Doctoral Dissertation

Comparative Analysis of Convergence on Regional Economic Integration: The Eurozone and ASEAN

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SUMMARY

There was a fundamental change in international relations after World War II; regionalization as a part of economic integration among neighboring countries has since become a trend, with the goal of improving the welfare of all citizens concurrently. Instilling deeper economic integration, according to Baldwin and Wyplosz (2006), will contribute to medium- and long-term economic performance. Generally speaking, economic integration will improve efficiency, increase GDP per worker, and provide more investment per worker. From this point, the capital per labor ratio starts to rise towards new, higher-equilibrium value and faster growth of output per worker. Long-term effects from economic integration are faster knowledge creation and absorption.

Since the economic crisis in 1997, ASEAN has shown interest in developing policies to set up greater regional exchange rate stability (Bayoumi, Eichengreen and Mauro, 2000) and the Eurozone was seen as the ideal example. The story of crisis however repeated in the area of most developed countries situated or Eurozone. A decade after the Euro, the crisis has erupted in the Eurozone, suggesting that common currency might be less attractive. Before being pulled into the crisis that exploded in 2007, the Eurozone demonstrated stability; however, fallout from the crisis made it clear that the euro had been unprepared for such severe conditions (Lapavitsas et al, 2010).

Based on Jovanovich's (2006) degrees of integration, the Eurozone has achieved half of an economic union and has ASEAN almost reached a free-trade area. While the Eurozone has

been implementing the European Monetary Union (EMU), ASEAN is still struggling to implement the ASEAN Economic Community (AEC) and has only started building the ASEAN Free Trade Area (AFTA).

Geographically, ASEAN is one of the most important crossroads of world trade. However, it is difficult to create ASEAN economic integration, because of differences in the size and development of member states, as well as social issues like language, history, religion, and culture (Jovanovic, 2005). AFTA, established in Southeast Asiain 1992, was one of the most important regional trade arrangements (RTA) in Asia, aiming to eliminate tariff barriers among member countries by agreement on the Common Effective Preferential Tariff (CEPT) scheme. Eliminating tariffs was expected to induce higher intra-regional trade among ASEAN members, and AFTA was expected to become a full free-trade area by the year 2008 (ASEAN Secretariat).

In 1999, the EU first introduced the euro with the Maastricht Treaty (MT) for guidance. Regardless pessimistic and doomed to failure (De Grauwe, 2005), it gained a reputation as a strong currency and a stable financial anchor. Some countries expressed interest in applying such monetary arrangements. with attraction of euro lies in its success demonstration than hollowing out hypothesis (Wyplosz, 2001). The primary objectives of creating a common currency, as explained by Eichengreen (1992), are to reduce transaction costs associated with the elimination of national currencies, increase the credibility of the participating governments, create price stability, achieve more efficient resource allocation through the elimination of exchange rate uncertainty, and promote market integration. The Maastricht Criteria (MC) was a policy designed to maximize benefit and reduce potential outlay,

allowing countries joining a common currency to weigh the potential benefit of joining against the inevitable cost (Mico, Stein and Ordonez, 2003).

ASEAN, intending to implement a full AEC by 2015, as announced at the Cebu Summit in January 2007, should consider the relevant macroeconomic policy lessons offered by the Eurozone, including the implementation of MC there as a guidance policy for implementing a common currency. The analysis in this paper primarily uses macroeconomic policy variables associated with MC to compare the effectiveness for both regions. After ASEAN countries suffered the exchange-rate crisis in 1998, encouraging the region to improve regional exchange-rate stability.

In this regard, this dissertation takes various approaches to comparatively measure regional economic integration between a developed, economically integrated area (the Eurozone, in the 6th stage of economic integration) and a developing one (ASEAN, in the 3rd stage of economic integration).

The objectives of this dissertation are as follows:

1. To investigate the importance of Euro with MC as a guidance policy for crisis in the Eurozone.
2. To examine the nominal convergence in term of MC variables in both the Eurozone and ASEAN;
3. To examine the real convergence (income, productivity, and unemployment rate) and growth in both regions; and
4. To investigate the impact of different degrees of economic integration on trade;

The dissertation consists of eight chapters. Four of eight (Chapters 4, 5, 6, and 7) are the primary analytical studies.

Chapter 1 provides a general overview of regional economic integration and MC policy. This chapter also provides the objective, scope, and outline of this dissertation.

Chapter 2 describes the figures and the facts of the Eurozone and ASEAN. It presents basic facts about the integration process of both regions.

Chapter 3 first discusses regional integration theory, then convergence theory, optimum currency area theory (OCA), international trade theory, and financial crisis theory.

In Chapter 4, by considering the Asian crisis, we track the Eurozone crisis by investigating the significant of Euro with MC on peripheral Eurozone countries. The results of descriptive and difference-in-difference analyses show that the pure effect was positive. Unfortunately, sharing a common currency restrains high per-capita GDP growth, and can create a higher deficit trade balance. The euro was not the main culprit in the current Eurozone crisis, since the debt crisis mainly derived from budget deficits, the inability to meet MC, trade imbalances between core and peripheral countries, the lack of a fund-transfer mechanism, and the lack of an institution by which to control capital mobility.

Chapter 5 describes the first research question, an empirical analysis of whether ASEAN satisfies MC criteria with the Eurozone as the benchmark. The study also measures the degree of convergence of MC variables in both the Eurozone and ASEAN. It was determined that ASEAN has high convergence of interest rates, and most countries met the budget criteria. High nominal convergence, price stability, and the Euro's evolution to become an anchor currency were signs that the modeling policy by the MC is a step in the right direction.

Chapter 6 examines the role of macroeconomic MC policy variables, using various approaches to analyze whether macroeconomic policy coordination in the Eurozone has improved the region's economic performance, compared to a region that does not have such a policy. Based on these results, convergence was found to be conditional rather than unconditional, except with respect to unemployment and productivity in the Eurozone. Imposing macroeconomic MC policy variables on convergence and growth in the Eurozone and ASEAN makes it possible to determine any significant influence.

Chapter 7 investigates the impact of different level of economic integration on bilateral trade. Applying an augmented gravity equation, the deepening impact on bilateral trade was positive if incorporates all Eurozone members. In ASEAN, AFTA generates positive results only among ASEAN-6 countries. A policy related to MC variables has a small influence on reciprocal trade in both regions. Horizontal integration improved in both regions, showing a positive coefficient for size and similarity. Intra-industry trade was a phenomenon in the Eurozone. For ASEAN, different factors determined higher bilateral trade when Cambodia, Laos, Myanmar, and Vietnam (CLMV) were included.

Finally, Chapter 8 reports the main findings in each analytical chapter. It provides further insight into which regional integration policies are most effective, followed by summaries and policy implications.

Chapter 1 Introduction

1.1 Background

ASEAN will usher in a new era of deepening economic integration by 2015. At the 13th ASEAN Summit on 20 November 2007 in Singapore, ASEAN leaders adopted the ASEAN Economic Blueprint to guide the establishment of the ASEAN Economic Community (AEC) by 2015, with following characteristics: a single market and production base, a highly competitive economic region, and a region of equitable economic development (ASEAN secretariat). The main challenge of AEC is diminishing barriers to free production across member countries.

Since the economic crisis in 1997-98, ASEAN has shown interest in developing policies encouraging regional exchange rate stability. Given this goal, ASEAN policy-makers are considering a regional monetary arrangement for ASEAN that provides flexibility with regard to the three main global currencies (the dollar, Euro, and yen). For its importance in diversified direction of trade, ASEAN provides no obvious single currency against which to peg (Bayoumi, Eichengreen and Mauro, 2000).

Economic crisis related to a unified currency, however, was shown partially in most developed in the Eurozone. A decade after introducing the Euro, crises erupting in the Eurozone suggest that a common currency might be less attractive. Before the 2007 economic exploded, the Eurozone demonstrated stability; however, fallout from the crisis made it clear that the euro had been unprepared for such severe conditions (Lapavitsas et al, 2010). Darvas

(2010) highlighted that the current crisis suffered by the Eurozone is the consequence of MC, with associated weaknesses:

- First, this is an asymmetric problem. Once a country is inside the Eurozone, MC and Strong Growth Pact (SGP), in principle, limited the scope of government action inside the Eurozone.
- Second, business cycle dependence implies that most countries can join only in positive economic circumstances, which does not make much sense, since this does not tell much about long-term sustainability.
- Third, the high stack sanction was not effective since only naming and shaming were applicable for member unsatisfied.

Since the fundamental change in international relations after World War II, regionalization and economic integration among neighboring countries has been a trend. Its goal is to improve the welfare of all member state concurrently. The most successful cases of regionalization in the world are the European Union (EU), which almost reaches an economic union, and ASEAN, which was the second highest rapid-growth area in the world in the 1990s, second only to East Asia (Japan, South Korea, Taiwan, and Hong Kong). Although the developmental stages and the process were different, ASEAN's intention of creating deeper economic integration can benefit from the lessons of the EU. When evaluating the success of international economic integration between at least two countries, Jovanovic (2006) identifies seven stages of evelopment to reach full integration:

1. A preferential tariff agreement (lowering tariffs among members compared to non-members)

2. A partial customs union (retaining tariffs among members and introducing common external tariff)
3. A free trade area (eliminating tariffs and quantitative restrictions)
4. A custom union (removing all tariffs and quantitative restrictions among members and introducing common external tariffs for non-members)
5. A common market (free mobility of factors of production among members, with common regulations or restrictions for non-members)
6. An economic union (synchronization of fiscal, monetary, industrial, regional, transport, and other economic policies)
7. A total economic union (a union with a single economic policy and a supranational government with great economic authority)

Based on those different steps toward integration, the Eurozone was categorized as "half of an economic union" and ASEAN almost reached "free-trade area" status.

Deeper economic integration, according to Baldwin and Wyplosz (2012), will contribute to medium- and long-term economic performance. In the medium-term, economic integration will improve efficiency, increase GDP per worker, and provide more investment per worker. From this point, the capital per labor ratio starts to rise towards new, higher-equilibrium value and faster growth of output per worker. Long-term effects from economic integration are faster knowledge creation and absorption.

This result arises from an increase in investment in knowledge, leading to a permanent increase in the growth rate. Agenor (2001) highlighted some benefits of economic integration as follows:

- Consumption smoothing (a country can borrow money in recession and lend money when booming),
- Domestic investment and growth (openness provides access to domestic investment, further contributing to growth),
- Enhanced macroeconomic discipline (free flow of capital will punish bad policy and reward good policy), and
- Increased banking system efficiency and financial stability (foreign banks will improve the overall quality of the financial system).

On the other hand, possible costs may also arise from concentration of capital flows and lack of access; domestic misallocation of capital flows; loss of macroeconomic stability; pro-cyclicality of short-term flows; herding; corruption and volatility of capital flows; and risk of entry by foreign banks.

There have been many efforts to enhance the cooperation of the EU member states, whose vision of a united Europe was primarily guided by political and economic considerations. Established in 1957 by six original members (Belgium, Germany, France, Italy, Luxembourg, and Netherlands), those who signed the Rome treaty, the current 27-member EU almost achieves full economic integration since January 1, 2007. The signing of The Treaty of Maastricht (MT) in 1992 introduced a new form of cooperation among its member states. Its primaryaim was pushing member countries into nominal convergence, which would transform gradually into real convergence (Marelly and Signorelly, 2010). MT, signed on February 7, 1992, states five convergence conditions (Afxentiou, 2000):

- The country's inflation rate is not more than 1.5% higher than the average of the three lowest inflation rates in the European monetary system.
- Its long-term interest rate is not more than 2% higher than the average experiential in the three lowest-inflation countries.
- It has not practiced devaluation during the two years preceding entrance into the Union, and its government budget deficit is not higher than 3% of its Gross Domestic Product (if it is, it should be declining continuously and substantially and come close to the 3% norm, or the deviation from the reference value (no more than 3%) should be exceptional and temporary and remain close to the reference value.
- Its government debt should not be exceeding 60% of Gross Domestic Product (if it does, it should diminish sufficiently and approach the reference value [60%] at a satisfactory speed.

Implementing these five criteria will ensure the sustainability of EU to absorb asymmetric shocks.

These criteria guided the introduction of a common currency in line with the principle "One Market, One Currency." The convergence criteria in the MT are needed since the macroeconomic situation differed widely from one country to another (De Grauwe, 2005). Therefore, the Treaty described, in detail, how the system was expected to work, including the statute of the ECB and the conditions under which a monetary union would be initiated[1]. In

[1] http://europa.eu/scadplus/leg/en/lvb/l25007.htm

line with this criteria, by signing a stability growth pact (SGP),[2] Eurozone members agreed to continuously satisfy the MC, following the logic that wherever the Euro is used, there must be consistent, and parallel between fiscal and monetary policy. The final goal of the EU is, as clearly specified in Article 2 of the MT, "convergence of economic performance and economic and social cohesion" (Marelli and Signorelli, 2010).

While the EU has been implementing the EMU, ASEAN is still struggling to execute the AEC and has only started to realize the portential of AFTA. Geographically, ASEAN is one of the most important crossroads of world trade. However, it is difficult to create an ASEAN economic integration because of the huge differences in size and development among member states, as well as social issues like language, history, religion, and culture (Jovanovic, 2005).

Kawai (2005) acknowledges the limitations of institutional support for deeper integration in ASEAN. However, ASEAN has great potential for further economic integration through various types of institutional cooperation: the establishment of an Asian FTA, stronger tools for regional financial stability, relative stability of intra-regional exchange rates, and providing various types of regional public goods.

In 1999, EU first introduced the euro with MT as guide; to many the project was deemed unrealistic and doomed to failure, but it gained a reputation as a strong currency and stable anchor. Soon, other countries expressed interest in applying such a monetary arrangement in other regions. The attraction of the euro lies in its demonstrated success

[2] There is an agreement among the Eurozone countries to ensure the stability of the EMU by stressing the implementation of MC in the Eurozone (http://ec.europa.eu/economy_finance/sgp/index_en.htm).

(Wyplosz, 2010). The main objectives of creating a common currency, as explained by Eichengreen (1992), are:

- Reducing the transaction cost associated with the elimination of national currencies
- Increase the credibility of participating governments to achieve price stability and more efficient resource allocation by eliminating exchange rate uncertainty, and
- Promote market integration.

He also noted the cost incurred as the incidence and magnitude of shocks resulted from speed of adjustment, wage adjustment, interregional migration, and interregional capital flows. Thus, the MC was designed to maximize benefit and decrease potential cost. The treaty, signed in Maastricht, The Netherlands in 1991, meant to push member countries into nominal convergence, which would transform gradually into real convergence (Marelly and Signorelly, 2010). Thus, the criteria imposed in the MT measured the equalization of nominal variables based on principles of gradualism, and captured optimum currency area (OCA) properties.

Any regional cooperation was aimed at increasing the welfare of less deleoped member states, by closing the gap among their nominal and real economic conditions. Both the EU and ASEAN maintained the policy of narrowing the development gap between member countries to encourage solidarity and togetherness, and to avoid further conflict between members.

The data show that on average in 1990–2010, the real per capita GDP and labor productivity of the Eurozone were US$29,054 and US$68,112, respectively—much higher than ASEAN's figures of US$1,437 and US$19,957 (as calculated from the Unstat and Total Economic Database). However, ASEAN's real per capita GDP grew three times faster (3.54%

compared to the Eurozone's 1.2%), and its labor productivity grew twice as fast (2.85% compared to 1.35%). Regarding unemployment rates, ASEAN's performance was better, as seen in the data: during this period, it was 5.1% (WDI data), compared to 7.8% in the Eurozone (OECD data).

Countries joining a common currency must weigh the potential benefit of joining against the inevitable cost (Mico, Stein and Ordonez, 2003). The benefits include a reduction in the transaction cost associated with trading goods and services between countries with different currencies. Countries heavily involved in international trade potentially benefit greatly from joining. On the other hand, some costs may arise from the possibility of dampening business cycle through counter cyclic monetary policy.

The adoption of the common currency in Europe in 1999, followed by releasing the euro coin, concluded the European convergence process. Trade barriers between member states the in Eurozone had already been removed during the 1990s; sharing a common currency further deepened real economic integration—directly, through reduced trade costs, and indirectly, through intensified competition due to enhanced price transparency (Belke and Spies, 2008). The most notable study of the impact of common currency on trade was initiated by Rose (2000).

AFTA, initiated in Asia in 1992, aimed to eliminate tariff barriers among member countries through the Common Effective Preferential Tariff (CEPT) scheme. Eliminating tariffs should stimulate higher intra-regional trade among ASEAN members, and AFTA was expected to become a full free-trade area by the year 2008 (ASEAN Secretariat).

In spite of oxymoron between the proposed AEC and the European Economic Community, individual ASEAN countries are reluctant to give up national economic policies vis-à-vis non-members. The AEC will not include a common external tariff. This is not too surprising, as there are huge discrepancies between member states in average external tariff rates (Cuyvers, Lombaerde and Verherstraeten 2005).

ASEAN, intending to implement a full ASEAN economic community (AEC) by 2015—as announced at the Cebu Summit in January 2007—should consider the relevant macroeconomic policy lesson offered by the Eurozone, including the implementation of the MC as the core policy when using a common currency.

1.2 Research Objective

1.2.1 Objective

Only a few studies focused on comprehensive investigation of the effectiveness of economic integration in the Eurozone versus ASEAN, a region still struggling in FTA. This analysis mainly uses macroeconomic policy variables associated with the MC to compare the effectiveness between these regions, because the MC was the guidance policy behind the Euro.

ASEAN countries suffered from an exchange rate crisis in 1998; this induced them to encourage greater regional exchange rate stability. The Euro, launched January 1, 1999 under the provisions of the MC was seen ideal for upcoming ASEAN integration; however, the financial crisis that erupted in 2007 raises the question of the Euro's future.

Many researchers claimed that the policy was beneficial for both nominal and real convergences, and contributing to increased development and better stability in the area.

Many others suggested that the policy would restrain growth and sustain a high unemployment rate. The euro in the Eurozone, AFTA in ASEAN, and diminishing differences among policy variables associated with the MC were seen by many researchers as welfare facilitators.

Regardless of benefits or costs consequent to these policies, many researchers suspect that the MC was a culprit in the current Eurozone crisis .This dissertation takes various approaches to comparatively measure the effectiveness of regional economic integration between a developed, economically integrated area (the Eurozone; 6th stage of full economic integration) and a developing one (ASEAN; 3rd stage of full economic integration).

The overall objectives of this research are:

1. To investigate the recent Eurozone crisis by considering the Asian 97 crisis.
2. To examine the nominal convergence of variables associated with MC in both the Eurozone and ASEAN.
3. To examine the real convergence (income, productivity, and unemployment rate) and growth in both regions.
4. To investigate the impact of different degrees of economic integration on trade.

1.2.2 Research Questions

Based on the above objectives, this paper will address the following research questions:

1. Is the Euro, driven by the MC as policy, the main cause of the current Eurozone crisis, and what is about the Asian crisis?

2. Is the current condition of ASEAN favorable to creating a common monetary arrangement, measured by MT criteria, as compared with Eurozone conditions?
3. What are the real convergence and growth conditions in both regions?
4. What is the impact of augmenting regional integration on trade at different stages of economic integration?

1.3 Significance and Contributions of Study

This dissertation contributes to the body of regional economic integration research in many respects, including those below.

1.3.1 Non-Technical Aspects

1. The Eurozone suffered from a financial crisis in 1997; this study analyzes the pure effect of common currencies in the Eurozone and ASEAN countries, since few studies analyze this phenomenon.
2. This study explores which regional integration policies were most effective by evaluating crisis, convergence, and trade.
3. Most previous studies on real convergence issues focused on one region without applying any benchmarks for analysis.
4. Both regions deep, and broad, experience; however, very limited study has been undertaken comparing the impact of trade intensity from both micro and macro perspectives.

1.3.2 Technical Aspects

1. The study explores the pure effect of the common currency on the recent European crisis, in order to explore whether or not the euro was a main culprit, with consideration of the Asian crisis.
2. In order to comprehensively understand the real convergence and growth in both regions, this analysis employed the decomposition and difference-in-difference approaches.
3. This research combined micro variables (H-O) with macro variables associated with MC, to explore the impact of different phases of economic integration on trade.

1.4 Scope of Study

This study compares the effectiveness of regional economic integration between the Eurozone and ASEAN, from the following perspectives:

1. Eurozone Crisis analysis: the study focuses on the Eurozone countries which are classified into "Peripheries" (Greece, Ireland, Italy, Portugal, and Spain), and "Cores" (Austria, Belgium, France, Germany, and the Netherlands), as well as benchmarking the Asian crisis.
2. Nominal Convergence analysis: samples are split into the Eurozone members integrating prior to the MT, and those in the current period, as well as current ASEAN members.
3. Real Convergence and Growth analysis: samples are split into the Eurozone and ASEAN, focusing on variables associated with the MC, production factor variables, and demographic variables.
4. Trade analysis: samples in both regions are classified into original member states and new member states, to capture the effects of deepening and widening economic integration.

5. The period of study ranges from 1980 to 2010.

1.5 Outline of Dissertation

The dissertation consists of eight chapters. Four out of eight (Chapter 4, 5, 6, and 7) were the main analytical studies. All chapters investigate the effectiveness of different phases of regional economic integration.

Chapter 1 is a general overview of regional economic integration and MC policies. This chapter also provides the objective, the scope, and the outline of this dissertation.

Chapter 2 presents basic facts and figures about the Eurozone and ASEAN, as well as the integration process of both regions.

Chapter 3 discusses regional integration theory, followed by convergence theory, OCA theory, international trade theory, and financial crisis theory.

Chapter 4 tracks the Eurozone crisis by investigating the Euro's impact on peripheral Eurozone countries, Euro by applying descriptive and difference-in-difference analyses in relation to the Asian crisis experience.

Chapter 5 investigates whether ASEAN satisfies the criteria determined in the MC, using the Eurozone as benchmark. The study also measures the degree of convergence in terms of MC variables in both the Eurozone and ASEAN.

Chapter 6 examines real convergence and growth using various approaches to analyze whether macroeconomic policy coordination in the Eurozone has influenced and improved the region's economic performance, compared to a region that does not have such a policy.

Chapter 7 investigates the impact of different level of economic integration on bilateral trade, applying augmented gravity model.

Finally, Chapter 8 reports the main findings from each analytical chapter, and provides further insight into which regional integration policies are most effective, as well as drawing policy implication.

Chapter 2 The Eurozone and ASEAN: Basic Facts, Figures, and Macroeconomic Indicators

2.1 Regional Economic Integration

Both theoretical and empirical works have been motivated by regional development issues with the EU, ASEAN, the North America Free Trade Area (NAFTA), and others. Jovanovic (2006) defines the economic integration process as a means by which a group of countries attempts to engage strong partnerships to improve social welfare. It is hoped that the integration process will encourage member states to be concerned about each other more than non-members. De Rosa (1998) defines economic integration broadly as "the equalization of relative prices for traded goods among countries."

2.2 The Eurozone

2.2.1 Basic Facts

The Eurozone now has 17 members, since Estonia joined in 2011. The area of the Eurozone covers 2.6 million square km, with a total population of more than 330 million people in 2011. The GDP is more than US$13,114 million, but unfortunately, shows low GDP growth (1.4%). The Eurozone was the most developed area for its high per capita GDP, as well as its trade.

Table 1. Selected Basic Eurozone Indicators

Indicators	Unit	2010	2011
Total land area	km2	2,578,868	2,624,094
Total population	Thousand	329,030	330,139
Gross domestic product at current prices	US$ billion	12,182	13,114
GDP growth	Percent	2.00	1.40
Gross domestic product per capita at current prices	US$	32,721	33,795
International merchandise trade	US$ billion	9,840	11,377
Export	US$ billion	5,010	5,792
Import	US$ billion	4,830	5,585
Foreign direct investments infow	US$ billion	104	225

Sources: Eurostat

By country, France has the largest land area, but in terms of population, Germany is largest.

Table 2. Selected Basic Eurozone Macroeconomic Indicators (1): 2011

Country	Total land area	Total population	Annual population growth	Unemp. rate	GDP	Per Capita GDP	
	km^2	thousand	percent	percent	US$ billion	US$	US$ PPP
Austria	83,858	8,421	0.39	4.20	349.94	32,026	41,556
Belgium	30,510	10,951	1.02	7.18	413.75	33,100	37,781
Cyprus	9,250	862	2.62	7.78	23.72	17,579	27,521
Estonia	45,226	1,340	0.00	12.48	27.31	8,978	20,379
Finland	337,030	5,401	0.48	7.78	194.34	29,847	35,981
France	547,030	63,128	0.54	9.63	2,213.78	28,539	35,068
Germany	357,021	81,779	0.03	5.98	3,113.93	29,938	38,077
Greece	131,940	11,194	0.10	17.33	293.94	16,266	26.257
Ireland	70,280	4,581	2.46	14.39	187.09	34,649	40,838
Italy	301,230	60,626	0.47	8.43	1,846.92	23,515	30,464
Luxembourg	2,586	514	1.58	5.70	41.45	65,617	80,559
Malta	316	423	0.71	6.50	10.83	13,014	25,598
Netherlands	41,526	16,690	0.45	4.43	701.37	33,300	42,023
Portugal	92,391	10,637	0.01-	12.74	248.51	14,985	23,363
Slovak	48,845	5,446	0.20	13.53	126.91	11,734	23,304
Slovenia	20,273	2,021	0.15	8.21	58.30	12,056	28,843
Spain	504,782	46,125	0.11	21.65	1,405.79	22,722	30,478
Eurozone	***2,624,094**	***330,139**	****0.67**	****9.88**	****11,257.87**	****34,594**	****33,051**

*Note: * is total summation and ** is average*

Source: Unstat.

In the Eurozone, Cyprus (2.62%) followed by Ireland (2.46%), have the highest population growth; Portugal shows negative growth (0.01%). By unemployment rates, Spain

(21.65%) has the highest, followed by Greece (17.33%); Austria was lowest (4.2%). Germany has the largest GDP (US$ 3.1 billion) and Malta has the smallest. Luxembourg was the wealthiest country in the Eurozone with a per capita GDP of US$ 65,617; by contrast, Estonia was the poorest at US$ 8,978.

Table 3. Selected Basic Eurozone Macroeconomic Indicators (2): 2011

Country	Infl. rate	Exchange rate at end of period[1/]		Exports	Imports	Total trade	Export/ GDP	Import/ GDP	Trade/ GDP
	%	Nat.curr per US$	Curr	US$ mil.	US$ mil	US$ mil	%	%	%
Austria	3.40	0.72	Euro	192,142	173,176	365,318	57.29	51.63	108.92
Belgium	3.21	0.72	Euro	345,485	332,338	677,823	84.69	81.46	166.15
Cyprus	4.16	0.72	Euro	8,608	9,294	17,902	44.94	48.53	93.47
Estonia	4.14	0.72	Euro	14,440	13,574	28,014	95.23	89.52	184.76
Finland	2.61	0.72	Euro	91,132	85,510	176,641	43.46	40.78	84.25
France	2.14	0.72	Euro	613,032	666,006	1,279,038	27.36	29.73	57.09
Germany	2.27	0.72	Euro	1,534,070	1,336,669	2,870,738	50.32	43.84	94.16
Greece	2.20	0.72	Euro	52,920	68,032	120,952	23.37	30.05	53.42
Ireland	1.42	0.72	Euro	198,935	147,084	346,018	94.77	70.07	164.83
Italy	3.65	0.72	Euro	504,279	500,511	1,004,790	28.44	28.23	56.67
Luxembourg	3.41	0.72	Euro	70,102	60,675	130,777	167.14	144.66	311.81
Malta	1.47	0.72	Euro	6,432	6,080	12,512	94.75	89.56	184.31
Netherlands	2.35	0.72	Euro	551,720	486,741	1,038,461	79.90	70.49	150.39
Portugal	3.50	0.72	Euro	66,288	73,896	140,184	34.37	38.32	72.69
Slovakia	4.65	0.72	Euro	56,521	51,149	107,670	91.06	82.41	173.47
Slovenia	2.07	0.72	Euro	29,025	27,700	56,724	73.97	70.59	144.56
Spain	2.36	0.72	Euro	352,455	353,771	706,226	29.77	29.88	59.66
Eurozone	**2.88**	**0.72**	**Euro**	**4,687,583**	**4,392,204**	**9,079,787**	65.93	61.16	127.09

Note: For Eurozone figure, exports, imports, and total trade are summation of all members; while others are average value
Source: Unstat.

Concerning selected macroeconomic indicators, the inflation rate in Slovakia was highest at 4.65%, and Ireland was the lowest at 1.42%. Germany is the dominant force in trade activity by export or import value. Luxembourg, as the wealthiest country in the Eurozone, has the highest trade dependency: trade-to-GDP ratio is three time the total GDP. Greece, Italy, France, and Spain show trade-to-GDP ratios lower than 60%.

2.2.2 Time Table

Baldwin & Wyplosz (2012) explain that the story of the euro started in 1957 by six countries: Belgium, Luxembourg, The Netherlands, France, Germany ,and Italy. The Rome Treaty served as the agreement for coordinating economic policy. In 1964, the European Economic Community (EEC) was established as a driving force behind a coordinated European monetary policy. This body spurred an economic and currency union by releasing "The Werner Plan," phasing in a common currency. Subsequently, in 1979, the European Currency System introduced the basket of currency as a new European currency unit and an exchange rate mechanism. In 1989, Delor's report mandated three stages to implement the Euro:

1. Liberalization of capital flows (as from 1 July 1990)
2. Establishment of European System of Central Banks (ESCB)
3. Independent central bank in the framework of the ESCB, introduction of a common currency, and binding rules for fiscal policy.

Following these stages, in 1991, the MT was signed; committing member states complete the process by 1999. The Maastricht Criteria was required to ensure the stability and outlook of a single currency:

1. Price Stability. The rate of inflation should not exceed the average rate of the three best performers by more than 1½ percentage points.
2. Soundness of public finance. The deficit of the general government budget should not be excessive.

3. Exchange rate stability. The exchange rate should have been kept within the normal band of the Exchange Rate Mechanism (ERM) for at least two years, without a devaluation against any other member's currency.
4. Durability. The long-term interest rate should not exceed the average rate of the three countries with the best inflation performance by more than 2 percentage points.

To fully implement the EMU, Delors' report divided Maastricht treaty implementation into three stages as described below (http://www.ecb.int/ecb/history/emu/html/index):

- The first stage of the economic and monetary union began on 1 July 1990.
- The second stage established the European Monetary Institute (EMI) on 1 January 1994, to strengthen central bank cooperation and monetary policy coordination, to make the preparations required for the establishment of the European System of Central Banks (ESCB), to perform as the agent of the single monetary policy, for the creation of a single currency in the third stage, and to carry out preparatory work on future monetary and exchange rate relationships between the Eurozone and other EU countries.
- The third stage began on 1 January 1999, commencing with the irrevocable fixing of currency exchange rates among the 11 initial Member States in the Monetary Union, and by creating a single monetary policy under the responsibility of the ECB.

To complement and specify Treaty provisions for the EMU, the European Council adopted the Stability and Growth Pact in June 1997, aiming to ensure budgetary discipline with respect to the EMU, supplemented by a Declaration of the Council in May 1998. On 2 May 1998, the Council of the European Union—represented by Heads of State or

Government—unanimously decided that 11 Member States (Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, and Finland) had satisfied the criteria to participate in the third stage of the EMU, adopting the single currency on 1 January 1999.

With the establishment of the ECB on 1 June 1998, the EMI had completed its tasks. All preparatory work entrusted to the EMI was approved by the ECB for final testing of systems and procedures. In order to manage monetary policy, The ECB has set the overriding objective of keeping inflation low.

According to De Grauwe (2009), the ECB generally stabilizes too little, from the point of view of the individual members. To meet price stability objectives, the ECB uses three types of instruments: open market operations, the most important instruments for buying and selling of securities to increase or reduce money market liquidity; standing facilities, providing and absorbing overnight liquidity from the NCBs; and minimum reserve requirements, the imposition of minimum reserves for banks.

Regarding membership extension, the signing of the Copenhagen Treaty (http://europa.eu/legislation_summaries/glossary/accession_criteria_copenhague_en.htm) paved the way for EU membership by compliance with the following criteria:

- A functioning market economy with the capacity to cope with competitive pressures and market forces within the community;
- Stability of institutions guaranteeing democracy, the rule of law, human rights, and respect for and protection of minorities; and

- Ability to take on the obligations of membership, including adherence to the aims of the political and economic and monetary union.

Before this process, economic integration in the EU achieved some criteria for an effective economic union. However, the introduction of the euro as a single currency for some members was a phenomenon in economic history; the last stage of this European currency union will not be forgotten by the European people.

Table 4. EU and EMU Timetable

1957	The Treaties of Rome
1964	European Economic Community
1970	Werner Plan
1972	The European Currency Snake
1979	European Currency System
1987	The Single European Act
1989	1st of Economic and Currency Union
1991	The Signing of Maastricht Treaty
1993	European Single Market
1993	The Copenhagen Treaty
1993	The MT Enter Into Force
1994	2nd of Economic and Currency Union
1997	The Stability and Growth Pact
1998	Membership Decision
1998	Creation of ECB
1999	Introduction of The Euro
2000	Establishing Lisbon Agenda
2001	Greece Join
2002	Introduction euro cash and coin
2004	Ten New Members of EU
2007	Slovenia Joined
2007	Eurozone Debt Crisis
2008	Malta and Cyprus Joined
2009	Slovakia Joined
2011	Estonia Joined
2012	The Treaty on ESM
2012	The Treaty on Stability, Coordination and Governance in the EMU

Source: Adapted mainly from Baldwin and Wyplosz (2012)

In response to financial crises in the Eurozone, the European Council released two important treaties in 2012. On December 17, 2010, the Treaty on Establishing the European Stability Mechanism (ESM) addressed the need for Eurozone countries to establish a

permanent stability mechanism to provide financial assistance to Eurozone members when needed, mobilizing funding and providing stability support, under strict conditions, for members experiencing, or threatened by, severe financial problems (*http://www.eurozone.europa.eu/media/migrated/596968/treaty_establishing_the_esm_2012_final.pdf*).

Following the ESM treaty, Eurozone members also agreed to discharge the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union. The treaty addressed the need for governments to maintain sound and sustainable public finance and to prevent excessive government deficit. This treaty introduced a balanced budget rule: government deficit may not exceed 3% of GDP at market prices, and government debt does not exceed, or is sufficiently declining towards, 60% of GDP at market prices, in line with the agreed SGP *(http://www.eurozone.europa.eu/media/304649/st00tscg26_en12.pdf).*

2.3 ASEAN

2.3.1 Basic Facts

In 2011, ASEAN consisted of 10 member countries situated southeastern Asia. The land area covered almost 4.5 million $km^{2,}$ with population numbering more than 600 million. ASEAN was seen as the most dynamic area in the world for growth durability; in 2010 and 2011, this region showed7.8% and 4.7% growth, with a per capita GDP of US$3,601 in 2011. Its trade volume showed a surplus, with total trade reaching more than US$2.4 trillion and an FDI inflow of US$114 billion.

Table 5. Selected Basic ASEAN Indicators

Indicators	Unit	2010	2011
Total land area	km^2	4,435,670	4,435,674
Total population	thousand	597,176	604,803
Gross domestic product at current prices	US$ million	1,882,700	2,178,148
GDP growth	percent	7.8	4.7
Gross domestic product per capita at current prices	US$	3,153	3,601
International merchandise trade	US$ million	2,045,731	2,388,592
Export	US$ million	1,070,941	1,242,286
Import	US$ million	974,790	1,146,306
Foreign direct investments infow	US$ million	92,279	114,111

Sources: ASEAN Secretariat

Evaluating selected basic ASEAN indicators in 2011, Indonesia not only has the largest area (1.9 million km^2), but also population (238 million) and GDP. Singapore has the smallest land area (714km^2), but the highest per capita GDP (US$ 60,744) and population growth (2.1%). Brunei has the smallest total population, but the second highest per capita GDP. Malaysia (0.2%), followed by Thailand, has the lowest population growth. By unemployment rate, Philippines (6.4%) was the highest and Cambodia was the lowest (0.2%).

Table 6. Selected Basic ASEAN Macroeconomic Indicators (1): 2011

Country	Total land area	Total population	Population growth	Unemployment rate	GDP	Per Capita GDP	
	km^2	Thousand	Percent	percent	US$ million	US$	US$ PPP
Brunei	5,765	422.7	2.0	2.6	16,359.6	38,702.5	52,059.0
Cambodia	181,035	14,521.3	1.5	0.2	12,766.2	879.1	2,287.4
Indonesia	1,860,360	237,670.7	1.5	5.0	846,821.3	3,563.0	4,736.0
Lao PDR	236,800	6,385.1	2.1	1.3	8,163.3	1,278.5	2,824.5
Malaysia	330,252	28,964.3	0.2	3.1	287,922.8	9,940.6	15,955.2
Myanmar	676,577	60,384.0	1.0	4.0	52,841.5	875.1	1,393.4
Philippines	300,000	95,834.4	1.9	6.4	224,337.4	2,340.9	4,288.8
Singapore	714	5,183.7	2.1	2.9	259,858.4	50,129.9	60,744.4
Thailand	513,120	67,597.0	0.4	0.7	345,810.8	5,115.8	8,906.8
Vietnam	331,051	87,840.0	1.0	3.6	123,266.9	1,403.3	3,439.6
ASEAN	**4,435,674**	**604,803.1**	**1.3**	**n.a.**	**2,178,148.1**	**3,601.4**	**5,580.7**

Sources: ASEAN Secretariat

Following table showed recent macroeconomic performance of ASEAN related with inflation, trade, and FDI inflow.

Table 7. Selected Basic ASEAN Macroeconomic Indicators (2): 2011

Country	Inflation rate	Exchange rate at end of period[1]		Exports	Imports	Total Trade	Exp/ GDP	Imp/ GDP	Trade/ GDP
	Percent	National Curr./US$	Currency	US$ mill	US$ mill	US$ mill	%	%	%
Brunei	2.0	1.26	Dollar (B $)	12,362.3	2,460.0	14,822.3	75.6	15.0	90.6
Cambodia	5.5	4,079	Riel	6,710.6	6,133.6	12,844.1	52.6	48.0	100.6
Indonesia	3.8	8,775	Rupiah (Rp)	203,496.7	177,435.6	380,932.3	24.0	21.0	45.0
Lao PDR	7.6	8,011	Kip	1,746.5	2,209.4	3,955.9	21.4	27.1	48.5
Malaysia	3.2	3.06	Ringgit (RM)	228,179.1	187,542.8	415,721.9	79.3	65.1	144.4
Myanmar	5.0	766.59	Kyat	8,119.2	6,805.9	14,925.1	15.4	12.9	28.2
Philippines	4.6	43.39	Peso (PhP)	48,042.2	63,709.4	111,751.6	21.4	28.4	49.8
Singapore	5.2	1.26	Dollar (S $)	409,443.5	365,709.1	775,152.6	157.6	140.7	298.3
Thailand	3.8	30.49	Baht	228,820.7	230,083.6	458,904.4	66.2	66.5	132.7
Vietnam	18.6	20,510	Dong	95,365.6	104,216.5	199,582.1	77.4	84.5	161.9
ASEAN	**n.a.**	**n.a.**	**n.a.**	**1,242,286.4**	**1,146,305.9**	**2,388,592.3**	**57.0**	**52.6**	**109.7**

Note: For ASEAN figure, exports, imports, and total trade are summation of all members; while others are average value
Sources: ASEAN Secretariat

Vietnam has the highest inflation rate (18.6%) in ASEAN, and also, the least valued currency. Singapore has the strongest currency, the highest FDI inflow, and the highest degree of openness compared with other countries. Brunei has the lowest inflation rate (2%), and in terms of trade, Myanmar has the lowest degree of openness (28.2%).

2.3.2 Timetable

Indonesia, Malaysia, the Philippines, Singapore, and Thailand established ASEAN on 8 August 1967. Later, Brunei Darussalam joined on 8 January 1984, Vietnam on 28 July 1995, Laos and Myanmar on 23 July 1997, and Cambodia on 30 April 1999 (www.aseansec.org). The main goals of ASEAN were long-lasting peace and common security in Southeast Asia. The ASEAN Declaration states that the aims and purposes of the Association (www.aseansec.org) are:

1. To accelerate economic growth, social progress, and cultural development in the region.

2. To promote regional peace and stability through abiding respect for justice and the rule of law in the relationship among countries in the region and adherence to the principles of the United Nations Charter.

Hill and Menon (2010) defined ASEAN by four broad characteristics:

1. It is a region of great diversity in economic, political, cultural, and linguistic diversity, related with colonial experiences;
2. Most countries achieved rapid economic development over the past 25 years, longer in some cases;
3. Diplomacy and cooperation have been characterized by caution, pragmatism, and consensus-based decision-making;
4. ASEAN has never been, and probably will never be, an EU-type organization, nor a NAFTA-type economic bloc.

The economic collaboration among ASEAN member states began in the 1970s. The signing of the Preferential Trading Agreement (PTA) in 1977 was the first step in economic integration. The impact, however, was not significant, since the countries were not ready to open national borders and the development gap among countries was considerable.

According to Vanderon (2005), the key development phase was concluded in January 1992, when ASEAN leaders decided to take their trade liberalization efforts to a higher level. To do so, they established the AFTA to promote the region's competitive advantage as a single production unit and to eliminate tariff and non-tariff barriers among member countries. Moreover, in 1995, they also concluded the supplementary ASEAN Framework Agreement

on Services (AFAS), and in 1998, ASEAN ministers established the ASEAN Investment Area (AIA). Other major integration-related economic activities of ASEAN include the following (Vanderon, 2005):

- The Roadmap for Financial and Monetary Integration of ASEAN, addressing four areas, namely, capital market development, capital account liberalization, liberalization of financial services, and currency cooperation;
- A trans-ASEAN transportation network consisting of major interstate highway and railway networks, including the Singapore to Kunming Rail-Link; principal ports and sea lanes for maritime traffic; inland waterway transport; and major civil aviation links
- The Roadmap for Integration of the Air Travel Sector;
- Interoperability and interconnectivity of national telecommunications equipment and services, including the ASEAN Telecommunications Regulators Council-Mutual Recognition Arrangement (ATRC-MRA) on Conformity Assessment for Telecommunications Equipment;
- Trans-ASEAN energy networks, specifically the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline Projects;
- The Initiative for ASEAN Integration (IAI), focusing on infrastructure, human resource development, information and communications technology, and regional economic integration, primarily in the CLMV countries;
- The Visit ASEAN Campaign and the private sector-led ASEAN Hip-Hop Pass to promote intra-ASEAN tourism; and
- Agreement on the ASEAN Food Security Reserve.

