAN countries between 1981 and 2000 is 18%, while average standard deviation is only 6.7% between 1979 and 1998 for countries in the EMU. This is consistent with one recent study (Baxter and Kouparitsas 2000), which indicates that terms-of-trade fluctuations are twice as large in developing countries than in developed countries. Most countries in ASEAN are developing nations, while most countries in the EMU have a developed nation status. These authors ascribe this difference to the factor that most developing
countries rely on commodity exports, and the prices of commodity goods are more volatile than the prices of manufactured goods.

Broda also argues that developing countries are "very exposed to terms-of-trade fluctuations because they have little, if any, leverage over their export prices" both under fixed and flexible exchange rate regimes (2003). More or less, his research proves that a very small number of developing countries are capable of exerting any influence on the world prices. Moreover, even if these countries do get to exert influence on the world prices, it is on a very small proportion of the goods they export. Therefore, the terms-of-trade shocks are mostly exogenous in developing nations because they are "determined by forces outside the countries' control." Broda's research is very relevant here because all the ASEAN countries besides Singapore have a developing nation status and all ten ASEAN countries do not have the ability to influence world prices. Some of the European countries on the other hand did have the ability to change world prices of the tradable goods. This partially explains why ASEAN countries overall experience more terms-of-trade fluctuations than European countries.

Broda's (2002) empirical results suggest that there is no strong relationship between the volatility of terms-of-trade and the exchange rate regime. However, the type of exchange rate regime is important in predicting how effectively a country will combat a terms-of-trade shock.

5.2.1 Sources of Data

Terms-of-trade data is acquired from World Development Indicators (WDI) and spans the period between 1979 and 2000. Only six of the ten ASEAN countries are included in the analysis because of lack of data. The primary purpose of this analysis is to
detect the level of symmetry in terms-of-trade shocks experienced by the ASEAN countries in comparison to the symmetry experienced by the euro-zone countries before 1998. In order to do so, a correlation matrix has been calculated for both groups of countries. The data is the net barter terms-of-trade, which is a ratio of the export price index and import price index measured relative to the base year 1995. The correlation matrix shows how correlated these numbers are for the member of ASEAN countries as well as for the members of euro-zone.

5.2.2 Data Analysis

Table 5.3 shows terms-of-trade correlations among six of the ten ASEAN countries. Singapore is most highly correlated with Indonesia, Malaysia and Myanmar at around 0.84. Indonesia and Malaysia, Malaysia and Myanmar, and Myanmar and Thailand are also highly correlated with each other as the matrix indicates.

<table>
<thead>
<tr>
<th></th>
<th>Indonesia</th>
<th>Malaysia</th>
<th>Myanmar</th>
<th>Philippines</th>
<th>Singapore</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.89</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.69</td>
<td>0.86</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>-0.55</td>
<td>-0.45</td>
<td>-0.56</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>0.87</td>
<td>0.84</td>
<td>0.83</td>
<td>-0.71</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>0.44</td>
<td>0.70</td>
<td>0.85</td>
<td>-0.22</td>
<td>0.65</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 5.3
Source: World Development Indicators (WDI)
The Philippines' terms-of-trade are negatively correlated with the other ASEAN countries. Negative correlation of terms-of-trade is highest between the Philippines and Singapore and lowest between the Philippines and Thailand. Some hypotheses explaining the negative correlation follow. Machinery and electrical appliances dominate the

![ASEAN Terms-of-Trade (1988-2000)]

**Graph 5.3**  
*Source: World Development Indicators (WDI)*

Philippines' exports. Seventy percent of its exports are in machinery and electrical appliances. Such high reliance on one export industry can lead to significant terms-of-trade fluctuations. Moreover, as the graph 5.3 suggests, the Philippines terms-of-trade were significantly lower than the terms-of-trade of most other countries during the late 1980s and early 1990s. Excessive imports have always been a problem for the Philippines. Additionally, during the 1990s the weaker world prices for the Philippine exports, higher production costs, and a slowdown in the economies of the Philippines'
major trading partners added to the worsening of the terms-of-trade. The Philippines has also had overvalued currency, which had to be devalued multiple times. The devaluation made the Philippines' export prices more competitive in the world and made the imported goods expensive domestically, thereby improving terms-of-trade. Given that the Philippines had a larger import sector than an export sector, the devaluation could be a cause of the worsening terms-of-trade.

The rising terms-of-trade in the late 1990s in the Philippines is primarily caused by a sharp increase in the country's export sector. Terms-of-trade is essentially the measure of the quantity of imports that can be purchased per unit of exports, and clearly exports outpaced imports in the late 1990s. Indonesia is the only other country, which also experienced an improvement in the terms-of-trade during that period, while other countries suffered a decline in their terms-of-trade. The Philippines is a big ASEAN country and its negatively correlated terms-of-trade raises questions about its membership in an ASEAN monetary union, especially if this negative correlation is systematic because of the Philippines' specific mix of imports and exports.

The other strange phenomenon in the ASEAN data is the sudden and sharp drop of the terms-of-trade of Myanmar. The drop might be a result of a widening gap between its imports and exports. Most of its trade is with other countries in ASEAN and Asia. The European Union withdrew the system of preferences for Myanmar, which has resulted in uncompetitive prices for Myanmar goods in the European market. Additionally, Myanmar is an agriculture based economy, and changes in the weather substantially effect its agricultural industry and thereby its exports. Myanmar has just not really recovered from East Asian crisis. Myanmar's kyat has depreciated significantly in the
years after the crisis. The depreciation makes imports expensive thereby worsening terms-of-trade. Any mix of these factors might be responsible for the drop in Myanmar’s terms-of-trade in the recent years. The data on imports and exports prices has been collected from many different sources, and WDI itself claims that there are many sources of errors in the data. The drop in terms-of-trade might be magnified as a result of erroneous data.

Table 5.4 shows the matrix of the terms-of-trade correlations among 10 of the 11 countries that are in the EMU. Luxembourg is not included because of a lack of data. Some of the countries such as Italy and France and Germany and Belgium have highly correlated terms-of-trade (0.9 and over). Both Austria and Ireland are negatively correlated with Spain and Italy. However the negative correlations are not very high, and some countries only have marginal negative correlation, such as −0.02 between France and Austria and −0.09 between Spain and Austria. In the ASEAN, the Philippines has significant negative correlation, such as −0.71 with Singapore, and −0.56 with Myanmar.

<table>
<thead>
<tr>
<th></th>
<th>Austria</th>
<th>Belgium</th>
<th>Finland</th>
<th>France</th>
<th>Germany</th>
<th>Ireland</th>
<th>Italy</th>
<th>Netherlands</th>
<th>Portugal</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>0.05</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>0.61</td>
<td>0.31</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>-0.02</td>
<td>0.95</td>
<td>0.37</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>0.30</td>
<td>0.91</td>
<td>0.57</td>
<td>0.92</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>0.80</td>
<td>0.20</td>
<td>0.47</td>
<td>0.08</td>
<td>0.36</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>-0.09</td>
<td>0.84</td>
<td>0.48</td>
<td>0.94</td>
<td>0.84</td>
<td>-0.08</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>-0.14</td>
<td>0.59</td>
<td>0.03</td>
<td>0.70</td>
<td>0.56</td>
<td>0.01</td>
<td>0.59</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>0.17</td>
<td>0.81</td>
<td>0.56</td>
<td>0.81</td>
<td>0.92</td>
<td>0.27</td>
<td>0.77</td>
<td>0.42</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>-0.09</td>
<td>0.91</td>
<td>0.40</td>
<td>0.94</td>
<td>0.66</td>
<td>-0.05</td>
<td>0.93</td>
<td>0.49</td>
<td>0.80</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 5.4
Source: World Development Indicators (WDI)
countries in comparison to the level of terms-of-trade correlation that existed in EMU at the time of adoption of the euro.