The ASEAN Vision 2020 was adopted in Kuala Lumpur by ASEAN leaders on the 30th Anniversary of ASEAN. This set forth a shared vision of ASEAN as "a concert of Southeast Asian nations, outward looking, living in peace, stability and prosperity, bonded together in partnership in dynamic development and in a community of caring societies" (www.aseansec.org). ASEAN Vision 2020 defines the AEC end goal as economic integration, establishing ASEAN as a single market and production base, turning characteristic diversity into complementary business opportunities, and making ASEAN more dynamic, a stronger part of the global supply chain. In 2003, ASEAN leaders resolved that an ASEAN community should be established with three pillars: the ASEAN Security Community, the AEC, and the ASEAN Socio-Cultural Community.

Table 8. ASEAN Timetable

1961	Maphilindo and ASA
1967	Establishment
1971	Reorganizing in Bali
1976	ASEAN Concord I
1977	ASEAN swap arrangement
1978	Trade Preference Arrangement
1979	Security Reserve Agreement
1980	Industrial Project
1981	Finance Corporation
1984	Brunei joins
1992	AFTA and CEPT
1995	Vietnam joins
1997	Laos and Myanmar join
1999	Cambodia joins
2003	Concord II+3, AEC by 2020
2003	AFTA&CEPT start
2005	ASEAN Charter
2007	FTA with China, Japan, South Korea, Australia, India, New Zealand
2007	Accelerating AEC by 2015

Source : Adapted mainly from ASEAN Secretariat.

AEC goals fall in four market areas (four freedoms): goods, services, investment and capital, and (skilled) labor. Thus, targets were based on AEM modalities. Current AEC

specifications refer mostly to border measures[3] concerning regional trade and factor mobility, factor movements (at the border), beyond- (or inside-) the-border measures[4], regional standardization and harmonization of technical regulations, standards and conformance assessment requirements of competition policies, business taxes and regulations of financial and capital regimes and standards, and use of a common currency[5] (www.aseansec.org).

According to Wattanapruttipaisan (2006), in a bid to achieve the AEC's targets, ASEAN will face some risks and challenges. First, *Intra-regional:*

- A large development divide and slow income convergence in ASEAN over time
- Persistence of big gaps in institutional development and implementation capacity within ASEAN
- Crisscrossing FTAs by ASEAN and ASEAN Member Countries
- Low levels of IP creativity and innovation
- Persistent, heavy dependence on low-value-added external technologies, and FDI
- Natural disasters and environmental degradation
- Mass outbreaks of communicable diseases, and
- Terrorism and crimes.

Their second set of challenges will be *Extra-regional:*

- Interruptions in oil supply and persistence of high oil prices
- Increasing market competition from China and India

[3] removal of tariffs and a variety of non-tariff barriers (NTBs) on regional trade
[4] no discrimination regarding regional sources of traded goods, services, and factor inputs inside member countries' borders and across-the-border measures
[5] a single (regional) market does not necessarily require or imply the use of a single currency or monetary union

- Natural and financial resources and off-shore services
- On-going advances in “disruptive” technologies, and commercial breakthroughs in consumer and producer goods
- Ever-rising thresholds for performance and productivity from producers, service suppliers, and workers
- More sophisticated, exacting, and fickle consumer and market demands
- Delayed negotiations and/or modest achievements under the Doha Development Agenda
- Geo-political problems, including those in East Asia
- Regional terrorism and crime.

The AEC’s goal is to create a stable, prosperous, and highly competitive ASEAN economic region, where there is a free flow of goods, services, and investment capital, resulting in equitable economic development and reduced poverty and socio-economic disparities by 2020. The AEC establishes ASEAN as a single market and production base, using the region’s characteristic diversity to develop opportunities for business cooperation, making ASEAN a more dynamic and stronger contributor to the global supply chain. ASEAN’s strategy consists of the integration of ASEAN and enhancements to ASEAN’s economic competitiveness. To move toward implementation of an ASEAN Economic Community, ASEAN’s members agreed on the following (www.aseansec.org):

- Instituting new mechanisms and measures to strengthen the implementation of its existing economic initiatives, including the AFTA, the ASEAN Framework Agreement on Services (AFAS), and the ASEAN Investment Area (AIA);

- Accelerating regional integration in the following priority sectors by 2010: air travel, agro-based products, automotives, e-commerce, electronics, fisheries, healthcare, rubber-based products, textiles and apparels, tourism, and wood-based products.
- Facilitating movement of business persons, skilled labor and talent; and
- Strengthening the institutional mechanisms of ASEAN, including improvement of the existing ASEAN Dispute Settlement Mechanism, ensuring expeditious and legally-binding resolution of any economic disputes.

At the 13th ASEAN Summit in Singapore, ASEAN leaders committed to the ASEAN Economic Blueprint as a coherent master plan guiding the establishment of the ASEAN Economic Community by 2015. In Brunei, at the 22nd ASEAN Summit, ASEAN leaders emphasized the importance of human resources as a central element of a post-2015 vision and agreed to intensify work toward an ASEAN Community *(www.asean.org).*

Chapter 3 Literature Review

3.1 Economic Integration

Regional integration has become a global trend, resulting in greater reliance on market forces, increased openness, and deeper integration into the world economy. These same forces are expected to generate faster economic growth, especially for poorer countries, and lead to the convergence of neighboring countries' income. Integration among neighboring countries has been characterized by loose and speculative discourse. According to Agenor (2003), the primary reason for the increase in integration around world is the concurrent increase in globalization spurred by investors seeking the highest return.

Until recently, economic integration has generated important debate among economists. Both theoretical and empirical works have been motivated by regional development issues within the EU, ASEAN, NAFTA, and others. Jovanovic (2006) defines economic integration as a process, the means by which a group of countries attempts to increase their communal welfare, creating strong partnerships to more easily achieve common goals. The integration process encourages communication and concern among member states, more than nations outside any proposed union. De Rosa (1998) defines economic integration broadly as the equalization of relative prices for traded goods among countries.

Jovanovic (2006) isolates international economic integration between at least two countries into seven stages:

1. PTA

   This trading bloc gives preferential access to certain products from participating countries, by reducing tariffs, not removing them fully. A PTA can be established through a trade pact, with the goal of a free-trade area.

2. Partial Customs Union

   This type of trading bloc retains tariffs among members, introduces common external tariff policy, and changes import quotas. These steps are meant to increase economic efficiency and establish closer political and cultural ties among member countries.

3. Free-Trade Area

   A free-trade agreement eliminates tariffs, quantitative restrictions, and purchasing preferences on most goods and services traded among trade bloc members. If economic structures are complementary, countries are most likely to choose this type of economic integration, with a customs union the second choice.

4. Customs Union

   Member countries remove all tariffs and quantitative restrictions among members and introduce common external tariff with non-members, and also agree to common external trade policy.

5. Common Market

   This type of trade bloc is based on free mobility of factor production among members, and common regulations and restrictions on non-members, to encourage easy movement of factor production. Physical, technical, and fiscal barriers among member states are removed to the maximum extent possible.

6. Economic Union

   Trade bloc encompasses a common market, a customs union, and a monetary union. It is established through a currency-related trade pact synchronizing monetary, fiscal, industrial, transport, and other economic policies.

7. Total Economic Union

   In the final stage of economic integration, a supranatural government is created, with common economic policy and considerable economic authority. Integrated units have negligible, or no, control over economic policy, including the harmonization of the monetary union and fiscal policy.

Baldwin and Forslid (2000) proposed two major mechanisms by which economic integration dynamically influences the evolution of an economy:

- A scale-effect channel resulting from positive spill-over and the growth rate of the integrated economic area.
- A factor-reallocation channel resulting from the share of resources allocated to dynamic economic sectors, changing the growth rate.

Integration can also be evaluated through the agglomeration effect, first developed by Lösch in 1944 (in Neibuhr and Stiller, 2002). In his work, he develops a consistent, albeit rather unknown, model dealing with spatial effects of economic integration. According to his model, consumers and production factors are assumed immobile and equally distributed in space. Lösch considers economies of scale and imperfect competition, by which firms relocate where spatially dispersed demand can be best, served, while maximizing potential

profit. Therefore, transportation costs for goods should be proportional to the distance between consumers and producers.

Hoover (in Niebuhr and Stiller 2002) discusses the significance of borders in traditional location theory. He shows that tariffs and other restraints on international trade raise transportation costs, distort market areas and supply networks, and increase the costs of producers located near borders. Therefore, producers will avoid territory near a trade barrier that might restrict their market or supply area, preferring to choose an area more central to domestic markets. This border effect theorizes that firms orientate towards the interior of an area enclosed by borders, since demand-and-supply relationships are denser in the geographical center of a country than in its periphery.

Hoover suggests that the aperture of a border for trade may dramatically change the economic situation in border regions. Border regions become more attractive to investors through the reduction of international trade barriers and low-cost access to foreign markets. Such conditions will spur relocation of firms to areas closer to a national border. When the national market is not large, new products can be supplied profitably by a firm located near the center of the common market. Therefore, through the process of integration, regions at the boundaries of domestic and the foreign markets attract production.

Viner (1950) shows that integration will reduce trade barriers and increase international trade, which affects international specialization in production. Intra-country reallocation of production will drive economic adjustment, since production factors are assumed to be mobile within countries and among sectors, though immobile internationally. Thus, countries develop fixed-factor endowments, and trade serves as a substitute for factor mobility. Transportation

costs, whether on a national or international level, are treated as a single geographic location. The assumption that spatial distance is irrelevant for the intensity of trade relations strongly contrasts empirical estimations of gravity models proving that distance is a very important determinant of international bilateral trade volume. As long as trade models neglect international factor mobility, the value of this inherent element of integration is lost.

Krugman (1991) proposes new economic geography to address the distribution of economic activities across space, explaining regional disparities by entirely endogenous location decisions. Krugman's model is called the "core-periphery model." This model uses a combination of elements from both traditional regional science and new trade theory. Krugman's models were typified by explicit spatial structure, interregional trade costs, economies of scale in production, and monopolistic competition. Since spatial equilibrium results from the location decisions of firms, workers, and consumers, the balanced distribution of workers and firms across space depends on the relative strength of centripetal forces (promoting the geographic concentration of economic activities) and centrifugal forces (promoting the geographic dispersion of economic activities). If centripetal forces dominate, workers and firms will be unequally distributed. Therefore, he suggests that there are agglomerations with a high density of economic activities, as well as regions with only a few firms, or no industry at all.

Niebuhr and Stiller (2001), studying the spatial impact of integration, showed two highly relevant economic geography hypotheses:

- Eliminating international trade costs and liberalizing the movement of cross-border labor will affect the balance of centripetal and centrifugal forces on the international level. This

integration will change the distribution of population, production factors, and firms among countries. Therefore, the spatial impact of integration may increase labor migration among countries. This labor migration will alter both national factor endowments and the international location of industrial activities.

- Eliminating international trade costs will change the balance of centripetal and centrifugal forces on a national level, since foreign markets become more important for buyers and suppliers. Thus, integration will change the distribution of population, production factors, and firms within countries. This implies that opening goods markets might affect the economic geography within a country because the location of economic activities within a closed economy is strongly inward-oriented, so such changes move toward an outward orientation in an open economy. The domestic market becomes less important and less attractive, which may cause reallocation of economic resources within a country away from previous centers to new locations.

Niebuhr and Stiller theorize that integration has a positive impact on foreign demand, potential markets, and cross-border backward and forward linkages. But these developments favoring economic activity in border regions are countered by forces intending to preserve pre-integration geography of economic activities. Hence, economic theory only allows very vague conclusions about the spatial effects of integration. The relative weight of these counteracting forces is ambiguous from the theoretical perspective. Results depend on specific circumstances, under which border regions might see benefits, losses, or no effect from integration.

Baldwin and Wyplosz (2012) define integration effects of growth into medium- and long-term. Medium-term effects, they say, are sequential economic integrationimproving efficiency, higher GDP per worker, and higher investment per worker. From this point, the capital-per-labor ratio shows higher value and faster growth of output per worker. Long-term effects are faster knowledge creation and absorption. This arises from increased investment in knowledge, leading to a permanent increase in growth.

In the case of financial integration, Agenor (2001) defined some benefits : consumption smoothing, whereby a country can borrow money in recession and lend money when booming; domestic investment and growth, whereby openness provides access for domestic investment, contributing to growth; enhanced macroeconomic discipline, whereby free flow of capital will punish bad policy and reward good policy; and increased banking system efficiency and financial stability, since foreign banks will improve the overall quality and resources of the financial system).

On the other hand, Agenor writes that costs may also arise from: concentration of capital flows and lack of access, domestic misallocation of capital flows, loss of macroeconomic stability, pro-cyclicality of short-term flows, herding, corruption and volatility of capital flows, and risks of entry by foreign banks.

3.2 Economic Crisis

According to Stiglitz (2010), integration of global markets was supposed to lead to greater financial stability, as risks were spread around the world; however, recent financial crises have thrown doubt on this conclusion; in the absence of appropriate government intervention, private transactions for profit may lead to systemic risk. The crisis suffered by

the Eurozone repeated the story of crises experienced by Latin America and Asia; however, the Eurozone was, of the three, by far the most developed area, well-known for its global economic and political power. The crisis happens in the area which all member countries had surrendered their currency policy to ECB avoiding them to adjust the nominal currency.

Palley (2011) followed a Minskian framework, hypothesizing that the Eurozone crisis resulted from instability of capitalist economic processes. Thus, Minsky (1977) emphasized the importance of adequate governmental constraint on private institutions to stabilize the economy.

Radelet and Sachs (2000) defined the five main types of financial crisis as:

1. Macroeconomic Policy-Induced Crisis, a balance-of-payment crisis involving currency depreciation, loss of foreign exchange reserve, or collapse of a pegged exchange rate.
2. Financial Panic, an adverse equilibrium outcome in which short-term creditors suddenly withdraw their loans from a solvent borrower.
3. Bubble Collapse, occuring when speculators purchase financial assets at a price above their fundamental value in order to realize capital gain.
4. Moral-Hazard Crisis, wherein banks borrow funds on the basis of implicit or explicit public guarantees of bank liabilities.
5. Disorder Workout, in which an illiquid or insolvent borrower provokes a creditor grab race and forced liquidation, even though the borrower is worth more as an ongoing enterprise.

Stiglitz (2000) theorized that capital market liberalization was responsible for the Eurozone crisis, based on standard efficiency arguments, employing a conventional neoclassical model and ignoring differences between financial and capital markets and

markets for ordinary goods and services. He ignored distributional consequences, presumably believing that if gains are large enough, benefits will trickle down to the poor. He argues that international competition for funds requires countries to create an attractive environment to business. He also proposes that open capital markets help stabilizes the economy through diversification and funding for needed investment projects. Stiglitz's empirical study stressed that there exists no strong relation between growth and liberalization stability, that capital market liberalization mainly produces instability, not growth, since financial and capital markets are different from markets for ordinary goods and services. Furthermore, he writes, financial openness only facilitates the flow of capital, rather than providing another channel for adverse effects.

The cause of the Eurozone crisis might also be explained by Minsky's financial instability hypothesis, which states that inadequate controls by the government on private industry led to natural capital instability (Minsky, 1977). Tse (2001) depicted big government and big banks as the two most important economic institutions, applying Minsky's analysis to the current situation in Europe. Palley (2011) proposed that capitalism demonstrates an inevitable tendency toward instability. This view might be expressed as: *"success breeds excess breeds failure* (Minsky, 1977)." Evolutionary factors are present because an economy evolves through stages that breed successive stages. Instability is present because the system periodically ends in failure and collapse. This hypothesis defined two cyclical processes:

1. Basic cycle

The basic cycle considered consumer psychology about market conditions, beginning with progressive optimism, when optimistic valuations of assets and investment revenue

streams are combined with an increased willingness to take on risk. The situation was critical that urges weakening market discipline, and emphasizing the emergence of gradually more fragile corporate balance sheets. It was marked by either reduced liquidity or higher debt-equity ratio. The chronicle stages were as follows:

a. Hedge Finance, or financial tranquility. At this stage, all agents can fulfill their contractual payment obligations by their cash flows. This condition tends to be associated with higher equity financing in the liability structure.
b. Speculative Finance, or financial fragility. At this stage, agents can fulfill their payment commitments through income accounts on their liabilities. In this stage, they unable to repay loan principle out of cash flows.
c. Ponzi Finance, or financial bust. The agents in this stage recognize that their cash flows from operations are not sufficient to fulfill either the repayment of principle or the interest due on outstanding debts by their cash flows from operation. The only ways to achieve liquidity are selling assets or borrowing.

2. Super cycle

The super cycle is a process of transforming business institutions, business practices, conventions, and the structures governing the market in a fashion that eventually gives rise to a major financial crisis. Palley's major concern was that the governmental structures were required to ensure the stability of capitalist economies, both public and private, with the goal of constraining outcomes, even when instability might not be observed.

Generally, the process of erosion and transformation was characterized by a super cycle taking several cycles simultaneous to the basic cycle. By this definition, financial busts only

happen once a generation, when Minsky's super cycles erode the economy's regulating institutions. At this stage, systemic stability is threatened by expanded risk taking, systemic exuberance, and the systemic vulnerability that occurs with excessive risk. This cycle demonstrates twin developments which are regulatory relaxation and increased risk-taking.

3.2.1 Asian Crisis

As demonstrated by the Asian financial crisis of 1997 year, Kaminsky and Reinhart (1998) pointed out that financial crises occur as an economy enters a recession, following a prolonged boom in economic activity fueled by credit creation and surges in capital inflow. Miskhin (1999) emphasized the Asian financial crisis was not only disastrous regionally, but also placed the global financial system under tremendous stress.

Wade (1998) demancated four steps leading to the Asian crisis:

1. The exchange collapse
2. An upsurge of bank failures and company bankruptcies resulting from the costs of unhedged foreign debt
3. A domestic recession resulting from falls in consumption and investment, as well as rising unemployment; and
4. Political reaction from the economic slump.

Wade's detailed chronology of the Asian crisis explores the underlying reasons for the economic downturn:

1. A capital push in 1985, when Japanese companies sought a new, cheaper manufacturing base in a US-dollar zone. Southeast Asia was the obvious choice—close to Japan, currency pegged to the US dollar, and cheap, well-educated workers.
2. Very cheap credit in Japan and strong Japanese government support helped to stimulate a Japanese investment and export boom. Rising exports sustained more borrowing, more equity issues, and more FDI.
3. Additionally, capital liberalization occurred when Asian countries operated a fixed exchange rate pegged to the US dollar. Concurrently, radical financial deregulation in the 1990s removed restrictions on the inflow and outflow of mobile capital.
4. The deregulation happened with little attention to the new kinds of regulations that would be required and with only a thin base of financial skills.
5. The deregulated financial systems enabled inexperienced private domestic banks and firms to take out large, dollar-denominated loans from foreign lenders and on-lend with generous spreads, especially in Thailand.
6. Before the huge inflow of capital, Asian households saved money. Gross Domestic Savings are typically one-third of GDP. East and Southeast Asia are low-income regions, however, where capital is more abundant than in the higher-income regions of North America and Europe.
7. A very high rate of domestic savings intermediated from households to firms via banks, creating a deep structure of domestic debt.

8. The crisis started with inflationary pressure; the inflow of financial capital, combined with a fixed exchange rate, forced an increase in domestic money supply, fuelling inflation at around 6%.
9. Then came major shifts in the exchange rate when the US dollar appreciated against other currencies. The appreciation of the dollar, coupled with domestic inflation at rates higher than trading partners, created a squeeze on exports and devaluation of imports.
10. Responding to high savings, domestic inflation higher than trading partners, and reduced prospects for export-oriented manufacturing, investors in Southeast Asia invested in real estate.
11. Property speculation flourished continually as foreign currency continued to pour in and domestic money supply continued to expand.
12. As consumers expected continued inflation, property investments appeared to be the best hedge.
13. As a result, Thailand's private sector property bubble burst in 1995, and the stock market crashed in 1996.
14. In May 1997, Japanese officials hinted that they might raise interest rates. The threat of a rise in Japanese interest rates, plus concerns about Thailand's currency, raised fears among commercial bankers, investment bankers, and others.
15. The contagion effect of the crisis finally spread across East and Southeast Asia.

Radelet and Sachs (2000) showed the reasons for the severe crisis in Asia:

- Large-scale, unanticipated, involved, unguaranteed lending to debtors, leading to lack of credit for viable enterprises

- Positive market reaction to initiate that bring creditors and debtors together for orderly workouts
- Triggering events leading to the sudden withdrawal of investor funds.

According to Radelet and Sachs (2000), the Asian crisis would not have been so severe if certain conditions had been met:

- If Japan had addressed its banking problem earlier
- If the Japanese government had pledged 10 billion rather 4 billion
- If the US Congress had been less isolationist
- If developing countries liberalized their financial systems more slowly
- If developing country political leaders had been prepared to check wild real estate investment and speculation in junk bonds
- If there had been sand in the wheels of the international financial system, such as a tax on international currency transactions, and
- If the IMF stuck to its mandate of helping countries to cope with temporary foreign exchange shortages.

Radelet and Sachs (2000) also concluded that the Asian crisis was unpredictable. Since capital inflows remained strong, risk premiums were attached to loans to emerging market economies. The assessments from credit-rating agencies were good, as were and investment forecasts. These conditions were supported a government debt in surplus and very high domestic saving and investment rates. The strong world market did not portend a crisis. However, the crisis emerged after risk expanded through growth of current account deficits,

an overvalued exchange rate, slowing export growth, and increasingly fragile financial institutions, deteriorating throughout the 1990s.

3.2.2 The Eurozone Crisis

The current Eurozone crisis, which began in the USA, now spread through the Eurozone—in fact, the entire world. The sovereign debt crisis in the euro zone is a symptom of failures and deficiencies in fiscal policy coordination (Schuknecht, et. al, 2011). The inception of EMU in the early 1990s followed a period characterized by big public expenditure, chronic budget deficits, and rapidly rising public debt ratios in many of the future EU countries.

The crisis suffered by the Eurozone resembled similar crises experienced by Latin America and Asia; however, this crisis was in one of the most developed areas in the world. The Eurozone maintains a very high level of global economic and political power, due to its relative stability. Until the crisis erupted in 2007, the euro gained a reputation as a stable anchor and strong currency. However, according to Obstfeld and Rogoff (2009), three trends of unsustainability appeared increasingly:

1. Real estate values were rising at a high rate in many countries, including the USA, the world's largest economy.
2. A number of countries were simultaneously running high, and rising, current account deficits.
3. Leverage had built up to extraordinary levels in many sectors across the globe.

Debate among economists arises around the responsible factors for the crisis in Europe. Some economists argue that external imbalances, or financial regulatory failures and policy errors, were responsible, but others believe there is a cross-relation between them. Among researchers, Obstfeld and Rogoff (2009) believed that global imbalances and the financial crisis are intimately connected. The relationship between Germany and peripheral nations resembled the trade imbalance between the US and China.

Perez-Caldentey and Vernengo (2012) explained that the original source of external crisis was a domestic debt crisis, combined with self-fulfilling expectations and financial sector imbalances. They showed that the stylized crisis depicted in the Keynesian framework indicated an inability to keep labor cost growth in the peripheral countries of Europe. This led to a loss of competitiveness and increasing external problems when combined with a financial crisis, resulted in a collapse of output and a fiscal crisis. The problem of competitiveness festered, because there was no depreciation mechanism for the nominal exchange rate, and there was an absence of supra-national fiscal authority to transfer resources. The only possible solution for external imbalances was fiscal contraction.

Bellofiore, Garibaldo, and Halevi (2010) charged that China and Germany conducted neo-mercantilist behavior, a biased policy to maintain a foreign trade surplus. In the Eurozone, German behavior during the crisis has been consistent with its traditional economic stance—non-cooperative at the global and European levels, relying on domestic price stability and export-led growth. Devaluation of the Euro improved German export competitiveness. Unfortunately, Germany profited from its neighbors' sacrifice. Peripheries couldn't recover

due to tightening fiscal policy encouraging price stability, and a lack of full control of monetary policy.

Germany's behavior before and during the crisis has also been consistent with neo-mercantilism behavior as described by Cesaratto and Stirati (2011):

- Taking advantage of a fixed exchange rate by pursuing a domestic inflation rate lower than competitors to foster exports;
- Relying on other countries' stimuli to aggregate demand, and taking advantage of their ensuing inflationary bias;
- Compensating with conservative domestic fiscal (and monetary) policy and possible labor market overheating, maintaining the external competitive hedge; and
- Replying to foreign criticism with moralistic tones, blaming their lack of discipline and proposing itself as a model.

Based on this study, monetary mercantilism is defined as price stability guaranteed by an independent central bank in the context of fixed exchange rates., and thus, the opportunity to gain competitiveness by keeping domestic inflation lower than competitors in the context of a fixed exchange rate regime. Hidden behind the centrality of price stability, the trade surplus became the central target of German policy.

Later, Germany obtained the same combination of lower domestic inflation and fixed exchange rates through the adoption of the EMU. Fiscal policy sustained the mercantilist strategy both in macroeconomic terms, by repeatedly posting budget surpluses to help tamp down domestic demand, and in microeconomic terms, by fiscal support to the export sector.

Whyte (2010) highlighted that the combination of trade surplus stemming from export-led growth, wage moderation, and domestic demand compression became the benchmark of Germany's long-term advantage over competitors. Therefore, Germany can be considered a mercantilist country.

Schuknecht (2011) showed that policy failures and deficiencies—particularly fiscal policy coordination—were the primary main causes of the recent crisis. The first nine years of the euro were not used effectively to improve public finances, and the Stability and Growth Pact (SGP) was neglected.

According to Vines (2011), inappropriate policy-making system was adopted has a direct consequence of the crisis. Launching the euro coin and paper currency for new members was based on the nation in question having fulfilled convergence criteria, including benchmarks for inflation, interest rates, exchange rates, deficits, and debt.

After the euro was introduced, interest and inflation rates converged at lower levels, which led to rapid mobilization of financial flows across borders, accelerating inflation rate and interest rate convergence. The ECB successfully accomplished its monetary goals. Low inflation and interest rates fueled a credit boom from 2003 to 2007, thereby increasing business-cycle fragility.

Credibility of ECB on inflation targeting accompanied by economic growth, induced optimism in financial market and the euro seen as a stable common currency. Investment soared as currency risk dramatically diminished, and competition boosted financial innovation, since firms and financial institutions could borrow easily from abroad. Investment growth in Peripheries was concentrated mainly in the housing sector, encouraging rapid growth of

construction and financial services, and a property boom. Credit growth translated into a buildup of debt. Faster growth experienced by peripheries increased consumption and demand for imports, and resulted in larger current account deficits. High economic growth meant rapid expansion of credit and property valuation. Without enough control of the private sector, as predicted by Minsky's hypothesis (Palley, 2011), mortgages, as well as banks relying heavily on wholesale external borrowing, created a state of financial fragility. Consequently, property prices crashed in 2009. Governments were not able to overcome large losses without outside support.

In response to the global financial crisis of mid-2007, the European Commission launched European Economic Recovery Reform (EERP). This plan coordinated short-term budgetary stimulus for fiscal stabilization, in order to strengthen demand by 1.5% of GDP. The reform also included capital injections for weak financial institutions. Unfortunately, given current fiscal deficits, debt dynamics, and additional contingent and implicit liabilities, major fiscal adjustments will be needed in almost all Eurozone countries over a long period of time to ensure fiscal sustainability (Schuknecht, et. al, 2011).

3.3 Convergence

The term "convergence," according to many authors, is not without certain ambiguity. Broadly, convergence can be defined two ways:

- *First,* the process in which less-developed countries can catch up to developed countries in terms of economic productivity and growth
- *Second,* the equality of long-term forecasts at a fixed time (Bernard and Durlauf, 1996).

According to Zdaarek and Sindel (2009), convergence is a process approaching a certain level or decreasing the difference between two values over time (the difference between the two variables reduces over time toward a zero value).

In this research we focus mainly on the terms “nominal” and “real” convergence.

3.3.1 Real Convergence

The neoclassical growth theory is the foundation of the real convergence concept, assuming convergence toward a steady status (identical for all economies), influenced by a variety of characteristics and parameters of the relevant economies (savings, population growth, degree of depreciation of capital assets, and so on). Basically, real convergence could be defined as advancement of one country’s economic standard towards the level of another developed country or a group of countries (within an integrated group). This is commonly measured by GDP per capita (Zdarek and Sindel, 2009).

Real convergence realizes different outcomes in long-run economic evolution and convergence, such as per capita income, productivity, and the labor market (Marelli and Signorelli, 2010). A long-run view of real convergence implies the narrowing of differences in the structural condition of different countries (or regions), thus allowing the achievement of similar performance of real variables or, more precisely, a catching-up in the transition period of backward countries, in terms of standard of living, productivity, etc. A short-run view stresses the business cycle features of economic growth of different countries.

Expanding on these definitions, two other broad analyses apply, which are complementary, but not excludable:

1. σ, or sigma convergence, which measures the dispersion of per capita income or productivity among different economies (regions or countries) over time. The σ convergence, or variance convergence, implies that wealth differences are diminishing among a set of countries or regions over time. These data are useful for observing periods of convergence or divergence through time.
2. β, or beta convergence, predicts the inverse relationship between the growth of per capita income or productivity, and their initial levels. These dataexplicitly show the rate of convergence across economies, implying that poor regions or countries grow faster than richer ones. This concept is expanded to two further theories:
    a. Absolute, or unconditional, convergence comes from standard neoclassical theory, based on diminishing returns to capital properties. Free trade and perfect factor mobility will guarantee the convergence result through the equalization of variables. Under these circumstances, policies have no role in shaping long-term economic growth. Empirical studies support the absolute convergence hypothesis only as a special case, when the sample involves economies with a high degree of homogeneity.
    b. Conditional convergence stems from "new endogenous" growth theory, which emphasizes the importance of human capital and innovation as the condition factors for convergence. This theory relaxes the assumption of diminishing returns to reproducible factors and states the possibility of constant, or even increasing, returns to scale emanating from human and physical capital accumulation. With constant or increasing returns to broad capital, the long-term rate of growth becomes endogenous,

depending on investment decisions, in turn influenced by policies and institutions. Conditional convergence (conditional on the steady state) implies that there is a negative partial correlation between the growth rate and the initial level of per capita income. In this context, absolute convergence is not the rule. Economies converge to a different steady state point, which depends mostly on human capital stock and capital accumulation, among other structural factors. When the underlying differences in technological progress and other factors are controlled in the convergence equation, the initial value of per capita income turns out to be strong and significantly negative.

De la Fuente (2002) stated that the necessary conditions for convergence are: the presence of decreasing return to scale of capital, and the presence of technological progress. The fundamental factordetermining the level of convergence is investment in physical and technological capital. Once a country suffers from a divergence in fundamental factors, it will be difficult for this country to catch up to the growth process experienced by the higher-income country. This view was supported by Ben-David (1998), who divides the world into its wealthiest countries (the convergence requires catch-up by poorer countries) and its poorest countries (the convergence requires downward movement by richer countries). This division results from a positive relation between the savings rate and level of development. The richer the country is, the higher the rate of savings, and the higher the level of development will be.

3.3.2 Nominal Convergence

Nominal convergence, as defined by Zdarek and Sindel (2009), is a broader process as it relates to the convergence of absolute values and growth rate in connection with Maastricht Criteria (interest rate, inflation rate, deficit and public debt, and exchange rate criteria), and a narrower process as it relates to the convergence of individual economies through their price (and economic) levels. The relationship between real and nominal convergence, for example, the relationship between the economic standard achieved (GDP per capita) and the price level, is bilateral and mutually influential and determinative. Normally, countries at a lower economic level have lower prices and wages. As standard of living increases, the price level tends to rise (due to inflation and a rising exchange rate). This process gradually leads to the elimination of cost-based competitiveness among local companies. If the economy is to retain its dynamism, progress toward non-price competition is necessary.

According to the EU Commission, nominal convergence gradually leads to real convergence, providing advantages like macroeconomic stability (price stability and fiscal discipline), the removal of exchange risk, reduction of uncertainty concerning inflation and interest rates, and stimulus of investment and international trade, all leading to stronger economic growth. Because these benefits may be more important for deviating economies or lagging countries, a real EU convergence is likely to occur in the long run.

3.4 Optimum Currency Area and Maastricht Criteria

Countries joining a common currency weigh the potential benefit of joining against the inevitable cost (Mico, Stein and Ordonez, 2003). Benefits like a reduction in transaction cost when trading goods and services between countries with different currencies will tend to

benefit countries heavily involved in international trade. On the other hand, costs may arrive from the possibility of dampening business cycle fluctuation through independent, counter-cyclic monetary policy.

In order to increase benefits and decrease costs, some economists suggest using an optimum currency area (OCA) framework as the background theory. MT, with convergence criteria, emphasizes the usefulness of the theory that a common currency will lead optimality of the currency area, as stated by Mundel (1973).

Mundel (1961) defined OCA as: "an economic unit composed of regions affected symmetrically by disturbances and between which labor and other factors of production flow freely." Tavlas (1994) defines OCA as: "a group of countries that maintain either a single currency or though maintaining separate currencies, have rigidly fixed exchange rate among themselves and full convertibility of the respective currencies into one another." Mongelli (2002) suggested that OCA was:

> *"The optimal geographic domain of a single currency, or of several currencies whose exchange rates are irrevocably pegged and might be unified."*

Mongelli (2002), based on his survey study on OCA, demarcated four phases of OCA:

1. The Pioneering Phase (1960-1970) covered the foundation of theory, debated borders of a currency area, and introduced OCA properties.
2. The Reconciliation Phase (1970-1980) examined OCA properties and additional Meta OCA properties (business-cycle synchronization), and created a structural analysis of costs and benefits.

3. The Reassessment Phase (1980-1990) introduced new OCA theory, reconsidering the costs and benefits of monetary integration, and continuing debate on the size and timing of currency areas.
4. The Empirical Phase (1990-present) reviewed all OCA properties in great detail to find out how their interpretations have changed. In this phase, it was concluded that the underpinnings of OCA theory were remarkably strong. Researchers also assessed why specific groups of countries may form an optimum currency area.

Mongelli (2002) also differentiated the properties of OCA as:

1. Price and wage flexibility: When flexible, adjustment following a disturbance is less likely to be associated with sustained unemployment in one country and/or inflation in another.
2. The mobility of labor and other factor production: High factor market integration can reduce the need to alter real factor prices and the nominal exchange rate in response to disturbances.
3. Financial market integration: Such integration can reduce the need for exchange rate adjustment.
4. The degree of economic openness: Higher degrees of openness translate to more changes in international prices of tradable goods. This increases domestic cost of living and reduces the potential for money and/or exchange rate illusion by wage earners.
5. Diversification in production and consumption: This will dilute the potential impact of a shock on any particular sector.

6. Similarity in inflation rates: When inflation rates between countries are similar or lower over time, terms of trade will also remain fairly stable. This will, in turn, foster more equilibrated current account transactions and trade, and reduce the need for nominal exchange rate adjustment.
7. Fiscal integration: Countries sharing a supra-national fiscal transfer system, which allows them to redistribute funds to a member country affected by an adverse asymmetric shock, also facilitate adjustments to such shocks and might require a lower nominal exchange rate adjustment.
8. Political integration: Political will fosters compliance with joint commitments, sustains co-operation on various economic policies, and encourages more institutional linkage. Similarity of policy approaches is relevant in turning a group of countries into a successful currency area.
9. Similarity in shocks: When shocks are more symmetrical, the benefit will be larger than the cost of a common currency.

In Mundel (1961), policymakers balanced the savings in transaction cost from the creation of a common currency against the consequences of diminished policy autonomy. The loss of autonomy follows from the loss of exchange rate and of independent monetary policy as instruments of adjustment. The costs are greater when macroeconomic shocks are more asymmetric, when monetary policy is a more powerful instrument for offsetting them, and when other adjustment mechanisms, like relative wages and labor mobility, are less effective.

The theoretical question—whether a single currency is beneficial for the participating countries—dates back to Mundell (1961), who proposed that a single medium of exchange

should reduce transaction costs, and thereby facilitate international trade, but he also stated that a single currency may be problematic in the case of coexisting asymmetric shock and nominal rigidity. Therefore, he suggested perfect labor mobility as an indispensable condition to lowering the stability losses associated with giving up monetary independence.

Mundell himself challenged his earlier proposal of a small currency union by introducing the foreign exchange market and international risk sharing. In his later model (Mundell, 1973), he suggested that the greater the number of countries involved, the better they can mitigate shocks by reserve pooling and portfolio diversification. Warin, Wunnava, and Janicki (2009) concluded that in the 1960s, Mundel argued that an economic area has to be optimal before using a common currency or a fixed exchange-rate mechanism; however, the causality was reversed in the 1970s—using a common currency or joining a fixed exchange-rate mechanism may help an economic area become optimal. McKinnon (2004) stated that a country could not participate in a common-currency regime if its own public financial system was too weak, no sufficiently stable monetary standard exists in the rest of the world.

Standard OCA theory explained that the net benefit of a monetary union is an increasing function of the magnitude of trade, since trade creates opportunities for reaping efficiency gains from currency unification (Kumakura, 2006). According to Eichengreen (1993), Europe at the time was clearly not an OCA. Consequently, the Maastricht Treaty was implemented in 1993, in order to force convergence to an OCA prior to adoption of a common currency. Five economic proxies were devised to ensure the convergence on the three public policy dimensions: (1) monetary policy (in a closed- and open-economy perspective); (2) fiscal

policy; and (3) structural policy. The proxies were respectively: inflation, exchange rate, national debt, public deficit, and long-term interest rates.

Schiavo (2006) summarized the effect of introducing a common currency for OCA, identifying the following three characteristics:

1. It will sweep away one of the main determinants of market segmentation, increase asset substitutability, and improve capital mobility.
2. It will encourage more tightly correlated cycles.
3. It provides better insurance for production risk and enhances specialization.

According to De Grauwe and Mongelli (2011), monetary integration has at least two ways to foster endogeneity from market-based and institutional forces. Mongelli (2002) summarized the benefits of a common currency as:

- Microeconomic Efficiency: Liquidity serviced from common currency.
- Macroeconomic Stability: Price stability and transparency.
- Positive External Effect: From savings on transaction costs.

He determined the costs to be:

- Microeconomic Inefficiency: Costs of switching to a new currency
- Declining Macroeconomic Stability: Narrowing the menu of policy instruments
- External Cost Effects: If a country suffers from a deteriorating position, it will impact on other members

Preparing for deeper integration with a common currency, in 1991, heads of EU states signed the MT. The Treaty was a strategy for moving towards a monetary union based on two

principles: the transition would be gradual, and entry into the union was conditioned upon satisfying the following four convergence criteria:

1. Price Stability. The rate of inflation should not exceed the average rate of the three best performers by more than 1½ percentage points.
2. Soundness of public finance. The deficit of the general government budget should not be excessive.
3. Exchange rate stability. The exchange rate should have been kept within the normal band of the Exchange Rate Mechanism (ERM) for at least two years, without a devaluation against any other member's currency.
4. Durability. The long-term interest rate should not exceed the average rate of the three countries with the best inflation performance by more than 2 percentage points.

This treaty stated that admission to the monetary union would not be automatic; therefore, convergence criteria were needed (De Grauwe, 2009):

1. Inflation Convergence

This required criterion was based on the fear that a future monetary union would have inflationary bias, if two countries were assumed to be identical except for their authorities' preferences, vis-à-vis inflation. Before the EU started, the candidate member countries were asked to prove that their interest in having an inflation rate as low as those of the low-inflation member countries. During this process, a temporary increase in unemployment was inevitable (i.e., a movement along the short-term Philips curve). Self-imposed suffering served as additional evidence that countries were committed to lowering inflation. Once they achieved low inflation rates, they could be safely granted

membership. When a common central bank captures the monetary policy of each member, it should reflect the average preference of the participating countries.

2. *Interest Rate Convergence*

   The justification for this criterion is that excessively large differences in interest rates could lead to large capital gains and losses. Suppose a country wanted to enter the monetary union, but at the moment of entry, its interest rate was higher than that of the monetary union zone. As a result, it would be quite attractive for bondholders to sell low-yield monetary union bonds and buy high-yield candidate country bonds. Thus, economic agents holding monetary union bonds would see capital losses, and economic agents holding candidate members' bonds would see capital gains; either could create disturbances in national capital markets.

3. *Exchange Rate Convergence*

   The main motivation for this criterion is to prevent countries from manipulating their exchange rates so as to force entry at a more favorable exchange rate (i.e., a depreciated one, which could increase their competitive position).

4. *Budgetary Convergence*

   High government debt creates an incentive to engineer surprise inflation. Suppose a member country has long-term bonds with an interest rate fixed in a previous period, based on prevailing inflation expectations. If the government were to create unexpectedly higher inflation rates, the real value of these bonds would erode and the bondholders would derive insufficient compensation, because the interest rate on their bonds does not reflect this inflation upsurge. A monetary union between low- and high-debt countries

creates a problem for the low-debt country. In the union, the low-debt country will be confronted with a partner who will have a tendency to push for more inflation. As long as one country has a higher debt-to-GDP ratio, it will have an incentive to create surprise inflation. As a result, the low-debt country stands to lose and force the high debt-to-GDP ratio country to reduce it. Once this is achieved, the incentives to produce inflation disappear, and the candidate country can be safely allowed into the union.

Perez-Caldentey and Vernengo (2012) highlighted the necessity of exchange rate convergence criteria to avoid the manipulation of the exchange rate to achieve improved competitiveness; inflation and budget convergence avoided of an inflationary bias. They stated that fiscal criteria should require members have balanced budgets or be in a surplus position in the medium-run, in order to offset deficits in times of economic downturn, and interest rate criteria should limit opportunities for capital gains and losses prior to entry.

In managing monetary policy, The ECB set theoverriding objective of keeping inflation low. It can certainly be concluded that the macroeconomic management conducted by ECB has been successful from the initial stage of Euro, in the period before the crisis, and during the early stages of the crisis. Inflation rates and interest rates were very low to help reverse the downturn, and liquidity was injected.

The ECB's major problem was how to conduct monetary policies in a union where asymmetric shocks occur. The ECB was responsible for maintaining price stability and stabilizing the EU economy as a whole. In the extreme case of a pure asymmetric shock, the ECB will never stabilize; it will experience complete economic paralysis. Thus, the effectiveness of the ECB in stabilizing output in individual countries depends on whether

shocks are symmetric or asymmetric. However, in practice, shocks are always some mixture of symmetric and asymmetric movements.

According to De Grauwe (2009), the ECB generally stabilizes too little from the point of view of individual members. To reach price stability objectives, the ECB uses three types of instruments: open market operations, implying buying and selling of securities with the aim of increasing or reducing money market liquidity; standing facilities, aimed to provide and absorb overnight liquidity from NCBs; and minimum reserve requirements, the imposition of minimum reserves for banks.

The basic insight of this view is that a country that finds itself on an unsustainable path of increasing government debt creates negative spillover effects for the rest of the monetary union. A country that allows its debt to-GDP ratio to increase continuously will have increase resources to the capital market of the union, thereby driving the union's interest rate upward. The increase in the union's interest rate, in turn, increases the burden of the government debts of the other countries. If the governments of these countries choose to stabilize their debt-to-GDP ratios, they will be forced to follow more restrictive fiscal policies.

Thus, an unsustainable increase in the debt of one country forces other countries to follow more deflationary policies. It will, therefore, be in the interest of these other countries that a control mechanism should exist restricting the size of budget deficits in the member countries. Based on the theory of optimum currency areas, this suggests that national fiscal authorities should maintain a sufficient amount of flexibility and autonomy. The second found its reflection in the MT and SGP. The conduct of fiscal policy in a monetary union has to be disciplined by explicit rules on the size of the national budget deficits.

The OCA view is probably over-optimistic about national budgetary authorities using budget deficits as instruments to absorb negative shocks. Although there are situations in which countries will need the freedom to allow the budget to accommodate for these negative shocks, the sustainability of these policies limit their effectiveness.

However, MT and SGP regulations on the size of national government deficits are weak, with little evidence that the rules are enforceable. In addition, national governments in a monetary union do not have the same access to monetary financing as most had before entry in the union. This 'hardens' budget constraints and reduces the incentive to run large budget deficits. The fear that national authorities will be less disciplined in a monetary union than in other monetary regimes does not seem to be well founded.

De Grauwe (1996) states that the convergence criteria in the Maastricht treaty are neither necessary nor sufficient to create a successful monetary union, since the economic structure in each member country may be similar. Therefore, not only asymmetric shock will not be happen but also the interest rate convergence and no devaluation two years before entry in the union are neither necessary nor sufficient to form a successful monetary union.

The reason for this is that if the monetary union does not involve some degree of centralization of national budgets, imposing budgetary convergence requirements will deteriorate the management of the union. De Grauwe suggests that the Maastricht requirement for initial inflation convergence is a technique that maximizes the cost of convergence—without guaranteeing success.

For example, Italy was forced to reduce its inflation rate before joining the union. Economic agents were skeptical and inflationary expectations were hard to overcome.

Suppose the Italian government failed to attain the same low inflation reputation as the German government? The Maastricht Treaty would require Italy to peg its exchange rate. Therefore, the lira experienced and increase in real appreciation during the transition. This led to doubts that the disinflation process could be sustained.

In criteria related to debt, De Grauwe demonstrates howpressures on the central bank can create surprise inflation and reduce the real burden of the debt. When two countries intend to form a monetary union, this causes a problem. As an example, the Italian government has the same preference for low inflation as the German government. However, Italy will have a stronger incentive to create surprise inflation because Italy's debt exceeds Germany's.

The need for budgetary convergence criteria is a different question. In the aforementioned example of Germany and Italy, even if preferences with respect to inflation are identical, budgetary convergence criteria ensures low inflation in the union and gives Germany an incentive to join the union.

However, these convergence conditions also bring greater risks that could split the European Union apart. The division of the EU will create problems not only for excluded countries, but also for original member states, since the breakup will be volatile, creating distortions in trade flows and undermining the single market program.

Imposing membership criteria will encourage these countries to reduce their budget deficits to a level closer to the 3% Maastricht norm. However, imposing the Maastricht conditions makes convergence difficult. Letting highly indebted countries, like Italy and Belgium, into the European Union would put price stability at risk, and will require them to reduce government debt to eliminate the risk of a deep division of the EU.

De Grauwe suggests shifting the focus from convergence requirements towards institutional strengthening of Europe's future monetary institutions. The future EMU will be in a zone of monetary stability, which will reduce the risk of a great and permanent division of the European Union. Such a division would not be in the interests of those who are allowed into the monetary union, let alone those who are left out.

Artus (1993) supports De Grauwe's argument: although imposing MC may restrict membership for countries with a demonstrated commitment to price stability and fiscal responsibility, and may postpone the beginning of the union to give adequate time for all members of the EC to demonstrate their commitment, a greater chance of success applies to countries that have already converged.

The treaty also does not adequately encourage the integration and flexibility of labor markets. Although legal obstacles to labor mobility have largely been removed, linguistic and cultural differences are bound to keep mobility relatively low, since the structure and strength of labor unions and institutional aspects of wage negotiations differ widely in the various EU Countries.

The fundamental issue is that some countries could still qualify for membership by cutting inflation through a severe recession without fundamentally changing their inflationary proclivity. If the transformation does not take place, the monetary union, or at least its objective of price stability, will be endangered.

Krugman (1992) argues that the MC entry criteria are quite unusual. Although proposed to constrict the exchange rate band, it essentially tests the discipline and effectiveness of each

country's central bank. It also tests the ability of governments to do the one thing that they will never need to do again.

In effect, under Stage 2, countries will have no independent monetary policies; their inflation rates will have nothing to do with monetary policy. Therefore, the criterion on inflation is also somewhat doubtful. The obvious concern is that countries will be penalized for success, since a country whose booming economy attracts large voluntary capital inflows will produce a real appreciation.

The deficit and debt criteria, both of which relate to fiscal policy, make somewhat more sense. But Krugman remains somewhat vague about the reasons that fiscal probity is a key issue for a monetary union. He points to the adverse effects of the German reunification deficit as a demonstration that fiscal policy carries strong externalities; however, the German case is an outlier the Bundesbank is in the peculiar position of making European monetary policy while serving only German interests. Under the EMU, no nation will be in that position, so the case for collectively policed fiscal policy will be much weaker.

3.5 International Trade and Economic Integration

3.5.1 Classical Theory of Trade

The earliest theories of international trade are referred to as the Mercantilist school of thought, which came into existence in Europe during 1500 to 1750, often referred to as *"the political economy of state building"* (Appleyard, Field, and Cobb, 2006). Central to Mercantilist theory is the concept that national wealth is reflected in holdings of precious

metals, and economic activity can be viewed as a zero-sum game, in which one country's economic gain was always at the expense of another.

Mercantilists divided the economic system into three sectors: manufacturing, rural (agriculture), and foreign colonies. The mercantilists employed a labor theory of values in which commodities were valued in terms of their relative labor content, and emphasized the need to maintain surplus as favorable balance of trade; therefore, the role of the government in the mercantilist view is to prohibit the export of gold, silver, and other precious metals by individuals (Heckscher, 1935). Mercantilist conventions also call for maximizing a positive trade balance and keep wages and production costs low, to make sure a country's products are more competitive in world markets.

Hume (1752 in of the Balance of Trade book, 1955) proposed a price-specie-flow mechanism, challenging the Mercantilist view that nations could continue to accumulate specie without any repercussions to its international competitive position. He stressed that the accumulation of gold (trade surplus) would lead to an increase in the money supply and, therefore, to an increase in prices and wages, reducing competitiveness. The classical price-specie-flow mechanism rests on several assumptions.

1. There must be some formal link between money and prices as provided in the quantity theory of money when full employment is assumed:

   $M_sV = P\ Yd$

   Where: M_s = the supply of money; V = the velocity of money, or the rate at which money changes hands; P = the price level; and Y = the level of real output.

2. Demand for traded goods is price elastic.

3. Perfect competition in both product and factor markets is assumed in order to establish the necessary link between price behavior and wage behavior, as well as to guarantee that prices and wages are flexible in both an upward and a downward direction.
4. It is assumed that a gold standard exists.

If all assumptions hold, the automatic adjustment mechanism will, allowing time for responses to occur, restore balanced trade any time it is disrupted.

The second critique of mercantilism came from Adam Smith, who propose the alternative "absolute advantage" theory (Irwin, 1996). He concluded that countries should specialize in and export those commodities for which they have an absolute advantage, and should import those commodities for which the trading partner has an absolute advantage. Each country should export those commodities it produced most efficiently, because the absolute labor required per unit was less than that of the prospective trading partner. In contrast with Mercantilism, international trade, according to Adam Smith, is a positive-sum game (all players can receive a positive payoff), a powerful argument for expanding trade and reducing government's role in controlling international trade.

Inspired by Smith's absolute advantage, David Ricardo proposed "comparative advantage" theory (Irwin, 1996). Although Adam Smith argued trade can only occur on the basis of absolute advantage, given the international immobility of the factors of production, gains from trade can be generated on the basis of comparative advantage. The essence of Ricardo's argument is that international trade does not require different absolute advantages and that is possible and desirable to trade when a comparative advantage exists. A comparative advantage exists whenever relative labor requirements differ between the two

commodities. When relative labor requirements are different, the internal opportunity cost of the two commodities is different in the two countries; that is, the internal price ratios are different between the two countries prior to trade. With new prices determined by trade, producers will necessarily increase production of the goods with a comparative advantage, because these products command a relatively higher price on the world market than in autarky. Complete specialization means that all resources are devoted to the production of one product. Both countries now alter their production patterns and engage in complete specialization in the commodities in which they have a comparative advantage.

Although the classical model seems limited in today's world of complex trade, economists are still interested in the extent to which its general conclusions are even now realized in international trade.

3.5.2 Neoclassical Trade Theory

Theoretically, there are two principal sources of relative price variation between two countries: difference in supply conditions and differences in demand conditions. The most important thing to keep in mind is that the opening of a country to international trade means exposing the country to a new set of relative prices. When these different prices are available, the home country's producers and consumers will adjust to them by reallocating their production and consumption patterns. This reallocation leads to gain from trade. The ultimate source of gain from international trade is the difference in relative prices in autarky between two countries.

According to neoclassical theory, two countries with identical production conditions can benefit from trade. Different demand in each country, and the presence of increasing opportunity costs, are the two principal conditions. Relative prices in autarky reflect underlying supply-and-demand conditions, thus depending jointly on the relative amounts and quality of available resources, the characteristics of production technologies employed, and the nature of demand in a country. Different relative prices can therefore exist between countries as long as one or more of these factors are different.

Applying such minimal conditions suggests a likely basis for trade between the many countries of the world. It is also clear that the underlying basis for trade can change as technology changes, as factors grow within or move between countries, and as individual country demand patterns change in response to economic development and/or increased exposure to different products and cultures.

Eli Heckscher (1919) and Bertil Ohlin (1933) proposed H-O theory, analyzing the effects of factor endowments on international theory (Spilimbergo, Londono, and Szekely, 1999). Their analysis makes a number of assumptions: There are two countries, two homogenous products, and two homogenous factors of production, assumed to be relatively different for each country; technology is identical; production is characterized by a constant return to scale for both commodities; the two commodities have different factor intensities; tastes and preferences are the same in both countries; perfect competition exists; factors are perfectly mobile within each country; there are no transportation costs; and there are no restricting policies for mobility between countries.

The main tenets of H-O theory are the emergence and structure of trade; different factor endowments in each country; and commodities that are always intensive in a given factor, regardless of relative factor price. It might be defined into two ways: the physical definition (capital or labor) and price definition (price of capital or labor).

A commodity is said to be factor-x-intensive whenever the ratio of factor *x* to a second factor *y* is larger when compared with a similar ratio of factor usage of a second commodity. The assumptions lead to the conclusion that with identical technology in both countries, constant return to scale, and a given factor-intensity relationship between final products, the country with abundant capital will be able to produce relatively more of the capital-intensive product, while the country with abundant labor will be able to produce relatively more of the labor-intensive good. Thus, the H-O theory of international trade could be stated:

> "*A country will export the commodity that uses relatively intensively its relatively abundant factor of production, and it will import the good that uses relatively intensively its relatively scarce factor of production".*

The second contribution of H-O theory is the factor price equalization theorem:

> *"In equilibrium, with both countries facing the same relative (and absolute) product prices, with both having the same technology, and with constant returns to scale, relative (and absolute) costs will be equalized. The only way this can happen is if, in fact, factor prices are equalized".*

This theorem could be observed in practice when the assumptions hold.

The third contribution of H-O regards income distribution effects of trade, and is explained in the Stolper-Samuelson Theorem:

> *"With full employment both before and after trade takes place, the increase in the price of the abundant factor and the fall in the price of the scarce factor because of trade imply that the owners of the abundant factor will find their real incomes rising and the owners of the scarce factor will find their real incomes falling."*

3.5.3 New Trade Theory

After the Neoclassical emphasis on factor endowment, some other, post H-O theories explained trade in different ways:

1. The imitation lag hypothesis (Posner, 1961):

   This theory relaxes the assumptions in H-O analysis. It assumes that the same technology is not always available in all countries and that there is a delay in the transmission or diffusion of technology from one country to another. The imitation lag is defined as the length of time that elapses between the product's introduction in country I and the appearance of the version produced by firms in country II.

2. Product Cycle Theory or PCT (Vernon, 1966):

   It is a life-cycle theory of a new product and its impact on international trade. It divides the life-cycle of a new product into three stages. In the new product stage, the product is produced and consumed only in the domestic market. The second stage, the maturing product stage, some general standards for the product and its characteristics begin to emerge, and mass production techniques start to be adapted. In the final, standardized product stage, the characteristics of the product itself and the production process are well known; the product is familiar to consumers and the production process to producers. Early, the innovating country exports the product, but then it is displaced by other developed countries, which, in turn, are ultimately displaced by the developing countries.

3. The Linder theory (Linder, 1961)

   The Linder theory proposed that trade will occur in goods that have overlapping demand. It implies that international trade in manufactured goods will be more intense between

countries with similar per capita income levels than between countries with dissimilar per capita income levels. The gravity models in a multiple regression context have been used to test of the Linder theory.

4. The Krugman model (Krugman, 1979)

   Krugman's model rests on two features.First, economies of scale determined by managerial skill, technology and cost advantage, and second, monopolistic competition. When two countries are opened to trade, market size is enlarged for each representative firm in each country, because there are now more potential buyers of any firm's good. When market size is enlarged, economies of scale can come into play and production costs can be reduced for all goods. Krugman (1983) emphasizes that factor endowments can determine the broad range of types of goods a country will export and import. Within that broad range, however, product differentiation and scale economies play a very important role in generating trade and the gains from trade. Thus, the "gainer-loser" income distribution aspects of trade do not necessarily occur if trade consists of an exchange of differentiated manufactured goods produced under conditions of economies of scale.

5. The Gravity Model (Tinbergen, 1962)

   Gravity theory attempts to explain the volume of trade, not focusing on trade composition, but using an equation framework to predict the volume of trade on bilateral basis between any two countries. It is concerned with selecting economic variables to explain—at least in a statistical sense—a substantial portion of trade that occurs. The variables nearly always used in the equation are (for example the export from country A to B). A national income variable for country B reflects consumer ability to buy which is expected to have a

positive relationship. A national income variable for country A reflects the capability to produce, and some measure of distance as a proxy for transportation costs. Sometimes other variables are augmented as for example Helpman (1999) included factor endowments and product differentiation as underlying causes of trade.

6. Intra-Industry Trade (IIT) (Ruffin, 1999)

   IIT occurs when a country is both exporting and importing items in the same product classification category. This differs from inter-industry trade, where a country's exports and imports are in different product classification categories. Traditional trade theory dealt only with inter-industry trade, but intra-industry trade clearly constitutes an important segment of international trade. Unfortunately, comparative advantage based on factor endowments is of little or no help in predicting intra-industry trade. In fact, intra-industry trade will be relatively greater the more similarities exist between the capital and labor endowments of the countries being examined. Several possible explanations for intra-industry trade are: (1) product differentiation; (2) transportation costs; (3) dynamic economies of scale; (4) degree of product aggregation; (5) differing income distributions in countries; and (6) differing factor endowments and product variety.

3.5.4 Trade Policy

Government generates different devices for restricting the free flow of goods and services, such as (Appleyard, Field, and Cobb, 2006):

1. Import tariff

a. Specific tariff: an import duty that assigns a fixed monetary (dollar) tax per physical unit of the good imported.
b. Ad Valorem tariff: levied as a constant percentage of the monetary value of 1 unit of the imported good.

2. Export taxes and subsidies

   Export taxes are levied only on home-produced goods destined for export, not for home consumption. An export subsidy—a negative export tax or a payment to a firm by the government when a unit of the good is exported—attempts to increase the flow of trade.

3. Non-tariff barriers to free trade
   a. Import quota: specifies that only a certain physical amount of the good will be allowed into the country during the time period, usually one year.
   b. Voluntary Export Restraints: An administrative agreement with a foreign supplier, whereby that supplier agrees voluntarily to refrain from sending some exports to importing country.
   c. Government procurement provisions: These provisions restrict the purchasing of foreign products by home government agencies.
   d. Domestic content provisions: Attempts to reserve some of the value-added and some of the sales of product components for domestic suppliers.
   e. Administrative classification: Because tariffs on goods coming into a country differ by type of product, the actual tax charged can vary according to the category into which a good is classified.
   f. Restrictions on services trade: Many non-tariff regulations restrict services trading.

g. Trade-related investment measures: Various policies associated with foreign investment activity within a country.

3.5.5 International Trade and Economic Integration

Economic integration implies differential treatment for member countries as opposed to non-member countries. Jacob Viner (1950) proposed two static effects of economic integration, trade creation and trade diversion, suggesting that they occur upon formation of any integration project. Trade creation occurs when economic integration leads to a shift in product origin from a domestic producer, whose resource costs are higher, to a member producer, whose resource costs are lower. Trade diversion happens when there is a shift in product origin from a non-member producer, whose resource costs are lower, to a member-country producer, whose resource costs are higher.

In addition to these static effects, there are dynamic effects. According to Viner, reducing trade barriers in economic integration will bring about a more competitive environment and possibly reduce the degree of monopoly power present prior to integration. It also might contribute to larger markets, allowing economies of scale to be realized in certain export goods. It is also possible to stimulate greater investment in member countries from both internal and foreign sources, and increasing levels of integration may lead to dynamic benefits from increased factor mobility.

Chapter 4 Analysis of Eurozone Crisis in Comparison with Asian Crisis

4.1 Introduction

The Lisbon Agenda[6] in 2000 was considered laudable when, in 2010, the European Union (EU) members agreed to make the EU the most competitive economy in the world, in terms of employment, growth, social cohesion, and environmental sustainability. Based on the Balassa model, which explains the stages of economic integration,[7]—the Eurozone has been designated one-half of an economic union.

Starting with the signing of the Maastricht Treaty (MT) in 1991, 11 members committed to the surrender of their monetary policy and the tightening of their fiscal policy, in order to meet the convergence requirements dictated in the Maastricht criteria (MC). In 1999, the euro was first introduced, quickly gaining a reputation as a strong currency and stable anchor.

Before the crisis in 2007, the Eurozone was stable; however, fallout from the crisis made it clear that the monetary union had been unprepared for such severe conditions. Lapavitsas et al. (2010b) suggest that the recent Eurozone crisis was caused by including as members certain peripheral countries[8]—henceforth, "Peripheries"—despite the fact that those countries had clearly not satisfied the relevant criteria, and Greece had been found to be manipulating its economic statistics. The Grecian debt crisis was considered extremely toxic, due to the possible contagion of other countries. The euro was released on the condition that the MC

[6] The European Council meeting, held on March 23–24 in Lisbon. Notes available at http://www.europarl.europa.eu/summits/lis1_en.htm.
[7] Free trade area, customs union, common market, economic union, and finally total economic integration (Baldwin & Wyplosz 2004).
[8] Peripheries: Portugal, Ireland, Italy, Greece, and Spain (Lapavitsas et al. 2010a; Perez-Caldentey and Vernengo 2012). Gros and Alcidi (2011) refer to them as 'PIIGS' countries.

were implemented—conditional criteria to be met prior to entry (Afxentiou, 2000), in the areas of inflation rate, interest rate, exchange rate, deficit-to-GDP ratio, and debt-to-GDP ratio.

Generally speaking, countries currently suffering from the crisis had been unable to meet the MC and could not improve their fiscal discipline; following the economic conditions of 2007–09, the ability of peripheries to meet the criteria was even more doubtful. Hein and Truger (2009) suggest that an incomplete synchronization of business cycles across the Eurozone contributed significantly to the crisis, given that the EMU had run the monetary union in the absence of a fiscal union, preventing the ECB from financing deficits.

Cesaratto and Stirati (2010) note that the Eurozone crisis resulted from a trade imbalance between the core countries and peripheries, combined with a process of monetary unification and financial deregulation due to Core Countries[9]—particularly Germany—following mercantilistic policies. The imbalance problem became more complicated as financial fragility resulted from the crisis, as predicted by the Minsky financial instability hypothesis (Palley 2011). According to Minsky, the economic process will follow evolutionary factors; an economy will evolve through stages that breed successive stages. The appearance of instability within the system periodically halted, resulting in failure and collapse.

Taking the Asian crisis as comparison, this study will track the economic crisis within the Eurozone by investigating economic indicators both before and after the release of the Euro, and by comparing the economic performance of peripheries with those of core countries

[9] Core countries: Austria, Belgium, France, Germany, and the Netherlands (Perez-Caldentey and Vernengo 2012).

(mainly Germany)[10]. Using descriptive and difference-in-difference (DiD) analyses in line with the work of Baskaran (2009), our objective is to capture the causal effect beyond the economic crisis in the Eurozone. We hypothesize that policies related to the release of the euro (i.e., fiscal consolidation and no centralized monetary policy power at the country level), and contrasts between the core countries and peripheries, established a causal relationship and contributed to the current crisis in the Eurozone.

4.2 The EU and EMU: Development at a Glance

The story of the Euro, summarized by Baldwin and Wyplosz (2012), started in 1957 with six countries (Belgium, Luxembourg, the Netherlands, France, Germany, and Italy) signing the Rome Treaty to coordinate economic policy. In 1964, the European Economic Community (EEC) was established as a driving force behind coordinated European monetary policy. To this end, the EEC released the Werner Plan and established a phased plan to bring about a common currency. The first step was to liberalize monetary and capital flows among members in 1989, followed by signing the MT in 1991, committing to complete the process by 1999.

In 1993, the EU members agreed to implement a single market. The establishment of the European Monetary Institute (EMI) in 1994 was the second stage of creating an economic and currency union. To ensure the stability of a common currency from the very start, in 1997, the European Council released the Stability and Growth Pact (SGP) in Amsterdam. In 1998, the EMI put forward membership recommendations for 11 initial members, and in that same year,

[10] The choice of Germany as the benchmark in descriptive analysis was based on its size and admirable trade performance in times of crisis (Lapavitsas et al. 2010a).

the ECB supplanted the EMI. The introduction of the Euro, on January 1, 1999, was the final step to creating the European currency union.

In the ten years after the Lisbon Agenda was agreed in 2000, the EU welcomed 6 new members. euro Greece joined the group in 2001, followed by Slovenia in 2007, Malta and Cyprus in 2008, Slovakia in 2009, and finally Estonia in 2011. In line with the EU agenda, the EMU had introduced euro cash and coin in 2002. Table 26 presents the timing of EU and EMU memberships.

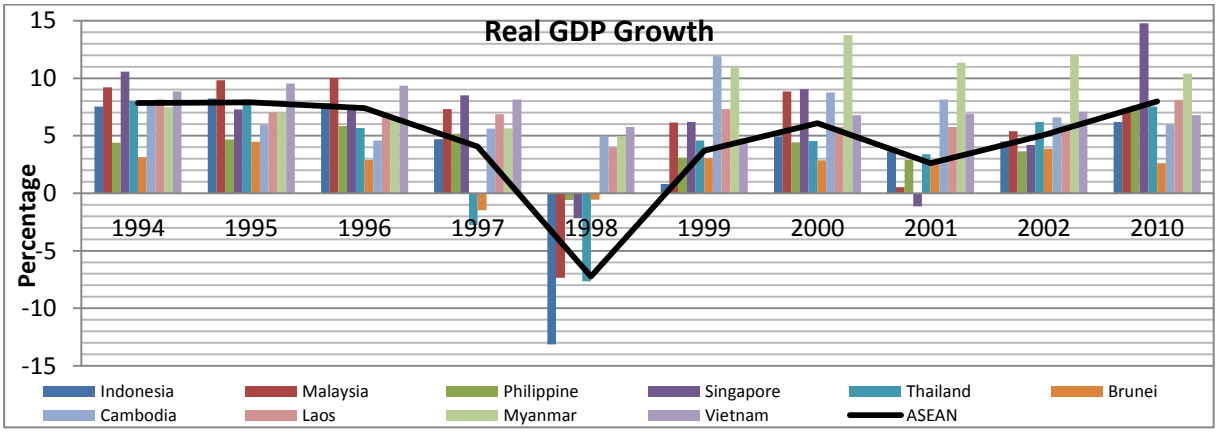
4.3 Asian Economic Crisis as Comparison

The Eurozone crisis is a repetition of the Asian crisis, except that the Eurozone crisis occurred in one of the most developed areas in the world, and within a union where all member countries had surrendered their currency policy to the ECB. Miyakoshi (2000) called the Asian crisis in 1997 a currency crisis, due to nominal depreciation of the local currency, at least between June 1997 and January 1998. There is no such depreciation in the other any 7 months during January 1994 and May 1999. The low ratio of foreign reserves, and the great progress of financial liberalization without regularity, was an indicator of financial sector fragility. Kho and Stulz (2000) found that the Asian crisis was rooted primarily in financial system vulnerabilities and other structural weaknesses.

Figure 1 shows the real GDP growth of ASEAN members across the years of crisis. Before 1998, ASEAN, on average, has very high annual GDP growth at 6.8%, with Malaysia as the leader (9.09%), followed by Vietnam (8.97%). However, the recession was clear even in 1998, with average negative growth at 7.23%, with Indonesia as the most severely affected country, with 13.13 negative growth, followed by Thailand at 7.65%. Regardless of the crisis

incurred by original ASEAN members, the CLMV countries seem immune to these severe conditions.

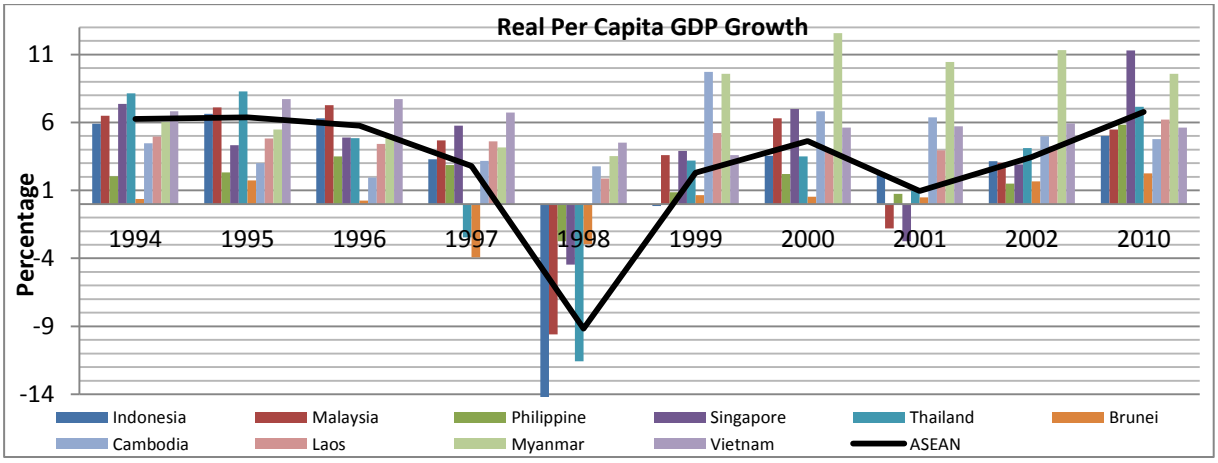
Figure 1. Real GDP Growth of ASEAN Countries



Source: Processed from Unstat 2012

In terms of real per capita GDP growth, Figure 2 is similar to its predecessor, indicating high real per capita GDP growth of 5.3% preceding the crisis, with Vietnam as the highest at 7.25%. The recession in 1998 was even bigger, with average negative growth of 9.17%, with Indonesia the most severely affected, with 14.28 negative growth.

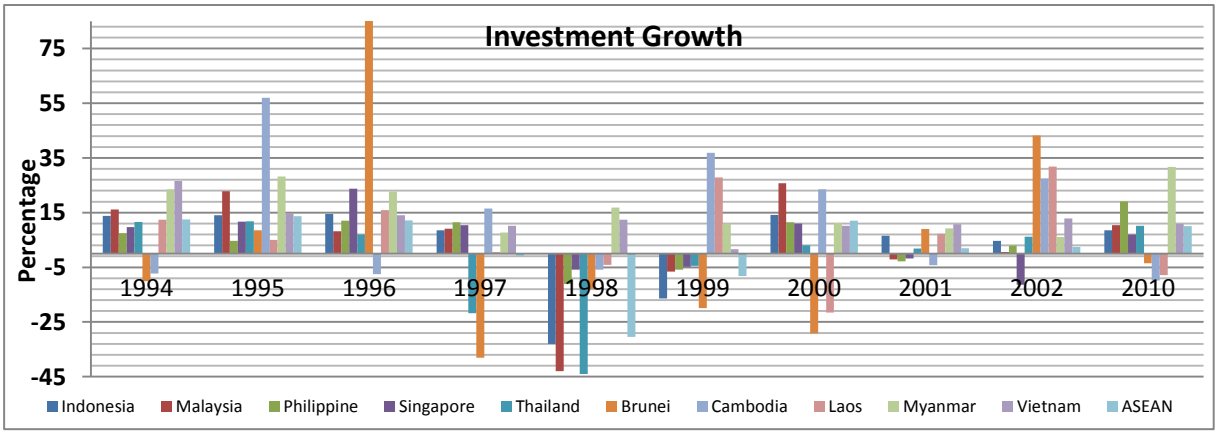
Figure 2. Real per Capita GDP Growth of ASEAN Countries



Source: Processed from Unstat 2012

Looking at investment growth across the years of the crisis in Figure 3, before 1998, ASEAN on average had very high annual GDP growth of 9.3%, with Myanmar as the highest with 20.5%, and Malaysia (of ASEAN-6) by 14.1%. However, investment growth became negative in 1998 at 30.5%, with Thailand as the most severely affected country, with 44% negative investment growth. After recovering from the crisis, the average investment growth was positive: 2% (1999-2002).

Figure 3. Investment Growth of ASEAN Countries

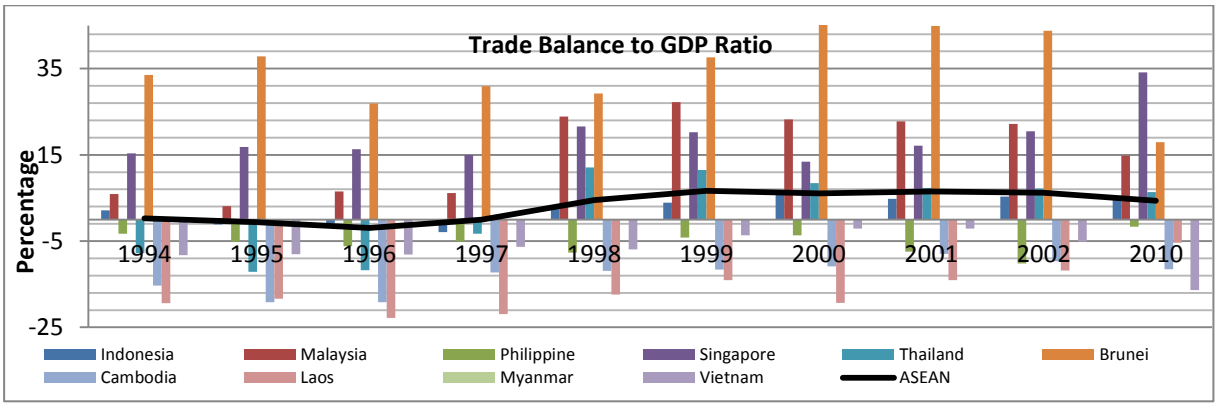


Source: Processed from Unstat 2012

Trade balance was a component of economic balance; deterioration of the trade balance could lead to a country's negative economic performance. Figure 4 shows that, on average before the crisis, ASEAN suffered from a trade-deficit-to-GDP ratio of 0.6%. Brunei has the highest surplus, 32.3%; by contrast, Laos has the biggest deficit, 20.6%.

During the economic crisis, in 1998, ASEAN had an average surplus of 4.5%. The surplus increased after the crisis by an average of 6.4%, with Brunei still leading at 43%, and Laos still the lowest, with a deficit of 14.8%. Miyakoshi (2000) noted two primary triggers of the Asian crisis: current account deficits and significant progress in financial liberalization.

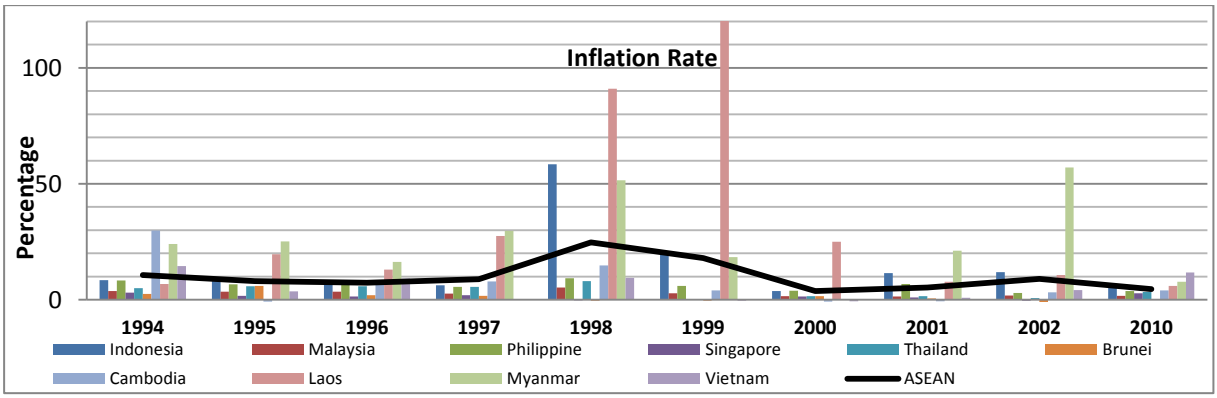
Figure 4. Trade Balance to GDP Ratio of ASEAN Countries



Source: Processed from Unstat 2012

Traditionally, ASEAN members have had a high average inflation rate, as has been shown in Figure 5. On average, prior to the 1998 crisis, the inflation rate was 8.7%. Among CLMV countries, Myanmar had the highest inflation rate, at 23.8%. Of the original ASEAN members, Indonesia had the highest at 8%. In 1998, the inflation rate soared dramatically, especially in Indonesia, 58%, and Laos by almost 100%. After the crisis, generally, the average inflation rate increased by 10%.

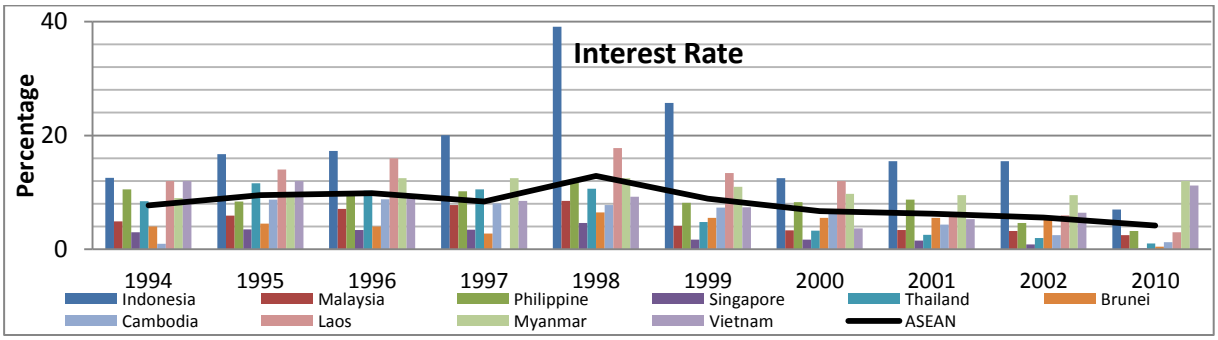
Figure 5. Inflation Rate of ASEAN Countries



Year-on-year change of the consumer price index, end of period
Source: IMF, WEO 2012.

Figure 6 shows the interest rate conditions of ASEAN countries around the time of the crisis. This figure confirms that the average interest rate before the crisis was 8.9%, and in 1999-2002 it decreased to 6.9%. In both periods, Indonesia had the highest interest rates at 16.6% and 17.3%; and responding high inflation rate in last 1997 and early 1998, it has the highest interest rate in 1998 by 39%.

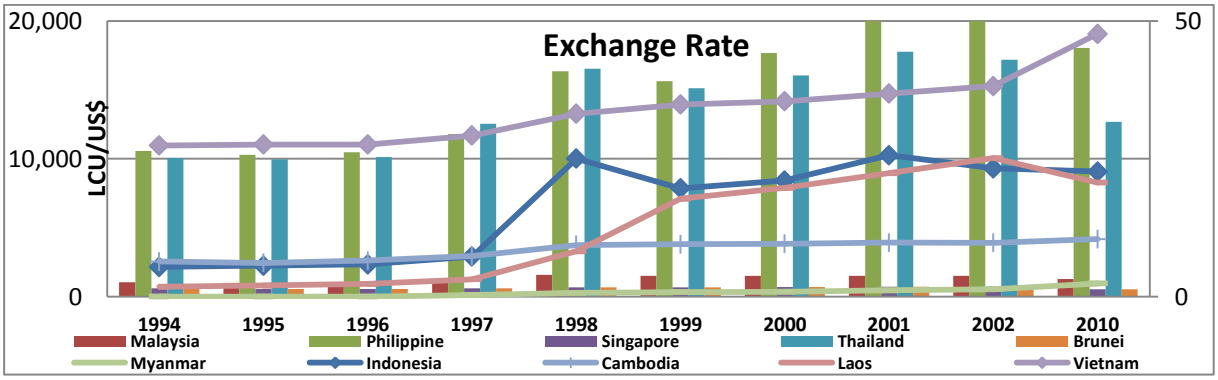
Figure 6. Interest Rate of ASEAN Countries



Deposit Interest Rate (%)
Source: World Bank, WDI

Related to the nominal exchange rate, Figure 7 shows that before the crisis, Vietnam had the least valued currency, in both before and after crisis by 11,180 and 14,528 over US$. The strongest currency was held by Singapore and Brunei.

Figure 7. Nominal Exchange Rate of ASEAN Countries

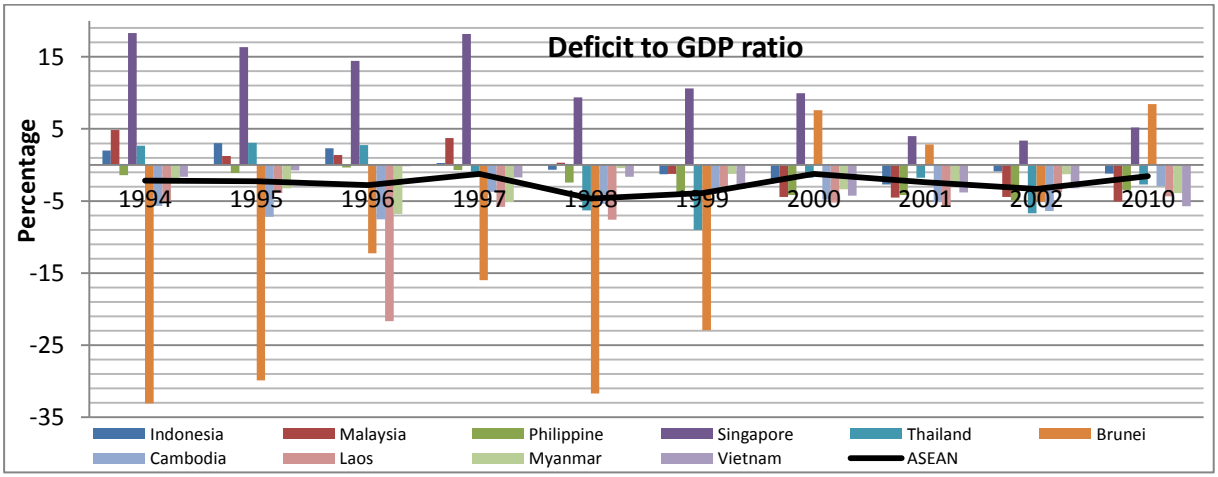


LCU per US$, period average
Source: Unstat 2012.

Kho and Stulz (2000) argued that the Asian crisis was rooted primarily in financial system vulnerabilities and other structural weaknesses; thus, a sharp depreciation of the Indonesia rupiah had an adverse effect on Indonesian banks. Furthermore, Miyakoshi (2000) showed that sharp depreciation of the local currency in 1998 was an indicator that relative fixed exchange rates and high interest rates showed policy weakness.

Figure 8 shows that the deficit-to-GDP of ASEAN members was relatively low, -2.11% in 1994-97 and -2.73 in 1999-2002; however, during the 1998 crisis, the deficit doubled.