Generally, the export and import industries are more diversified in Europe than in South East Asia, and manufactured goods form a significantly large portion of their trade. Diversification can diminish the impact of terms-of-trade shocks, because it is not likely that all the different industries will experience large price changes at the same time. Consequently, a large change in the price of one export or import good will not change the overall terms-of-trade. This effect insulates the European countries from high fluctuations in terms-of-trade. In addition, as the Graph 5.4 shows, most countries' terms-of-trade have improved significantly in the 1990s. Nevertheless, excluding the Philippines overall ASEAN members seem to have similar terms-of-trade correlation patterns as EMU.

5.3 Business Cycles

As emphasized in the last few sections, one of the essential characteristics of a monetary union is that the countries of a monetary union suffer symmetrical exogenous shocks. Besides suffering external shocks, countries also suffer internal output shocks, i.e, a fluctuation in a country's Gross Domestic Product (GDP) per capita. These fluctuations in output affect a country's unemployment level among other things. Monetary policy can be used to smoothen these fluctuations in the GDP; therefore, flexible exchange rates are better than fixed exchange rates in times of huge output fluctuations. However, if the members of a monetary union suffer symmetrical output shocks, then the monetary union can collectively use a monetary policy to smoothen its output over time. Business cycles are a measure of this fluctuation in output. This section uses this measure and looks at the
country’s business cycle. To assess the correlations among the business cycles of the countries in ASEAN and euro-zone, I correlate the X’s of all the countries.

5.3.2 Data Analysis

Graph 5.5 shows the business cycles of the ASEAN countries. It is interesting to note that most countries were suffering negative shocks between 1990 and 1993. Most countries then experienced a boom between 1993 and 1997, and a recession between 1997 and 2001. These trends are not that surprising because the Asian Miracle explains the boom in the early 90s and then the surge in output was probably a result of the East Asian Crisis in 1997.

---

**Graph 5.5**

*Source: World Development Indicators (WDI), and United Nations (UN) statistics.*
Every country experiences fluctuations in its output (business cycles), but for a group of countries to form a monetary union, it is essential that these fluctuations are of similar magnitude and they occur at the same time. Table 5.5 illustrates the output

<table>
<thead>
<tr>
<th></th>
<th>BRUNEI</th>
<th>CAMBODIA</th>
<th>INDONESIA</th>
<th>LAOS</th>
<th>MALAYSIA</th>
<th>MYANMAR</th>
<th>PHILLIPINE</th>
<th>SINGAPORE</th>
<th>THAILAND</th>
<th>VIETNAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRUNEI</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAMBODIA</td>
<td>0.74</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDONESIA</td>
<td>0.58</td>
<td>0.69</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAOS</td>
<td>0.63</td>
<td>0.76</td>
<td>0.93</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALAYSIA</td>
<td>0.80</td>
<td>0.76</td>
<td>0.92</td>
<td>0.94</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MYANMAR</td>
<td>0.05</td>
<td>-0.43</td>
<td>0.01</td>
<td>-0.09</td>
<td>0.02</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHILLIPINE</td>
<td>0.79</td>
<td>0.72</td>
<td>0.84</td>
<td>0.79</td>
<td>0.91</td>
<td>0.20</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SINGAPORE</td>
<td>0.89</td>
<td>0.76</td>
<td>0.74</td>
<td>0.82</td>
<td>0.91</td>
<td>0.04</td>
<td>0.90</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THAILAND</td>
<td>0.77</td>
<td>0.82</td>
<td>0.87</td>
<td>0.93</td>
<td>0.95</td>
<td>-0.04</td>
<td>0.90</td>
<td>0.91</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>VIETNAM</td>
<td>0.75</td>
<td>0.30</td>
<td>0.46</td>
<td>0.43</td>
<td>0.63</td>
<td>0.59</td>
<td>0.73</td>
<td>0.75</td>
<td>0.57</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 5.5
Source: World Development Indicators (WDI), and United Nations (UN)

(business cycle correlations) among ASEAN countries. It is interesting to observe that almost all ASEAN countries have positively correlated output cycles. Highly correlated business cycles might be a result of the contagion effect experienced by East Asian countries during the financial crisis of 1997. Contagion effect occurred when the currency of Thailand collapsed and it caused the currencies of the adjoining nations to collapse as well. The currency crisis spread from one country to another very quickly, and it is speculated that this happened because there is a high level of convergence among East Asian countries.

Myanmar is the only country, which is negatively correlated with three ASEAN countries: Cambodia, Laos, and Thailand. This means that when these ASEAN countries experience a boom, Myanmar suffers a recession and vice versa. Also, Myanmar’s
business cycles are not very correlated with the business cycles of Brunei, Indonesia, Singapore and Malaysia. Vietnam and the Philippines are the only countries that experience comparatively similar business cycle fluctuations as Myanmar. This data proposes that Myanmar would not benefit from adopting a similar monetary policy as other ASEAN countries; therefore, on the basis of correlated business cycle criterion, Myanmar is a bad candidate for ASEAN monetary union.

Table 5.6 demonstrates the level of business cycle correlation among the European countries in the years before they formed a monetary union. It is clear that the European countries have very correlated business cycles. In fact, business cycles of some of these countries are more highly correlated than the business cycles of some ASEAN members. The least correlated countries in the European group are Ireland and Finland. However,

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AUSTRIA</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 5.6
Source: World Development Indicators (WDI), and United Nations (UN)

unlike Myanmar, both Finland and Ireland are positively correlated with all European countries and the level of correlation is fairly higher. This suggests that Finland and Ireland were more prepared to adopt the euro than Myanmar is prepared to join AMU.
66% of EMU terms-of-trade correlations are above 0.50, while 76% of ASEAN terms-of-trade correlations are above 0.50. This suggests that business cycles are relatively more correlated in ASEAN than in the EMU, however the difference is not very significant. This suggests that on the basis of business cycle correlations, ASEAN is as prepared to form a monetary union as the European countries were in 1998.

5.4 Summary

After analyzing the data on net foreign assets, terms-of-trade shocks and business cycles, it can be concluded that ASEAN countries have a rather high level of convergence. Besides Singapore and the countries I don’t have data for, the net foreign asset positions of ASEAN countries have experienced symmetrical movements over time. If I exclude Philippines and the countries with no data, the ASEAN countries have rather highly correlated terms of trade, even more so than that of EMU members in 1998. Additionally, even the business cycles of ASEAN have been very correlated. It is surprising to see that the level of symmetry among ASEAN nations is in fact higher than the level of symmetry that existed among EMU members before the adoption of the euro. However, it is essential to remember that the data of all the ASEAN countries is not included and there are other criteria besides symmetry and convergence that are important in making a decision about ASEAN’s preparedness to form an AMU.
6 Trade integration and Currency Union

6.1 Theoretical Background

In a currency union, all member countries have to forego their independent monetary policies, and they cannot depend upon an exchange rate mechanism to buffer their economic systems in times of county-specific crisis and shocks. As pointed out in an influential paper written by Robert Mundell (1961), a common currency area is therefore optimal if it suffers symmetric supply and demand shocks and has high mobility of labor, because member countries of such an area will incur fewer costs by yielding their independent monetary policies. Most economic literature on currency unions suggests that countries that suffer asymmetric shocks without suitable adjustment mechanisms (wage or labor mobility) should not form a currency area if there is not an increasing level of economic convergence among the countries.