Figure 8. Deficit-to-GDP Ratio of ASEAN Countries

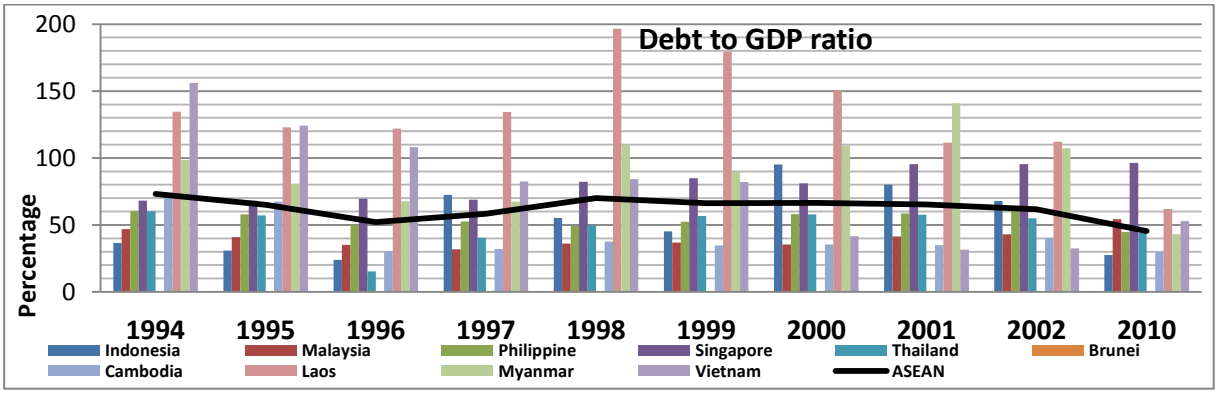


General Government net lending/borrowing as percent of gross domestic product
Resource: IMF, WEO 2012

Figure 9 shows that the debt-to-GDP ratio preceding the crisis was around 62.14%, but increased to 64.9% after 1998. During the 1998 crisis, the average debt-to-GDP ratio was 70.1%, with Laos as the highest at 196.5%. Chan, Chao and Chuo (2002), also supported by Kim (2001), argued that economies with trade similarities, and other parallel macroeconomic fundamentals, are particularly susceptible to the contagion effect of rapidly spawning currency attacks. This results in increasing economic uncertainty, decreasing public

confidence in financial institutions, financial liberalization, and a reduction in the corporate leverage ratio.

Figure 9. Debt-to-GDP Ratio of ASEAN Countries



General government gross debt as percentage of gross domestic product
Source: WEO 2012.

Radelet and Sachs (2000) suggested that the Asian crisis was unpredictable.Capital inflows remained strong, risk premiums were attached to loans to emerging market economies, and assessments from credit-rating agencies and investment forecasts remained positive. The conditions were supported by the fact that government debt was in surplus, domestic savings and investment rates were very high, and world markets did not portend a crisis. However, the crisis emerged in the 1990s, after risk expanded through current account deficits, overvalued exchange rates, slowing export growth, and increasingly fragile financial institutions.

To investigate which countries in ASEAN suffered most acutely from the crisis, we apply descriptive difference-in-difference analysis on various levels of economic performance among ASEAN-6 members. Indonesia, Malaysia, Philippines, Singapore, Thailand, and Brunei serve as as the treatment group; the CLMV countries—Cambodia, Laos, Myanmar, and Vietnam—comprise the control group.

The periods under examination were those before and after Asian crisis, from 1991 to 2004. As the peak of Asian crisis was in 1998, we established 1997 as the cut-off point. Following Baskaran (2009), we measured effects using a descriptive DiD method on some variables of interest (Q): growth in per-capita GDP, inflation and interest rates, deficit-to-GDP and debt-to-GDP ratios, and trade balance-to-GDP ratio. The descriptive DiD equation is set down in the following formula:

(4.1) DiD ASEAN=$(Q^{\text{AS-6}}{}_{98-04} - Q^{\text{AS-6}}{}_{91-97}) - (Q^{\text{CLMV}}{}_{98-04} - Q^{\text{CLMV}}{}_{91-00})$

Table 9 reports that the growth of real per-capita GDP of ASEAN-6 worsened after the Asian crisis, in contrast with the performance improvements of CLMV; therefore, the pure impact of the crisis was most painful for ASEAN-6. Related to inflation and interest rates, although the per-capita GDP decreased for ASEAN-6, it was lower in comparison with CLMV members.

Table 9. Descriptive DiD Results: The Impact of the Asian Crisis on Original ASEAN States: 1991–2004

	GGDPC	Inf	Int	ER	Def	Debt	TB
			ASEAN -6				
Post-Crisis	1.43	4.60	6.65	1525.12	-1.81	51.66	15.37
SD	0.78	6.36	5.85	3688.48	3.71	30.23	17.11
N	42	42	42	42	42	42	42
Pre-Crisis	4.86	5.19	8.97	384.27	0.32	44.81	7.16
SD	2.31	2.84	5.41	912.58	10.41	24.29	14.88
N	42	42	42	42	42	42	42
Difference	**-3.43**	**-0.59**	**-2.32**	**1140.85**	**-2.13**	**6.85**	8.21
			CLMV				
Post-Crisis	5.31	18.94	7.81	6854.62	-3.81	82.18	-7.21
SD	4.45	18.50	2.73	6114.53	1.41	45.75	6.06
N	28	28	28	28	28	28	28
Pre-Crisis	2.75	26.52	11.07	3494.17	-4.46	116.29	-9.27
SD	2.11	16.22	3.77	5044.65	2.24	47.58	7.62
N	28	28	28	28	28	28	28
Difference	**2.56**	**-7.59**	**-3.26**	**3360.45**	**0.65**	**-34.11**	**2.07**
Diff-in-diff	**-5.99**	**7.00**	**0.94**	**-2219.61**	**-2.78**	**40.96**	**6.14**

Note: Pre-Crisis was from 1991 to 1997 and Post-Crisis was from 1998 to 2004.
Source: Author's calculation

Thus, the pure impact of the crisis was still negative. ASEAN countries have employed an outward-looking strategy, so the depreciation of currency, although not as sharp as during the crisis, was beneficial in inducing higher exports. The currency depreciation was higher in CLMV by comparison with ASEAN-6; however, recent currency conditions might be desirable for ASEAN-6.

Related to fiscal conditions, the deficit-to-GDP ratio rose in ASEAN-6 countries by 2.13, but declined in CLMV; debt-to-GDP ratio was in line with deficit values. Thus, the fiscal performance deteriorated in ASEAN-6 in after crisis period.

Finally, we evaluated trade balance figures. Although sharp depreciation, mainly in Indonesia, the Philippines, Malaysia, and Thailand, shocked economic performance, the general impact on export performance was positive. Table 9 confirms that the trade surplus in ASEAN-6 was improving by 8.2%, which is higher than the improvement in CLMV, 2.1%. From these figures, we might conclude that the Asian crisis in 1998 was mainly incurred by ASEAN-6 countries.

This finding was in line with Sarno and Taylor (1999), who showed that of ASEAN members, Indonesia, Malaysia, the Philippines, and Thailand had more severe conditions, due to bursting asset price bubbles fostered by strong capital inflows, moral hazard problems, and a vicious cycle of asset price deflation.

Radelet and Sachs (2000) suggested different causes for the severity of the crisis in Asia, as shown in figure 3:

- Large-scale, unanticipated, involved, unguaranteed lending to debtors, leading to lack of credit for viable enterprises

- Positive market reaction to initiate that bring creditors and debtors together for orderly workouts
- Triggering events leading to the sudden withdrawal of investor funds.

Wade (1998) demarcated four steps in the chronology of the Asian crisis: the exchange collapse; the upsurge of bank failures and company bankruptcies resulting from the unavoidable costs of un-hedged foreign debt; a domestic recession resulting from falls of consumption and investment, combined with rising unemployment; and political reaction from the slump. It began with inflationary pressure from the combination of financial capital inflows and fixed exchange rate regimes, ultimately resulting in the property bubble burst of 1995 and the stock market crash of 1996.

According to Radelet and Sachs (2000), the Asian crisis would not have been so severe developed countries mainly Japan and USA commit to help more and the process of financial liberalization was slower. Radelet and Sachs (2000) also summarized the five inherent characteristics of a financial crisis: (1) a macroeconomic policy-induced crisis, (2) a financial panic, (3) a bubble collapse, (4) a moral hazard crisis, and (5) a disorder workout. Kaminsky and Reinhart (1998) pointed out that the Asian crisis occurred as economies entered a recession that followed a prolonged boom in economic activity, which had been fueled by credit creation and surges in capital inflow.

These conditions were supported by the fact that government debt was in a surplus state (Fig. 9), domestic savings and investment rates were very high (Fig. 3), and the world market did not portend a crisis. However, the crisis emerged after risk grew: throughout the 1990s, there had been growth in current account deficits (Fig. 8), an overvalued exchange rate (Fig.

7), slowing export growth (Fig. 4), and increasingly fragile financial institutions. According to Tse (2001), historically, financial crashes occur when everything seems to be going well—when economic growth is strong, inflation is low, and optimism is high. In 1997, The contagion effect of the crisis finally spread in East and Southeast Asia.

Palley (2011), following the Minskian framework, hypothesized that the crisis resulted from an unstable economic process under financial capitalism. Stiglitz (2000), meanwhile, believed that capital market liberalization was responsible for the Asian crisis, since it mainly produces instability, rather than growth. In this vein, Minsky (1977) emphasized the importance of adequate government constraints on institutions to stabilize the economy.

4.4 Identifying the Crisis in the Eurozone

Various arguments have been made to explain the Eurozone crisis. Perez-Caldentey and Vernengo (2012) argued that the original source of the crisis in the Eurozone is domestic debt, combined with self-fulfilling expectations and financial sector imbalances. Based on the Keynesian framework, the inability to contain labor cost growth within Europe's peripheries led to a loss of competitiveness; furthermore, they argued that more and more external problems have combined with the financial crisis, resulting in a collapse of output, and finally, fiscal crisis. The competitiveness problem festered, as there was no depreciation mechanism with respect to nominal exchange rates, and there was an absence of supranational fiscal authority that could otherwise transfer resources.

Germany's mercantilistic behavior—characterized by the maintenance of a foreign trade surplus, being non-cooperative at the global and European levels, and relying on domestic price stability and export-led growth—was accused of contributing to the crisis (Bellofiore,

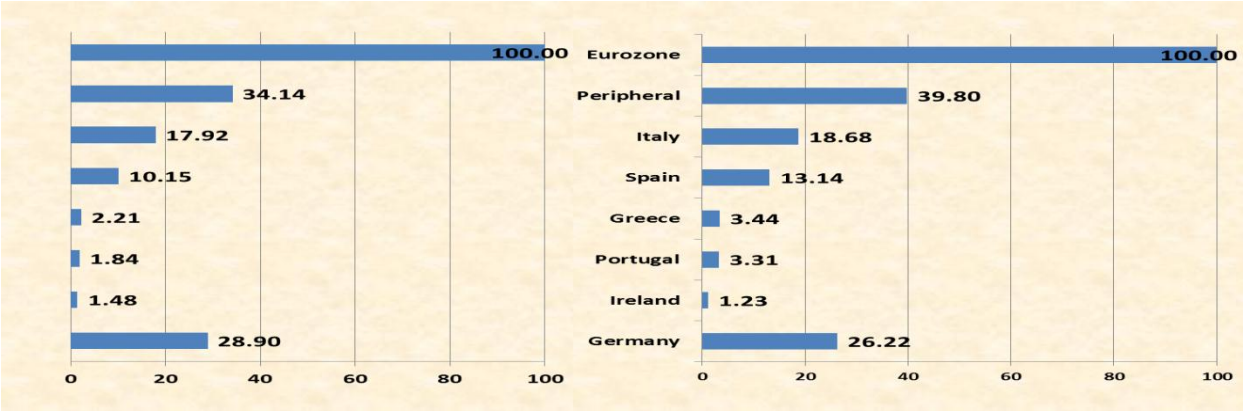
Garibaldo and Halevi 2010). The European crisis led to a devaluation of the Euro, which improved German export competitiveness; ultimately, Germany profited from its neighbors' sacrifice.

The peripheries could not reinforce their economies, due to a fiscal-tightening policy that was meant to maintain price stability, but led to an inability to fully control monetary policy. Germany's behavior has been consistent with neo-mercantilism (Cesaratto and Stirati 2011), which includes taking advantage of a fixed exchange rate to increase exports, by pursuing a domestic inflation rate lower than competitors; relying on other countries' stimuli to promote demand; taking advantage of ensuing inflationary bias, while compensating with conservative domestic fiscal (and monetary) policy; and responding to foreign critics by blaming their lack of discipline.

Low wages induced a depressed domestic market and encouraged firms to find external markets, thus generating export hypertrophy. The combination of trade surplus (as a result of an export-led growth strategy), wage moderation, and domestic demand compression gave Germany a long-term advantage over its competitors (Whyte 2010). Regardless of their size in 1980–2010, the peripheries' existence could not be ignored, since any crisis in a small country like Greece or Ireland could have a contagion effect on others.

Regarding population, the peripheries' share was 40% of the Eurozone's (308 million total), larger than their proportion of the GDP. Italy has the biggest share of population (18.7%), while Ireland has the smallest (1.2%); Germany, meanwhile, accounts for 26.2% of the Eurozone population. Clearly, the peripheries' share of population is not aligned with their share of GDP within the union.

Figure 10. Size of Peripheries: Real GDP and Population (Eurozone = 100)



Note: In percentage; GDP is 2005 constant prices in USD. Source: Unstat.

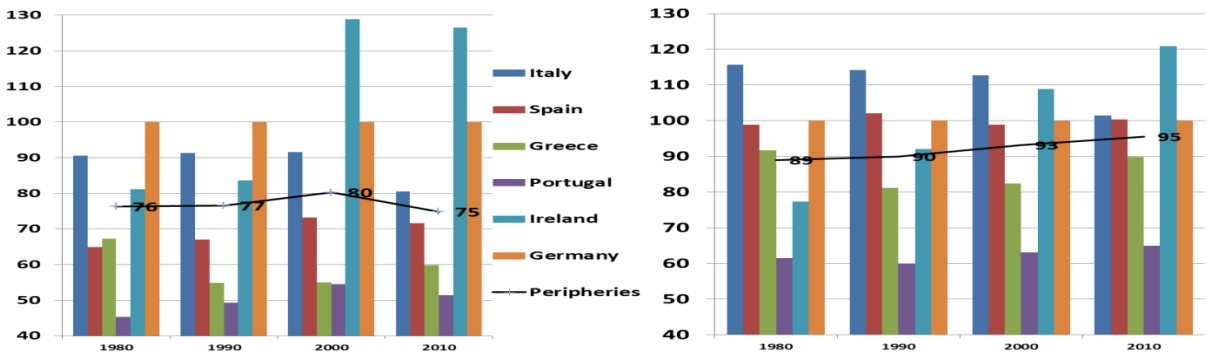
Figure 11 compares the development of real per-capita GDP between the peripheries and Germany. In 1980, the average per-capita income in the peripheries was 76% lower than the Eurozone (91.6%). Italy's (90.6%) was higher than the other peripheries, followed by Ireland (81.2%). Portugal was the poorest country of the peripheries, with only 45% of Germany's per-capita GDP.

A surprising change occurred in 2000, when Ireland (USD42,007) overtook Germany (USD32,608) by 28.8% in terms of per-capita GDP. In 1980, there was virtually no difference between the peripheries and Germany, in terms of productivity. In that year, Italy's productivity was the highest, at 115% of Germany's. In 1990, Italy and Spain were still stronger than Germany (by 14% and 2.1%, respectively). Ireland's huge leap occurred in 2010, when its productivity skyrocketed from 77% to 120% of Germany's. Portugal had the lowest position for four decades, around 60% of German productivity.

High per-capita GDP and productivity were supported by high growth rates, as shown in Figure 20. Ireland enjoyed a 94.4% growth rate relative to Germany, along with a 3.1%

average annual growth rate. Generally speaking, the peripheries experienced a higher rate of growth (56.8%) than the Eurozone average (52.7%).

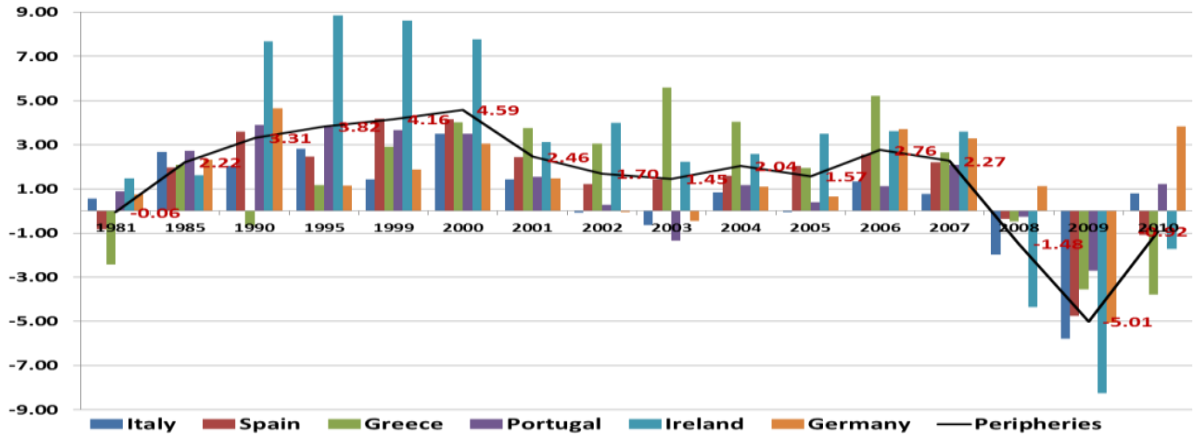
Figure 11. Real Per-capita GDP and Productivity (Germany = 100)



Note: In percentage; real per-capita GDP is GDP with 2005 constant prices in USD (Source: Unstat). Productivity is real GDP over persons employed (Source: The Conference Board of Total Economic Database).

In the 1980s, the peripheries experienced a normal growth rate of 2.2%; this figure was higher in the 1990s, but decreased in the 2000s by 0.7%. It can be concluded from Figure 3 that the Eurozone's growth rate suffered from a recession in 2009. Ireland—which achieved top growth performance in 1997 (10%)—plunged into a very deep contraction (–8.2%).

Figure 12. Income Growth

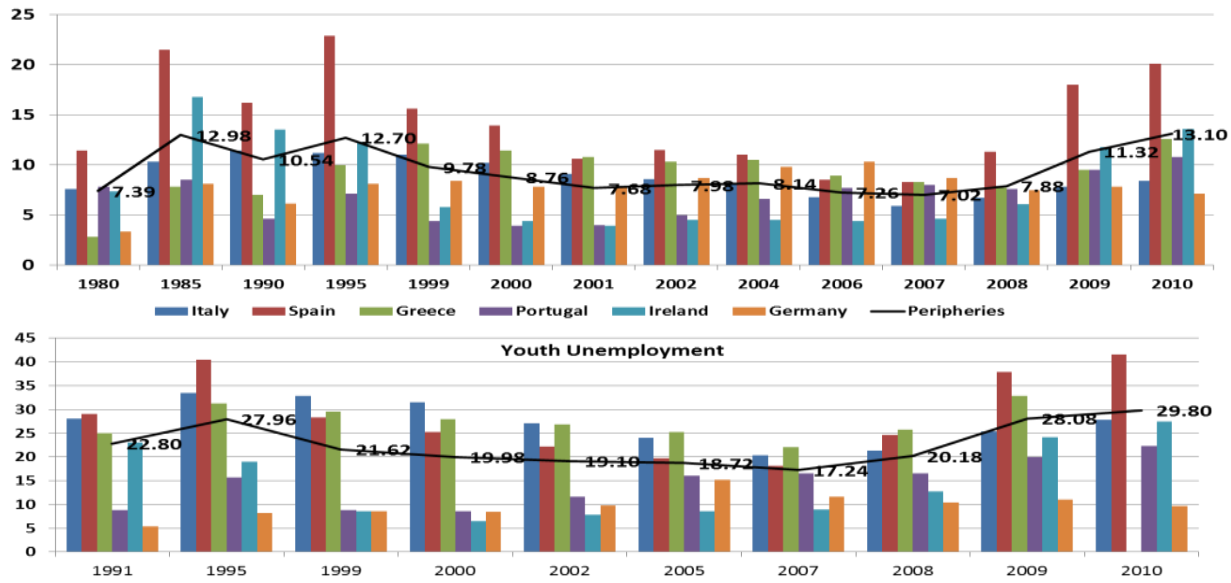


Note: Real GDP Growth in percentage. Source: Unstat

Spain has had the highest average unemployment rate in the Eurozone (17.8%). The other peripheries have also experienced persistently higher unemployment rates compared to the core Eurozone countries.

In 1983, Ireland followed Spain in experiencing a high level of unemployment (14.7%). According to Bentolila and Cahuc (2010), Spain's high unemployment rate was caused by a large gap in firing costs between permanent and temporary contracted workers, the absence of free collective use among temporary contracts, and the high availability of low-skilled jobs through very flexible contracts and a huge inflow of low-skilled immigrants.

Figure 13. Unemployment and Youth Unemployment Rates



Note: In percentage (WDI); unemployment: share of the labor force that is without work but available for and seeking employment. Youth unemployment refers to unemployment among those aged 15–24.

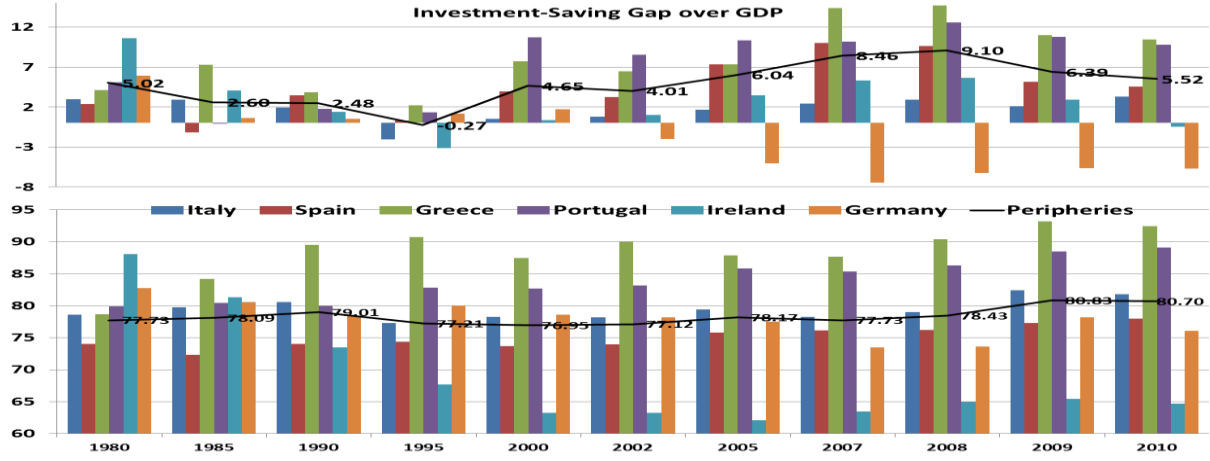
In 1993, Spain's unemployment rate exceeded 20%, followed by Ireland at 15.7%. Portugal, on the other hand, enjoyed the lowest rate of unemployment (5.13%). In 2003,

generally speaking, the peripheries (8.29%) achieved a lower level of unemployment than did Germany (9.8%).

The youth unemployment rate in the peripheries was persistently high, accounting for 22.91% of all unemployment; the highest figure was in 2010 (29.8%), and the lowest was in 2007 (17.24%). Conditions vis-à-vis youth unemployment were significantly worse there, compared to those in Germany (9.7%). The highest average youth unemployment rate belonged to Spain (29.9%).

Investments are important to inducing growth, as explained by neoclassical growth theory. Looking at Figure 14, in 1980–2000, it is clear that Portugal had the highest investment-to-GDP ratio (36.2%). Investment declined in the peripheries and Germany, especially in 2010; Portugal suffered a huge drop in this ratio, from 36.2% in 1980 to 19% in 2010.

Figure 14. Investment-Saving Gap-to-GDP Ratio, and Consumption-to-GDP Ratio



Source: Unstat, in percentage.

Mainly, the source of investment was from savings. The gross domestic savings-to-GDP ratio statistics show that, on average, the German rate of saving (22.8%) was higher than the

peripheries (19%). In 1980, Portugal achieved the highest rate of saving (31%), but it dropped sharply in 2010, to only 9%. These conditions are similar to those seen in Ireland, which had a rate of saving of 19% in 1980, achieved its peak in 2000, but dropped to 11.5% in 2010. The conditions in Greece were very bad, where the savings ratio started at 21% in 1980, but dropped continuously until it bottomed out at 4.1% in 2010.

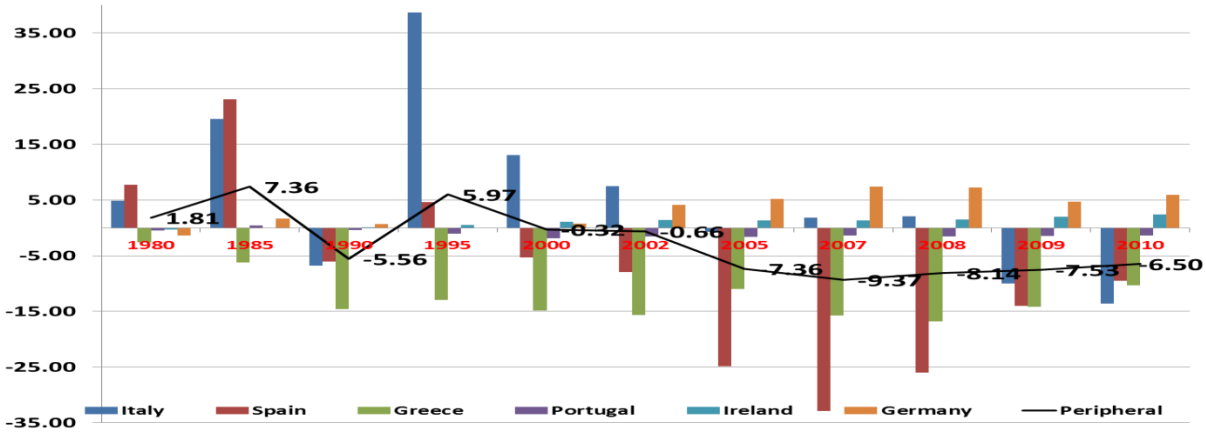
High investment in the peripheries was driven by speculative motives: large capital inflows in 2002–07 (Figure 14), were quickly fueled by high growth, which had, in turn, been driven by strong demand for consumption and construction investment. Capital was financed easily by credit from abroad. When the crisis exploded—especially as investments had not financed productive sectors—these countries needed to repay their debts, but in the absence of the support of previous investments. Thus, investment directed to consumption rather than production had contributed to inflated bubbles that produced temporary, but ultimately unsustainable, nominal growth.

Financial deficits in Greece, Portugal, and Spain correlated with the collapse of savings, especially in 2010. Figure 14 shows that, among the peripheries, Greece had the highest consumption-to-GDP ratio. Ireland has been most effective at lowering its consumption-to-GDP ratio, and thus, has had the lowest consumption-to-GDP ratio in the Eurozone since the 1990s, even compared to Germany.

Generally speaking, from the 1980s until the early 2000s, the consumption-to-GDP ratios of the peripheries were lower than that of Germany, but after the 2000s, things changed. With respect to the trade balance-to-GDP ratio (Figure 15), in 1980, Spain and Italy enjoyed high surpluses (7.7% and 4.8%, respectively), but the other peripheries suffered from deficits. Italy

enjoyed a surplus in 1980, but suffered a deficit in 2010 (–13.64%). Greece suffered persistent trade deficits, starting with –2.7% in 1980, and later, –20.9% in 2010. By contrast, Germany and Ireland started with deficits but later had surpluses. The peripheries were showing trends of growth vis-à-vis international trade. Unfortunately, after the 2000s, the growth of imports exceeded that of exports, in contrast with the conditions in Germany.

Figure 15. Trade Balance-to-GDP Ratio



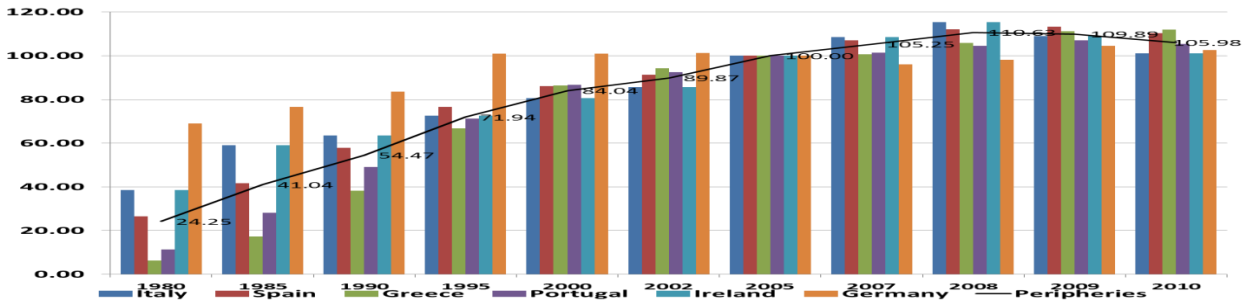
Note: Export–Import over GDP, in percentage. Source: Unstat.

We might address the issue of competitiveness to explain trade phenomena; these phenomena cab be explained in terms of the cost of production, or unit labor cost, as implied by Cesaratto and Stirati (2011).

In 1980–2010, the average growth of unit labor cost in Germany (1.55%) was very low compared to the peripheries (6.7%). Among the peripheries, Greece had the highest growth (10.6%) and Ireland (3.98%) the lowest. Germany's strong performance, according to Vines (2011), derived from its ability to pursue wage moderation and restraint policies vis-à-vis labor costs. The peripheries did not have the same mechanisms to counteract Germany's

actions—actions which, in Germany, had compensated for the loss of output associated with a decline in competitiveness.

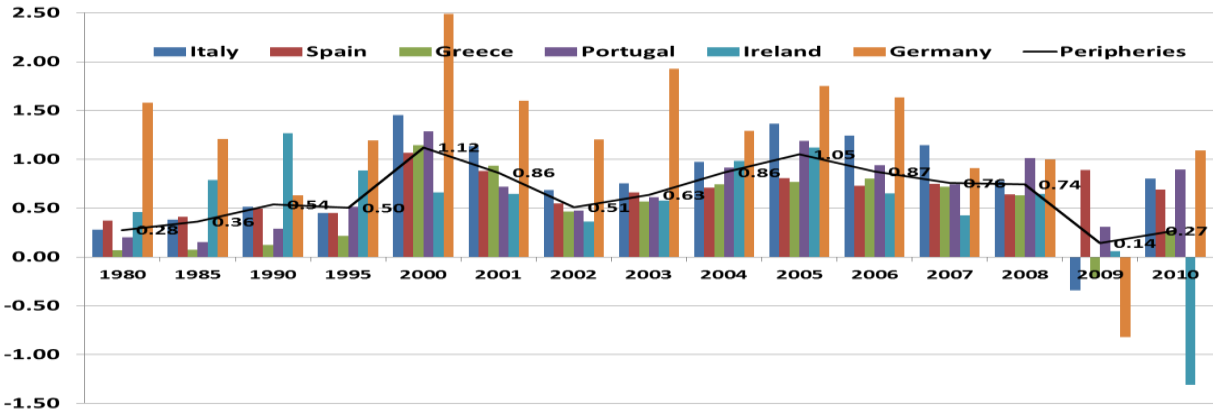
Figure 16. Growth of Unit Labor Cost



Note: Total economy unit labor cost (index 2005 = 100). Source: OECD statistics. Measures of the average cost of labor per unit of output are calculated as the ratio of total labor costs to real output.

Level of trade competitiveness is determined not only by the cost of labor, but also by exchange rates. Since all Eurozone members fully surrendered their own currencies and monetary policies to the ECB to make use of the Euro, they became unable to devalue or depreciate their currency to enhance competitiveness.

Figure 17. Real Exchange Rate



*Source: Unstat & WDI, RER = a*b, where a = Nominal exchange rate and b = US CPI/Domestic CPI. After 2002, only b was different among countries.*

Figure 17 shows that Germany's real exchange rate has always been higher than the peripheries, which might explain why Germany has had trade surpluses while the peripheries

had deficits. The combination of low growth in unit labor costs and a lower real exchange rate—especially in comparison to the peripheries, as implied by Lapavitsas et al. (2010a)—has helped Germany enjoy a trade surplus supported by its competitiveness and the peripheries' economic sacrifice.

To clarify the importance of the MC in stabilizing the Eurozone, we divided our period under analysis into two subperiods: the years before the introduction of the euro in 1999, as the final stage of monetary union realization, and the time around the Eurozone crisis.

Table 10. Maastricht Criteria and Peripheries: Prior to euro Introduction

	MC	Italy	Spain	Greece	Portugal	Ireland	Germany
Inflation[a]							
1996	**2.65**	3.97*	3.56*	8.20*	3.12*	1.69	1.45
1997	**2.76**	2.04	1.97	5.54*	2.16	1.44	1.88
1998	**2.32**	1.96	1.83	4.77*	2.72	2.43	0.94
Interest[b]							
1996	**4.90**	6.49*	6.12*	13.51*	6.32*	0.29	2.83
1997	**5.00**	4.83	3.96	10.11*	4.56	0.46	2.69
1998	**4.91**	3.16	2.92	10.70*	3.37	0.43	2.88
Deficit[c]							
1996	**-3.00**	-6.96*	-4.85*	-6.79*	-2.87	-0.11	-3.33*
1997	**-3.00**	-2.68	-3.39*	-6.02*	-1.69	1.43	-2.65
1998	**-3.00**	-3.07*	-3.21*	-3.91*	-1.77	2.24	-2.18
Debt[c]							
1996	**60.00**	113.62*	56.06	101.60*	61.29*	64.70*	22.88
1997	**60.00**	110.95*	55.28	105.22*	56.24	57.31	24.25
1998	**60.00**	108.72*	53.56	103.75*	52.99	47.8	26.06

*Note: a. Calculated by summing average inflation rate of three lowest inflation rate countries in 1996–98 plus 1.5%; b. Calculated by summing average long-term interest rates in these three low-inflation countries in 1996–98 plus 2%; c. The exact number determined in Maastricht Treaty; and * Indication of inability to meet the criterion.*

The main reason that Greece's membership application was rejected in 1998 was that the country had been unable to meet the MC in 1996–98. Similarly, Italy, Portugal, and Spain failed to meet the inflation criterion in 1996. Concerning the fiscal criteria, Italy had failed to control its finances, Spain had been unable to meet the deficit criterion, and Ireland and

Portugal followed Germany in meeting almost all criteria required to become an EMU member.

As a retest of conditions in 2007–09, Table 30 shows that Greece met only the interest rate criterion; Greece was far from satisfying fiscal criteria, as its public debt was twice that allowed by the MC, and its deficit was five times higher than the MC criteria. Portugal failed to meet deficit and debt criteria, and Italy failed to meet the debt criterion. Finally, Ireland and Spain had huge deficit problems in 2009.

Table 11. Maastricht Criteria and Peripheries: Prior to 2009 Eurozone Crisis

	MC	Italy	Spain	Greece	Portugal	Ireland	Germany
Inflation[a]							
2007	**3.14**	1.82	2.79	2.9	2.81	4.88*	2.29
2008	**4.07**	3.38	4.07	4.15*	2.59	4.05	2.63
2009	**1.07**	0.75	-0.4	1.21*	-0.83	-4.48	0.31
Interest[b]							
2007	**6.31**	4.49	4.31	4.5	4.42	4.33	4.22
2008	**6.24**	4.68	4.36	4.8	4.52	4.55	3.98
2009	**6.00**	4.31	3.97	5.17	4.21	5.23	3.22
Deficit[c]							
2007	**-3.00**	-1.49	1.898	-6.69*	-3.15*	0.08	0.26
2008	**-3.00**	-2.69	-4.15*	-9.80*	-3.54*	-7.34*	0.12
2009	**-3.00**	-5.30*	-11.13*	-15.51*	-10.11*	-14.20*	-3.06*
Debt[c]							
2007	**60.00**	95.63*	30.02	105.67*	66.62*	19.83	39.55
2008	**60.00**	98.09*	33.70	110.62*	68.88*	28.00	39.55
2009	**60.00**	106.78*	46.03	127.02*	78.73*	47.07	44.21

*Note: a. Calculated by summing average inflation rate of three lowest inflation rate countries in 1997–99 plus 1.5%; b. Calculated by summing average long-term interest rates in these three low-inflation countries in 1997–99 plus 2%; c. The exact number determined in the Maastricht Treaty; and * Indication of inability to meet the criterion.*

The ECB was successful in its monetary role, keeping interest rates and inflation low. Vines (2011) implies that the process of euro adoption, starting from January, 1 1999, led to rapid cross-border flows of finance and induced inflation and interest rate convergence. Unfortunately, Greece, Italy, and Portugal each had large fiscal deficits and very high debt-to-GDP ratios, prompting discretionary policy action.

The inability to meet fiscal MC criteria was one of the main causes of the recent crisis in the peripheries. As the governments were compelled to increase expenditures to mitigate the impact of the crisis—even as revenues concurrently declined—budget deficits were inevitable and emerged as a frequently cited cause of the debt crisis.

The success of the ECB in fulfilling its monetary duties fueled a credit boom in 2003–07, which increased business-cycle fragility. The credibility of the ECB on inflation targeting and the Euro was seen at a stable currency and optimism in the financial market. Investments soared as currency risk dramatically diminished and competition boosted financial innovation, as firms and financial institutions could borrow easily from abroad.

Investment growth in the peripheries concentrated mainly in the housing sector, boosting rapid growth, and credit growth translated into a build-up of debt. Faster growth experienced by the peripheries induced consumption, fed demand for imports, and led to a larger current account deficit. Thus, the twin deficits suffered by Greece finally led the country to a 15.5% budget deficit-to-GDP ratio and a 127% debt-to-GDP ratio in 2009. For these reasons, Greece suffered high external debt, and a low rate of national savings plunged the country into a sovereign debt problem.

Ireland has been an inspiring success story since the late 1990s. Its transformation from a poor country lacking natural resources to an affluent country was evidenced by its dramatic growth in terms of per-capita GDP, from USD23,420 in 1990 to USD52,472 in 2007. Improvements, according to Anand, Gupta, and Dash (2012), were due to intensified global economic activity, as well as the state's policy of encouraging the attainment of high-level skills and attracting investment in high technology companies.

Table 12. Summary of Crisis Indicator in Peripheries

Country	Condition	Crisis Indicator	Type of Crisis*
Greece	High growth in 2000s	Negative growth	BOP crisis
	Traditional trade deficit country	–15.5% and 127% deficit and debt-to-GDP ratio	Bubble collapse
	Growth come from consumption	High unemployment	Moral hazard
	Unable to satisfy MC	Low real exchange rate	
	High ULC growth	High trade deficit	
Ireland	High growth induced by investment post-1990s	Private sector crisis translated into fiscal stress	Bubble collapse
		–14.2% deficit-to-GDP ratio	Financial panic
		High unemployment	
		Recession, –8% real GDP growth	
Spain	Traditionally high unemployment	High general and youth unemployment (20% and 40%)	BOP crisis
		Private sector crisis translated into fiscal stress	Bubble collapse
		–11.3% deficit-to-GDP ratio	
		High trade deficit	
Portugal	Lowest per-capita GDP	–9.14% and 87.9% deficit and debt-to-GDP ratio	BOP crisis
	High consumption	High deficit trade balance	Bubble collapse
	Deficit trade country	High unemployment	
	High growth of ULC	Low productivity	
Italy	Chronic low growth	–4.5% and 109% deficit and debt-to-GDP ratio	BOP crisis
	8th highest GDP in world	–13.6% high trade deficit-to-GDP ratio	
	Changing pattern from surplus to deficit trade		

*Note: *Crisis typology based on Radelet and Sachs (2000).*

High economic growth led to a rapid expansion in credit and property valuation, but in the absence of sufficient control of the private sector, there was an increase in mortgages, accompanied by the banks' overreliance on wholesale external borrowing (i.e., financial fragility), as predicted by Minsky's hypothesis (Palley 2011). Therefore, the property price crash in Ireland in 2007 resulted from losses in the banking sector (Avellaneda, Dellepiane and Hardiman 2010). Clearly, a government cannot overcome such large losses without outside support.

Spain's low rates of inflation and interest attracted significant foreign investment, especially in the real estate sector, which accounts for 16% of its GDP (Anand, Gupta and Dash 2012). The real estate price collapse in 2007 caused a significant increase in personal debt. The decline in government tax revenue caused a dramatic increase in the deficit-to-GDP

ratio, from –0.86% in 2000 to –5.30% in 2009. Fortunately, its debt-to-GDP ratio (51.7% in 2010) was lower than that demanded by the MC.

As implied by Gros and Alcidi (2011), the main problem in Spain was the dependence of Spanish banks on foreign finance, accompanied by the structural problem of a persistently high unemployment rate, which has always been in excess of 10%. Spain, even with its lower debt and higher rate of savings, plunged into crisis, and financial activities within the country faced serious liquidity problems.

The financial crisis in Portugal can be viewed in terms of a deterioration in the debt-to-GDP ratio, from 54% in 2002 to 87.9% in 2010, as well as a sharp fiscal deficit plunge, from –0.36% in 2007 to –9.14% in 2010. Although the country experienced an investment boom in the 1990s—leading to a 5.5% rate of growth—after the euro was launched, Portugal suffered from annual negative investment growth (–2.9%). A significantly large external current account deficit and external debt have been fueled largely by a combination of private sector borrowing, low productivity, high unemployment rates, and high growth in unit labor costs. Portugal, therefore, has a complicated economic problem that features a low rate of national saving—a problem that has manifested as insolvency and a sovereign debt problem.

The contagion effect of the crisis will become even more serious if it reaches Italy, due to that country's economic size. Among the peripheries, Italy had the lowest annual per-capita GDP growth (1.1%) in 1980–2010. Low growth, a high deficit (–4.5% in 2010), and a high debt-to-GDP ratio (109% in 2010) has pushed the country into recession. The problem was exacerbated by its high trade deficit (–13.6% in 2010).

Traditionally, Italy has been able to create surplus foreign trade by devaluing its currency, and thus maintaining its competitiveness (Bellofiore and Halevi 2011), but by surrendering the lira and the authority to devaluate the common currency it shares, Italy has been unable to maintain its competitiveness, largely because it has been unable to maintain labor costs at a level as low as Germany's. Fortunately, Italy had a high saving rate, which helped alleviate problems relating to its huge public debt.

4.5 Difference-in-Difference Analysis

To investigate the causal impact on the peripheries of the release of the Euro, we applied the DiD method, which is widely applied in empirical work to establish the causal effect of a given nonrandom policy intervention.

Table 13. Definitions and Source of Variables

Name	Definition	Source
	Dependent variables	
GGDPC	Growth of GDP/population	Unstat, National Accounts Main Aggregate (SNA) Database
GLP	Growth of GDP/persons employed	Conference Board Total Economy Database
Unemp	Ratio of unemployment/labor force	World Bank, WDI
Inf	Percentage-change in consumer price index	World Bank, WDI
Int	Long-term interest rate	OECD statistics
Def	Revenue–expenditure-to-GDP ratio	OECD statistics
PD	Public debt-to-GDP ratio	OECD statistics
TB	Export–Import to GDP ratio	Unstat, SNA Database
	Institutional variables	
DI	Dummy = 1 if time of euro introduced is 2001–10	Author's calculations
DP	Dummy = 1 if belong to peripheries	Author's calculations
DE	Dummy = 1 if in peripheries and in 2001–10	Author's calculations
DK	Dummy = 1 if time of crisis in 2007–10	Author's calculations
	Exogenous control variables	
Open	Export + import-to-GDP ratio	Unstat, SNA Database
K	Gross of fixed capital formation/GDP	Unstat, SNA Database
WA	Percentage of population aged 15–64/total population	World Bank, WDI
Pop	Logarithm of population	Unstat, SNA Database
ULC	Growth of unit labor cost	OECD statistics

As a treatment group, we investigated the various levels of economic performance among the peripheries (Italy, Spain, Greece, Portugal, and Ireland), as countries with the euro as a

common currency and established in peripheral areas of the European continent. The core countries (Germany, France, Belgium, Austria, and the Netherlands—countries in the heart of the continent) comprise the control group. The periods under examination were those before and after they became euro members, from 1991 to 2010. As the birth of euro cash and coin was January 1, 2002, with a soft launch on January 1, 1999, we established 2000 as the cut-off point.

The DiD methodology in this study is useful because the peripheries were not randomly chosen. In particular, all countries had to be located within the peripheral area of the Eurozone. This nonrandomness could lead to biased estimates, due to unobserved heterogeneity and/or reversed causality. Technically, the critical assumption inherent in the validity of the DiD methodology is that the variables of interest in both the treatment and control groups have followed the same time trend. Since all countries in our sample are Eurozone members, it seems to be appropriate to assume that there were no systematic differences between the two groups during the analysis period. Following the logic of Mayer (1994), Angrist (1999), and Baskaran (2009), we measured the effect through the use of the DiD methodology on some variable interest (Q): growth in per-capita GDP, labor productivity, unemployment, inflation, interest rate, deficit-to-GDP ratio, debt-to-GDP ratio, and trade balance-to-GDP ratio. The general DiD equation is:

$$(4.2) Q_{it}^{j} = \alpha + \beta d_t + \gamma d^{j} + \delta d_t^{j} + e_{it}^{j}$$

where j is the index of two groups, with $j = 1$ for peripheries and $j = 0$ for core countries; d_t is a dummy variable that takes the value of 1 for 2001–10, and 0 for 1991–2000; d^j is a dummy variable that takes the value of 1 for peripheries (P), and 0 for core countries (C); d^{j}_{t}

is an interaction dummy that takes the value of 1 for P and in period 2001–10, and 0 otherwise; α is the coefficient for C and in 1991–2000; β is the coefficient for the dummy period; γ is the coefficient value for the dummy group; δ is the coefficient value for the interaction dummy group and period (DiD coefficient); and e^{j}_{it} is an error term. The DiD result can be calculated by using the following formula:

(4.3) $(Q^{P}_{01-10} - Q^{P}_{91-00}) - (Q^{C}_{01-10} - Q^{C}_{91-00}) = (\beta + \delta) - (\beta) = \delta.$

We also calculated descriptive DiD for recent conditions in the Eurozone, by using the following formula:

(4.4) $(Q^{P}_{07-10} - Q^{P}_{01-06}) - (Q^{C}_{07-10} - Q^{C}_{01-06}) = (\beta + \delta) - (\beta) = \delta.$

The DiD estimation is usually determined by regression. The advantages thereof include the ease of obtaining final estimates, calculating the standard error, or extending the model to cover more periods, treatments, or additional covariates, without expending much more computational effort. In this way, the residual variance may be reduced (Meyer 1994). Since descriptive calculations can offer only preliminary evidence, we re-estimate with the following model:

$$(4.5) Q_{it} = \alpha + \beta DI_t + \gamma DP_i + \delta DE_{it} + e_{it},$$

where *DI* is a dummy that takes the value of 1 for the 2001–10 period, and 0 otherwise; *DP* is a dummy variable that takes the value of 1 for peripheries, and 0 otherwise; and *DE* is a categorical interaction variable that takes the value of 1 for peripheries and in 2001–10 period, and 0 otherwise. The estimated coefficient δ is identical to the estimated coefficient in equations (4.2) and (4.3). Since many unobservable, country-specific factors (e.g.,

geographical position, climate, and technological progress) could correlate with the error term, ordinary least squares (OLS) results might be biased; thus, we apply the fixed-effect approach:

$$(4.6) Q_{it} = \alpha_i + \omega_t + \delta DE_{it} + e_{it},$$

where α_i is country fixed effects, and ω_t is the year fixed effect. The *DP* and *DI* dummies are dropped from this specification, due to perfect collinearity with subsets of the country and year fixed effects. Since we have a vector of characteristics for each country under examination, we augmented them as additional vectors of explanatory variables. Thus, the OLS equation is:

$$(4.7) Q_{it} = \alpha + \beta DI_t + \gamma DP_i + \delta DE_{it} + \lambda dk_t + \theta_k x_{kit} + e_{it},$$

where *dk* is a dummy for the Eurozone crisis, and it takes the value of 1 for 2006–07, and 0 otherwise; and *x* (1, 2, …, k) are control variables, as described in Table 5. Equation (7.6) provides us with a simple way of adjusting differences between the observations in the two groups. Using this equation may also improve the efficiency of δ estimation by reducing the residual variance. The inclusion of explanatory variables might assist in detecting omitted variables or functional form misspecifications that could otherwise render regression adjustments inadequate. In fixed-effect regression, the equation is:

$$(4.8) Q_{it} = \alpha_i + \omega_t + \delta DE_{it} + \lambda dk_t + \theta_k x_{kit} + e_{it}.$$

4.6 Result

Table 33 reports that the growth of real per-capita GDP and labor productivity in the peripheries worsened after the euro was introduced. With the exception of slower growth in

per-capita GDP and the deterioration of trade balances, other indicators were more promising. Following the introduction of the Euro, core countries had higher per-capita GDP growth figures and lower unemployment rates, but lower labor productivity growth.

Table 14. Descriptive DiD Results: The Impact of the euro on Peripheries in 1991–2000

	GGDPC	GLP	Unemp	Inf	Int	Def	Debt	TB
Peripheries								
Post-Euro ($\alpha+\beta+\gamma+\delta$)	0.60	0.84	8.63	2.65	4.28	-4.23	70.40	-6.29
N	50	50	50	50	50	50	50	50
Pre-Euro ($\alpha+\gamma$)	2.82	1.98	11.41	4.89	7.06	-4.25	75.24	0.83
N	50	50	50	50	50	50	50	50
Difference ($\beta+\delta$)	**-2.22**	**-1.13**	**-2.78**	**-2.24**	**-2.78**	**0.02**	**-4.84**	**-7.12**
Core countries								
Post-Euro ($\alpha+\beta$)	0.87	0.65	6.64	1.86	3.92	-2.34	58.62	4.18
N	50	50	50	50	50	50	50	50
Pre-Euro (α)	1.96	1.51	7.46	2.19	3.77	-3.29	57.26	1.52
N	50	50	50	50	50	50	50	50
Difference (β)	**-1.09**	**-0.86**	**-0.82**	**-0.33**	**0.16**	**0.95**	**1.36**	**2.66**
DiD (δ)	**-1.13**	**-0.27**	**-1.96**	**-1.91**	**-2.93**	**-0.93**	**-6.20**	**-9.78**

Note: "Post-Euro" is 2001–10, and "Pre-Euro" is 1991–2000.

The peripheries, on the other hand, followed trends consistent with inflation and deficit. Adjustments to the MC can cause increases in interest rates and debt-to-GDP ratios. While the peripheries suffered from very large trade deficits, the core countries enjoyed growing trade surpluses. The results indicate that the peripheries received benefits upon embracing the Euro, in the form of lower unemployment rates, inflation rates, interest rates, and deficit- and debt-to-GDP ratios. Unfortunately, growth in per-capita GDP, labor productivity, and trade balances worsened.

Suspecting that the peripheries experienced deterioration in some key indicators in 2007–10, we applied equation 4.4 (Table 15). Not only had the growth of per-capita GDP and labor productivity worsened during the crisis period, but also, variables associated with MC: either unemployment or interest rates were increasing, and there was considerable deterioration in

deficit- and debt-to-GDP ratios, and trade balances. The pure effect showed that the crisis occurred mainly in the peripheries in terms of per-capita GDP growth, unemployment, deficit and debt-to-GDP ratios, and trade balances.

Table 15. Descriptive DiD Results: The Impact of Crisis on Peripheries in 2001–10

	GGDPC	GLP	Unemp	Inf	Int	Def	Debt	TB
Peripheries								
Postcrisis ($\alpha`+\beta`+\gamma`+\delta`$)	-1.68	0.60	9.83	1.92	4.83	-7.92	76.00	-7.88
N	20	20	20	20	20	20	20	20
Precrisis ($\alpha`+\gamma`$)	2.12	1.01	7.83	3.14	3.92	-1.77	66.67	-5.24
N	30	30	30	30	30	30	30	30
Difference ($\beta`+\delta`$)	**-3.80**	**-0.41**	**2.00**	**-1.23**	**0.92**	**-6.15**	**9.33**	**-2.65**
Core countries								
Postcrisis ($\alpha`+\beta`$)	0.37	0.03	6.35	1.75	3.82	-2.95	60.30	4.58
N	20	20	20	20	20	20	20	20
Precrisis ($\alpha`$)	1.21	1.07	6.84	1.94	3.99	-1.93	57.50	3.91
N	30	30	30	30	30	30	30	30
Difference ($\beta`$)	**-0.83**	**-1.05**	**-0.50**	**-0.19**	**-0.17**	**-1.02**	**2.80**	**0.68**
DiD ($\delta`$)	**-2.97**	**0.64**	**2.50**	**-1.04**	**1.09**	**-5.13**	**6.53**	**-3.32**

Note: "Post-crisis" is 2007–10, and "pre-crisis" is 2001–06.

Table 16 indicates that the signs and coefficients of the DiD estimation (indicated by DE) are identical to those derived through descriptive calculations (Table 14).

Table 16. The Impact of euro on Economic Variables *(OLS Model)*

	GGDPC	GLP	Unemp	Inf	Int	Def	Debt	TB
C (α)	1.9610*	1.5028*	7.4620*	2.1920*	3.7658*	-3.2922*	57.2626*	1.5156*
DI (β)	-1.0890	-0.8534***	-0.8180**	-0.3304	0.1556	0.9520	1.3582	2.6604*
DP (γ)	0.8604***	0.4122**	3.9520*	2.6946*	3.2952*	-0.9622**	17.9790*	-0.6876
DE (δ)	-1.1312	-0.3242	-1.9640*	-1.9062*	-2.9350*	-0.9274	-6.2022*	-9.7834*
N	200	200	200	200	200	200	200	200
F	7.2466	7.7248	16.8450	19.5003	14.0405	2.8330	5.0396	13.3539
R^2	0.0861	0.0920	0.1928	0.2181	0.1643	0.0269	0.0574	0.1570

Note:, **, and *** indicate significance at the 1%, 5%, and 10% significant levels, respectively.*

To check for robustness and preclude heterogeneity, we applied a fixed-effect estimation. The results confirmed the robustness of the signs of the variables of interest, save that the influence of the euro on reducing growth in per-capita GDP, productivity, and debt was found

to be insignificant. The deficit-to-GDP ratio result was inconclusive, due to insignificance within both models.

Table 17. The Impact of euro on Economic Variables *(Fixed Effects Model)*

	GGDPC	**GLP**	**Unemp**	**Inf**	**Int**	**Def**	**Debt**	**TB**
DE(δ``)	-2.2202***	-1.1776*	-2.7820*	-2.2366*	-2.7794*	0.0246	-4.8440	-7.1230*
N	200	200	200	200	200	200	200	200
F	3.2656	3.1493	38.6847	11.5749	14.1787	3.4949	109.2464	22.5935
R^2	0.1022	0.0975	0.6544	0.3470	0.3984	0.1114	0.8447	0.52041

Note:, **, and *** indicate significance at the 1%, 5%, and 10% significant levels, respectively.*

With additional control variables, the OLS estimation results in Table 18 obviously confirm our previous results: the euro had an insignificant effect on the growth of labor productivity and unemployment, and despite the positive influence of the euro in lowering the inflation rate, interest rate, and public debt, it has also been responsible for higher deficit and trade deficit-to-GDP ratios. Thus, the euro has had a negative effect on the growth of per-capita GDP, deficit-to-GDP ratios, and trade balances.

Table 18. The Impact of euro on Economic Variables *(Augmented OLS Model)*

	GGDPC	**GLP**	**Unemp**	**Inf**	**Int**	**Def**	**Debt**	**TB**
C	29.2466**	19.6317*	35.5820*	-28.4916*	-37.9548*	23.8146*	512.7116*	-93.4874*
DI	-0.2889	-0.6567*	-1.7190*	0.1443	0.1991	2.2251*	0.7371	3.4258*
DP	0.3325	0.5037**	5.3739*	2.1632	3.3900*	-1.8429*	12.7232*	3.5344***
DE	-1.8118*	-0.3522	0.0641	-1.6136*	-1.9242*	-2.5106*	-5.2091**	-12.4114*
DK	-2.1416***	-0.8490**	0.2362	-0.5315	0.3242	-3.0620*	0.2455	-0.7917
OPEN	0.0011	-0.0020	-0.0180*	-0.0035**	-0.0094*	0.0058**	0.1978*	-0.0036
K	35.1365*	3.4554	-33.1109*	-14.5512***	-48.8414*	82.3149*	-309.1698*	6.1197
WA	-0.4305**	-0.2272*	-0.5855*	0.6188*	0.9018*	-0.7257*	-3.9462*	1.0080*
POP	-0.3096*	-0.1872**	1.1441*	-0.4800*	-0.5189*	0.2888*	-8.2690*	1.6045*
ULC	-0.1121***	-0.1134**	0.0490	0.1700***	0.1521	-0.0561	-1.1922*	-0.7584*
N	200	200	200	200	200	200	200	200
F	9.5564	5.3440	15.6782	14.2264	17.7692	17.7375	27.5189	9.8883
R^2	0.2790	0.1642	0.3990	0.3743	0.4313	0.4308	0.5453	0.2867

Note:, **, and *** indicate significance at the 1%, 5%, and 10% significant levels, respectively.*

The results in Table 19 (fixed-effects estimation) reaffirm those in Table 18 , which confirmed that the peripheries' embrace of the euro was significantly detrimental to growth in

per-capita GDP, labor productivity, and trade balances; however, it was good for lowering unemployment rates and debt-to-GDP ratios.

Table 19. The Impact of euro on Economic Variables (*Augmented Fixed Effects Model*)

	GGDPC	**GLP**	**Unemp**	**Inf**	**Int**	**Def**	**Debt**	**TB**
DE	-2.4423*	-0.8819*	-1.5832*	0.4474	-0.0267	-0.4561	-5.0769*	-6.3440*
DK	-1.5654	-1.0299*	-1.5307*	1.4949**	1.5196*	-0.7745	-3.9461***	1.2200
OPEN	0.0209*	0.0018	0.0102**	-0.0111*	-0.0140*	0.0211***	0.0380**	-0.0055
K	62.4838*	-2.4779	-87.1732*	7.3964	-53.0874*	133.9429*	-232.2805*	-24.3109
WA	-0.6224***	-0.1151	-0.8211*	0.8580*	1.1298*	-1.0617*	-6.6582*	0.7504*
POP	-10.7888***	-1.4171	10.8556*	-35.2699*	-22.7657*	-24.0179**	74.9339*	-23.9445
ULC	-0.1953**	-0.1315**	-0.0162	0.0920	0.1629	-0.1981*	-0.2249	-0.5702*
N	200	200	200	200	200	200	200	200
F	8.5833	3.5144	57.2849	15.6216	18.3094	15.8239	112.0740	15.5506
R^2	0.3788	0.1682	0.8190	0.5404	0.5819	0.5438	0.8993	0.5391

Note:, **, and *** indicate significance at the 1%, 5%, and 10% significant levels, respectively.*

In cautiously interpreting the impact of the control variables on the variables of interest, one can surmise that the crisis suffered by the Eurozone starting in 2007 gave rise to lower growth in per-capita GDP and in labor productivity, higher unemployment, higher inflation and interest rates, and lower debt-to-GDP ratios.

Low inflation and interest rates induced excessive borrowing, particularly in the peripheries. A complete lack of financial mobility controls created a collapse in the real estate sector (the main target of investment), pushing the Eurozone into recession. In anticipation of worsening conditions, inflation and interest rates significantly increased, and both were associated with lower levels of labor productivity. The crisis was mainly incurred by the peripheries, and it became more severe in 2009; thus, either the unemployment rate or the debt-to-GDP ratio was still in decline.

As for the impacts of openness, a more open country induces higher production and production factor mobility. It also induces greater efficiency, and thus a push to higher levels of per-capita GDP. Openness has been slow to impede production; it has had an indirect

impact by leading to higher unemployment rates, as it can produce the inability to compete with countries that have low unit labor costs.

The role of investment has been vital, as explained by neoclassical theory and as underscored by Ireland's amazing economic performance starting in the 1990s. The impact on the unemployment rate could not be overlooked, as a higher per-capita GDP is associated with lower unemployment rates. Higher investment correlated to higher capital availability—which can push interest rates to lower levels—has been due to easy access to capital resources. High levels of investment provide greater revenue, in the form of collected taxes, and so the deficit and debt-to-GDP ratios could be in decline.

Normally, working age contributes positively to per-capita GDP growth; however, we found an unexpected result. The increase in the working age in the Eurozone may have had a great impact on capital dilution, related to higher inflation and interest rates. Thus, it may ultimately have contributed negatively to output.

The change in working age contributed to an increase in government revenue from income tax, and reduced the share of the budget directed to younger and older people, both of whom tend to be associated with lower deficit and debt-to-GDP ratios. Population has a negative impact on lower per-capita GDP, which is related to lower output. Divided among more people, this leads to an indirect impact on lowering inflation and interest rates.

Since the Eurozone was one of the most prosperous areas in the world, it attracted net immigration and high population growth, thus inducing lower growth of per-capita GDP. Whenever job creation is outpaced by population growth, a higher unemployment rate is

inevitable. A larger population would also lead to increased needs vis-à-vis public goods and services provisions, which could spur higher government deficit and debt-to-GDP ratios.

The influence of a higher unit of labor cost on rising production costs could contribute to lower output; thus, it is essential to keep unit labor costs low. It is also associated with higher government expenditure, and therefore adversely impacts the deficit-to-GDP ratio. The essence of Perez-Caldentey and Vernengo's (2012) argument is that the unit labor cost's contribution to the deficit trade balance is made by way of lower competitiveness, combined with each member's inability to devaluate the Euro.

The results are robust enough to conclude that for the peripheries, the euro was detrimental to growth in terms of per-capita GDP and labor productivity. The result of the ECB's commitment to make the Eurozone an area of low inflation and low interest rates has induced exchange rate and price stability.

With a strong and stable currency, the Eurozone will attract high levels of investment, which will have the indirect effect of lowering unemployment. Since the peripheries tend to have low levels of saving (Figure 5), investment will be supported mainly by foreign saving. Investment in the peripheries has been mostly speculative, thus inducing lower unemployment rates, but it has failed to support higher growth in per-capita GDP or labor productivity.

The positive impact of investment in the peripheries on growth has been canceled out by trade balance deterioration and low debt-to-GDP ratios, both of which have been consequences of joining the Euro. This serves as a possible explanation as to why the euro was a determinant of growth and the area fell into recession. The high growth in unit labor cost has been associated with lower per-capita GDP and lower labor productivity, reducing

the competitiveness of the peripheries' products and giving rise, eventually, to deficit trade balances.

4.7 Discussion

Macroeconomic management conducted by the ECB was admirably successful in the initial stages of the Euro, and even during the early stages of the crisis, in terms of keeping both inflation and interest rates low (as confirmed by our DiD results). The peripheries' sacrifice—surrendering their monetary policy and tightening their fiscal policy in exchange for belonging to the Euro—marks their commitment to keeping inflation and interest rates low, which has attracted considerable investment.

This relative lack of fiscal unity in the monetary union compels its members to commit to the SGP, thus constraining government activity to preclude asymmetric shock. Symptoms of the crisis appeared when the peripheries accepted large savings as great investment opportunities. Large capital inflows quickly generated high growth driven by a strong demand for consumption and construction investment, given the ease of foreign credit access. Large and persistent inflows fundamentally signaled the accumulation of external debt in receiving countries. In some cases, capital inflows funded consumption and contributed to inflated bubbles that produced temporary and unsustainable growth.

Low growth in the Eurozone, as indicated by our DiD estimation, is in line with the prediction of Irvin (2005). Although low growth has been experienced by all Eurozone members, the pure impact upon embracing the euro was more severe in the peripheries. As Radelet and Sachs (2000) argue, the output contraction was a consequence not only of the MC

and SGP, but also of the debt crisis, resulting in a sort of combination of bubble collapse, spurred by speculative activity in real estate investment, and moral hazard.

Generally, the euro has been good for the peripheries, in terms of unemployment; unfortunately, deterioration in the financial market induced higher deficit and debt-to-GDP ratios. Furceri and Zdzienicka (2012) point out that the bailout costs associated with some financial institutions gave rise to output contraction, eventually increasing the number of unemployed individuals, especially in 2007–10.

The pure effect of the euro on trade balance in the peripheries was severe, but the core countries, particularly Germany, enjoyed surpluses (Figure 15). The imbalance suffered by the peripheries could be considered a consequence of a common currency, given the reluctance to correct imbalances by devaluating the Euro. The countries in deficit have no other alternative but to plunge into recession.

In the peripheries—particularly Greece, Ireland, Portugal, and Spain—governments must increase their expenditures to mitigate the impact, even as revenues concurrently decline, and so budget deficits are inevitable. For this reason, deficits have emerged as an oft-cited cause of the crisis, which is why it has been referred to as a "debt crisis."

The path to the crisis in the Eurozone—prolonged by low inflation and interest rates, which gave rise to a boom in economic activity—was fueled by ease of access to credit. In this sense, it is identical to the Asian crisis (Kaminsky and Reinhart 1998). To some extent, the chronologies of the crises differ; the Asian crisis, as Wade (1998) explains, involved an exchange rate collapse and subsequent inflationary pressure, while in the Eurozone, the crisis resulted from private sector pressure, which translated into a large deficit and a large debt-to-

GDP ratio. These symptoms are similar to those in Minsky's hypothesis, which refers to historical financial crashes that occurred just when everything seemed to be going well.

4.8 Conclusion

The pure effect of a common currency among the peripheries has been positive, mainly in terms of a convergence of low inflation rates, interest rates, deficits, and debt-to-GDP ratios, as well as lower unemployment rates. Thus, the euro itself was not the main culprit of the recession experienced in the Eurozone.

Having a common currency, as Irvin (2005) suggests, restrains high per-capita GDP growth as a cost of stability. Unfortunately, the crisis contributed to lower per-capita GDP, higher unemployment rates, higher deficit and debt-to-GDP ratios, and higher deficit trade balances. The problems were mainly derived from the toxic US derivative market and more serious in those countries unable to meet fiscal MC. The crisis was also more severe in the peripheries, due to a large trade deficit compared to the core countries' surpluses.

The absence of an institution to control capital mobility, as well as the lack of a transfer mechanism by which countries enjoying a surplus could "redistribute the wealth" to those countries suffering from deficit situations, are two Eurozone weak points. The role of the ECB—which has only limited responsibility for inflation targeting—and low EU budget levels caused a deeper crisis. The lack of a "super government" and of a "big bank," together with the restrictive fiscal and monetary policy inherent in the MC, pushed the peripheries into a deep recession. This explains why the recession was more severe in the Eurozone than in the United States. Since it is difficult to achieve political unification, any policy will be awkward and bear serious implications.

Although austerity reduces public expenditures and weakens private consumption, it is, perhaps, a rational road to take in steering the peripheries from collapse in the short term. The transfer of some funds from the surplus (core) countries in order to create job opportunities in the peripheries will also help reduce the pain in the immediate future. Two possible long-term means exist to preclude Minsky's systemic vulnerability associated with excessive risk: revising the MC and SGP to create a more unified fiscal policy at the Eurozone level, and entrusting the ECB with a larger budget so it may act as "lender of last resort" and as a "checks and balances" institution.

Chapter 5 Applying Maastricht Criteria as Nominal Convergence Criteria

5.1 Introduction

Regional economic integration has been a global trend, and the most integrated area is the EU, which almost reaches the status of an economic union. There have been efforts to enhance European cooperation since the Rome Treaty in 1957[11]. The 27-member EU almost achieved full economic integration on January 1, 2007[12] following the signing of the Maastricht Treaty (MT), in 1992.

The MT states five convergence conditions (Afxentiou, 2000) for entrance to the EMU. ASEAN may reflect the EU's success story as it deepens its economic integration. The EU has been implementing the EMU, but ASEAN is still in the process of fully implementing the ASEAN Free Trade Area (AFTA).

However, it is quite interesting to know whether ASEAN was favorable to form a common currency as EU did by releasing EMU with MC. Regardless of initial projections, difficulties emerged from the huge differences in size, level of development, and social issues among ASEAN member states (Jovanovic, 2005). After being hit by the economic crisis in 1997, ASEAN developed policies to create greater regional exchange rate stability.

Creating a common currency has several objectives, as explained by Eichengreen (1992). It should reduce the transaction cost associated with the elimination of national currencies, increase the authority of the participating governments to ensure price stability, achieve

[11] The founders are: Belgium, Germany, France, Italy, Luxembourg, and Netherlands
[12] European Council Decision determining the enlargement of EU into 27 members available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:001:0011:0012:EN:PDF

greater efficiency of resource allocation through the elimination of exchange rate uncertainty, and promote market integration. He also noted the cost incurred as the incidence and magnitude of shocks resulted from speed of adjustment, wage adjustment, interregional migration, and interregional capital flows. Thus, MC was designed to maximize benefit and decrease potential cost.

The criteria imposed in MT were meant to equalize some nominal variables based on principles of gradualism, and to capture some OCA properties. These criteria guided the introduction of a common currency with the principle "one market, one currency." Of primary importance was diminishing asymmetric shocks and to increasing similarity in response to shock.

Perez-Caldentey and Vernengo (2010) argued that prior to establishing a monetary union exchange rate convergence was designed to avoid manipulation to achieve competitive position; inflation and budget convergence were barriers for inflationary bias; fiscal criteria for members were required, such as balanced budget, or budgets in surplus in the medium-run, in order to offset future deficits; and interest rate criteria were needed to limit arbitrage opportunities, and prevent capital gains and losses.

Before the Eurozone crisis exploded in 2007, the euro had shown great stability, but the fallout from the crisis raised questions about the efficiency of the MC. Darvas (2010) highlighted that the current crisis suffered by the Eurozone is the consequence of MC, with associated weaknesses: First, this is an asymmetric problem. Once a country is inside the euro Eurozone, MC and Strong Growth Pact (SGP), in principle, limited the scope of government action inside the Eurozone. Second, business cycle dependence implies that most countries

can join only in positive economic circumstances, which does not make much sense, since this does not tell much about long-term sustainability. Third, the high stack sanction was not effective since only naming and shaming were applicable for member unsatisfied.

Buiter, Corsetti, and Roubini (1993) emphasized some limitations of MC. Perhaps most important to this thesis is the contention that achieving fiscal sustainability prior to adopting the euro is a necessary, and appropriate, condition for membership, but controlling fiscal policy only in the time of crisis is insufficient to ensure a country can function in the long-term. These authors concluded that controlling private sector vulnerabilities.

Before and during the early stages of the crisis, inflation rates and interest rates were very low to address the downturn, but Perez-Caldentey and Vernengo (2010) implied that the monetary unification process and financial deregulation fuelled unsustainability during the global crisis.

Since governments must increase expenditures to mitigate the impact of a recession, while at same time, revenues tend to decline, budget deficits are inevitable and emerge as a favourite cause of any debt crisis. Regardless of the importance and limitations of MC, this study investigates the costs and benefits of applying MC to ASEAN, in comparison with the EMU. Applying Maastricht criteria and using Cronbach's coefficient, we try to answer whether the MC was significant for the EU, whether the condition of ASEAN states met the MC, how much the degree of convergence of ASEAN countries was impacted by MC, and whether a similar treaty is applicable in ASEAN.

5.2 Economic Integration in Brief: European Monetary Union (EMU) and ASEAN

5.2.1 European Monetary Union (EMU)

Arguably, Building the EMU to with 17 members is the greatest achievement in the history of the EU. One of the expected consequences was that member countries had similar prices for traded goods. The EMU carefully passed the MT, a map that specifies how and when the single currency would be launched, and laid down a precise set of institutional arrangements (Baldwin and Wyplosz, 2006).

Table 20. EMU Timetable

Toward Maastricht		**The Transition**		**The single currency**	
1970	Werner Plan	1994	European Monetary Institute	1999	Monetary Union starts
1979	European Monetary System starts	1997	Stability and Growth Pact	2001	Greece joins
1989	Delors Committee	1998	Decision on membership	2002	Euro coins and notes introduced
1991	MT signed	1998	Conversion rates set	2007-	Slovenia, Malta, Cyprus,
1993	MT ratified	1998	Creation of ECB	2011	Slovakia, and Estonia Join

Source: Adapted from Baldwin and Wyplosz (2006: 380)

In 1991, the MT was signed, calling for a gradual transition toward a monetary union, with proposed membership conditioned on satisfying convergence criteria (De Grauwe, 2005).

In May 1998, 11 countries (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Spanish and Portugal) joined the EMU and met the MC. Greece joined in 2002. Recently Slovenia, Malta, Cyprus, Slovakia, and Estonia Joined in 2007-2011. To fully implement the EMU, the MT was divided into 3 stages[13]: the realization of an economic and monetary union would begin on July 1, 1990; the establishment of the European Monetary Institute was scheduled for January 1, 1994; and on January 1, 1999, the irrevocable fixing of the exchange rates among currencies.

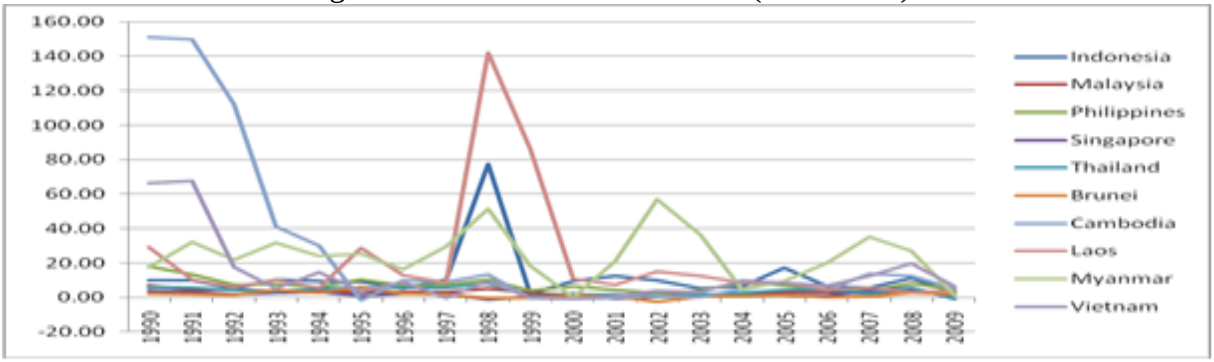
[13] Available at: http://www.ecb.int/ecb/history/emu/html/index

5.2.2 ASEAN

Established in 1967, ASEAN now has ten members[14]. The ASEAN Declaration states that the purposes of the Association are: "to accelerate economic growth, social progress and cultural development in the region and to promote regional peace and stability" (www.aseansec.org).

The ASEAN Vision 2020 was adopted in Kuala Lumpur on the 30th Anniversary of ASEAN, and declared three pillars: the ASEAN Security Community, the AEC, and the ASEAN Socio-Cultural Community. ASEAN released an AEC Scorecard promoting the establishment of a single market and production base by 2015[15].

Figure 18. Inflation Rate: ASEAN (1990-2009)

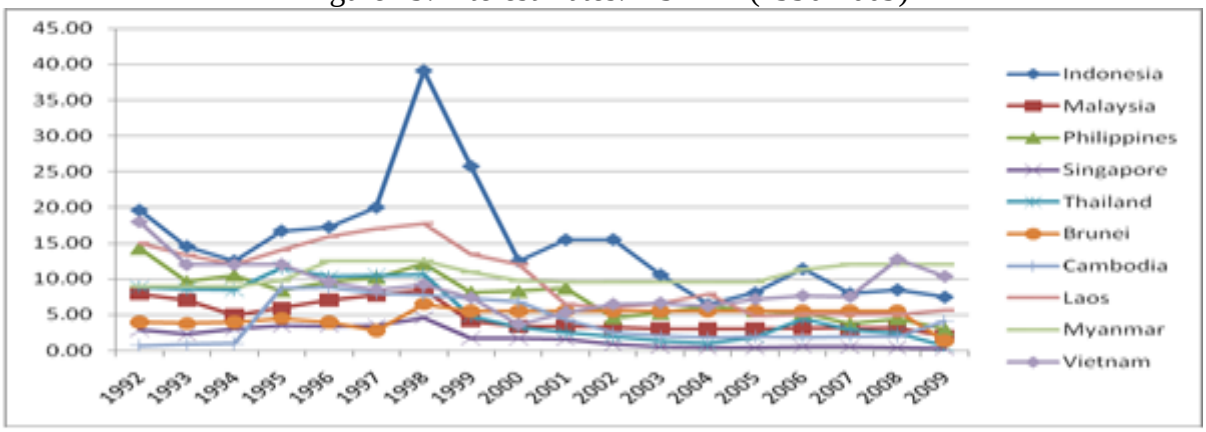


Year-on-year change of the consumer price index, end of period
Source: IMF, WEO 2010.

Before going into further detail, we will discuss ASEAN's initial condition, based on variables in MC. Figure 18 shows that the average inflation rate in ASEAN varies between 1.38 (Brunei) and 28.19% (Cambodia). Cambodia reduced its inflation rate dramatically from more than 151% in 1990 to 5.33% in 2009.

[14] Original members are: Indonesia, Malaysia, Philippine, Singapore and Thailand. Brunei Darussalam, Vietnam, Laos, Myanmar and Cambodia later joined in 1984-1999
[15] Available at http://www.asean.org/publications/AEC%20Scorecard.pdf

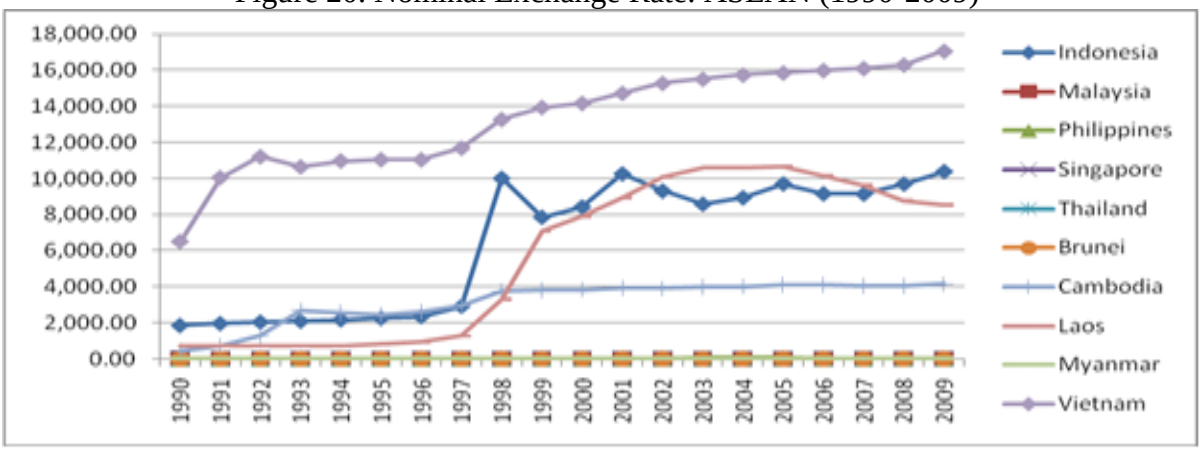
Figure 19. Interest Rates: ASEAN (1990-2009)



Deposit Interest Rate (%)
Source: World Bank, WDI

Figure 19 shows that Singapore (1.87%) and Cambodia (4.02%) have the lowest interest rates, while Indonesia (15.41%) and Myanmar (10.46%) have the highest.

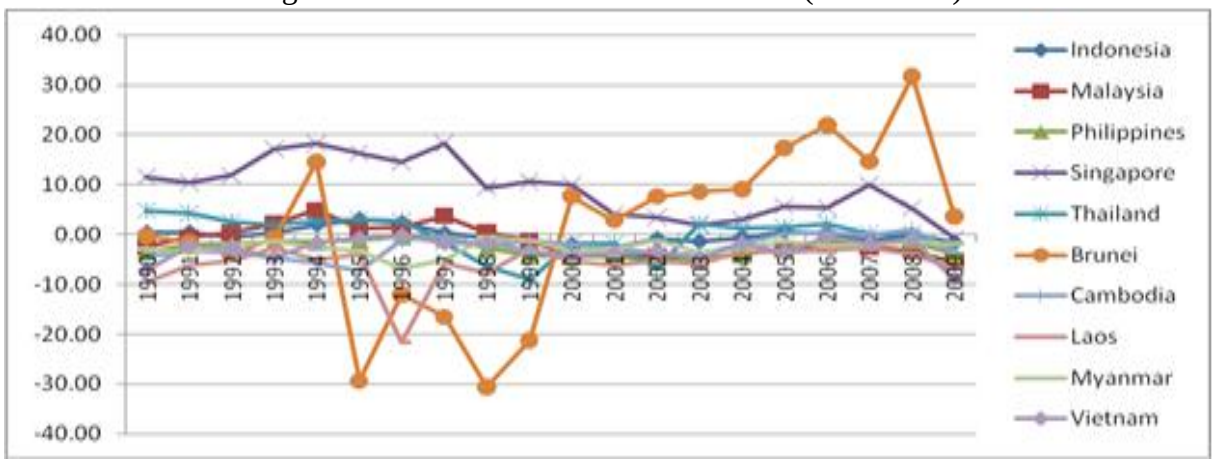
Figure 20. Nominal Exchange Rate: ASEAN (1990-2009)



LCU per US$, period average
Source: WDI 2010.

After the Asian economic crisis, ASEAN's average exchange rate depreciated sharply, from 1998 to 2009, it dropped to3753.6. Vietnam (15,330.4) and Brunei (1.64) were the highest and lowest, respectively. ASEAN countries experienced sharp depreciation in the exchange rate in 1997-1998.

Figure 21. Deficit-to-GDP Ratio: ASEAN (1990-2009)

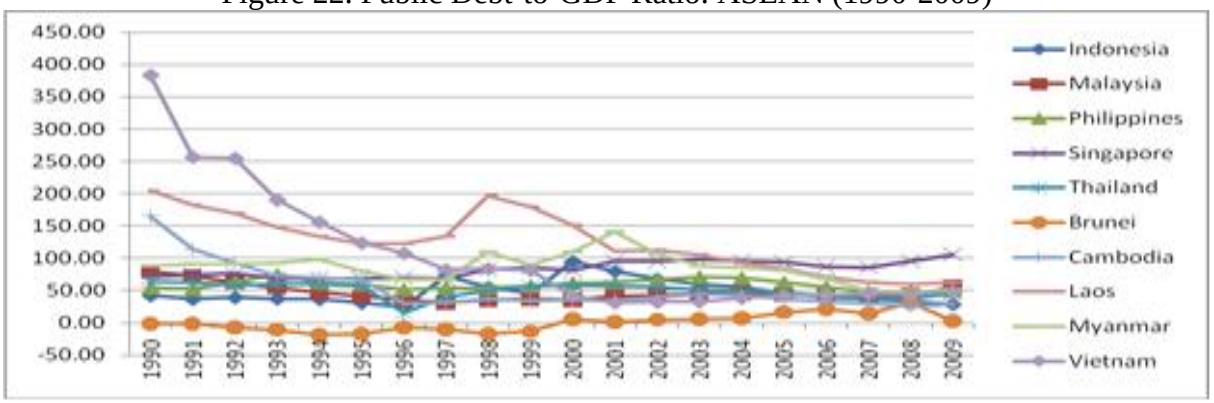


General Government net lending/borrowing as percent of gross domestic product
Resource: IMF, WEO 2010

In 1990-2009, Singapore experienced an average budget surplus of 9.3%, while Laos (-5.84%) had the highest budget deficit. In 1990-1997 ASEAN's average deficit was -0.55, lower than 1998-2009, when the deficit averaged -0.94. Laos had the highest deficit in both periods (-7.52 and -4.72), while Singapore was the lowest (14.78) in the first period, Brunei (6.11) second.

Figure 22 shows Laos and Vietnam (125.42% and 106.3%) have the highest public debt-to-GDP ratio, but they both reduced their debts 62.09%, and 50.83% respectively in 2009.

Figure 22. Public Debt-to-GDP Ratio: ASEAN (1990-2009)



General government gross debt as percentage of gross domestic product
Source: WEO 2010.

In 1998-2009, the average public debt among ASEAN countries was 57.90, whereas in 1990-1997, this number grew to 77.84. Vietnam (194.75%) had highest public debt in 1990-1997, Laos (107.48) in 1998-2009. Brunei (-8.97 and 6.80) had the lowest in both periods.