As seen in the sections above, ASEAN members do not always suffer symmetric shocks. Additionally, ASEAN countries also have very different financial institutions and political system. This suggests that these countries utilize different economic and monetary policies to run their country; therefore, they suffer from asymmetric shocks. Just because a group of countries suffer asymmetric shocks, however, does not mean that they cannot form a monetary union. A group of countries are still good candidates for a monetary union if they have mechanisms to combat these asymmetric shocks. It is believed that high level of trade intensity diminishes the negative effects of asymmetric shocks.

For the purpose of this thesis, high level of trade intensity will mean a high intra-regional trade integration and high openness. Intra-regional trade integration is the level
of trade among the members of a monetary union and openness means the trade with the entire world. Many economists argue that trade integration is a step towards higher convergence among countries, which not only increases the number of symmetric shocks the members of a currency union experience, but also helps buffer the countries in case of asymmetric shocks. Trade integration is also very important for countries in a single currency area because adopting one currency enables the countries to trade without the exchange of currencies, which significantly decreases currency transaction costs and eliminates exchange rate risk involved with trade. If the countries have a high level of trade among them, then the benefits of a single currency area are huge. Trade is therefore an important link between countries, and many researchers believe that trade must play an important role in transmitting shocks and disturbances between countries.

From a theoretical point of view, the relationship between increased trade integration and correlation of shocks or business cycle activities among countries looks ambiguous. There is no consensus on whether increased trade increases or decreases correlation of business cycles and shocks between countries. On one hand, Paul Krugman (1991), claims that trade integration will not lead to more highly correlated business cycles among countries. He states, a “more integrated market leads to divergence in both the economic structure and the growth rates of regions” (pp. 244), and Eichengreen (1992) and Kenen(1969) agree with him. They all believe that as trade integration increases because of a reduction in transaction costs, the countries within the monetary union will become specialized in different goods. Comparative advantage will increase inter – industry trade (different countries will export different products) as opposed to

---

3 If a country has flexible exchange rate and it is revalued and devalued often, then there is a risk involved in trading with that country because traders do not know what to expect.
intra-industry trade (different countries will export different varieties of the same products). This specialization will cause "industry-specific" shocks, especially in face of technological advances. A new technology can replace the demand for an older technology, and the industries specializing in older technology will suffer immensely. Thereby, the countries specializing in those industries will experience the shocks while others would not, resulting in less synchronization of business cycles and causing country-specific shocks.

Even though Krugman is correct in arguing that trade integration may cause specialization, it is also true that with increased trade integration, national borders become less important and regions become more important. For example, if the textile industry is labor intensive and Southern Europe is a labor-abundant region, with increased trade, North part of Southeast Asia may specialize in the textile industry. Now the textiles will not be produced in all of China, rather they will be produced in Southern part of china and Northern part of India, and the specialization will be more region based rather than country based. The shocks suffered by the textile industry will now be region specific and not country specific. Now, government cannot use a single monetary policy to combat the shocks when only a part of the country suffers the shocks because changing exchange rates to buffer the shocks could be harmful for the rest of country. Therefore, having flexible exchange rates and independent monetary policies is not very useful in this case (deGrauwe, 2000).

Many economists also believe that increased trade integration will increase intra-industry trade, and not just inter-industry trade. It is a known fact that people have different tastes and preferences, hence they like variety. This means that with increased
trade, countries with similar resources will trade in similar products. For example both Germany and France will trade in cars. If countries of the currency union have some of the same industries, then they will suffer similar shocks, which will increase business cycle correlation among countries.

To resolve the theoretical ambiguity related to trade integration and its effects on business cycle correlations, Rose and Frankel did an empirical study with data on bilateral trade intensity, real GDP, unemployment rate and industrial production cycles for 21 industrialized countries, covering the period between 1950 – 1993. They tested the relationship between trade and business cycles, and their results show that there is a strong positive relationship between the degree of bilateral trade intensity and cross-country bilateral correlation of outputs. This means that as the trade between the countries increases, the business cycles of these countries become more correlated because they experience an increase in intra-industry trade as opposed to inter-industry trade. This suggests that high level of trade integration can decrease the cost of joining a monetary union.

The famous trade theory called “factor-price equalization,” also emphasizes the importance of trade intensity when deciding if a country should join a single currency area (Krugman & Obstfeld, 2003). Robert Mundell (1961) not only emphasized that an area is an “optimum currency area”, if the member countries suffer symmetric shocks but also if the countries have high mobility of labor. Educational, cultural, and language differences decrease the mobility of labor among countries, as is the case in ASEAN countries. Therefore, in times of shocks, labor cannot move from one country to another and act as a mechanism to lessen the intensity of the shocks.
"Factor price equalization" states that when the prices of the traded goods are equalized between countries, as countries move to free trade, then the prices of the factors (capital and labor) will also be equalized between countries. Essentially the wages and rentals of capital will become equal among the countries that trade. Indirectly the theory implies that trade between countries can help overcome the lack of mobility of labor. The countries do not completely specialize in any goods that are being traded, but they do export goods that mostly use factors that the country has in abundant amount. For example, labor abundant country A produces more of labor intensive good, cloth, while land-intensive country B produces more of land-intensive good food. The trade is not a simple trade of goods, but it is an exchange of factors of productions. Thus, country A exports its labor by exporting labor intensive goods, while country B exports its land indirectly by exporting land intensive good. Even though mobility of factors of production is not possible, trade makes it possible in an indirect way. Therefore, if the countries have high trade integration and openness they are more likely to fulfill at least one of Mundell's (1961) criteria required to form a currency union, i.e. high mobility of labor.

"Factor price equalization" has many limitations because countries might completely specialize in goods, or may trade in goods that require same factors of productions. More importantly, transport costs and other trade barriers prevent the goods price equalization and therefore factor price equalization, in which case this model falls apart. Therefore, this theory not only supports trade but it supports free trade, and free trade usually results in higher trade integration.
6.1.1 Openness

McKinnon (1963) argues that open economies (countries that trade a lot with the outside world) are better suited for a currency union because the cost of losing the exchange rate mechanism to buffer shocks is reduced for more open economies. In McKinnon’s model, if an economy experiences a negative demand shock in its export sector, then the country will have to devalue its currency. This will make imports more expensive as the domestic currency will be worth less and the exports will become cheaper. This will shift back the trade balance by increasing the demand of exports. However, because the purchasing power of the wages in this country has decreased because of the devaluation, the employees will demand higher wages. Higher wages will again increase the prices of exports, negating the correction mechanism of exchange rates.

The more open the economy is, the less effective the devaluation mechanism becomes, because the open economies will depend more on imports and with devaluation their purchasing power will be diminished more and the employees will ask for a higher increase in wages. Therefore, for an open economy the cost of losing exchange rate mechanism is small, as it does not work as an effective instrument to combat shocks. The main flaw with McKinnon’s article is that larger economies are less dependent on exports and imports (openness) because large economies generally have a very diversified trade sector and can self-sustain themselves. Therefore, his argument is only applicable to small economies.