5.2.3 Differences in GDP Per Capita and Population

Compared with ASEAN difference, table 10 shows relatively small differences in GDP per capita among Eurozone countries in 1992, with an average of 19,361. The highest GDP per capita was Luxembourg (36,308), 4 times more than Portugal (8,735), which was the lowest.

Table 21. Population and GDP per capita in the Eurozone (1992)
at Current Price, in Euro Currency

Country	Population	GDP per capita	
	(million)	Nominal	Gap
Austria	7.91	21569	2208
Belgium	10.04	20445	1084
Finland	5.04	18495	-866
France	57.37	20898	1537
Germany	80.59	22536	3175
Ireland	3.56	12002	-7359
Italy	56.86	19275	-86
Luxembourg	0.39	36308	16947
Netherlands	15.18	19228	-133
Portugal	9.83	8735	-10626
Spain	39.01	13481	-5880
Eurozone	**285.78**	**19361**	

Sources: ECB

Contrary to the EMU, the gap of GDP per capita among nations in ASEAN was huge, as shown in table 21. The average GDP per capita of ASEAN in 2009 was US$13.679.4. Singapore had the highest (US$49,765.8), followed by Brunei (US$49,266.8). Both have

significant gaps with other members. For instance, Singapore's and Brunei's GDP per capita were about 45 times higher than Myanmar (US$1.093.4).

In line with economic conditions, governmental stability in the EU is more effective than in ASEAN nations, since conditional factors for membership in the EU, set forth in the Copenhagen Treaty of 1993[16], guarantee it. The EU has several institutions to create and implement laws applying to member states, a fundamental difference from ASEAN.

Table 22. Population and GDP per capita: ASEAN, 2009
at Current Price, in US$

Countries	Population (million)	GDPpercapita Nominal	Gap
Indonesia	231.37	4,174.9	-9,504.42
Malaysia	28.31	13,593.8	-85.51
Philippines	92.23	3,525.1	-10,154.29
Singapore	4,987.60	49,765.8	36,086.43
Thailand	66,903.00	8,072.2	-5,607.16
Brunei	0.41	49,266.8	35,587.44
Cambodia	14.96	1,802.3	-11,877.02
Laos	5.92	2,431.3	-11,248.05
Myanmar	59.53	1,093.4	-12,585.99
Vietnam	87.23	3,067.9	-10,611.42
ASEAN	**59.18**	**13.679.4**	

Source: www.aseansec.org

5.3 Maastricht Convergence Criteria and Cronbach's Coefficient

MC ensures that admission to the EU monetary union is not automatic; this is why convergence criteria are needed (De Grauwe, 2005):

[16]The conditions are: stable institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities; a functioning market economy and the capacity to cope with competitive pressure and market forces within the Union; the ability to take on the obligations of membership, including support for the aims of the Union. They must have a public administration capable of applying and managing EU laws in practice available at: http://europa.eu/pol/enlarg/index_en.htm

1. Inflation convergence

Fear of inflationary bias in future monetary unions should be avoided that the EMU would be inclined to inflation. It was assumed that low inflation convergence in the union would promote economic growth, and limit the risk of destabilizing social conflicts, by decreasing economic uncertainty .

2. Interest rate convergence

The justification for interest rate convergence was that extreme differences in the interest rate before joining could lead to large capital gains and losses at the moment of entry. Hence, if the exchange rate irrevocably fixed, there is no exchange risk until returns on the euro and other currencies are equalized. Pursuing this similarity in interest rates was meant to avoid arbitration in financial markets, especially in the period, when there were many currencies subject to this rigid exchange rate.

3. Exchange Rate Convergence

Exchange rate convergence was intended to prevent countries from manipulating their exchange rates to force a more favorable exchange rate, with competitiveness as the motive. Based on the MT, countries should maintain their exchange rate within the normal band of fluctuation during the two years preceding their entry into the EMU. The upper limit of the normal band was 2 x 2.25%, and later became 2 x 1.5%).

4. Government Deficit

High budget deficits lead to the crowding-out effect of private expenditures on consumption and investment, limiting the long-run possibilities of economic growth.

5. Public Debt

High government debt creates incentive for surprise inflation, because a large debt will create a higher default risk. If a country in this state were allowed into the union, the pressure for a bailout in the event of a default crisis will increase.

Buiter, Corsetti and Roubini (1993) emphasized that fiscal criteria were required to prevent free riders and spill-over effects, and to ensure fiscal sustainability. This is effective because such requirements ensure new member states cannot use inflationary measures to decrease the real value of their public debt, nor devaluate their currency to boost economic growth.

De Grauwe (2005) explained that the norms of 3% of GDP and 60% budgetary have been derived from the well-known formula determining the budget deficit needed to stabilize the government debt: d=gb; Where b is the (steady state) level at which the government debt will be stabilized (percentage of GDP); g is the growth rate of nominal GDP; and d is the government budget deficit (percentage of GDP).

The formula shows that to stabilize the government debt at 60%, budget deficits must be brought to 3% of GDP, if—and only if—the nominal growth rate of the GDP is 5% (0.03=0.05 x 0.6). This rule is quite arbitrary. It is unclear why debt should be stabilized at 60%, or why this rule is conditioned on the nominal growth rate of the GDP. Seemingly, the only reason is that 60% was the average of European countries in 1991 (61.7%).

De Grauwe (1996) criticized the MC. He argued that such criteria are neither necessary nor sufficient to create a successful monetary union. If economic structures in each member country are similar, asymmetric shocks will not happen. The requirements for interest rate

convergence and no devaluation two years before entry into the union are not effective in forming a successful monetary union. He suggests shifting from convergence requirements towards institutional development.

Artus (1993) argued a successful economic union is only possible among countries that have already converged, and has a negligible effect on the integration and flexibility of labor markets. Krugman (1992) was concerned that economically stronger countries will be penalized for success, since a country whose booming economy attracts large voluntary capital inflows will experience more real appreciation. In this case, fiscal criteria make somewhat more sense, but the question remains: why is fiscal probity a key issue for a monetary union?

In an empirical study, Artus (1993) showed that in 1992, of 12 EC countries satisfying all criteria, only France and Luxembourg and other EC countries that could join only Switzerland satisfies the criteria. Guldager (1996), dividing the criteria of the MT into inflation and public debt performance, found that five EU Members[17] converged towards the EMU requirements.

Casario and Dadkhah (1998), employing fuzzy [18] analysis, found that inflation convergence fell from 3.8% in 1992 to 3% in 1993 and rose to 3.5% in 1994. Interest rates have demonstrated significant convergence. Both of these fiscal criteria show that the EU faces considerable difficulty. The first six years of the period showed a gradual increase in the degree of budget deficit convergence, and the EU has experienced the least degree of

[17] France, Ireland, Spain, Portugal, and the United Kingdom

[18]Fuzzy analysis has the potential to aid economic analysis, yet has found most favor with engineers, who have applied it to a host of forecasting and control problems.

convergence in the debt ratio. Some European countries have shown considerable progress toward meeting the MC.

Green (1994), applying Cronbach's coefficient, showed substantial cohesion in nominal and real exchange rates in ASEAN, little interest rate convergence, and divergent fiscal variables in the late 1980s. The increasing cohesion, in general, was clear around the same time.

Xu, Ward and Gan (2007), generated a SVAR model and Kalman Filter[19], concluding that Singapore, Thailand, and Malaysia are in a favourable position to form a single currency, due to convergence in nominal exchange rates, inflation rates, positive correlation in external shocks, and a high degree of correlation in inflation and growth. Azali (2007), using The Bound Testing Approach on ASEAN-5, found criteria fulfilled in interest rates, inflation rates, and debt ratio, but not in exchange rates or budget criteria. The findings showed ASEAN-5 countries had the potential to form a single currency.

5.4 Maastricht Convergence Criteria and Cronbach's Coefficient

Based on previous data, the primary intention of this paper is to investigate whether the Eurozone and ASEAN met the MC, and to measurethe relative degrees of convergence.

[19] An algorithm for sequentially updating a linear projection for a state-space form. When applied to a model in state-space form, it produces prediction errors ut and prediction error variances Ft.

5.4.1 Maastricht Criteria

The Maastricht Treaty agreed that the transition to the final stage of the monetary union was conditional on a number of convergence criteria[20]. Following Artus (1993), we measure the countries meeting the criteria as follows:

Table 23. Maastricht Criteria and Benchmark Value

Criteria	Benchmark of Meeting the Criteria
1. Inflation rate is not more than 1.5% higher than the average of the three-lowest inflation rates of EU members.	The countries having average inflation rate value less than or equal to average of three lowest inflation countries plus 1.5% $= (\frac{Inf_{L1} + Inf_{L2} + Inf_{L3}}{3}) + 0.015$
2. Long-term interest rate is not more than 2% higher than the average observed in these three low-inflation countries.	The countries having average interest rate value less than or equal to average of interest rate value of three lowest inflation countries plus 2%. Or $= (\frac{Int_{LI1} + Int_{LI2} + Int_{LI3}}{3}) + 0.02$
3. Has joined the exchange rate mechanism of the EMS and has not experienced devaluation during the two years preceding entrance into the union.	Not Applicable: Since it became obsolete upon transferring monetary policy to the ECB in the Eurozone; and No benchmark for criterion for ASEAN.
4. Government budget deficit is not higher than 3% of its GDP (if it is, it should be declining toward to the 3%).	The countries having average government deficit-to-GDP ratio less than or equal to -3%.
5. Government debt should not exceed 60% of GDP (if it is, it should declining toward the referenced value).	The countries having average debt-to-GDP ratio less than or equal to 60%.

Note: $Inf_{L1..L3}$ were inflation rates in three lowest inflation rate countries, and $Int_{LI...L3}$ were interest rates in three lowest inflation rate countries.

For ASEAN, the observation period covers 1990-2009. The Asian Crisis in 1997-1998 created severe problems in almost all criteria; therefore, we divided this timeline into 1990-1997 and 1998-2009. For the Eurozone, the data cover 1983-1992, the period before ratification of the MT, and 2002-2009, after the euro was introduced.

[20] The Maastricht Treaty available at http://www.eurotreaties.com/maastrichtec.pdf

5.4.2 The Cronbach's Coefficient

Following Green (2004), we used Cronbach's coefficient[21] to analyse the degrees of convergence among ASEAN and Eurozone members. The estimation model can be seen in following specification:

$$\text{Cronbach's Coefficient} = \frac{k}{k-1}\left[1 - \frac{\sum_{i=1}^{k} \text{var}(x_i)}{\text{var}\sum_{i=1}^{k} x_i}\right]$$

Var refers to sample variance; k for numbers of countries; x is variable in MT. The coefficient value is close to 1 when individual measures convergence and can have large negative value when divergent[22] (Green, 2004). For purposes of measurement, we have applied these equations to the same periods for each zone as the previous analysis.

5.4.3 Data Specifications

Inflation, in this analysis, refers to the percentage of change in the consumer price index at the end of each period. The data for ASEAN were from the World Economic Outlook (WEO) from the IMF. Due to issues with data availability, estimated data still serve as proxies for historical series. Eurostat data was used for Eurozone analysis; these figures were designed for international comparison to assess the inflation criterion.

[21] Cronbach's coefficient measures how well a set of items (or variables) measures a single one-dimensional latent construct. When data have a multidimensional structure, Cronbach's alpha will usually be low or less than 0.5 (Carmines and Zeller, 1979) and (Cortina, 1993). Instead of alpha, to avoid confusion with other convergent terminology in this study, we used Cronbach's coefficient.

[22] It could be happen if the gap between values is very huge for example the huge difference between nominal exchange rate of Vietnam and nominal exchange rate of Singapore. Since my analysis was consisting of many countries, multiple years, and more than two countries, the results most probably will be disappearing.

Interest rates for both economic zones were taken from deposit interest rate data from the World Development Indicator (WDI), defined as the rate paid by commercial or similar banks for demand, time, or savings deposits. Although using deposit interest rate as the proxy for long-term interest rate was arbitrary, since the sources of data are same, the comparison will be more reliable.

Nominal exchange rate variables were derived from the WDI, defined as US$ currency / local currency unit. This proxy was reliable for analysis, as it was relevant to the MC exchange rate definition.

Deficit data were taken from the WEO for both ASEAN and the Eurozone, with government net lending/borrowing (percentage of GDP) calculated as revenue minus total expenditure. The GDP corresponding to each fiscal year was measured at current price (in national currency). Public debt data were taken from the WEO and is defined as total gross debt to GDP. Gross debt consists of all liabilities that require payment, or payments of interest and/or principal, by the debtor to the creditor in the future.

Most data were derived from the WEO, which is comprised of estamated IMF data. To some extent, the reliability of data for some ASEAN countries , as well as Myanmar, Laos, Cambodia, was questionable, as was the deficit and debt data of Greece (Lapavitsas, et.al, 2010), which was known to have manipulated statistics to become a member of the EMU. Regardless of data quality and completeness, these are the data sets we will use as proxies. Therefore, results should be taken in the context of the limitations of this analysis. Future analysis may provide more reliable data.

5.5 Main Results and Findings

5.5.1 The Eurozone

MC are preconditions that serve as a screening and commitment mechanism, requiring governments to show their willingness to follow economic policies that do not cost others. Meeting these goals shows their strong political commitment to mutually beneficial agreements. Based on table 24, no countries met all criteria during the period from 1983 to 1992[23]. This result correlates with the findings of Artus (1993), showing that only France and Luxembourg passed in 1992. The degree of convergence in MC was high (shown by Cronbach's coefficient, except for government deficit).

Table 24. Measurement Results: Eurozone in 1983-1992

Countries	**Inflation**	**Interest**	**Exchange**	**Deficit**	**Debt**
Austria	2.88	3.54	1.06	-2.32	60.14
Belgium	3.49	5.94	1.06	-9.13	61.62
Finland	5.19	7.71	0.81	1.63	55.41
France	4.40	5.34	1.02	-2.80	57.59
Germany	2.31	5.22	1.06	-1.85	60.57
Ireland	4.65	6.19	0.92	-6.53	68.81
Italy	7.39	8.57	0.74	-11.30	63.17
Luxembourg	4.41	5.86	1.06	2.71	-
Netherlands	1.8	3.64	1.06	-4.57	50.14
Portugal	15.07	18.03	0.72	-5.37	45.09
Spain	7.77	10.33	0.77	-4.17	38.12
Maastricht Criteria	**3.83**	**6.13**		**<-3%**	**<60%**
Cronbach's Coefficient	**0.92**	**0.84**	**0.98**	**0.57**	**0.90**

Source: Author's calculation

[23] Austria and Germany failed the debt criterion. France and Luxemburg didn't satisfy inflation criteria. Tthe Netherlands failed the deficit criterion. Ireland and Italy failed almost all criteria.

Imposing the MC after the euro launched indicated strong convergence as shown in table 25. Six countries[24] met all criteria. The level of nominal convergence based on the MC is very high (shown by Cronbach's coefficient result—almost above 0.9, except for debt criterion). Coefficient results showed better convergence than in 1983-1992, except for debt criterion, where the Eurozone was poisoned by the mortgage crisis.

Table 25. Measurement Results: Eurozone (2002-2009)

Countries	**Inflation**	**Interest**	**Deficit**	**Debt**
Austria	1.82	4.13	-1.86	61.03
Belgium	2.01	4.15	-1.28	92.03
Finland	1.57	4.08	2.75	40.70
France	1.89	4.06	-3.73	65.75
Germany	1.64	3.93	-2.42	39.53
Ireland	2.52	4.30	-1.98	34.93
Italy	2.30	4.33	-3.40	98.32
Luxembourg	2.20	3.73	1.08	8.53
Netherlands	1.92	4.06	-1.37	43.50
Portugal	2.35	4.23	-2.35	67.67
Spain	2.93	4.13	-1.43	37.88
Cyprus	2.46	4.90	-2.54	62.55
Greece	3.22	4.47	-6.37	100.59
Malta	2.45	4.81	-4.48	66.04
Slovakia	4.15	4.85	-3.83	35.58
Slovenia	3.96	5.12	-1.44	26.45
Eurozone	**2.09**	4.11	-2.66	69.92
Maastricht Criteria	**3.18**	**6.05**	**-3.00**	**60.00**
Cronbach's Coefficient (1983-1992, EMU-11)	**0.92**	**0.84**	**0.57**	**0.90**
Cronbach's Coefficient (EMU-16)	**0.94**	**0.95**	**0.93**	**0.85**

Source: Author's calculation

5.5.2 ASEAN

Inflation is the core of the MC, due to its risk in causing asymmetric shock. Table 26 shows that in 1990-1997, average inflation criterion was 4.53% and only Malaysia, Singapore,

[24] Finland, Germany, Ireland, Luxemburg, Netherlands, and Spain

and Brunei met the target figures. From 1998 to 2009, the average was 2.88% and only Thailand satisfied the requirements. This result seems to correlate with Cronbach's coefficient data from 1998-2009 (0.60), higher than from 1990-1997 (0.51).

Achieving a long-term interest rate is required to convince skeptical financial markets that inflation rates will stay low. Interest rate data for ASEAN from 1990-1997 shows that MC for ASEAN is 6.57%. Singapore, Brunei and Cambodia met it. For 1998-2009, the MC for ASEAN was 5.51%, and Malaysia and Thailand replaced Brunei. This result is in line with Cronbach's coefficient data, which, from 1998-2009 (0.84), is much higher and indicates better convergence than the period from 1990-1997 (0.58).

Table 26. Measurement Result: ASEAN (1990-2009)

Criteria	Period	MC	Average	Countries Satisfying	Cronbach's Coefficient
Inflation Rate	1990-1997	4.53	15.71	Brunei, Singapore, Malaysia	0.51
	1998-2009	2.88	8.75	Brunei, Singapore, Malaysia, Thailand	0.60
Interest Rate	1992-1997	6.57	9.22	Brunei, Singapore, Cambodia	0.58
	1998-2009	5.51	6.48	Singapore, Malaysia, Thailand, Cambodia	0.84
Exchange Rate	1990-1997		1542.3		0.58
	1998-2009		3753.6		0.44
Budget Deficit	1990-1997	<-3%	-0.55	Indonesia, Malaysia, The Philippines, Singapore, Thailand, Vietnam	0.03
	1998-2009	<-3%	-0.94	Indonesia, Singapore, Thailand, Brunei, Cambodia, Myanmar	0.40
Public Debt	1990-1997	<60%	77.84	Indonesia, Malaysia, Philippines, Thailand, Brunei	0.77
	1998-2009	<60%	57.90	Indonesia, Malaysia, Philippines, Thailand, Brunei, Cambodia, Vietnam	0.50

Source: Author's calculation,

The exchange rate condition in the MT requires member countries to demonstrate the ability to keep their exchange rate tied to the future monetary union currency. Table 15 shows that from 1990-1997, ASEAN countries experienced sharp depreciation in 1997-1998. Cronbach's coefficient in 1998-2009 was 0.44, lower than from 1990-1997, indicating weaker

convergence. Exchange rate criterion could not be applied since no benchmark currency was established.

A high government deficit creates an incentive to spur surprise inflation. If a government borrows to finance its budget deficit, the debt will increase. If it is unchecked, the budget deficit will create rapid money growth, and eventually, high inflation. For the purposes of meeting the MC, the deficit must be lower than -3%. From 1990-1997, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam met the criteria; from 1998-2009, Brunei, Cambodia, and Myanmar replaced the positions of Malaysia, the Philippines, and Vietnam in satisfying the criteria. Although Cronbach's coefficient in 1998-2009 was weak (0.40), it was better than in the period from 1990-1997 (0.03).

Criteria for the public debt ratio was created to enhance fiscal discipline, to avoid inflation being lowered temporarily so deficits can be made "good" in any given year. Table 15 shows that ASEAN performance in 1998-2009 was better than that in 1990-1997, in terms of average public debt and the number of compliant countries. In 1998-2009 the average public debt was 57.90 and seven countries met the criteria. However, from 1990-1997, the average public debt reached 77.84 and only five countries were compliant. Five members met the public debt criteria in the period from 1990-1997, and only Cambodia and Vietnam satisfied the requirements from 1998-2009. However, Cronbach's coefficient in 1998-2009 (0.50) is lower than 0.70 in 1990-1997, indicating weaker convergence.

Overall in the second period, only Thailand met all criteria. Malaysia, Singapore, Brunei, and Cambodia would probably pass. Malaysia closed to -3.0 in deficit criterion. Singapore

must make a concerted effort to meet debt criterion. Brunei and Cambodia were nearly satisfied the inflation criterion, but the others were far from passing.

The degree of convergence in the Eurozone indicated by Cronbach's coefficient data, is much higher in all criteria except for interest rates. In this area, we achieved the same result (0.84). Government deficit data (0.57) is comparable to ASEAN (0.40).

Inflation in the Eurozone (0.92) is much higher than that in ASEAN (0.60), as are exchange rates (0.98 versus 0.44), and debt (0.90 versus 0.50). The reason we see a higher degree of convergence in the Eurozone in the descriptive analysis, was relatively close figures in GDP per capita.

Table 27. Measurement Result: ASEAN Countries (1998-2009)

Countries	**Inflation**	**Interest**	**Exchange**	**Deficit**	**Debt**
Indonesia	13.82	14.66	9,289.38	-0.96	53.77
Malaysia	2.43	3.74	3.71	-3.31	42.67
Philippines	5.62	6.58	48.46	-3.43	58.98
Singapore	1.20	1.21	1.64	5.64	91.86
Thailand	2.73	3.38	39.05	-1.79	48.93
Brunei	0.52	5.59	1.64	6.11	6.80
Cambodia	5.21	3.65	3,971.37	-1.64	35.33
Laos	25.77	8.17	8,844.31	-4.72	107.48
Myanmar	23.48	10.56	6.00	-2.05	85.84
Vietnam	6.75	7.25	15,330.4	-3.22	47.33
Total	**8.75**	**6.48**	**3,753.60**	**-0.94**	**57.90**
MC	**2.88**	**5.51**		**-3.00**	**60**
Cronbach's Coefficient	**0.60**	**0.84**	**0.44**	**0.40**	**0.50**

Source: Author's calculation

Although De Grauwe (1996), Artus (1993) and Krugman (1992) argued the criteria in MT are neither necessary nor sufficient to create a successful monetary union, the EMU experienced a higher degree of nominal convergence, and the euro gained an early reputation for stability as one of the world's anchor currencies.

The EMU has some weaknesses when facing crises, especially in terms of asymmetric problems and business-cycle dependence, but the current crisis shows that countries currently most deeply are the countries in which failed to meet the MC.

Vines (2011) suggested that low inflation and interest rates led to rapid mobilization of financial flows across borders and induced a debt crisis. This condition was exacerbated by the limited power of the ECB to control financial circulation. A monetary union on one hand, without a fiscal union, required members to fall in line with SGP to reduce asymmetric shock. Thus, fiscal policy imposed constraints for government activity to neutralize the crisis.

Even considering the limitations of the MC, ASEAN can still take significant lessons from the guiding forces that allowed the euro to emerge as a strong currency and ensure price stability in the Eurozone. In terms of convergence, ASEAN conditions in 2009 were not as favorable for introducing a common currency, but this wasn't so different from the EU in 1992.

However, seven years after the MT was signed, 11 countries met the MC and the EMU was able to expand the number of members. Following in the footsteps of the EMU seemed difficult, because unlike the EU, , ASEAN has much more diversity in income among countries, a weaker financial sector, and a lack of political preconditions and constitutions (Madhur, 2002). However, signers of the ASEAN Concord II have committed to form a single market or reaching AEC by 2015. Based on empirical results, ASEAN in 1998-2009 was not significantly worse than EU in 1983-1992, as shown by Artus (1993) and Guldager (1996).

In terms of the relevant criteria, the inflation criterion will have to be significantly adapted if it is benchmarked on the "three best-performing member states in terms of price stability or lowest inflation rate." The only potential members are Brunei, Singapore, Malaysia, and Thailand.

Regarding deficit criteria, since ASEAN members were developing countries with the potential to grow deficits higher than 5%, if the deficit target of 3% were relaxed to 4%, it would be more applicable to ASEAN.

For the exchange rate criterion, since the currency gap value vis-à-vis the US dollar was huge, taking the Singapore dollar as the stable anchor was plausible; however, the band should be determined cautiously.

The current condition of the EMU gives an optimistic perspective for ASEAN, as shown in the study of Azali (2007). In early stages, to ensure stability, membership should be limited as suggested by Green (1994) and Xu, Ward and Gan (2007), particularly based on per-capita GDP.

Creating a monetary union establishes welfare reduction in Brunei and Singapore, as they should take into account the average preferences of others. For these reasons, MC could be useful for ASEAN, since it requires candidates to impose uniformity in inflation, interest rates, exchange rates, and budgets, which will help member countries when facing asymmetric shock.

The Eurozone crisis indicated that the countries hit hardest by the current crisis were those unable to meet MC. Clearly, if allowed into the union, the pressure for a bailout of these nations in the event of a default crisis will increases.

5.6 Conclusion

Several critiques addressed by Krugman (1991) and De Grauwe (1996) argue that the MC had very little to do with convergence and made little economic sense. Seventeen countries have joined the EMU, and the level of nominal convergence is very high (Cronbach's coefficient above 0.9). Still, it continues expanding as more countries determine that the benefits outweigh the costs of membership. Despite some limitations in facing the current crisis (Darvas, 2010), the euro , has evolved into a strong currency; combined with price stability in the Eurozone, this shows that the monetary and fiscal stability provided by the MC was a step in the right direction.

ASEAN has high convergence in term of interest rates, but in all criteria, the level of convergence was below the Eurozone's initial position. Given adapted criteria, when comparing countries satisfying the MC, we find conditions were not much different in the EU prior to the signing of the MT. Applying the MC to ASEAN countries shows Thailand meeting all criteria, and most countries satisfying budget criteria, indicating fiscal sustainability. Thus, the MC was adaptable to ASEAN, with some reformulation of nominal value, especially in inflation and interest rate criteria (revising the benchmark to average value).

Adopting the MC can be useful to impose stable macroeconomic performance, if ASEAN intents to create a deeper integration through a common currency. Similarity in variables associated with the MC can help member states enhance flexibility in a crisis, reduce cross-border contagion, and foster growth by promoting financial system soundness. These efforts must be guided by a strong supranational institution as a binding decision maker.

Although some difficulty arises in implementation due to weaker institutions, because of huge differences in GDP per capita, financial systems, and degree of market liberalization (Vanderon, 2005), ASEAN should not begin a deeper regional integration abruptly, as the EU did in the beginning of first stage of the MT.

At this stage, ASEAN still needs a stronger regional surveillance mechanism and should develop a trigger to accelerate the formation of a common currency. Implementing AFTA, accelerating the AEC, and increasing economic openness may be the roads to a common currency, guided by criteria similar to the MC.

Chapter 6 Assessing Determinants on Real Convergence and Growth

6.1 Introduction

ASEAN[25] may be starting to resemble the EU[26] in creating deeper economic integration. Some members of the EU—which consists of 17 member countries that comprise what is otherwise known as "the Eurozone"[27]—have been implementing a European Monetary Union (EMU) since 1999, while ASEAN's 10 member countries are still in the process of achieving a full free-trade zone.

To create the EMU, EU members needed to agree to surrender their authority over monetary policy and tighten their respective fiscal policies. Their agreement, signed in Maastricht, The Netherlands in 1991, had the primary aim of pushing member countries into nominal convergence, which would transform gradually into real convergence (Marelly and Signorelly, 2010).

The treaty consisted of several criteria, popularly called the Maastricht Convergence Criteria (MC). In line with this criteria, by signing a stability growth pact (SGP)[28], Eurozone members have agreed to continuously satisfy the MC, following the logic that wherever the euro is applicable, there had to be consistency of fiscal policy to match the single monetary policy.

[25] The Association of Southeast Asian Nations (ASEAN) consists of 10 members: Brunei, Cambodia,Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.
[26] The European Union (EU) consists of 27 members.
[27] "The area" refers to the countries that use the euro as a common currency.
[28] There is an agreement among the Eurozone countries to ensure the stability of the EMU by stressing the implementation of MC in the Eurozone (http://ec.europa.eu/economy_finance/sgp/index_en.htm).

Instilling deeper economic integration by creating a common currency was a good idea in terms of protecting the Eurozone from financial crisis and economic global uncertainty, and increasing its level of convergence; however, the recent financial crisis that hit the Eurozone in 2007-10 raised questions about the future of the EMU and the effectiveness of the criteria used to achieve convergence and spur growth.

Benassy-Quere and Boone (2010) point out that low growth in the Eurozone resulted from a lack of enforcement of MC compliance and misguided oversight. However, Irvin (2005) stresses that in the 1990s growth in the Eurozone was constrained as member countries tightened their budgets to meet MC, as a condition of joining the Eurozone.

Hein and Truger (2005) note that an incomplete synchronization of the business cycle across the Eurozone has also contributed to problems. ASEAN, intending to implement a full ASEAN economic community (AEC) by 2015—as announced at the Cebu Summit in January 2007 (Shimizu, 2010)—should consider the relevant macroeconomic policy lessons offered by the Eurozone, including the implementation of the MC there.

Among conditional variables determining convergence, changes in demographic structure played an important role in productivity and growth, as summarized in Bloom and Williamson (1998). These researchers proposed three main hypotheses about the impact of demographic variables on growth.

First were "population pessimists," who believe that rapid population growth is deteriorating because it tends to overwhelm, and induces technological progress and capital accumulation. Their second hypothesis centers on "population optimists," believing that rapid population growth allows countries to capture economies of scale and promote technological

and institutional innovation. The last group they identified was "population neutralists," who believe that changes in fertility and mortality imply very different changes in age distribution. Members of this group argue that population growth affects economic growth insofar as it affects the ratio of the working-age population to the dependent population.

In looking at the data, we find that generally, in 1990–2010, the real per-capita GDP and labor productivity of the Eurozone were US$29,054 and US$68,112, respectively—much higher than the ASEAN's figures of US$1,437 and US$19,957 (as calculated from the Unstat and Total Economic Database). However, ASEAN's real per-capita GDP grew three times faster (3.54%, compared to the Eurozone's 1.2%), and its labor productivity grew twice as fast (2.85%, compared to 1.35%).

Regarding unemployment rates, ASEAN's performance was better, as seen in the data: during this period it was 5.1% (WDI data), compared to 7.8% in the Eurozone (OECD data). Low income and productivity growth rates, as well as high levels of unemployment in the Eurozone compared to ASEAN, raises questions about the effectiveness of macroeconomic policy in the Eurozone, with respect to real convergence and growth.

The purpose of this study is to comparatively reassess the determinants of macroeconomic policy and demographic variables on convergence and growth, by comparing the Eurozone and ASEAN. Based on the data and the recent crisis in the Eurozone—more than a decade after the release of the Euro—we can evaluate the impact of macroeconomic policy, the MC, on real convergence and economic performance, by comparing a region that has implemented these criteria with one that has not.

To meet this objective, we use the β convergence approach of Barro and Sala-i-Martin (1992), Solow (1956), and other researchers to review the determinants of convergence and economic growth.

The study conducted by Soukiazis and Castro (2005) found that the macroeconomic policy of the MC has made contributions primarily by its restrictive rules vis-à-vis economic policy and institutional orientation. Castro (2010) addressed the impact of the MC fiscal criteria on growth, and found that the MC's and SGP's fiscal roles did not harm growth.

Lombard (2000) confirmed that the enforcement of MC has impeded reductions in unemployment. Azali et al. (2007), using an autoregressive distributed lag (ARDL) approach, shows a long-term relationship between variables in the MC and ASEAN growth. Mahmood and Sial (2012), also using ARDL approach, showed the importance of monetary and fiscal policies in determining economic growth.

To strengthen estimated results, we compared productivity and unemployment in these two economic zones. Difference-in-difference (DID) analysis was used to confirm differences between the Eurozone and ASEAN in the period after the euro was released. We also used the decomposition approach.

This study breaks research ground in the literature by comparing growth and convergence in income, productivity, and unemployment between a developed economic integration area (the Eurozone) and a developing one (ASEAN). Only Soukiazis and Castro (2005) have examined such issues, and even then, solely within the EU.

As part of a policy evaluation, the current study also seeks to confirm the benefits of imposing MC on a region, by comparing a region subject to MC to one that is not. Relative to

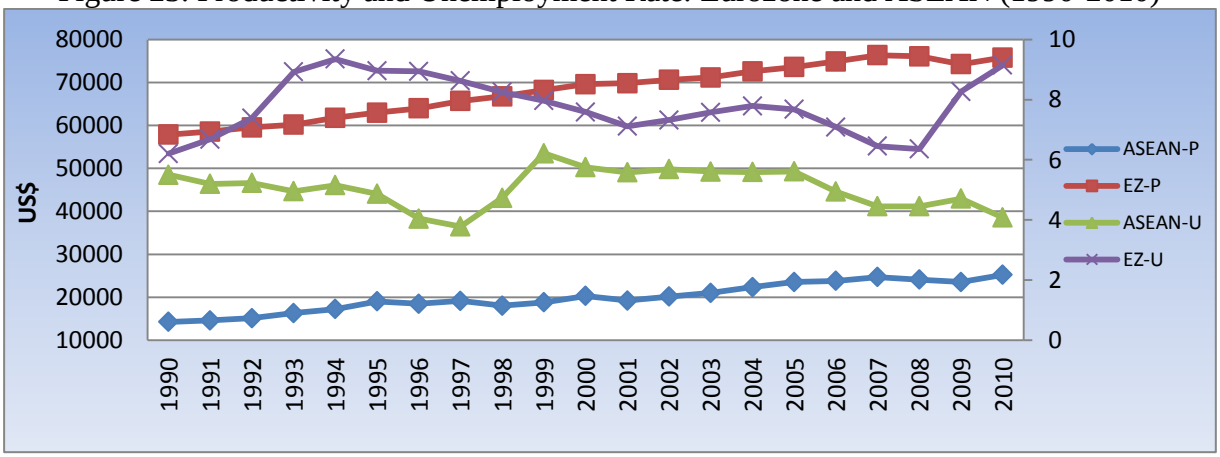
previous empirical studies, some improvements have been made; besides its use of the well-known β convergence approach, it also uses the DiD and decomposition approaches. The results will be beneficial in examining the sustainability of regional integration, based mainly on the Eurozone experience as an *ex ante* and *ex post* lesson.

6.2 Productivity, Unemployment, and Maastricht Variables

Before looking in-depth at convergence, it will be helpful to compare the income, productivity, and unemployment conditions in the Eurozone and ASEAN regions in the period from 1990–2010.

Figure 23 reports that productivity, or GDP over labor, in these two regions show upward trends. In the Eurozone, the initial level in 1990 was US$57,878, growing 31% to US$75,802 in 2010. In ASEAN, the 1990 figure was US$14,274 and the 2010 figure was US$25,240—a 77% increase.

Figure 23. Productivity and Unemployment Rate: Eurozone and ASEAN (1990-2010)

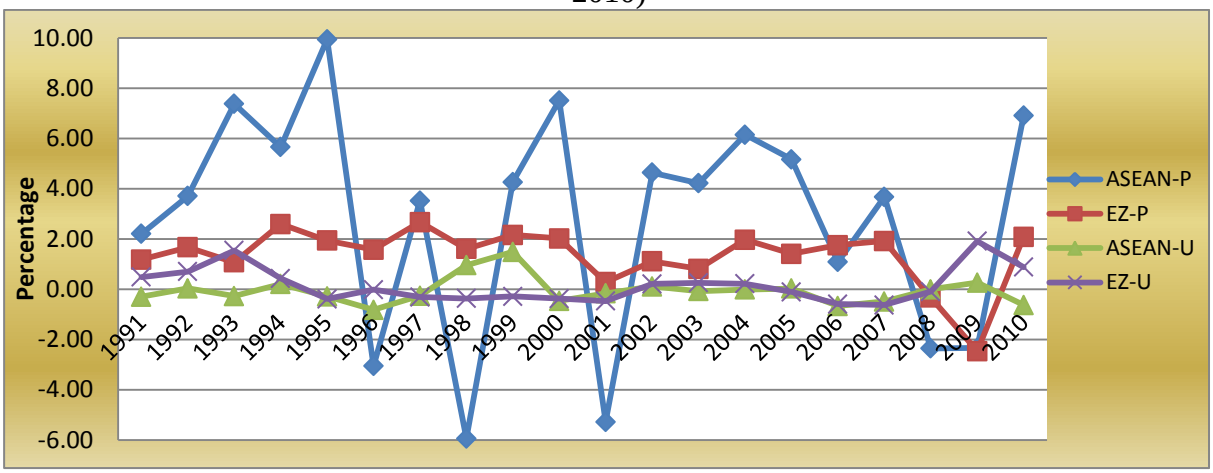


Note: EZ: Eurozone; P: productivity; and U: unemployment rate. The left axis indicates labor productivity and the right axis unemployment rate.
Sources: Productivity figures were taken from The Conference Board Total Economy Database™, September 2011, http://www.conference-board.org/data/economydatabase/, and Eurozone unemployment rate figures are from the OECD Stat online database, while those of ASEAN are from the World Bank, World Development Indicator (WDI).

Concerning the unemployment rate, the Eurozone generally had a higher unemployment rate (7.79%) compared to ASEAN (5.06%). Unemployment rates nonetheless fluctuated, with those in the Eurozone reaching their highest points in 1994 and 2010, and those in ASEAN reaching their highest point during the 1997–98 Asian economic crisis.

Figure 24 presents figures pertaining to growth in productivity and unemployment in these two regions. The increase of productivity in the Eurozone was more stable than ASEAN. In the Eurozone, the rate of growth ranges from a high of 2.59% in 1994 to a low of –2.47% in 2009. The ASEAN trend was more erratic: the top per-capita income growth rate was 9.94% in 1995, decreasing sharply to reach the lowest value just three years later (–5.94%).

Figure 24. Growth of Productivity and Unemployment Rate: Eurozone and ASEAN (1991-2010)

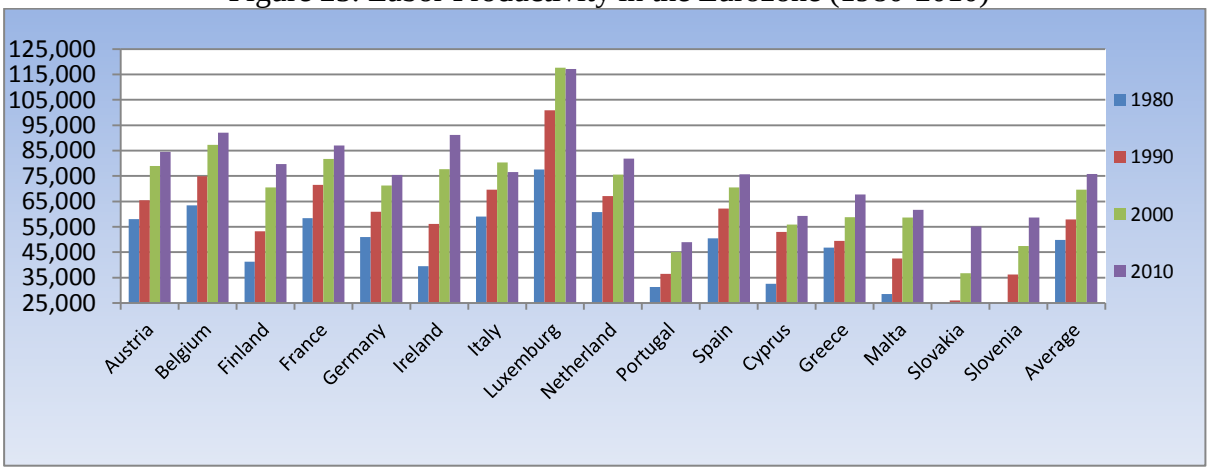


As also seen in Figure 24, unemployment rates were more erratic in the Eurozone than in ASEAN. ASEAN experienced its highest rate of unemployment growth (1.48%) in 1999, in line with drops in per-capita GDP and productivity. In the 1990–2008 period, ASEAN's lowest unemployment rate was in 1996 (–0.82%); the Eurozone suffered from high unemployment while ASEAN saw relatively low unemployment rates. The Eurozone's

highest unemployment rate (1.91%) was seen in 2009, in line with the debt crisis the region experienced.

Figure 25 describes each Eurozone country's productivity. The data suggest a growing trend of productivity in the Eurozone, with slight declines in the last two years, during the recession suffered by some Eurozone countries.

Figure 25. Labor Productivity in the Eurozone (1980-2010)



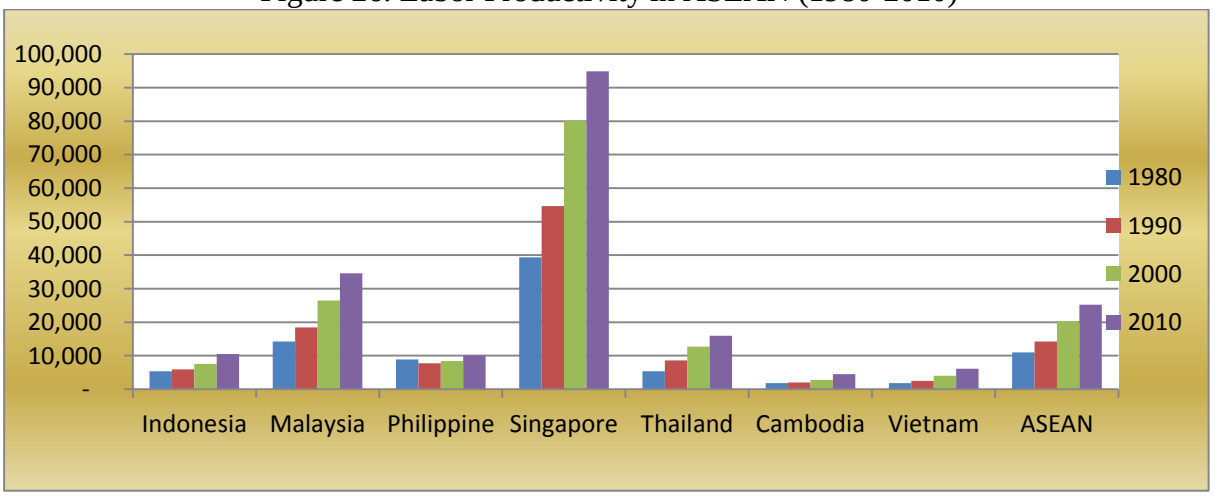
Source: The Conference Board Total Economy Database™, September 2011, http://www.conference-board.org/data/economydatabase/

During 1980-2010, Luxembourg (104,454) enjoyed the highest labor productivity, while Slovakia (37,534) had the lowest. Ireland demonstrates the highest productivity growth (83%) and Italy the lowest (26%). The ASEAN data in Figure 26 suggests that Singapore was by far the highest productive country in ASEAN. On average, ASEAN labor productivity was 15,512; Singapore had the highest (66,506), and Cambodia the lowest (2,612).