Calvo and Kumhof (2003) also look at openness of countries and conclude that the benefits of exchange rate flexibility are larger for a relatively closed economy. They
define an open economy as one that has a large export to GDP\(^4\) ratio. The countries in their model suffer interest rate shocks or terms of trade shocks, i.e. real exogenous shocks. An increase in the real interest rate increases savings, which results in a decrease in consumption and demand of imported goods and domestically produced non-tradable goods.

If the exchange rate is flexible, the relative prices of the goods can drop immediately, so consumption need not drop by as much. A decrease in demand forces producers to decrease the supply of the goods and as a result many employees will lose their jobs, causing unemployment to rise. This rise in unemployment is usually higher in closed economies because closed economies have a very insignificant export sector; therefore, contraction in non-traded and import goods consumption is deeper for a closed economy. Most laborers are employed in the non-traded goods industries and they suffer a large burden of this shock.

This analysis suggests that a “fixed exchange rate entails not only a much larger drop in consumption, for a very closed economy, but also a much larger increase in unemployment” (Calvo & Kumhof, 2003). Therefore, an open economy is more prepared to join a currency union and can lose flexible exchange rates as an adjustment mechanism.

As much as both McKinnon and Calvo and Kumhof’s articles make a convincing case that open economies are less affected by loss of monetary policy, and flexible exchange rate mechanism to combat shocks, one needs to remember that each of their models make some assumption about prices, size of the economies and the types of shocks; therefore, their arguments are not specific to these economic conditions. Many

\(^4\) GDP is Gross Domestic Product. It measures production done within the national borders of a country.
different models have emphasized that high trade integration and openness of the economies are essential criteria for countries to successfully join a currency union. The next sections will look at data from member countries of ASEAN to evaluate if these countries have high intensity of trade.

6.1.2 Data

In this section I will look at intra-ASEAN trade integration and ASEAN’s overall openness to assess the level of trade intensity among the ASEAN countries. To evaluate if the countries are prepared to join a monetary union in respect to trade intensity, I will use euro-zone as a benchmark and compare the ASEAN trade relations to those of the euro-zone countries before they adopted the euro. Comparing a potential ASEAN Monetary Union (AMU) to the euro is appropriate because the euro’s recent launch and its success so far makes it an interesting parallel. Moreover, historically most monetary unions have been formed as a result of political unification and ASEAN is not politically united at this time. The euro is a good reference because it was also adopted by 11 politically independent nations.

My dataset includes exports and imports and GDP of the countries in ASEAN and the euro-zone. All values used are units of dollar-million. To measure trade integration and openness among ASEAN countries, I look at bilateral trade among the 10 countries of ASEAN. It is important to note that even though I use data from all 10 countries between the years of 1989 and 2002, Vietnam did not join ASEAN until 1995, Laos and Myanmar only joined in 1997 and Cambodia recently joined in 1999. I use data from all

5 Intra-ASEAN trade integration is different from intra-industry trade. Intra-industry trade is trade in different varieties of the same product, while intra-ASEAN trade integration is intensity of trade within a region or group of countries. So level of trade among the 10 countries of ASEAN will indicate the level of intra-ASEAN trade integration.
10 countries throughout, for consistency. These countries, moreover had such a small share of the total trade done by the ASEAN as a whole, that the results did not change significantly by adding these countries to the data set.

The bilateral trade data is taken from the International Monetary Fund's *Direction of Trade Statistics*; and nominal GDP data is taken from *International Financial Statistics* and *World Outlook indicators*. The data is annualized and covers 10 ASEAN countries between the years 1990 and 2002, and 11-euro zone countries between the years 1980 and 2000. The long time-span is necessary to assess the growth in openness and intra-ASEAN trade, but most other analysis is based on year 2001 and 1998 for euro area. 1998 is used for the EMU because it was the year before euro was adopted.

Imports and exports of each ASEAN country to the rest of ASEAN as a share of that country's GDP is used as the measure of the level of intra-ASEAN trade. The equation is given below:

$$W_{jk} = \frac{[(X_{jk} + M_{jk})/ 2(Y_j)] \times 100}{k = \text{region}}$$

$X_{jk}$ is country j’s exports to the rest of the countries in region k (ASEAN). $M_{jk}$ is country j’s imports to the countries in region k. $Y_j$ is the nominal GDP of country j in million dollars. I divide the numerator by 2 because I add both exports and imports and I want a weighted average of both. The higher the $w_{jk}$ is, the more the country j trade with the rest of the countries in the region. Country j’s openness to the rest of the world can also be calculated using a form of the above equation.
To measure ASEAN's overall level of trade integration, I sum ASEAN exports and imports of all the 10 countries and divide it by the sum of their nominal GDP. The equation used is shown below.

\[ W_k = \frac{\sum_{k} (X_{ik} + M_{ik})}{2\sum_{j} Y_j} \]

Here \( X_{ik} \) are exports by country \( j \) to the entire ASEAN region \( k \) and \( M_{ik} \) are imports to country \( j \) from ASEAN. These values are summed for all the ten countries in ASEAN and then the total trade is divided by the sum of the nominal GDP of all ten countries. Higher values of \( W_k \) demonstrate higher intra-ASEAN trade. Similar calculations will be done for the euro-region for the purpose of comparing ASEAN to the euro-region.

6.1.3 Data Analysis: ASEAN Trade-Integration and Openness

To understand the changes in the level of trade intensity among ASEAN nations, it is essential to look at existing trade arrangement in ASEAN. As indicated previously, ASEAN Free Trade Area (AFTA) has implemented Common Effective Preferential Tariff (CEPT) Scheme, which decreases internal trade barriers in the ASEAN region. The CEPT program started in 1993, and has increased the level of trade integration in the area. Trade statistics from ASEAN statistical databases suggests that in between 1993 and 1994 intra-ASEAN exports as a share of the total trade done by ASEAN countries grew by 39.22%. This growth was seen specifically in products covered under the CEPT scheme. Given that approximately 80% of Intra-ASEAN exports are made up of products that come under the CEPT scheme, a 39.22% growth in the exports of these products is rather significant. Even after you take into account all the products that are under the CEPT scheme and those that are not under the scheme, the growth in exports from 1993
to 1994 was 39.0%. Within a year after the implementation of the CEPT scheme, these growth rates in intra-ASEAN exports are exemplary, and this anticipates the effectiveness of a free trade are in making ASEAN highly trade integrated in the future and also makes these countries a step closer to becoming prepared to form a monetary union. Now, I analyze the data on the level of trade intensity in ASEAN that I collected.

In order to acquire a complete picture of trade intensity among the countries of ASEAN it is very important to look at openness of the countries, where openness is defined as trade as a share of a country’s GDP. Table 6.1 indicates that the ASEAN region is becoming more open, as the region's extra-ASEAN trade, i.e. trade to the rest of the world as a share of its total regional GDP has experienced a growth of 44.7% between 1989 and 2001. In 1989 ASEAN’s trade to the world was 33.3% of its GDP and in 2001 the figure had reached 48.3% of ASEAN GDP.