This graph shows a huge gap, especially between Singapore and other member countries, which reflected wide differences among countries in competitiveness, even with similar, and competing, natural resource endowments and exports, and low technological capabilities. The graph shows that Vietnam had the highest growth of productivity, starting with only 1,848.

Recent years, labor productivity in Vietnam is 6,154, more than tripling. By contrast, the growth rate of productivity in the Philippines was the lowest in the area. In 1980, its productivity was 8,914, and now it is only 10,179; it only grew by 13.26%.

Figure 26. Labor Productivity in ASEAN (1980-2010)



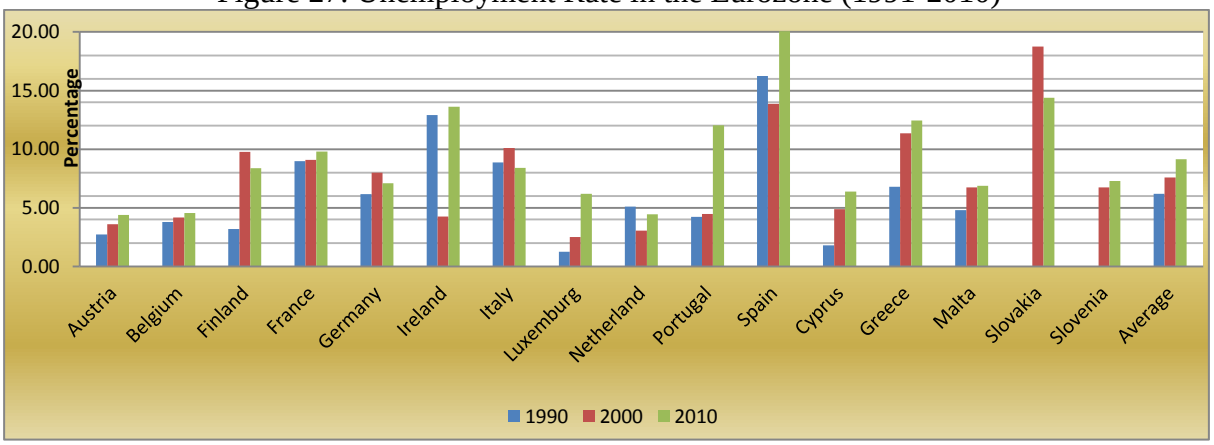
Source: The Conference Board Total Economy Database™, September 2011, http://www.conference-board.org/data/economydatabase/

Clearly, average labor productivity of the Eurozone (63,543) was much higher than ASEAN (15,512)—indeed, more than four times higher—but ASEAN has twice annual average growth at 2.83% of it in the Eurozone (1.41%). In the analysis period, the Eurozone grew 42.36% while ASEAN grew 84.8%. Luxembourg had a 69,919-point difference with Slovakia, the lowest.

In ASEAN, the productivity gap was huge. Singapore had a 63,814-point difference with Cambodia, the lowest; however, gap rapidly narrowed with huge growth, especially in the CLMV countries, the new emerging market. Analysis of these determinant variables for productivity convergence may produce surprising results.

Unemployment disparities are often perceived as constant, caused by stable equilibrium differentials among regional unemployment rates. Labor market adjust toward equilibrium in the long-run; the convergence of regional unemployment rates was a stabilizer stabilized as unemployed workers took jobs in other areas, or as capital was infused into a low-wage region to take advantage of lower labor costs (Blanchard and Katz, 1992). However, if the speed of adjustment was slow, unemployment disparities might arise as a result of negative demand shocks, which affect some regions more than others.

Figure 27. Unemployment Rate in the Eurozone (1991-2010)

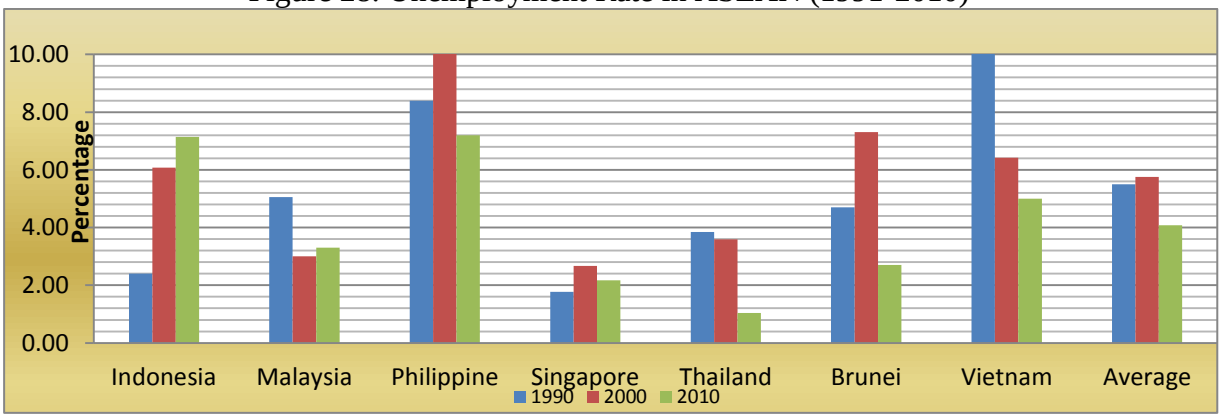


Source: OECD Stat online database

As seen in Figure 27, the initial Eurozone unemployment rate was 6.20%, with Spain as the highest (16.24%). On average, Spain has the highest unemployment rate (15.75%) and Luxembourg the lowest (3.4%); the Eurozone average was 7.9%. This is in line with the findings of Ljungqvist and Sargent (2008), indicating that in Europe, after the 1970s, unemployment became persistently higher. Unemployment in Spain and Ireland declined rapidly at the end of the 1990s, but increased when the crisis hit. Spain reached peaks in its unemployment rate in 2010 and the early 1990s, both times above 20%.

The data in figure 28 show that the unemployment rate was persistently high in the Philippines, fluctuating between 7 and 12%, and it was consistently low in Thailand, fluctuating around 2%. Overall, the average unemployment rate in ASEAN was 5%, with Philippine (9.5%) as the highest and Thailand (2.4%) as the lowest.

Figure 28. Unemployment Rate in ASEAN (1991-2010)



Source: World Bank, World Development Indicator (WDI)

By comparison, unemployment rate in the Eurozone (6.2%) was higher than in ASEAN (5%). The yearly growth rate in the Eurozone was 2.1%, while in ASEAN, it was -0.9%. The performance of the ASEAN unemployment rate was clearly better than in the Eurozone; during 1991-2010, the ASEAN unemployment rate decreased 17.9%, in contrast with the Eurozone, which increased 39.73%. The contrast was caused by increased investment in ASEAN countries as an emerging market, and by problems in creating a common Eurozone currency, such as difficulties synchronizing monetary and fiscal policy, difference welfare states, varying wages among countries and different well-organized labor movements. The gap in the Eurozone, between Luxembourg as the lowest with Spain (12.4 points) was also higher than it in ASEAN (4.62 points) between Thailand and Vietnam.

In January 2002, the Euro was released. The MC became fundamental in ensuring the stability of this new currency in the region, which meant that compliance among member countries was essential. In assessing member countries' MC compliance, we sought to measure the current conditions of the Eurozone based on MC requirements. Averaged data from 2002–10, seen in Table 28, paints a picture of the initial status of each potential member prior to unification.

Table 28. MC in the Eurozone (2002–10)

Countries	**Inflation**	**Interest**	**Deficit**	**Debt**
Austria	1.85	4.03	–2.38	61.54
Belgium	2.04	4.05	–1.62	92.50
Cyprus	2.68	4.87	–2.86	62.54
Finland	1.43	3.97	2.05	37.82
France	1.72	3.96	–4.12	54.88
Germany	1.51	3.80	–2.51	40.59
Greece	3.31	4.99	–7.97	114.78
Ireland	2.24	4.49	–5.30	31.05
Italy	2.10	4.30	–3.53	99.69
Luxembourg	2.21	3.65	0.76	4.30
Malta	2.35	4.79	–4.47	65.81
Netherlands	1.78	3.94	–1.86	44.39
Portugal	2.24	4.36	–3.32	68.01
Slovakia	4.06	4.74	–4.34	33.12
Slovenia	3.73	4.93	–1.86	27.64
Spain	2.71	4.14	–2.30	39.41
Eurozone	**2.37**	**4.31**	**–2.85**	**54.88**
MC	**3.05**	**5.90**	**–3.00**	**60.00**

Source: Author's calculations

Judging on the inflation criterion, only Slovakia and Slovenia were unable to satisfy the MC; their inclusion in the zone occurred quite late. In terms of the interest-rate criterion, all members satisfied it. With respect to fiscal policy, in looking at the deficit criterion, France, Greece, Ireland, Italy, Malta, Portugal, and Slovakia failed to comply. When evaluating debt, Belgium, Cyprus, Greece, Italy, Malta, and Portugal satisfied the arbitrary "60% debt-over-GDP ratio" criterion.

Despite the fact that some members were unsuccessful in satisfying various MC, on average, the Eurozone as a whole satisfied all requirements. However, when looking at the causes of the most recent crisis in Europe, it is clear that noncompliance with the MC—especially fiscal criteria—has played a part. For instance, this may explain why Greece had so much difficulty recovering from the current crisis.

Based on descriptive data, the Eurozone is more stable than ASEAN in terms of productivity growth, but the former showed more volatile unemployment rates. When evaluating for MC compliance, almost all members fulfill the monetary criteria, but many members have been unable to satisfy the fiscal criteria.

6.3 Descriptive DiD and Decomposition

To strengthen the econometric results and best depict income, productivity, and employment, we employed DiD analysis to determine the impact of deeper regional integration (i.e. through the introduction of the euro) on productivity and unemployment growth.

The outcome can be calculated by computing a double difference: one over time (before and after) and one across subjects (between beneficiaries and non-beneficiaries). This method is more feasible than any based on a single difference (either over time or between groups), since examining differences only between beneficiaries and non-beneficiaries will not reveal the effects of intervention as readily as examining differences in one group across time.

Based on the approach used by Baskaran (2009), we have analyzed the impact of the release of the euro; however, we have analyzed the period before and after the release, with

two different subjects: the Eurozone (beneficiaries) and ASEAN (non-beneficiaries). We do s, using the following formula:

$$(6.1)\ \hat{\Delta} = (\bar{Q}_{eurozone,aftereuro} - \bar{Q}_{eurozone,beforeeuro}) - (\bar{Q}_{ASEAN,aftereuro} - \bar{Q}_{ASEAN,beforeeuro}),$$

In which Δ is the DID result and *Q* is a calculated variable. (The calculated variables in this study were per-capita GDP, productivity, and unemployment).

Table 29. Descriptive DID Estimates of the Impact of the Euro on Income, Productivity, and Unemployment Growth
(Annual average growth rates, in percentage points)

Region	**Real Per-Capita GDP**			**Productivity**			**Unemployment**		
	1993–2001	2002–10	DID	1993–2001	2002–2010	DID	1993–2001	2002–10	DID
Eurozone	1.86	0.53	–1.33	1.79	0.93	–0.86	–0.12	3.37	3.49
ASEAN	2.85	4.19	1.35	2.86	3.11	0.26	1.76	–3.21	–4.97
DID	–0.99	–3.66	–2.67	–1.07	–2.19	–1.11	–1.88	6.58	8.45

Note: For the Eurozone, data exclude Cyprus, Malta, Slovakia, and Slovenia. For ASEAN, productivity figures exclude Brunei, Laos, and Myanmar, and unemployment figures exclude Cambodia, Laos, and Myanmar.
Source: Authors' calculations.

The implementation of a common currency (in this case, the euro) should be guided by policy, in order to guarantee stability. The MC, followed by SGP, were tools used to ensure the stability of the euro; however, the use of restrictive policy is not without risk. Therefore, we applied this approach, but added an econometric test.

Based on Table 29, looking at the real per-capita GDP results, Column 1 shows that the two regions did not differ much in terms of income growth in the decade before the euro was released; however, ASEAN had 0.99-percentage-point higher income growth than the Eurozone, and that difference grew 3.7-fold in the decade following the euro's release (–3.66%).

The importance of double differencing can be more fully appreciated if the table is read in rows, rather than columns. The first row suggests that Eurozone membership has no real

benefit: the average income growth in the Eurozone decreased –1.33 percentage points, while that of ASEAN countries increased by 1.35 percentage points. This results in an overall difference between the two regions of –2.67 percentage points.

One explanation is that delivering monetary policy to the European Central Bank (ECB), and tightening fiscal policy, made it difficult for each Eurozone member to avoid the crisis and induce growth. Fiscal federalism does not allow for addressing regional and structural asymmetries as stressed in the SGP; therefore, income growth slowed.

ASEAN policy is often used to encourage a free-trade area. One example is the ASEAN Concord II in 2003, with its goal of forming a single market. Additionally, ASEAN has, in total, a 2.67-percentage-point higher growth rate than the Eurozone, as a result of not implementing a common currency—an act that comes with the consequence of policy constraints.

In the area of productivity growth, Column 2 in Table 29 shows a significant difference between the two regions in the decade before the euro was released (–1.07 percentage points); that gap doubled in size in the decade after its release (–2.19 percentage points). If the table is read by rows, the first row suggests that the release of the euro was relatively ineffective in promoting productivity: there was a 0.86-percentage-point decrease in the Eurozone, while ASEAN productivity increased by 0.26 percentage points during that time.

The annual productivity growth in the Eurozone-12 has not successfully increased since the release of the euro. During the period from 2002-10, it was clear that the countries joining the Eurozone were significantly less economically successful than the ASEAN countries, which did not share a common currency—the two areas showed opposing trends. The DID

rating is 1.11, showing that ASEAN—which none of the economic policy restrictions that come with a common currency—performed better in all periods, with a growth rate 1.11-percentage points higher.

Unemployment conditions are reported in Table 29. Before the release of the euro, the Eurozone had negative unemployment growth (–0.12 percentage points), higher than ASEAN (–1.76 percentage points). Later, the opposite condition occurred: the Eurozone suffered from high growth in unemployment rates and ASEAN experienced large unemployment rate reductions.

Examining this table by row, we see that the introduction of the euro was painful for the Eurozone, as economic performance vis-à-vis unemployment worsened (i.e., increasing 3.49 percentage points). The "big picture" of the Eurozone was considerably worse than that of ASEAN, whose members did not share a common currency. ASEAN performed very well, with a negative unemployment growth of 3.21 percentage points—quite different from the 4.97 percentage points of the previous period. The overall difference was 8.45 percentage points, indicating that ASEAN's unemployment performance was much better than the Eurozone.

To acquire a comprehensive understanding of the variables investigated, we use the same decomposition approach as Bloom et al. (2010) to determine the link between per-capita GDP (Y/N) and demographic factors:

$$\frac{Y}{P} = \frac{Y}{L}\frac{L}{WA}\frac{WA}{P}$$

In this identity equation, WA represents the working-age population. The identity states that the level of income per capita equals the level of income per worker times the labor participation rate (L/WA) times the ratio of working-age to total population (WA/N). Defining:

$$y = \ln(\frac{Y}{P}), lp = \ln(\frac{Y}{L}), pr = \ln(\frac{L}{WA}), wa = \ln(\frac{WA}{P})$$

So the identity could be:

$$\ln y = \ln lp + \ln pr + \ln wa$$

Totally differentiating the identity, we see that the growth rate of income per capita equals the growth of income per worker plus the growth of labor participation plus the growth of the ratio of working-age to total population. That is:

$$\Delta \ln y = \Delta \ln lp + \Delta \ln pr + \Delta \ln wa$$

Or

$$(6.2) g_y = g_{lp} + g_{pr} + g_{wa}$$

Based on equation (6.2), we divided the analysis into two periods (i.e., 1993–2001 and 2002–09) and compared the Eurozone and ASEAN.

Table 30. Real Per-Capita GDP Decomposition
(Annual average growth rates, in percentage points)

	Eurozone		**ASEAN**	
	1993–2001	2002–09	1993–2001	2002–09
Real per-Capita GDP	2.27	1.19	3.36	3.19
Decomposition				
Labor Productivity	1.79	0.78	2.86	2.61
Participation Rate	0.36	0.36	–0.08	–0.04
Working Age to Population	0.13	0.04	0.58	0.62

Note: Authors' calculations and annual average growth rates in percentage points.

Table 30 reports that income growth in ASEAN, as supported in the descriptive and DID analyses, was higher than that in the Eurozone in all periods. In the first period, the income growth in ASEAN was higher, supported mainly by productivity. The participation rate in the labor force declined slightly, since a few subsets of the working-age population chose education over industry.[29] Working age contributed positively, since high population growth, a result of ASEAN's high birth rate in the early 1980s, had translated into a larger working-age population.

In the second period, income growth in ASEAN decreased slightly due to lower productivity growth, but it was still higher than the Eurozone. The participation rate improved by 0.04 percentage points, the same amount as the working-age population.

The growth of per-capita GDP in the Eurozone was also supported by productivity growth; when productivity growth dropped sharply (by more than half) in the second period, per-capita GDP also decreased. The participation rate did not change in either period, but the number of working-age people decreased 0.09 percentage points, contributing to lower income growth. These results underscore the important contribution of productivity to per-capita income, as discussed by Bloom et al. (2010).

The decreasing trend in the ASEAN participation rate suggests the development of middle and higher-level education systems in ASEAN is pushing working-age people to continue education, rather than joining the workforce. Since the Eurozone faces the long-term problem of an aging population, the contribution of the working-age population was close to zero, especially after the 1990s. It will be difficult for any country in this position to support

[29] In some cases—for example, Indonesia—policies require individuals to complete a minimum of nine years of schooling.

growth. Unlike in ASEAN, where an increase in the number of working-age people, and their inclusion in the working-age job market, will support further growth in the region.

Through equation (6.2), we can derive definitions for per-capita income, productivity, participation rate, and working-age population. The analysis used to compare the Eurozone and ASEAN was divided into two periods, 1993–2001 and 2002–09. Since labor productivity played an important role in supporting welfare, or per-capita income (Table 19), by reformulating Blanchard's (2004) approach as equation (5.3), we can further analyse productivity by focusing on labor conditions in the 2001–08 period. We start with an accounting identity that links income per labor, or labor productivity, (Y/L) to income per hours worked (Y/HW):

$$\frac{Y}{L} = \frac{Y}{HW}\frac{HW}{P}\frac{P}{WA}\frac{WA}{L}$$

This identity states that the level of productivity equals the level of income per hours worked (Y/HW) times hours worked per population (HW/P) times the ratio of population per working age (P/WA) times the ratio of working-age to total labor (WA/L). Defining:

$$\ln lp = \ln(\frac{Y}{L}), \ln yh = (\ln \frac{Y}{HW}), \ln hp = (\ln \frac{HW}{P}), \ln pwa = \ln(\frac{P}{WA}), \ln wal = \ln(\frac{WA}{L})$$

So the identity will be:

$$\ln lp = \ln yh + \ln hp + \ln pwa + \ln wal$$

By differentiating the identity, we see that the growth rate of labor productivity equals the growth of income per hours worked plus the growth of hours worked per population plus

the growth of the ratio of population to working-age and plus working age to total labor. That is: $\Delta \ln lp = \Delta \ln yh + \Delta \ln hp + \Delta \ln pwa + \Delta \ln wal$

Or

$$(6.3) g_{lp} = g_{yh} + g_{hp} + g_{pwa} + g_{wal}$$

Table 31. Productivity Decomposition: 2001–08
(Annual average growth rates, in percentage points)

	Eurozone*	ASEAN**
Labor Productivity	1.39	5.88
Decomposition		
GDP per Hours Worked	1.64	4.11
Hours Worked per Population	0.51	0.47
Population Divided by Working Age	–0.02	1.13
Working Age Divided by Labor	–0.75	0.16

*Note: *Refers to all members of the Eurozone except Malta; **refers to Indonesia, Malaysia, Philippines, and Singapore, due to data limitations.*

Looking at the first row, during 2001–08, both regions saw an increase in labor productivity. The ratio of working-age growth over labor was growing positively in ASEAN, but it was negative in the Eurozone. The difference could derive from the fact that many working-age ASEAN people chose to pursue educational opportunities rather than entering the labor market, the opposite scenario from the aging Eurozone.

Population divided by working age also grew negatively in the Eurozone, but it was positive in ASEAN, due to a falling mortality rate. In terms of hours worked per population, ASEAN experienced lower growth. To some extent, this was caused by higher population growth in ASEAN, as explained previously.

Finally, the increase in labor productivity almost completely accounted for the increase in GDP per hours worked. We can infer that ASEAN workers enjoyed a very high wage

increase (4.11 percentage points) compared to their Eurozone counterparts (1.64 percentage points).

6.4 Theoretical Framework, Data and Model Specification

6.4.1 Convergence

The main purpose of this study is to investigate real convergence in the Eurozone and ASEAN, as determined by macroeconomic policy related to MC variables. To achieve this end, we borrow a popular neoclassical model of economic growth, the Solow model.

The study of β convergence is flourishing, as it derives directly from the different rates of convergence among various countries in the world, indicating that both poor and rich countries converge toward a steady state (Barro and Sala-i-Martin, 2004). This approach is used to predict unconditional and conditional convergence.

Unconditional convergence derives from standard neoclassical growth theory, and relates to diminishing returns on capital properties (Solow, 1956). It occurs when countries are similar in every respect—with the exception of initial capital stocks, in which case, poorer countries will grow more quickly than wealthier ones. All countries are assumed to have access to identical preferences in technology, population, and investment, but differ in their initial per-capita incomes, and in the access support used to foster the process and grow more quickly. Under such conditions, there is no suggestion that policies determine economic growth.

Based on some studies, unconditional convergence exists only when countries have the same level of economic homogeneity. Following Barro and Sala-i-Martin (1992), the typical unconditional convergence equation could be:

$$(6.4)\ln y_{i,t} - \ln y_{i,t-1} = \alpha + \beta \ln y_{i,t-1} + v_{i,t}$$

where y is the real per-capita GDP, α is the constant variable, β is the coefficient indicating convergence, t indicates the time interval, $(t - 1)$ is the initial of the time interval, and v indicates the error term. To capture the level of unconditional convergence using the β convergence term, we test the hypothesis that:

$$H_0 = e^{gt} = y^{\beta}{}_{t-1}$$

where e is the exponential and g is the growth.

$$gt = \ln y_t - \ln y_{t-1} = \Delta \ln y_t$$
$$\Delta \ln y_t = \beta \ln y_{t-1}$$
$$\Delta \ln y_t = (1+\beta) \ln y_{t-1}$$

The hypothesis suggests that unconditional convergence holds when the coefficient of the initial dependent variable is negative and between 0 and –1. If $\beta > 0$, then y_t will increase enormously, as if $\beta < -1$.

Conditional convergence derives from the new endogenous growth theory, which stresses the importance of not only physical capital, but also human capital and innovation as determinants of convergence (Barro and Sala-i-Martin, 2004). Conditional convergence occurs if we control for the determinant of the steady state by relaxing the assumption of diminishing returns to reproducible factors such as human and physical capital accumulation. By relaxing the assumption, the growth becomes endogenous, depending on investment

decisions that can be determined by policies and institutions. Conditional convergence (i.e., conditional on the steady state) implies that there is a negative partial correlation between the growth rate and the initial level of per-capita income. In this context, unconditional convergence is not the rule.

When underlying differences in technological progress and other factors are controlled in the convergence equation, the initial value of per-capita income is found to be strong and significantly negative, and the theory predicts faster growth for economies that have not yet reached their steady-state value. Since determinants of economic growth differ across countries, Barro and Sala-i-Martin (1992) favor the notion of conditional convergence. The policy and institutional variables in the conditional convergence equation are used as proxies for differences in country steady-state per-capita GDP level. The general model for analysis could be:

$$(6.5)\ \ln y_{i,t} - \ln y_{i,t-1} = \alpha + \beta \ln y_{i,t-1} + \gamma X_{i,t} + v_{i,t}.$$

In terms of equation (6.5), a significantly negative β greater than –1 implies that convergence holds conditionally when $\gamma \neq 0$. Bassanini and Scarpetta (2001), investigating OECD countries, summarized a number of studies asserting that the condition factors of convergence include the accumulation of physical and human capital, research and development, macroeconomic policy-making, financial development, and international trade.

Barro and Sala-i-Martin (1992) concluded that the benchmark rate of convergence based on cross-country studies is about 2% per year; however, panel analysis has shown that the rate of growth was actually higher.

A vast number of studies investigate income or productivity convergence in either the Eurozone or ASEAN. Ismail (2008) found conditional convergence in the ASEAN-5 and showed that ASEAN had a role in improving its own growth. Chowdhury (2005) found an absence of convergence in ASEAN in a different study period, which was attributed to missing trade links—a circumstance not conducive to long-term economic growth, and perhaps a contributor to weak governance among some ASEAN countries.

Vojinovic and Prochniak (2009) confirm the existence of unconditional convergence in the EU-10 countries, while Kaitila (2005) found conditional convergence of labor productivity in the EU-15. The latter's finding confirms that higher investment, lower public consumption, and lower inflation each contribute positively to growth, but deeper European integration is thought to accelerate growth whenever inflation is not part of the equation.

Kaitila (2005) also found conditional convergence among eight central and eastern European countries in 1993–2002, and suggested that higher investment and public consumption supported growth in the area. Bijsterbosch and Kolasa (2010), investigating productivity convergence in Central and Eastern Europe, pinpoint the existence of convergence and the impact of foreign direct investment inflows.

6.4.2 Maastricht Criteria

The use of the MC as control variables is based on the policy aim of achieving nominal then, gradually, real convergence (Marelly and Signorelly, 2010). The Maastricht Treaty, signed in 1991, contains some criteria from the Optimum Currency Area (OCA) theory. Mongelli (2005) summarizes the properties of OCA, based on many empirical studies: price

and wage flexibility, labor market integration, factor market integration, financial market integration, the degree of economic openness, the diversification of production and consumption, similarities in inflation rates, fiscal integration, political integration, and similarity of shocks.

OCA is defined as the optimal geographic domain of a single currency, or of several currencies whose exchange rates are irrevocably pegged and might be unified. This definition is based on the work of Mundell (1961), who first introduced the concept of OCA. The Maastricht Treaty was signed based on the principles of gradualism and convergence criteria. The criteria capture some of the OCA properties, although the treaty has placed more emphasis on macroeconomic convergence criteria. The main reason for this emphasis was to diminish asymmetric shock and increase similarities in policy responses to shock. De Grauwe (2009) explains:

Inflation Convergence

Inflation Convergence criteria were included in the treaty based on the fear that a future monetary union would have an inflationary bias. Before the EU started, candidate member countries were asked to commit to an inflation rate as low as the member countries with the lowest rate.

During this process, a temporary increase in unemployment was inevitable (i.e., a movement along the short-term Philips curve). Self-imposed suffering served as additional evidence that potential member states were serious about fighting inflation. Once they achieved low inflation rates, they could be safely granted membership. When a common

central bank captures the monetary policy of each member, it should reflect the average preference of the participating countries.

Interest Rate Convergence

The justification for this criterion is that excessively large differences in interest rates could lead to large capital gains and losses. Suppose a country wanted to enter the monetary union, but at the moment of entry, its interest rate was higher than the monetary union zone. As a result, it would be quite attractive for bondholders to sell low-yield monetary union bonds and buy high-yield candidate country bonds. Thus, economic agents holding monetary union bonds would see capital losses, and economic agents holding candidate members' bonds would see capital gains; either could create disturbances in national capital markets.

Exchange Rate Convergence

The main motivation for this criterion is to prevent countries from manipulating their exchange rates to force entry at a more favorable exchange rate (i.e., a depreciated one, which could increase their competitive position).

Budgetary Convergence

High government debt creates an incentive to engineer surprise inflation. Suppose a member country has long-term bonds with an interest rate fixed in a previous period, based on prevailing inflation expectations. If the government were to create unexpectedly higher inflation rates, the real value of these bonds would erode, and the bondholders would derive insufficient compensation, because the interest rate on their bonds would not reflect this inflation upsurge.

A monetary union between low- and high-debt countries creates a problem for the low-debt country. In the union, the low-debt country will be confronted with a partner with a tendency to push for more inflation. As long as one country has a higher debt-to-GDP ratio, it will have an incentive to create surprise inflation. As a result, the low-debt country stands to lose, and force the high debt-to-GDP ratio country to reduce it. Once this is achieved, the incentive to produce inflation disappears, and the candidate country can be safely allowed into the union.

Relationship between MC and Growth and Convergence

Soukiazis and Castro (2005) investigated the relationships between MC and the convergence variables of of income, productivity, employment, investment, and unemployment in the EU-15; they found that for income, there was no absolute convergence; reducing the deficit was beneficial to the convergence process; and inflation was significant to growth. As with income, there was no absolute convergence in productivity in the Eurozone, but conditional convergence existed when the equation was controlled by MC. Together, the MC have a significant influence on productivity growth and inflation, the latter the only variable to have a consistent negative influence on productivity growth. Also, in using the MC as control variables, they found that the EU's unemployment converged both unconditionally and conditionally.

A budget deficit has a negative influence on unemployment growth, and Afxentiou and Serletis (2000), using the ordinary least squares (OLS) approach, uncovered the significance of the MC in promoting economic growth. Papaioannou (2010), investigating the influence of SGP criteria, found that inflation has a significant negative impact on growth; neither deficit

nor debt has any impact. He also found that fulfilling SGP criteria has a positive and significant effect on unemployment.

Savona and Viviani (2003) suggest that an indifferent budget deficit between current and investment spending limited growth; that public investment contributed positively; that a high interest rate slowed economic growth; that openness was good for growth; and that capital formation benefitted growth.

Baskaran (2009), using the DiD approach, found that joining the EMU had an influence on GDP growth, but no impact on unemployment. Castro (2010), using a dynamic fixed-effect panel, found conditional convergence in the EU, and that conversion to the euro was not harmful to growth. He also found that variations in inflation have an impact on growth, but only in the long term. Lombard (2000) confirms that the imposition of the MC impedes reductions in unemployment. Finally, Azali et al. (2007), using the ARDL approach, showed the long-term relationship between variables in the MC and ASEAN growth. Brauninger and Pannenberg (2002), estimating the relationship between unemployment and productivity growth by use of an augmented Solow model, found that an increase in unemployment reduces the long-term productivity level, if unemployment has an effect on labor efficiency.

Some researchers have also tried to estimate the determinants of unemployment. Ljungqvist and Sargent (2008), investigating the reason for systematically high unemployment in Europe, found that Europe has strong employment protection and generous unemployment insurance provisions. Tyrowicz and Wojcik (2010), using the β convergence approach, found no unconditional unemployment convergence. They also found rural locations not to be significant, the youth percentage to be significant, and the percentage of

individuals over the age of 50 to contribute negatively. Bassanini and Duval (2006), using panel equations and investigating some macro-level variable shocks, found a significant impact on unemployment from total factor productivity shock, as well as the terms of trade shock, interest rate shock, and labor demand shock .

6.4.3 Relation Demographic Variables with Growth and Unemployment

Demographic change has been relatively neglected in the literature. Changes in demographic structure of the workforce will lead to changes in aggregate human capital, in the form of experience. Bloom and Williamson (1998)explained thata rise in working age, brought about by a decline in the fertility rate, can increase income per capita, because output per worker remains unchanged, but the number of youth dependents declines.

Bloom and Williamson (1998) summarized three main hypotheses about the impact of demographic variables on growth. First were “population pessimists,” who believe that rapid population growth is deteriorating because it tends to overwhelm, and induces technological progress and capital accumulation, as proposed by Coale and Hover (1958) and Ehrlich (1968).

Their second hypothesis centers on “population optimists,” as proposed by Boserup (1981), Kuznets (1967) and Simon (1981), who believe that rapid population growth allows countries to capture economies of scale and promote technological and institutional innovation.

The last group they identified was “population neutralists,” who believe that changes in fertility and mortality imply very different changes in age distribution, as discussed by Kelly

and Schmidt (1995). Members of this group argue that population growth affects economic growth insofar as it affects the ratio of the working-age population to the dependent population.

Population growth attributable to improvements in longevity among the elderly should have an immediate negative effect on economic growth, implying more elderly dependents to support. Population growth attributable to a general decline in mortality has no effect, because the ratio of the economically active population to dependents stays the same. Population growth attributable to a rise in fertility should have an immediate negative effect on economic growth given the presence of more mouths to feed, as should population growth stemming from a fall in infant mortality. These latter demographic effects will, however, have a delayed positive impact on economic growth, because the economically active population will boom two decades later.

Bloom, Canning and Sevila (2001) showed that an increase in the working age can produce deviation to economic growth; Kogel (2001) found a relationship between total factor productivity and dependency ratio; Persson (2002) found that the age structure of the entire population affects output; and Sarel (1995) implied the age structure of the population has a significant effect on output.

Feyrer (2007) indicated that changes in workforce have a strong and significant impact on the growth rate of productivity, and dependency ratio has no influence on productivity. Bloom and Finlay (2009) found significant changes in demographics leading to East Asian growth and labor force growth has a significant and positive influence on growth, as do working age population and life expectancy. Bloom, et. al, (2010), investigating the impact of

demographic change on growth, found that conditional income convergence existed both in China and India, where working age has a positive impact on growth and life expectancy.

Brauninger and Pannenberg (2002), estimating the relationship between unemployment and productivity growth with an augmented Solow model, found that an increase in unemployment reduces the long-run level of productivity, if unemployment has an effect on labor efficiency.

Some researchers also tried to estimate the determinants of unemployment. Ljungqvist and Sargent (2008), investigating the reasons for systematic high unemployment in Europe, found that Europe has strong employment protections and more generous unemployment insurance. Biagi and Lucifora (2008), using panel estimation, showed a significant contribution from the 15-24 age group on unemployment.

Tyrowicz and Wojcik (2010), using the β convergence approach, found no unconditional unemployment convergence. They also found that rural areas were not significant, the youth percentage was significant, and the percentage of people over 50 contributed negatively. Bassanini and Duval (2006), using a panel equation to investigate macro variable shocks, found that total factor productivity shock, terms of trade shock, interest rate shock, and labor demand shock have a significant impact on unemployment. In a departure from the existing literature, this study intended to address defects and errors, and provide a clear empirical answer to whether the MC variables, demographic variables, and typical Barro variables had affected economic growth in ASEAN and the Eurozone.

6.4.4 Data

In this analysis, we employed the data shown in Table 32.

Table 32. Relevant Data and Sources

Name	Definition	Source
Per-capita GDP	GDP/population	Unstat, National Accounts Main Aggregate Database
Labor Productivity	GDP/person employed, in US$	The Conference Board Total Economy Database
Unemployment Rate	Ratio of unemployed to labor force	World Development Indicator (WDI) and World Bank stats for ASEAN; OECD stats for the Eurozone
Growth of Capital	Growth of gross fixed capital formation	Unstat, National Accounts Main Aggregate Database
Openness	Ratio of export + import to GDP	Unstat, National Accounts Main Aggregate Database
Working Age	Population aged 15–64, as a percentage of total population	World Bank, WDI
Government Expenditure	Ratio of government expenditure/GDP	World Bank, WDI
Population Growth	Percentage derived from birth rate minus death rate, divided by population	World Bank, WDI
Inflation	Percentage of changing consumer price index (CPI)	World Bank, WDI
Interest Rate	Long-term interest rate	WDI and World Bank stats for ASEAN; OECD stats for Eurozone
Exchange Rate	US$ divided by local currency	Unstat, National Accounts Main Aggregate Database
Deficit	Deficit ratio divided by GDP	WEO stats for ASEAN; OECD stats for Eurozone
Public Debt	Public-debt ratio divided by GDP	WEO stats for ASEAN; and OECD stats for Eurozone
Dependency Ratio	Percentage of population -15 and +64 over working age population	World Bank, WDI
Density	People per sq.km. of land area	World Bank, WDI
Urban	Percentage of population living in urban areas over total population	World Bank, WDI
Dummy Membership	To capture the effect of membership integration: a member takes a value of 1; all others take a value of 0	www.ecb.int and www.aseansec.org
Dummy Crisis	To capture the effect of a crisis in both areas	

6.4.5 Model Specifications

Contrary to the existing literature, this study intends to provide a clear empirical answer to the question of whether the use of MC variables, demographic variables, and typical Barro variables affects assessments of economic growth in ASEAN and the Eurozone, using the empirical models below.

Real Per-capita GDP

The initial specifications of the equations are consistent with the standard neoclassical growth model—including the sole convergence factor and the initial level of per-capita GDP. The first equation tests the hypothesis of unconditional convergence. The extended model adds the typical input factors, representing investment, openness, population growth, dummy membership, and dummy crisis. We also follow Soukiazis and Castro (2005) in augmenting the MC variables and input variables. For income convergence, the equation for the full model is:

$$(6.6a)\ \ln y_{i,t} - \ln y_{i,t-1} = \alpha + \beta \ln y_{i,t-1} + \gamma_1 DM_{i,t} + \gamma_2 DK_{i,t} + \gamma_3 GK_{i,t} + \gamma_4 GWA_{i,t} + \gamma_5 O_{i,t} + \gamma_6 Inf_{i,t} + \gamma_7 Int_{i,t} + \gamma_8 ER_{i,t} + \gamma_9 Def_{i,t} + \gamma_{10} Debt_{i,t} + v_{i,t}$$

where *DM* is dummy membership, *DK* is dummy crisis, *GK* is growth of capital formation, *GWA* is growth of working age, *O* is openness, *Inf* is inflation rate, *Int* is interest rate, *ER* is exchange rate, *Def* is the deficit-to-GDP ratio, and *Debt* is public debt-to GDP ratio. The countries included in the equation for the Eurozone were all of its members, and the same was the case for ASEAN.

We captured the impact of demographic variables instead of policy variables, with the following formula:

$$(6.6b)\ \ln y_{i,t} - \ln y_{i,t-1} = \alpha + \beta \ln y_{i,t-1} + \gamma_1 DM_{i,t} + \gamma_2 DK_{i,t} + \gamma_3 GK_{i,t} + \gamma_4 GWA_{i,t} + \gamma_5 O_{i,t} + \gamma_6 Gov_{i,t} + \gamma_7 Dep_{i,t} + \gamma_8 Dens_{i,t} + \gamma_9 Urban_{i,t} + v_{i,t}$$

Productivity Convergence

In this study, output per worker is used as a proxy to measure productivity. The dependent variable is the growth of productivity in relation to its initial level (the convergence

factor). Within the real per-capita GDP convergence equation, we induce the same control variables. The general form of the equation is:

$$(6.7a)\ln p_{i,t} - \ln p_{i,t-1} = \alpha + \beta \ln p_{i,t-1} + \gamma_1 DM_{i,t} + \gamma_2 DK_{i,t} + \gamma_3 GK_{i,t} + \gamma_4 GPop_{i,t} + \gamma_5 O_{i,t} + \gamma_6 Inf_{i,t} + \gamma_7 Int_{i,t} + \gamma_8 ER_{i,t} + \gamma_9 Def_{i,t} + \gamma_{10} Debt_{i,t} + v_{i,t}$$

where *p* is labor productivity and *GPop* is population growth. The countries included in the estimation for the Eurozone were all of its member countries. For ASEAN, due to data limitations, we included only Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

We also capture the impact of demographic variables instead of policy variables, by the following formula:

$$(6.7b)\ln p_{i,t} - \ln p_{i,t-1} = \alpha + \beta \ln p_{i,t-1} + \gamma_1 DM_{i,t} + \gamma_2 DK_{i,t} + \gamma_3 GK_{i,t} + \gamma_4 GPop_{i,t} + \gamma_5 O_{i,t} + \gamma_6 Gov_{i,t} + \gamma_7 WA_{i,t} + \gamma_8 Dep_{i,t} + \gamma_9 Dens_{i,t} + \gamma_{10} Urban_{i,t} + v_{i,t}$$

Unemployment Convergence

Although the extensive literature of convergence between countries and regions focuses mostly on per capita income or their related income and productivity measures, this focus may be fruitfully extended to other areas in economies as Quah (1996) pointed out. Therefore, in this research I borrow the techniques from the literature on growth convergence. Theoretical mechanism of convergence process of unemployment is that labor markets adjust toward equilibrium in the long run, there is convergence of regional unemployment rates because unemployed workers take jobs in other areas or because capital flows into low-wage country to take advantage of lower labor costs (Blanchard and Katz, 1992); However if the speed of adjustment is slow unemployment disparities may arise during adjustment as a result

of negative demand shocks affecting some regions more than others (Amsrong and Taylor, 2000).

Following Soukiazis and Castro (2005) which also augmented some Maastricht Criteria variables on the model as well as other variables, we apply the convergence approach to test unemployment convergence in both the Eurozone and ASEAN regions. The dependent variable is the growth of unemployment in relation to its initial level (the convergence factor). Within the following per-capita GDP convergence equation, we induce the same control variable. The equation in its general form could be:

$$(6.8a)\ \ln u_{i,t} - \ln u_{i,t-1} = \alpha + \beta \ln u_{i,t-1} + \gamma_1 DM_{i,t} + \gamma_2 DK_{i,t} + \gamma_3 GK_{i,t} + \gamma_4 GPop_{i,t} + \gamma_5 O_{i,t} + \gamma_6 Inf_{i,t} + \gamma_7 Int_{i,t} + \gamma_8 ER_{i,t} + \gamma_9 Def_{i,t} + \gamma_{10} Debt_{i,t} + v_{i,t}$$

where u is the unemployment rate. The countries included in the equation for the Eurozone are all of its member countries, while for ASEAN, the countries include Brunei, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

To estimate productivity, instead of policy variables, we augmented with demographic variables by using the following formula:

$$(6.8b)\ \ln u_{i,t} - \ln u_{i,t-1} = \alpha + \beta \ln u_{i,t-1} + \gamma_1 DM_{i,t} + \gamma_2 DK_{i,t} + \gamma_3 GK_{i,t} + \gamma_4 GPop_{i,t} + \gamma_5 O_{i,t} + \gamma_6 Gov_{i,t} + \gamma_7 WA_{i,t} + \gamma_8 Dep_{i,t} + \gamma_9 Dens_{i,t} + \gamma_{10} Urban_{i,t} + v_{i,t}$$

6.5 Results

6.5.1 Income Convergence

Using equation (5.6), in line with the findings of Ismail (2008) and Chowdhury (2005) with respect to ASEAN, and with those of Vojinovic and Prochniak (2009), Castro (2010),

Soukiazis and Castro (2005), and Kaitila (2005) with respect to the Eurozone, we found that both regions converged only conditionally.