<table>
<thead>
<tr>
<th>Year</th>
<th>Trade/GDP (%)</th>
<th>Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>33.3</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>35.1</td>
<td>5.4</td>
</tr>
<tr>
<td>1997</td>
<td>39.8</td>
<td>13.4</td>
</tr>
<tr>
<td>1998</td>
<td>47.4</td>
<td>19.1</td>
</tr>
<tr>
<td>1999</td>
<td>44.4</td>
<td>-6.3</td>
</tr>
<tr>
<td>2000</td>
<td>49.6</td>
<td>11.7</td>
</tr>
<tr>
<td>2001</td>
<td>48.3</td>
<td>-2.7</td>
</tr>
</tbody>
</table>

| Growth (1989-2001) | 44.9 |
| Growth (1993-2001) | 37.5 |

Table 6.1
Source: International Monetary Fund (IMF).
However, for our purposes it is more important to evaluate the level of intra-ASEAN trade, i.e. we need to figure out what percent of ASEAN GDP is attributed to trade done among ASEAN countries. Graph 6.1 illustrates intra-regional trade for ASEAN and yearly growth of intra-ASEAN trade between the years of 1989 and 2001. In 1989 ASEAN experienced a 7.01% intra-regional trade, and by 2001, within twenty years, the region experienced a 114% growth in the intra-ASEAN trade. Intra-ASEAN trade was 15% its total GDP in 2001. Even though a much smaller percentage of regional GDP is attributed to the trade within the region, the growth rates imply that intra-regional trade has been growing faster than ASEAN’s overall trade with the world. This increase in intra-ASEAN trade can be significant when deciding whether the countries are ready to form a currency union.
Table 6.1 shows that extra-ASEAN trade increased by 37.5% between 1993 and 2001, while the graph 6.1 shows that intra-ASEAN trade increased by 62.5%. The growth rate of intra-ASEAN trade is not only higher than the growth rate of extra-ASEAN trade, but the growth rate of intra-ASEAN trade has increased since 1993 (despite the dips in growth rate intermittently). This suggests that at least in the past, CEPT agreement has been responsible for quickening intra-ASEAN trade growth. It is surprising to see that between 1997 and 1998 (the years of East Asia Crisis), intra-ASEAN trade experienced a high growth of 18.8%. This increase is explained less by the level of trade increasing among ASEAN countries, and is explained more by the decrease in total regional GDP of ASEAN during that period. The East Asian Crisis did negatively affect the productivity growth of the Asian countries; therefore, GDP decreased substantially in 1997.

ASEAN countries are trading more with each other and exports and imports almost equally account for this increase in this openness. In order to evaluate individual countries’ contribution to this increasing openness, I will look at 2001 data for all the 10 countries.

<table>
<thead>
<tr>
<th>ASEAN openness to the world (2001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myanmar</td>
</tr>
<tr>
<td>Laos</td>
</tr>
<tr>
<td>Indonesia</td>
</tr>
<tr>
<td>Cambodia</td>
</tr>
<tr>
<td>Philippines</td>
</tr>
<tr>
<td>Vietnam</td>
</tr>
<tr>
<td>Brunei</td>
</tr>
<tr>
<td>Thailand</td>
</tr>
<tr>
<td>Malaysia</td>
</tr>
<tr>
<td>Singapore</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Std</td>
</tr>
</tbody>
</table>

Table 6.2 Extra-ASEAN Trade Source: International Monetary Fund (IMF).

Table 6.2 demonstrates 10 ASEAN countries’ trade to the rest of the world as a share of their individual GDPs. The table is organized in an ascending order with Myanmar being the least open and Singapore being the most open. In fact, Singapore is so open that it trades more than its GDP. A high standard deviation of 36.4
indicates that the level of openness among ASEAN countries varies considerably. As suggested in the previous sections, high openness is important because if countries are open, then it means that they trade a lot, and as the non-tariff barriers under CEPT scheme will be eliminated, trade being done with the rest of the world can be diverted to the trade being done among ASEAN countries, increasing intra-regional trade integration. However, if countries are not very open then there is not much scope for an increase in intra-trade integration. Once Again, it is also essential to look at how integrated the ASEAN countries are with each other.

Table 6.3 displays intra-ASEAN trade of individual countries in an ascending order.

<table>
<thead>
<tr>
<th>Intra-ASEAN trade (2001)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myanmar</td>
</tr>
<tr>
<td>Indonesia</td>
</tr>
<tr>
<td>Philippines</td>
</tr>
<tr>
<td>Vietnam</td>
</tr>
<tr>
<td>Thailand</td>
</tr>
<tr>
<td>Brunei</td>
</tr>
<tr>
<td>Cambodia</td>
</tr>
<tr>
<td>Laos</td>
</tr>
<tr>
<td>Malaysia</td>
</tr>
<tr>
<td>Singapore</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Std</td>
</tr>
</tbody>
</table>

Table 6.3 Source: International Monetary Fund (IMF).

Again Myanmar is the least integrated country and Singapore is the most integrated country, and the standard deviation is significant at 11.48%, indicating substantial variation in the level of intra-regional trade among ASEAN countries. Only very small percentage of GDP of Myanmar, Philippines, Indonesia, and Vietnam is contributed to trade with other ASEAN countries. However, there is a key difference between Myanmar and other three countries. As table 6.2 suggest, Myanmar also has a very small percentage of its GDP contributed to extra-ASEAN trade, while the other three countries do trade a significant share of their GDP. This implies that Myanmar is not a very open country, while the other three countries are moderately open economies, but their trade with other ASEAN
countries is significantly low. It can be hoped that elimination of intra-ASEAN tariff and non-tariff barriers under CEPT scheme will help divert some of the extra-ASEAN trade to intra-ASEAN trade. However, this can only succeed if the country is open (trades) in the first place. Therefore, the CEPT scheme is more likely to succeed in making Philippines, Indonesia, and Vietnam a candidate for a monetary union, while Myanmar’s will require a lot more work. It is also essential to remember that Myanmar and Vietnam are more recent admits to ASEAN and AFTA, and they have a longer time frame to meet CEPT requirements, and as they approach these deadlines they might have transformed into better candidates for a monetary union.

Comparing table 6.2 with ASEAN countries’ extra-ASEAN trade and table 6.3 with countries’ intra-ASEAN trade clearly ascertains that Extra-ASEAN trade makes the greatest contribution to each country’s GDP. If only the trade flows can be changed so that intra-ASEAN trade increases, without overall trade increasing by much, then ASEAN, overall, can become a better candidate for a monetary union.

So far we have evaluated where individual countries of ASEAN stand in comparison to each other in terms of openness and intra-regional trade integration, but it is essential to compare ASEAN as a whole to the euro-region to see if the ASEAN as open an area as euro-area was in 1998 before it adopted the euro.
6.1.4 Euro Zone openness vs. ASEAN openness

Graph 6.2 illustrates overall regional openness of euro-zone, which has grown from 11% in 1986 to about 13% in 1998. This indicates that the euro-zone only experienced 15% growth in intra-regional trade in the 10 years before the adoption of euro, while ASEAN’s intra-trade has been growing at a much faster pace in the last years.

More importantly, as of 2001 ASEAN intra-trade was 15% of its regional GDP, while in 1998 euro-zone it was only 12.65%. This is key, because this proposes that ASEAN is a more integrated region than euro-zone was before adoption of the euro.

Source: International Monetary Fund
Table 6.4 and Table 6.5 show how integrated individual countries of euro-zone were in 1998. Among the 11 euro-zone countries, Italy was trading the smallest percentage of its GDP to the entire world, as well as to the countries of the euro-zone, while Belgium was trading the largest percentage of its GDP to both the entire world and the other euro-zone nations. Table 6.5 suggests that variation in intra-regional trade among euro-zone countries is similar to that of the ASEAN countries, especially because both regions have very similar standard deviations for their intra-regional trade. To understand the level of trade intensity among ASEAN countries, it is also essential to look at the trade flows, and examine which countries trade the most with each other. The next section looks at relevant data.

6.2 ASEAN Trade Partners

The last section compared ASEAN's intra-ASEAN trade to extra-ASEAN trade. This section seeks to do two things. First, using ASEAN’s trade as a percentage of the
total trade done by the region, this thesis wants to determine whether there has been some shift from extra-ASEAN trade to intra-ASEAN trade. Second, this section identifies each ASEAN member's major trade partners within ASEAN. This is important because it illustrates whether or not all the ASEAN countries trade equally with each other. The countries that trade more with each other are better prepared to join a monetary union. This is true because as the theory indicates above, the countries that trade greatly with each other are more dependent on each other and are more likely to suffer symmetric shocks. Euro-zone is used as the benchmark again.

6.2.1 Methodology

To calculate the intensity of trade flows among countries, I use the exports and the imports of a country m to another country j as a proportion of country m's total trade. I will use the equation below (Frankel & Rose, 1998): 

\[ W_{nj} = \frac{(X_{mj} + M_{nj})/(X_m + M_m)}{100} \]

If \( W_{nj} \) is high, it indicates that a high percentage of country m's trade is attributed to the trade done with country j. In other words, the intensity of trade flow between country m and j is high. Here, \( X_{mj} \) is the exports from country m to country j and \( M_{nj} \) is the imports of country m from country j. \( X_m \) is the total exports of country m to the world, while \( M_m \) denotes total imports of country m from the world.

In order to compare intra-ASEAN trade as opposed to Extra-ASEAN trade as a percentage of total trade, I use the equation below.

\[ W_{region} = \left( \frac{\sum_{m=region} (X_{mk} + M_{mk})/\sum_{m=region} (X_m + M_m)}{100} \right) \times 100 \]
This equation is used to calculate the percentage of intra-ASEAN trade. Here $X_{mk}$ are the exports by country $m$ to the entire ASEAN region $k$. Similarly $M_{mk}$ are the imports of the country from the ASEAN region. The summation sign indicates that I add imports and exports of all the 10 ASEAN countries. In the denominator, $X_m$ is the total exports of the country to the world and $M_m$ is the imports to the country from the world. Again, notice the summation sign, which suggests that I need to sum up the total trade of all the 10 countries.

![Graph 6.3](image)

**Graph 6.3**
Source: International Monetary Fund

I can just subtract $W_{\text{region}}$ from 100 to get the percentage of Extra-ASEAN trade.

### 6.2.2 Data Analysis

Graph 6.3 illustrates how the percentage of total trade done by ASEAN has been divided between intra-ASEAN trade and Extra-ASEAN trade. It is interesting to see that the difference is huge. The percentage of intra-ASEAN trade and extra-ASEAN trade is 20% and 80% respectively. This means that ASEAN countries mostly rely on the outside
world for their exports and imports. This graph shows that in the last ten years this ratio has changed. In 2001 it was approximately 25% intra-ASEAN trade and 75% extra-ASEAN trade. This shift in percentage indicates that ASEAN is becoming more integrated. Nonetheless, in order to be prepared to form a monetary union, ASEAN countries would need to change these percentages more significantly and would have to start relying more on other ASEAN members for trade rather than on the outside world.

When I compare ASEAN’s data to that of euro-area’s, the problem becomes more evident. Graph 6.4 shows euro-area’s trade mix over years. Back in 1986, trade with outside world was a bigger share of total trade done by the 11 European countries. In 1990s this trend was overturned and over half of the total trade was contributed to the trade done within the euro-zone. Again in 1997, trade done with the outside world became a higher share of the total trade done. It is important to note that the trade done with the countries of the monetary union was equivalent if not more than the trade done with the outside world. Europe distributes its trade with outside world and its monetary union members more equivalently than ASEAN does.

It is also important to call attention to the fact that ASEAN countries are smaller; therefore, they might not have very diversified trade industries. This might be a key reason why they have to depend on the outside world for most of their trade. However, this reasoning does not detract from the fact that ASEAN countries do need to increase the level of intra-trade integration before they will be fully prepared to form a monetary union, even if that means diversifying their industries and improving their manufacturing industries.
6.2.3 Trade Flows

Besides looking at the level of trade integration among ASEAN countries, it is also important to examine if all the countries in the theoretical AMU trade equally with each other or if certain trade flows dominate the trade occurring within the region. Table 6.6 is Intra-ASEAN trade flows matrix, which shows trade of individual ASEAN countries with each other as a proportion of total trade done by each country.

Philippines, Indonesia and Thailand have a rather small proportion of their trade contributing to the ASEAN trade (12%, 14%, 15% respectively). While Laos and

<table>
<thead>
<tr>
<th></th>
<th>Brunei</th>
<th>Cambodia</th>
<th>Indonesia</th>
<th>Laos</th>
<th>Malaysia</th>
<th>Myanmar</th>
<th>Philippines</th>
<th>Singapore</th>
<th>Thailand</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>X</td>
<td>0.00</td>
<td>0.04</td>
<td>0.00</td>
<td>0.18</td>
<td>0.01</td>
<td>0.14</td>
<td>0.50</td>
<td>0.28</td>
<td>0.00</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.00</td>
<td>X</td>
<td>0.05</td>
<td>0.13</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
<td>0.16</td>
<td>0.27</td>
<td>0.58</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.12</td>
<td>4.65</td>
<td>X</td>
<td>0.08</td>
<td>1.71</td>
<td>2.72</td>
<td>1.19</td>
<td>3.44</td>
<td>1.40</td>
<td>1.58</td>
</tr>
<tr>
<td>Laos</td>
<td>0.00</td>
<td>0.06</td>
<td>0.00</td>
<td>X</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.32</td>
<td>0.65</td>
</tr>
<tr>
<td>Malaysia</td>
<td>5.89</td>
<td>4.49</td>
<td>2.42</td>
<td>0.12</td>
<td>X</td>
<td>7.17</td>
<td>2.74</td>
<td>15.92</td>
<td>3.89</td>
<td>1.63</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.01</td>
<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
<td>0.17</td>
<td>X</td>
<td>0.01</td>
<td>0.27</td>
<td>0.25</td>
<td>0.01</td>
</tr>
<tr>
<td>Philippines</td>
<td>1.01</td>
<td>0.24</td>
<td>0.73</td>
<td>0.01</td>
<td>1.30</td>
<td>X</td>
<td>1.60</td>
<td>0.97</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>15.04</td>
<td>15.44</td>
<td>8.84</td>
<td>1.68</td>
<td>17.09</td>
<td>18.11</td>
<td>5.37</td>
<td>X</td>
<td>7.80</td>
<td>14.53</td>
</tr>
<tr>
<td>Thailand</td>
<td>7.33</td>
<td>16.37</td>
<td>1.75</td>
<td>45.69</td>
<td>3.36</td>
<td>5.81</td>
<td>2.11</td>
<td>4.72</td>
<td>X</td>
<td>2.98</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.02</td>
<td>9.28</td>
<td>0.56</td>
<td>12.38</td>
<td>0.30</td>
<td>0.08</td>
<td>0.44</td>
<td>0.72</td>
<td>0.50</td>
<td>X</td>
</tr>
<tr>
<td>Total</td>
<td>30.42</td>
<td>50.52</td>
<td>14.48</td>
<td>60.08</td>
<td>24.16</td>
<td>34.12</td>
<td>12.01</td>
<td>27.33</td>
<td>15.67</td>
<td>22.84</td>
</tr>
</tbody>
</table>

Table 6.6: Intra ASEAN trade Matrix % (average over 1989-2002)

Note 1: This matrix show each countries trade with the other country as a % of total trade done in the ASEAN region. (Read from top to bottom)
Note 2: Total column shows a country’s trade with ASEAN as a percentage of its total trade
Note 3: Singapore data did not have Indonesia exports and imports of Indonesia so used Indonesia’s data.
Source: (Directions of Trade, IMF)

Cambodia contribute over 50% of their trade to the trade between other ASEAN members. In my section on "Openness", however, I suggested that Laos and Cambodia are not very open and they trade only a very small percentage of their GDP. This
primarily implies that countries such as Laos and Cambodia are “beginners” in trade and need to gain experience by trading with their neighboring countries i.e., members of ASEAN.

Table 6.6 also identifies the major intra-ASEAN trading partners. As would have been predicted, certain countries trade more with some countries than with others. For example, the majority of Brunei’s trade in the ASEAN region is divided between Thailand, Singapore, and Malaysia and to some extent Indonesia. It is easy to observe that no country trades equally with the other nine countries in the region. It is beyond the scope of this thesis to evaluate why certain countries trade more with each other than with others, but it probably has much to do with the type of goods demanded and supplied by each country as well as comparative advantage. More importantly, it is significant that Malaysia, Singapore, Thailand and to a lesser extent Indonesia, are major trade partners of almost all the countries in ASEAN. This means that these countries would make important members of ASEAN monetary union, because they are relatively open economies and they not only trade a lot with each other, but also trade with other members of ASEAN. They are more likely to be synchronized with all the other ASEAN countries.

6.3 Implications

European countries are much bigger than the ASEAN countries, not only geographically, but also in terms of their GDP. Overall, European countries are also more open than ASEAN members. Nonetheless, a larger percentage of ASEAN’s total GDP is contributed to intra-ASEAN trade than the percentage of euro-area GDP contributed to

---

6 If Laos and Indonesia have very similar factors of production, they might not trade as much.
intra-euro zone trade. Given that European countries are bigger, they trade more, and a considerably large portion of this total trade is contributed to the trade done with the other members of their monetary union. ASEAN is notably behind in this criterion.

Overall, ASEAN does not have as high a level of intra-trade integration as European countries had in 1998, right before adopting Euro. However, the CEPT scheme should help increase the intra-trade integration in the near future, especially because six of the ten countries should meet the criteria set up under the CEPT scheme by 2003. Also, Cambodia, Myanmar, Laos, and Vietnam are more recent additions to ASEAN, and it might take them some time to increase their trade with the other countries in the region.
7 Political Economy

The 1997 East Asian crisis has in many ways provided the motivation for an ASEAN single currency initiative. Among other things, the crisis highlighted the potential contagion among countries in the region and created an awareness of the need of a higher level of cooperation on important economic and policy issues. It had become necessary to explore options that would minimize the reoccurrence of the financial crisis. It was believed that a common currency could strengthen the long-term objective of ASEAN regional cooperation.

In fact, in December of 1998, a Hanoi Plan of Action was issued during ASEAN summit. Under this proposal, among other things, ASEAN was to “Study into the feasibility of establishing an ASEAN currency and exchange rate system” (http://www.bis.org/publ). In 2000, an ASEAN Central Bank Forum Task Force was established for this purpose. The Task Force completed the study in September 2002.

Formation of an ASEAN monetary union is still a relatively new idea and further research needs to be conducted to make any decisive predictions, but from this study and from my research and analysis, it is evident that the ASEAN countries are on a road to greater economic integration, and forming an ASEAN Economic Community by 2020 is part of that pathway. It is true that presently there is more competition rather than cooperation among the national governments of ASEAN member countries. Additionally, there is huge development gap among ASEAN countries, which poses many further difficulties of integration (http://www.fesspore.org). However, governments and other organizations such as NGOs and civil society organizations are asked to work on these
issues and the countries are hoping for positive results. Even though ASEAN has a long way ahead of itself, it is often compared now to the European Union (EU).

Still, it is necessary to realize that there are important differences between the EU and ASEAN. The EU has since the day of its inception, relied upon strong institutional framework and the rule of law for economic integration. While ASEAN has relied more on personal relationships, mutual accommodation and consensus, it has never tried to supersede individual national sovereignties. When there is a lack of consensus on some important issue, ASEAN members can disagree and walk away without taking a specific stand on the given issue.

The point of this description is that ASEAN has not been designed to be like the EU. ASEAN recognizes the letter of the law, but it has legal pluralism, and a lack of strong institutional framework. When someone mentioned that ASEAN should be like EU, “H.E. Rodolfo Severino in Brussels, answered by quoting the famous lament of Professor Higgins in “My Fair Lady”, when he asked: ‘Why can’t a woman be more like a man?’” (http://www.asia-europe-institute.org/toc.htm). The two groups are legally and structurally very different. In fact, as of right now, ASEAN does not even have a common foreign policy and each member state, and not ASEAN negotiates trade and other agreements with the outside countries.

7.1 A Lack of anchor currency in ASEAN

The euro was adopted by eleven politically independent states and it was believed that all the countries would have symmetrical political positions; with no one country’s say being more important than the other’s. Partly, this is the reason why no anchor currency was used. In his paper, Mundell (2002) argued that because of a lack of an
anchor "the [formation of] European Monetary union took three decades longer because Europe took the indirect route through fluctuating exchange rates" (Mundell, 2002, pp. 5). Asia can avoid this mistake by having an anchor currency. Mundell further elaborates that Asia lacks the institutional, economic and political groundwork that Europe already had for ages. The custom union, and the Economic Community in Europe have existed for decades and they worked as a stepping-stone towards monetary integration in Europe. Asia is only starting to build that framework, but it could "leap-frog to a currency area if the potential members were willing to use an internal or external anchor" (Mundell, 2002, pp.5).

Additionally, even though Europe lacks an anchor currency, German DM has often played that role for the EMU. The problem with applying this approach to Asia is that there is no single currency in ASEAN that could plausibly function as an anchor. Only large countries could function as the anchor, because large currency areas are more stable. This limits ASEAN’S choices to Chinese yuan (or renminbi) or the Japanese Yen. China’s currency however at this time is not convertible on capital account, and the country does not have a very well developed financial system. This reduces the credibility of Chinese currency. Japan is a very rich economy and it is world’s largest creditor nation, but recently its economy has suffered some severe problems as well. Japan’s banking sector is struggling. Yen’s excessive appreciation between 1985 and 1995 resulted in yen’s value tripling against the dollar. This has weakened the corporate balance sheets of Japan; causing trillions of non-performing loans in gave to other countries. Japan, overall has been struggling with many macroeconomic problems
because of conflicting monetary and fiscal policies and at least at this time yen should not be used as an anchor currency for a monetary union.

Besides the options given above, ASEAN can make the dollar its anchor currency, but the East Asian crisis has made economists very skeptical about this option. Even though McKinnon and some other economist are in favor of East Asian currencies pegging to the dollar again, it is still a matter that requires further research. The last option is for ASEAN countries to make a basket of currencies and designate it as a unit of account and a reference point to measure the Asian currency. Overall, the need of an anchor currency and the ideal anchor currency for ASEAN is a topic that requires further research, and is beyond the scope of thesis. However, this does not mean that there is no solution of this problem, and therefore, formation of an AMU cannot be dismissed on these grounds.

Even though ASEAN countries trade extensively with Japan and China, a large portion of their intra-regional trade is invoiced in dollars. This exacerbates the problem of a lack of internal anchor in East Asia. "This general voluntary use of dollar in East Asian trade explains why individual East Asian governments choose (not always successfully) to stabilize their dollar exchange rates" (McKinnon, 2004). This argument is used not only to qualify why the ASEAN and other East Asian countries should continue pegging their currency to dollar, but it also indirectly makes an argument against the formation of an AMU. Even though this argument is convincing, it is essential to examine why most East Asian countries use dollar as a vehicle currency. It is partly because East Asia, and more importantly, ASEAN has many small countries, and currencies of small countries do not have much credibility and weight in the international market. However, if the
countries adopt a currency together, in time this new ASEAN currency can partly replace dollar as a vehicle currency. This argument can be substantiated by the fact that since the inception of EMU, euro has started making its place in the international market. The developing countries do suffer from other problems related to currency.

7.2 The Problem of Original Sin

The section above indicated that most of the trade done by the developing countries, especially ASEAN countries is invoiced in dollar, and their individual currencies are not often used in the international financial market. These countries face a similar problem when they want to borrow money for internal expenditures and investment. They cannot borrow money in their currency. This problem is known as the problem of “original sin” and it not only makes the countries more prone to crisis, but it diminishes the credibility of these individual currencies. The doctrine of “original sin” is defined by Barry Eichengreen and Ricardo Hausmann (1999, P.3):

“Original sin” is a situation in which domestic currency cannot be used to borrow abroad or to borrow long term, even domestically. In the presence of this incompleteness, financial fragility is unavoidable because all domestic investments will have either a currency mismatch (projects that generate pesos will be financed with dollars) or a maturity mismatch (long-term projects will be financed by short-term loans).

While explaining this phenomenon is beyond the scope of this paper, it is essential to note that McKinnon (2003), in his paper shows that East Asian countries, including ASEAN members certainly do suffer from this problem of “original sin”, where they cannot borrow internationally in their own currencies. If the countries borrow in another currency then their balance sheets show currency mismatch. Overall, the countries with "original sin" are riskier than countries that do not borrow, or borrow in their own
currency. If countries have huge private holdings (borrowed money and bonds) denominated in other currencies, then a currency attack forcing a domestic devaluation could result in magnanimous domestic bankruptcies. This happens because the devaluation makes the local currency worth a lot less than the currency has been borrowed in, which results in losing large amounts of money. This idea of original sin indicates that if the countries borrow in foreign currency, they need to avoid depreciation and devaluation of currency, in order to avoid becoming bankrupt (exchange rate fluctuation is bad).

McKinnon argues, further, that in the face of this “original sin” problem, a dollar peg is the best option because it would help East Asian countries stabilize their exchange rates, and would help overcome other problems incurred by “original sin”. This implies that a monetary union is not such a good idea for ASEAN because even though the members of a monetary union fix their exchange rates among themselves, they generally exercise the policy of floating exchange rates with the rest of the world. A Floating exchange rate automatically implies room for exchange rate fluctuations, which is bad for countries with “original sin.” Nevertheless, Eichengreen, Hausmann and Panizza (2003), in their article, “The pain of original sin,” argue that “original sin” is a global phenomenon and it seems associated with the fact that majority of the international financial transactions are denominated in few major currencies. If ASEAN can adopt a single currency, then it is conceivable that just like the euro, it can also establish itself in the international market and could be used for borrowing money from other countries. ASEAN would not have to be dependent on other currencies if it can form its own strong and single currency, and this would be a better long-run solution for ASEAN to combat
the problem of “original sin.” Some other political concerns related to the formation of a
monetary union in ASEAN are highlighted in the next section.

7.3 Other concerns

Many argue that ASEAN countries in comparison to the EMU countries are small
and not economically very strong and cannot support each other in times of economic
crisis. EMU has economically weak countries such as Spain and Portugal, but it also has
strong countries such as Germany and France to support them. This argument is
convincing, however, it is essential to remember that Singapore is economically strong
and other countries such as Thailand, Indonesia and Malaysia are big countries that can
support each other. More importantly, small countries such as Laos and Cambodia
require “small help” in times of crisis. Also, ASEAN can always consider including
Japan and China in their monetary. Further research needs to be done on this possibility.

Opponents of the AMU also argue that the ASEAN countries are politically very
different, where some are based on a democratic ideology, while others are not. Even
though the proposed monetary union will enable the member countries to function as
politically independent states, conflicting ideologies might make the formation of the
union hard. This is a very valid argument, however just like in Europe; the economic ties
could aid political convergence in ASEAN as well. After all, that was the thinking EMU
was based upon.

Benefits of a single currency depend on a country’s financial markets and
information technology. These sectors are still very underdeveloped in ASEAN region.
Formation of ASEAN itself and more importantly the participation of member countries
in international forum on various issues stimulate social integration among ASEAN
countries. As indicated above, there is no doubt that the ASEAN does not have the kind of formal institutions Europe had before the formation of EMU. However, ASEAN has started on the path of economic development and assimilation. AFTA is on schedule, eliminating the internal tariffs and non-tariff barriers. The launch of the Asian Investment Area Agreement (AIA) has become a great recent asset. In the financial area, sharing information on capital flows, country data and country policies between central banks of ASEAN countries has also become well established. ASEAN has a long way to go, but it seems to be on the right path.
8 Conclusion

Complete political and economic unification played an important role in implementing a single currency in the United States and in the United Kingdom. However, there are no historical grounds to believe that East Asian economies will experience any such political unification. Such unification in Europe also seems far-fetched. Therefore, economic development and narrowing the gap among ASEAN countries is imperative for the introduction of a single currency in the region. Costs of forming a monetary union are immediate, but the benefits should be long-term.

Different economic criteria as tested in the previous sections have different implications for a potential AMU. However, most criterion suggest that even though ASEAN might not be completely prepared to form a currency union, but at least economically it is rather close to fulfill the criteria of convergence. Nonetheless, not all ASEAN countries are ready to form a currency union at this time.

It is unclear how long it might take for ASEAN to completely integrate to form a monetary union and adopt a single currency, but it is clear that if ASEAN members can smoothen their economic and political differences and can come to a consensus to adopt a single currency then the small countries of ASEAN would not have to remain unacknowledged forever, and would also be able to make their voices heard. It will require a substantial amount of time for ASEAN to adopt a single currency, but the time is now to find out what the countries need to get there.
References


12.) De Grauwe, Paul (2000), The Economics of Monetary Integration, Oxford University Press.