As reported in Table 33, conditional convergence in the Eurozone was higher than in ASEAN. The slower convergence speed in ASEAN indicates the large amount of heterogeneity in per-capita income among member countries, as implied by Barro and Sala-i-Martin (2004). As such, richer countries had a higher steady-state value of *k* (capital), and poorer countries would have no possibility of convergence in an absolute sense.

Table 33. Real Per-capita GDP Estimates: Eurozone and ASEAN (1990–2010)

Specification	**1**		**2**		**3**		**4**		**5**	
Region	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**
Model	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**
Basic Explanatory Variables										
Constant	1.7713	–0.0658	2.0929*	0.1589**	2.6678*	0.0722	3.5405*	0.2542*	5.2981*	0.2417*
Per-Capita GDP (–1)	–0.1729	0.0143	–0.2055*	–0.0216**	–0.2719*	–0.0085	–0.3563*	–0.0386**	-0.5059*	-0.0238**
Dummy Membership			0.0286*	0.0480*	0.0198*	0.0375*	0.0182*	0.0175	0.0327**	0.0316*
Dummy Crisis			–0.0527*	–0.0808*	–0.0111	–0.0738*	–0.0152	–0.0697*	-0.0032	-0.0737*
GK					0.2123*	0.0681*	0.0994*	0.0696*	0.1429*	0.0674*
WA					–0.0359*	0.0080***	–0.0457*	0.0049	-0.0731**	0.0079
Openness					0.0955	–0.0102	0.1294*	0.0018	0.1456*	-0.0036
Government									-1.4203*	-0.4253*
Maastricht Variables										
Inflation							–0.0008	–9.61E-05		
Interest Rate							–0.0020	–0.0006		
Ln Exchange Rate							–0.0223	0.0114*		
Deficit							0.0029*	0.0002		
Public Debt							–0.0003	–9.86E-05		
Demographic Variables										
Dependency Ratio									-0.0060[a]	-0.0005
Density									0.0020[b]	-2.29E-06
Urban									-0.0026	0.0002
Adj R2	0.2544	0.2462	0.3022	0.4888	0.4596	0.5604	0.5304	0.5810	0.6492	0.5692
F-Statistic (ρ)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
L-R Test (ρ)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0127
Hausmann Test (ρ)	0.0000	0.0119	0.0000	–	0.0000	–	0.0000	–	0.0000	-
Observations	335	210	335	210	334	210	318	210	334	210

*Note: *, **, and *** denote values significant at the 1%, 5%, and 10% levels, respectively. EZ: Eurozone; FE: Fixed Effect. Columns 1, 2, 3, and 4 contain unconditional convergence, augmentation with dummy variables, inclusion of input variables, and the full model, respectively.*

Conditionally, each country would have a tendency toward more rapid growth, which would exacerbate the gap between its initial level of per-capita income and its own long-term

steady-state per-capita income. Convergence would need to progress considerably to reach a different steady-state value, especially between old and new members.

Shimizu (2010) shows that some centrifugal forces in intra-ASEAN economic cooperation—such as an unstable domestic political situation—can also contribute to a slow convergence speed in the area. The result does not differ markedly from that of Onwuka, Baharumshah, and Habibullah (2006), who found convergence in ASEAN-5, but not in ASEAN-10.

The initial release of the euro to initial EU members occurred in 2002, and continued with each new member until its last release within Slovenia in 2009. Throughout this period, its was found to have a positive influence on income growth. For its member countries, joining ASEAN likewise showed consistent positive estimates in all equations.

Both regions suffered from crises—ASEAN in 1998 and the Eurozone in 2009—although this was found to be insignificant in some equations. When input variables were inserted into the equation (Column 3), the speed of convergence increased. The Eurozone had a higher speed (27%) than ASEAN (0.9%).

Individually, growth of capital strongly influenced income growth in both areas and in all equations, as confirmed by neoclassical theory. Openness correlated positively in the Eurozone when augmented by the MC, but it was not significant in ASEAN. Increasing the working age had a negative impact, which confirmed the "population pessimist" view proposed by Coale and Hover (1958) and in line with Bloom et al. (2010)—tending to overwhelm and induce a response by technological progress.

With respect to the macroeconomic policy variables related to the MC in the Eurozone only, deficits had an impact on income growth, as indicated by the fact that a one-percentage-point decrease in deficit pushes growth up by 0.0029 percentage points, as found also by Soukiazis and Castro (2005).

In ASEAN only, the exchange rate had an influence; a one-percentage-point depreciation could push growth up by more than 0.01 percentage points. Insignificant public debt, to some extent, confirmed the finding of Reinhart and Rogoff (2010), who suggested that the relationship between debt and growth is strong only if debt exceeds 90% in developed countries or 60% in emerging markets.

On average, the Eurozone countries had achieved nominal convergence (confirmed in Table 1) and still satisfied the MC and SGP criteria. Although not all MC variables were significant—also shown by Soukiazis and Castro (2005)—the correlation of all variables was significant. The result also was in line with Mahmood and Sial (2012), confirming the importance of monetary and fiscal policy for growth.

6.5.2 Productivity Convergence

Table 34, based on equation (6.7), shows that an unconditional β convergence existed in the Eurozone, with a convergence rate of 2%, as shown in Column 1; this result aligns with the findings of Vojinovic and Prochniak (2009).

When augmented with the dummy membership variable, the rate was slower (1.2%), and joining the economic union had no impact. These findings are in line with Lapavitsas et al. (2010), who found that Germany enjoys a higher productivity rate, because it has a flexible

labor market that attracts cheap labor from countries like Greece, Portugal, Spain, and Italy—countries with rigid labor markets and strong labor unions.

Table 34. Labor Productivity Estimates: Eurozone and ASEAN (1990–2010)

Specification	**1**		**2**		**3**		**4**		5	
Region	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**
Model	**RE**	**OLS**	**RE**	**FE**	**RE**	**FE**	**FE**	**FE**	**FE**	**FE**
Basic Explanatory Variables										
Constant	0.2371*	0.0757**	0.1558*	0.6851*	0.2465*	1.2862*	1.0472*	1.8986*	-2.2862	2.6231**
Productivity (–1)	-0.0201*	–0.0048	–0.0125**	–0.0743*	–0.0214*	–0.1385*	–0.0930*	–0.1972*	-0.0630*	-0.3314*
Dummy Membership			–0.0029	0.0436**	–0.0011	0.0192	0.0009	–0.0273	-0.0005	0.0084**
Dummy Crisis			–0.0364*	–0.0891*	–0.0248*	–0.0687*	–0.0348*	–0.0525*	-0.0341*	-0.0548
GK					0.0749*	0.0386*	0.0454*	0.0166	0.0515	0.2881*
GP					–0.0055**	–0.0239*	–0.0064**	–0.0331*	-0.0076**	-0.0183*
Openness					0.0082*	0.0380**	0.0225*	0.0727*	0.0345*	0.0699*
Gov									0.0618	0.0839
Maastricht Variables										
Inflation							–0.0026*	0.0005***		
Interest Rate							–0.0003	–0.0030*		
Ln Exchange Rate							–0.0037	–0.0052		
Deficit							–0.0006**	0.0056*		
Public Debt							-0.0002***	–0.0002		
Demographic Variables										
Working-Age									0.0335***	0.0031
Dependency Ratio									0.0132	0.0013
Density									-0.0002**	-5.93E-05**
Urban									0.0013***	-0.0020
Adj. R-Squared	0.0467	0.0033	0.1873	0.1987	0.3088	0.3004	0.5057	0.4570	0.3192	0.3761
F-Statistic (r)	0.0000	0.2253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
L-R Test (r)	0.0183	0.1883	0.0032	0.0142	0.0003	0.0006	0.0000	0.0000	0.0000	0.0000
Hausmann Test (r)	0.3086	0.038	0.6031	0.0104	0.1425	0.0007	0.0048	-	0.0004	-
Observations	336	147	336	147	334	147	318	147	336	147

*Note: *, **, and *** denote values significant at the 1%, 5%, and 10% levels, respectively. EZ: Eurozone; FE: Fixed Effect; RE: Random Effect; and OLS: Ordinary Least Squares. Columns 1, 2, 3, and 4 contain unconditional convergence, augmentation with dummy variables, inclusion of input variables, and the full model, respectively.*

Incorporating input variables (3), the speed of convergence increased the growth of capital by 2.1%, and openness encouraged growth. The population took a value of –1, in line with Coale and Hover (1958). Among macroeconomic policy variables, inflation, as per Soukiazis and Castro (2005), Papaioannou (2010), and Castro (2010), has an impact on productivity growth. The result implies that a 1-percentage-point increase in inflation reduces growth by 0.2 percentage points. A higher debt ratio could restrain productivity growth,

although the impact would be relatively small. The impact of the deficit ratio on productivity growth, in line with the findings of Soukiazis and Castro (2005), was found to be negative.

The speed of convergence increases when we incorporate variables into 9.3% (Column 4). From the result, we determined that macroeconomic policy associated with the MC plays an important role in determining productivity convergence within a region, given its ability to explain variations in productivity growth, demonstrated by the adjusted R-squared of 45.7% and significant joint variables.

The situation with ASEAN is the opposite of the neoclassical assumption: no unconditional β convergence exists. This result is in line with Chowdhury (2005), and was significant after incorporating dummy variables.

ASEAN membership had no effect in improving productivity, but the crisis was significantly painful for members. In applying input variables (Column 3), the speed of convergence increased, implying that ASEAN conditionally converged at a rate of 13.85%.

The growth of capital formation and openness had positive impacts as a channel for physical capital and innovation. Population growth had a negative influence, as suggested by Kelly and Schmidt (1995): the association between population growth and productivity was negative for the positive effects of scale and induced innovation. Augmentation with policy variables indicated that inflation, interest rate, and deficit each played a part. A one-percentage-point increase in inflation promoted productivity by a very small amount, through the resulting hope of wage increases. The low interest rate served as an incentive for money circulation to increase by 0.003 percentage points, thus pushing economic activity and productivity.

Comparing all models, we found that policy variables had a great influence in determining productivity growth, since they had adjusted the R-squared value of 45.7%. The result was in line with descriptive data showing that the Eurozone had much higher productivity (US$68,112) than ASEAN (US$29,054). This might be due to a much higher minimum wage in the Eurozone than in ASEAN, or because the labor–capital ratio is much higher in ASEAN, reflecting the state of technology there (Blanchard, 2004), attractive to foreign investment. Although the gap was large (Figure 6), the average growth rate of productivity in ASEAN (3.5%) was higher than in the Eurozone (1.2%).

Joining the Eurozone had no impact on productivity, but joining ASEAN did have a positive effect. The inconsequential results of joining the Eurozone are in line with Castro (2010), who pointed to weak coordination between fiscal and monetary policy, and argued that there is almost no way of entering a political union that will synchronize fiscal policy, labor, and the welfare system.

One possible explanation is offered by Ismail (2008): as ASEAN policy improves openness by implementing AFTA, involving more than 600 million people, it will also improve the productivity of this emerging market. Therefore, ASEAN has greater potential for rapid growth than the Eurozone, where the market has already matured.

The impact of economic crisis on productivity was enormous in both areas: the Asian economic crisis in 1998—as stressed by Mishkin (1999)—was not only economically harmful but also threw the global financial system into a huge recession. The same was true of the Eurozone crisis of 2009.

These results are consistent with DiD results showing that ASEAN has a higher productivity growth. A possible explanation is that ASEAN, with its lower capital to labor ratio, has an incentive for high capital remuneration, and thus, attracts vast capital inflows. As confirmed by econometric estimations, that physical capital has a significant role in inducing productivity growth, a complementary factor in the growth of the labor force. This confluence of circumstances for ASEAN, as an emerging market, has caused an increase in both the rate of growth and the degree of convergence. On the other hand, the economic role of the euro has been restrictive, suggesting that stability was causing reductions in the rate of growth.

6.5.3 Unemployment Convergence

Table 35 reports the results for the Eurozone. An unconditional β convergence (Column 1) exists, since the regression result of initial unemployment did not exceed unity and was significantly negative. The rate of unconditional convergence was 17.44%, and was at its highest level when augmented with input variables (12.6%). These results are in line with the findings of Soukiazis and Castro (2005) and Baskaran (2009).

Eurozone membership has a positive effect on unemployment growth, and the crisis significantly increased this figure. The growth of investment reduced unemployment. This finding is in line with neoclassical theory, since it is beneficial for job creation. A one-percentage-point increase in capital formation can reduce unemployment growth by more than 0.3 percentage points in all equations. Trade openness can also help reduce unemployment, since a one -percentage-point increase in degree of openness can cause a 0.14-percentage-point unemployment reduction.

The population growth had no significant impact, since it could reflect a general decline in mortality—as implied by Bloom and Williamson (1998)—and may, therefore, have no influence. The augmentation of the MC variables into the basic model indicates that policies adopted to lower the interest rate were responsible for inducing unemployment growth, and that a deficit reduced it. None of the other variables had a significant role. These results align with Lombard (2000), who confirms that imposing the MC has impediments that reduce unemployment. MC variables were explained the fluctuation in unemployment, as the adjusted-R squared was 50.46%.

Table 35 also reports that ASEAN converged either unconditionally or conditionally, since the regression result of the previous unemployment rate was negative and does not exceed unity. This result suggests that the speed of unconditional unemployment convergence was very high, which is consistent with the homogeneity of unemployment rate among member countries. When dummy membership was included in the equation, the result indicated that ASEAN membership had a role in reducing unemployment; ASEAN policies adopted to induce labor mobility and to increase the degree of cooperation worked to decrease the unemployment rate.

Economic crisis was insignificant with respect to the growth of unemployment (Figure 24). In times of crisis, ASEAN's unemployment rate was relatively stable. This finding indicates that the Asian crisis in 1998 mainly hit the financial sector and had no real influence on ASEAN labor, mainly in the agricultural sector.

The highest rates of convergence occurred wherever macroeconomic variables were inserted into the equation. With the augmentation of input variables, only investment was

found to make a significant contribution to reducing the growth of unemployment, since it can push job creation. The reverse was true in the Eurozone, where openness was not responsible for fluctuations in the unemployment rate.

Population increases did not contribute to changes in unemployment growth in ASEAN, as it had in the Eurozone. Among variables related to the MC, we saw that the exchange rate and public debt each had a significant role in determining unemployment rate. Single-point currency depreciation was responsible for 0.25 percentage points of unemployment growth; although the impact was relatively small (0.003), restrictive policy around public debt has had a positive impact in reducing unemployment.

Table 35 Unemployment Estimates: Eurozone and ASEAN (1991–2010)

Specification	**1**		**2**		**3**		**4**		**5**	
Region	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**	**EZ**	**ASEAN**
Model	**RE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**	**FE**
Basic Explanatory Variables										
Constant	0.3544*	0.6030*	0.3047*	0.9028*	0.4250*	1.0302*	0.3824*	–0.1566	12.5030	-2.9600
Unemployment (–1)	–0.1744*	-0.4274*	–0.1547*	–0.4483*	–0.1258*	–0.4450*	–0.1224*	–0.5759*	-0.2404*	-0.6267*
Dummy Membership			0.0039	–0.2820***	0.0300***	–0.3512**	0.0427**	–0.1161	-0.0007	-0.0884*
Dummy Crisis			0.2106*	0.0828	0.0712**	–0.0068	0.0501	–0.0800	0.1335*	-0.0501
GK					–0.8063*	–0.3754**	–0.5164*	–0.3200***	-2.4200*	-2.2774*
GP					–0.0200	–0.0299	0.0018	–0.0154	-0.0145	-0.0674
Openness					–0.1453*	0.012	–0.1489*	–0.0026	0.1401**	-0.0786
Gov									4.3575*	1.0516
Maastricht Variables										
Inflation							–0.0074	–0.0056		
Interest Rate							0.0062***	0.0038		
Ln Exchange Rate							0.0161	0.2520*		
Deficit							–0.0135*	–0.0028		
Public Debt							–0.0006	0.0028***		
Demographic Variables										
Working-Age									-0.1411	0.0554
Dependency Ratio									-0.0638	-0.0099
Density									-0.0006	0.0008*
Urban									0.0029	0.0573*
Adj. R-Squared	0.0896	0.2012	0.1927	0.2108	0.4028	0.2274	0.5046	0.2704	0.3524	0.3228
F-Statistic (r)	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
L-R Test (r)	0.0000	0.0000	0.0327	0.0000	0.0003	0.0001	0.0002	0.0000	0.0000	0.0000
Hausmann Test (r)	0.0000	0.0000	0.0008	0.0000	0.0001	0.0000	0.0000	–	0.0000	-
Observations	316	139	316	139	316	139	305	139	330	139

*Note: *, **, and *** denote values significant at the 1%, 5%, and 10% levels, respectively. EZ: Eurozone; FE: Fixed Effect; and RE: Random Effect. Columns 1, 2, 3, and 4 contain unconditional convergence, augmentation with dummy variables, inclusion of input variables, and the full model, respectively.*

The rate of convergence in ASEAN was higher, both unconditionally and conditionally. For unconditional convergence, the rates in ASEAN and the Eurozone were 42.7% and 17.4%, respectively. In ASEAN and the Eurozone, the highest rates occurred when the equation was augmented with policy variables (i.e., 57.6% and 12.2%). Thus, with the higher rates denoted in Figures 23 and 24 during 1991–2010, the unemployment rate in the Eurozone was 8%, higher than in ASEAN (5%).

The volatility of unemployment rates also implied that ASEAN was more stable. Ljungqvist and Sargent (2008) pointed out that after the 1970s, unemployment in the Eurozone was persistently high, consistent with the generosity of the welfare system. Other arguments are offered by Lombard (2000) and Bassanini and Duval (2006), who suggested that the high unemployment rate in the Eurozone was not only the result of generous unemployment benefits and high minimum wages, but also high hiring and firing costs. Other perspectives pertain to different wage systems, including the argument that the strength of labor unions in Europe contributed to a lower degree of unemployment convergence (Lapavitsas et al., 2010).

ASEAN membership had a negative impact on unemployment, except after being controlled with MC variables; Eurozone membership, on the other hand, helped explain the unemployment rate there. The financial crisis was harmful to employment in Eurozone, but not in ASEAN. In line with this theory, the growth of capital formation was a key factor in creating job opportunity and lowering the unemployment rate (Soukiazis and Castro, 2005), as the regression result showed its impact on reductions to unemployment growth in both areas. For the Eurozone, the growth of capital, openness, the interest rate, and the deficit were

determinant variables that explain changes in unemployment growth. For ASEAN, among all the variables, only the growth of capital, the exchange rate, and public debt influenced unemployment.

This result aligns with the unemployment DiD result that indicates joining the EU had no positive impact on unemployment. Again, the restrictive economic policies of the ECB and the tightening of fiscal policy to stabilize the euro have had a hand in these circumstances.

6.6 Conclusion

This current study addressed the impact of macroeconomic and demographic variables on growth and convergence in income, productivity, and unemployment in the EU, in the decade before and the decade after the Euro was introduced.

We presented a comparative study of developed regional integration (i.e., the Eurozone, which implemented MC) with a developing one (i.e., ASEAN). Data showed that the Eurozone had a higher per-capita GDP and productivity, but ASEAN performed better in terms of income growth, productivity growth, and low unemployment levels. Income and productivity growth were more stable in the Eurozone, but ASEAN had less fluctuation in unemployment.

Focusing on regression results, convergence was found to be conditional rather than unconditional, except for the case of unemployment and productivity in the Eurozone. The ability to explain variation in dependent variables improved substantially when the condition factor was included as the magnitude of convergence.

Heterogeneity of income and some centrifugal forces in intra-ASEAN economic cooperation, as noted by Shimizu (2010), also contributed to a slower speed of convergence in

ASEAN member countries. A lower capital–labor ratio, combined with higher growth in productivity, induced a "catching up" process, by which ASEAN derived a comparatively higher speed of productivity convergence.

Homogeneity in the unemployment rate in ASEAN complemented its different wage system, and the strength of labor unions in the Eurozone could be a determinant of a faster speed of unemployment convergence in ASEAN, as also confirmed by Lombard (2000), Bassanini and Duval (2006), and Lapavitsas et al. (2010).

The augmentation of input variables was essential for all equations. The positive impact of the growth of fixed capital formation aligned with the neoclassical theory, and the negative impact of population growth on productivity and working age in per-capita income were in line with the assertions of Coale and Hoover (1958), indicating that population growth diminishes growth and induces responses in the form of technological progress and capital accumulation.

Unfortunately, population growth was found to have no influence on unemployment volatility. Going deeper into the specific impact of macroeconomic policy (i.e., those relating to MC) on growth and real convergence, results were mixed in different estimates. In the per-capita GDP equation, only deficit had a positive influence on growth in the Eurozone, and depreciation had a positive impact on growth in ASEAN.

The Eurozone's productivity estimation results indicated that inflation, deficit, and public debt had negative effects on productivity growth and on the control of convergence. By contrast, in ASEAN, inflation and deficit each had a positive impact, and the interest rate discouraged growth. Looking at unemployment convergence, the interest rate had a positive

influence and deficits reduced unemployment. For ASEAN, the exchange rate and debt contributed positively to unemployment growth.

Due to limitations inherent in the panel estimation, care should be taken with the interpretation of results, since country-specific effects should differ.Therefore, country-specific investigations are needed to obtain more robust interpretations. Although individually, not all variables relating to the MC were significant, in all equations, joint variables were significant, as indicated by the significance of F-stat results. The results implied that those macroeconomic policies associated with the MC should not be ignored in promoting convergence and growth.

Demographic variables were very important relating to productivity in the Eurozone; however, among included variables, only density had an impact on unemployment. For the MC variables, the Eurozone's policy of keeping inflation low was relevant, since the variable had the power to reduce productivity and increase unemployment.

For ASEAN, investment was a very important factor for encouraging productivity and reducing unemployment. Since ASEAN was a new, emerging market, especially after the CLMV countries joined, providing a good environment was required. For ASEAN, density had negative impact for productivity and increased unemployment for urban dwellers. In the case of ASEAN, lower public debt had a negative impact on productivity and increased unemployment. While the MC as policy variables in both areas appear to play a major role in shaping productivity and unemployment patterns, demographic conditions are also important. The result of demographic change in both regions supported the "population neutralist" view

that population growth in the short run was not beneficial, but would push the economic performance in long run.

Economic crisis was painful for both regions, as had been suspected; however, it had no significance vis-à-vis unemployment. The inclusion of a dummy-membership variable brought mixed results. It was positive in terms of inducing the growth of per-capita GDP.I It was beneficial to productivity in ASEAN, but insignificant for the Eurozone. It was beneficial for reducing ASEAN unemployment growth, but increased the Eurozone's figures.

What happened in the Eurozone was implied by Lapavitsas et al. (2011), who asserted that joining the euro was beneficial for Germany and other core countries, but more peripheral countries incurred losses when joining the economic union. The data were supported by DID analysis, the overall results of which showed that ASEAN performed better in terms of growth of income, productivity, and unemployment.

The comparatively better income performance in ASEAN was supported by higher productivity and an increased number of working-age people, as shown through decomposition. The increase in GDP per hours worked—which can be interpreted as wages—was responsible for the increase in productivity, especially in ASEAN, which experienced high annual growth.

ASEAN member countries have no macroeconomic policy restrictions, and they performed better in terms of income, productivity growth, unemployment; however, in term of the business cycle, the Eurozone was more stable. With respect to this, the main task of the ECB—as well as the main aim of the MC—is to encourage stability in an area (De Grauwe, 2009), and it was certainly headed in the right direction. The MC could sufficiently push

countries to achieve convergence. However, it was difficult to bring about a political union in the Eurozone, and the region had asymmetrical monetary and fiscal-policy structures. Therefore, both the MC and the SGP criteria were needed, embedded with incentives to satisfy member countries, and clear sanctions for non-compliance.

To ensure a stronger euro, a decade after its introduction, some criteria were set forth in tandem with policy coordination—especially that which imposed price-stability tasks for the ECB, pushed growth, and mitigated unemployment. ASEAN can learn from the Maastricht Treaty to implement suitable criteria to increase the likelihood of economic stability and nominal convergence, if ASEAN intends to adopt a common currency.

Judging the euro as a mistake was premature. We assert, along with Marelly and Signorelli (2010), that satisfaction of the MC by Eurozone member countries brought about slow rates of growth as a result of handing over monetary policy to the ECB and tightening fiscal policy. However, in the long term, those countries will benefit from macroeconomic stability and convergence.

Research examining the decade before and the decade after the release of the euro provides us with enough information about real convergence and growth in the Eurozone; however, future comparative research is still needed to capture more definitive answers.

Appendix 6.1

Model Development

The analysis of convergence was based on the neoclassical growth theory framework, developed mainly by Solow (1956) and Barro and Sala-i-Martin (1992). We start with the general Cobb–Douglas production function model:

$$(A.1) Y_{i,t} = K_{i,t}^{\alpha}(A_{i,t}L_{i,t})^{1-\alpha},$$

where $Y_{i,t}$ is the total amount of production of the final good at time t in country i, $K_{i,t}$ is the capital stock at time t in country i, $A_{i,t}$ is technology at time t in country i, and $L_{i,t}$ is total employment in country i at time t. Defining $k_{i,t} = K_{i,t}/A_{i,t}L_{i,t}$ as the stock of physical capital per unit of effective labor, and $y_{i,t} = Y_{i,t}/A_{i,t}L_{i,t}$ as output per unit of effective labor in country i at time t, we derive the differential equation:

$$(A.2) \frac{\dot{dk}_{i,t}}{d_t} = s_i y_{it} - (g + n + \delta)k_{it},$$

where g is the technological progress of A, n is the growth rate of the labor force, and δ is the depreciation of K. The production function in the intensive form could be written as $y_{i,t} = k^{\alpha}_{i,t}$. Then, the intensive form of the steady state of capital is:

$$(A.3) \ln k_i^* = \frac{1}{1-\alpha}\ln s_i - \frac{1}{1-\alpha}\ln(g_i + n_i + \delta).$$

Substituting the steady state k* we obtain:

$$(A.4)\ln y_i^* = \ln(A_{i,o}) + g_{i,t} + \frac{\alpha}{1-\alpha}\ln s_i - \frac{\alpha}{1-\alpha}\ln(g_i + n_i + \delta)$$.

Following Barro and Martin (1992), the unconditional income convergent equation would be:

$$(A.5)\ln y_{i,t} - \ln y_{i,t-1} = \alpha + \beta \ln y_{i,t-1} + v_{i,t}$$,

where y is real GDP per capita, α is the constant variable, β is the coefficient indicating convergence, t indicates the time interval, (t – 1) is the initial of the time interval, and v indicates the error term. Since the production function in the intensive form can be written as $y_{i,t} = k^{\alpha}_{i,t}$. substituting the steady state k* in (3), we obtain:

$$(A.6)\frac{Y}{AL_i}^* = (\frac{s}{g+n+\delta})^{\frac{\alpha}{1-\alpha}}$$

Taking the log at both sides:

$$(A.7)\ln(\frac{Y}{AL_i}^*) = \frac{\alpha}{1-\alpha}\ln s_i - \frac{\alpha}{1-\alpha}\ln(g_i + n_i + \delta)$$

Defining productivity at the steady state as $p^* = (Y/L)^*$ then:

$$(A.8)p_i^* = A.(\frac{s}{g+n+\delta})^{\frac{\alpha}{1-\alpha}} = A_0 e^{gt}(\frac{s}{g+n+\delta})^{\frac{\alpha}{1-\alpha}}$$.

Taking the log at both sides:

$$(A.9)\ln p_{i,t}^* = A_0 + gt + \frac{\alpha}{1-\alpha}\ln s_i - \frac{\alpha}{1-\alpha}\ln(g_i + n_i + \delta)$$

Following Barro and Sala-i-Martin (1992), the unconditional productivity convergent equation would be:

$$(A.10)\Delta \ln p_t = \alpha + \beta \ln p_{i,t-1} + v_{i,t}$$

Recent literature on economic convergence among countries and regions focuses mostly on per-capita income or other related productivity measures. Therefore, like Soukiazis and Castro (2005), we borrowed the convergence approach to test unconditional and conditional convergence in both the Eurozone and ASEAN. The equation for unconditional unemployment convergence was:

$$(A.11)\Delta \ln u_t = \alpha + \beta \ln u_{i,t-1} + v_{i,t}.$$

Since determinants of economic growth differed across countries, Barro and Sala-i-Martin (1992) favored the notion of conditional convergence. The policy and institutional variables in the conditional convergence equation are used as proxies for differences in country steady-state per-capita GDP. The general model for analysis could be:

$$(A.12)\ln q_{i,t} - \ln q_{i,t-1} = \alpha + \beta \ln q_{i,t-1} + \gamma X_{i,t} + v_{i,t}$$

.

Chapter 7 Augmented Analysis of Economic Integration Impact on Trade

7.1 Introduction

After previously investigated the level of nominal and real convergence in chapter 5 and 6, according to Linder (1961), the trade will be more intensive in goods that have overlapping demand. It implies that international trade will be more intense between countries with similar per capita income levels or have converged. Before the crisis hit the Eurozone in 2007-2009, creating a common currency was seen as a good way to exploit potential benefit from trade, and the European Monetary Union (EMU) looked like an ideal model for the emerging ASEAN economy. The success of the euro's launch, its evolution into a strong currency, and relative price stability in the Eurozone were the signs that the monetary and fiscal stability provided by the Maastricht Criteria (MC) were steps in the right direction.

According to Mutaqin and Ichihashi (2013), however, many of the Eurozone countries now suffering most deeply after the economic crisis, are mainly those that violated the parameters of the Maastricht Treaty and Strong Growth Pact (SGP). Therefore, ASEAN may not be remiss following in the footsteps of the European Union (EU) to create deeper regional economic integration.

The main aim of this paper is to comparatively investigate the impact of different levels of economic integration on bilateral trade in two areas, one region having a common currency (the Eurozone), and the other a struggling free-trade area (ASEAN).

This paper centers on the following research questions:

- Whether the different integration process has exerted a different impact on intra original and original-new bilateral trade relationships;
- Whether membership enlargement impact was positive;
- Whether convergence in variables associated with the MC were significant; and
- Whether new trade theory and H-O hypotheses could explain the phenomena.

To answer these questions, we augment the gravity model by combining the micro approach with macro approach (MC variables).

Economic integration is often described using the five stages of the Balassa model. Pelkmans (2001) divides the steps thusly: (1) Free trade area (FTA), (2) Custom union (CU), (3) Common Market (CM), (4) Economic Union, and (5) Total Economic Integration. Today, 17 of the 27 members of EU form the European Monetary Union (EMU), initiated by 11 members in 1999. According to the Balassa model, this union has advanced past Stage 4 but hasn't reached Stage 5.

ASEAN started with 6 members, growing to 10 after allowing Cambodia, Laos, Myanmar and Vietnam (CLMC) to become members. They are now in the process of accomplishing an ASEAN FTA and intend to achieve CM by launching the ASEAN Economic Community by 2015.

Countries joining a common currency weigh the potential benefit of joining against the inevitable cost (Mico, Stein and Ordonez, 2003). Benefits like a reduction in transaction cost when trading goods and services between countries with different currencies will tend to benefit countries heavily involved in international trade. On the other hand, costs may include

the possibility of dampening business cycle fluctuation through independent, counter-cyclic monetary policy.

The EU designed institutions to assure economic convergence prior to introduction of the Euro. The Maastricht Criteria (MC), following Maastricht Treaty (MT) in 1991, were strict guidelines for member states to follow, with the ultimate goal of adopting a single currency. In order to maximize the benefit and minimize the cost, the MC enforced convergence in several factors: inflation rate, interest rate, and exchange rate as monetary criteria; deficit and debt-to-GDP ratio as fiscal criteria (Afxentiou, 2000). Although conditions in the Eurozone have worsened in terms of income and productivity growth, and the EU has experienced a high level of unemployment, the significance of the MC in determining real convergence indicated the criteria were sufficient to achieve convergence and stability, as shown by Mutaqin and Ichihashi (2012).

To achieve these goals, as stressed by Marelli and Signorelli (2010), member countries in the short term will suffer from slow growth as a result of surrendering monetary policy to the ECB and tightening fiscal policy, but in the long run, countries will benefit from macroeconomic stability, such as price stability, fiscal discipline, removal of exchange rate risks, reduced uncertainty about inflation and interest rates, and increased investment and international trade.

The adoption of the common currency in 1999, followed by the release of the euro coin, concluded the European convergence process. As expected in the process of creating a common currency, trade barriers between member states in the Eurozone had already been removed during the 1990s. Sharing a common currency may further deepen real economic

integration—directly, through reduced trade costs, and indirectly, through intensified competition due to enhanced price transparency (Belke and Spies, 2008).

Despite some limitations, seventeen countries have joined the EMU, and it continues expanding, as more countries decide the benefits outweigh the costs of membership (Darvas, 2010). At the European Council summit in Copenhagen (June 1993), the Union invited the Central and Eastern European countries (CEEC) to enter the EU with the contingencies that the nations guarantee democracy, develop market economies, and fulfill membership obligation[30]. Following the Copenhagen Treaty, six countries joined the EU. Greece joined in 2001, followed by Slovenia in 2007, Malta and Cyprus in 2008, Slovakia in 2009, and finally, Estonia in 2011.

ASEAN also expanded their membership by preparing Indo-Chinese countries to be members thorough the Treaty of Amity and Cooperation in Southeast Asia in 1976. Although Vietnam refused the invitation, the resolution of the Cambodia Crisis paved the way for reconciliation between ASEAN and the Indo-Chinese countries. Finally, the Singapore declaration in 1992 allowed all Southeast Asian Countries to be members of ASEAN (Angresano, 2004).

The ASEAN free-trade area (AFTA) was established in 1992, and was one of the most important regional trade arrangements in Asia, aimed at eliminating tariff barriers among member countries through agreement on the Common Effective Preferential Tariff (CEPT) scheme. Eliminating tariffs should induce higher intra-regional trade among ASEAN

[30] http://ec.europa.eu/enlargement/enlargement_process/accession_process/criteria/index_en.htm

members, and AFTA was expected to become a full free-trade area by the year 2008 (ASEAN Secretariat).

In mid-1997, the Asian financial crisis suddenly erupted. According to Hill and Menon (2010), it had serious ramifications for ASEAN. For some time, the region lost some of its commercial appeal, and ASEAN was seen by many as an ineffective and feeble institution, unable to respond decisively at a time of crisis. The crisis urged ASEAN to accelerate AFTA implementation, agreed at the ASEAN summit at Hanoi in 1998. The story of this crisis, however, played out similarly to the most developed countries situated or in the Eurozone.

A decade after the euro, the crisis erupting in the Eurozone has made the benefits of a common currency less attractive, especially for trade. Although the situations sound similar, there are structural differences between the proposed AEC and the European Economic Community. Most notably, individual ASEAN countries are reluctant to give up nationalistic economic policies about non-members; the AEC guidelines will not include a common external tariff. This should not be too surprising, as there are huge discrepancies between the member states in average external tariff levels (Cuyvers, Lombaerde and Verherstraeten 2005). Thus, the lesson of the EMU will provide insight into the future development of ASEAN.

The rise in globalization fosters an increasing number of studies on the source of trade. In reality, the main international trade pattern is multilateral; however, investigation would be hampered by data limitations and methods. Thus, using the gravity model as a bilateral trade model emerged as the appropriate method. Used by many researchers, the approach was clearer, and it was convenient to explain trade patterns. According to Yamarik and Ghosh

(2005), the gravity model has become extremely popular in empirical trade literature, for many reasons, because:

- Modern theories of trade, based on differentiated products, provide an improved theoretical foundation for the equation.
- The model has proved quite successful in estimating bilateral flows.
- There is an increased interest in empirical testing of the trade effects on regional trading arrangements.
- And, among economists, there has been new interest in the subject of geography and trade.

Based on Newton's law of gravitation, the model predicts that the volume of trade between two countries should increase with size and decrease with transaction cost (the proxy was distance).

Helpman (1987) provides the theoretical foundation to build the augmented model, which is based on a micro foundation approach to new trade theory (size and similarity), and Heckscher-Ohlin theory (relative factor endowment). Egger and Pfaffermayr (2013) use Helpman's approach to explain the pure effects of European integration, and Warin, Wunnava, and Janicki (2009) combine Helpman's model with convergence measures (MC), to explore the bilateral FDI of EU countries.

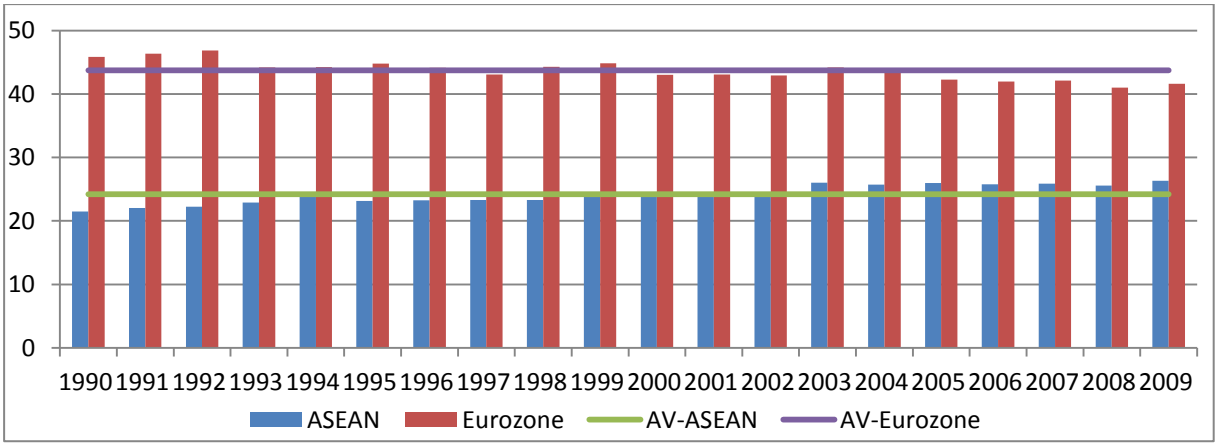
This study is differentiated from previous works in several respects. First, this analysis provides a better understanding of the impact of different stages of integration on trade. Second, this study measures the effectiveness of regional economic integration on trade, especially in the current global crisis. Third, the study combined micro approach variables

(size, similarity, and endowment) with macro approach variables (associated with MC). Fourth, although there are a number of studies on the effects of regional economic integration, little research has compared the effects of the euro on the Eurozone and AFTA in ASEAN.

Trade Pattern

Figure 29 shows average bilateral intra-Eurozone and intra-ASEAN trade. On average, bilateral trade in the Eurozone (43.72%) was almost double ASEAN (24.20%). The highest degree of reciprocity in the Eurozone was in 1992 (46.88%) and in ASEAN was in 2009 (26.32%). Overall, bilateral trade in the Eurozone is declining, while in ASEAN, the trend is improving. The increasing trend for ASEAN implies that and outward-looking strategy, the hallmark of ASEAN, encourages high trade volume (Cuyvers, De Lobaerde and Verherstraeten 2005).

Figure 29. Bilateral Trade over Total Trade: ASEAN and Eurozone (1990-2009)



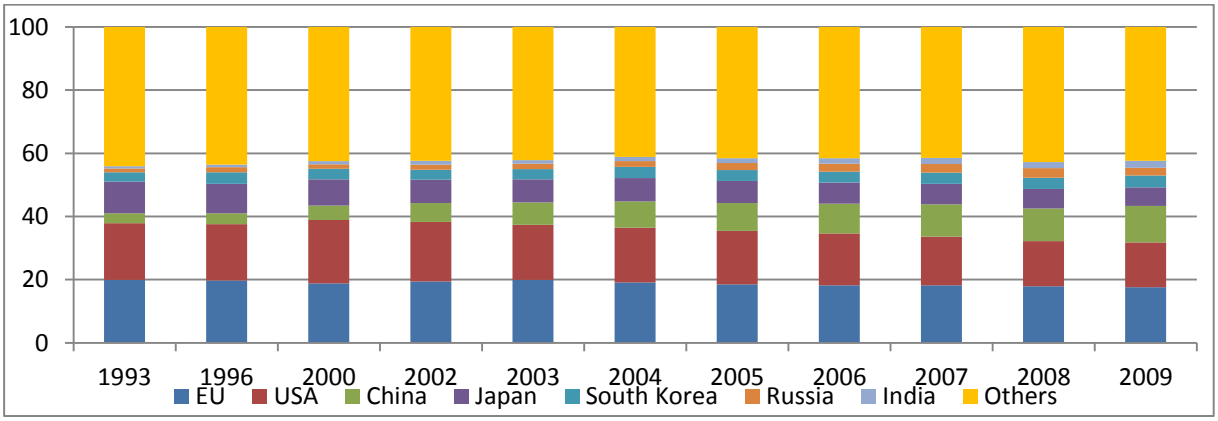
Author's calculations, dividing bilateral trade over total trade, in percent.
Source: DOTS, IMF

Further detail for the EU's main trading partners is shown in Figure 30, which shows that domestic destinations (intra-EU) contribute the highest portion by 18.9%. Unfortunately,

the trend was decreasing by -1.2% annually. The USA was the second most important partner for the EU by 16.98%; however, their share was also declining.

China emerged as the EU's most important partner, by 265% from 1993 to 2009. The emergence of China as a major player in international trade, was due to their rapid economic growth from investment, a direct result of their open-door policy. As the most highly populated area in the world, China also has a reputation for its trading commodity competitiveness.

Figure 30. Percentage Share of EU Trade by Trading Partner (1993-2009)



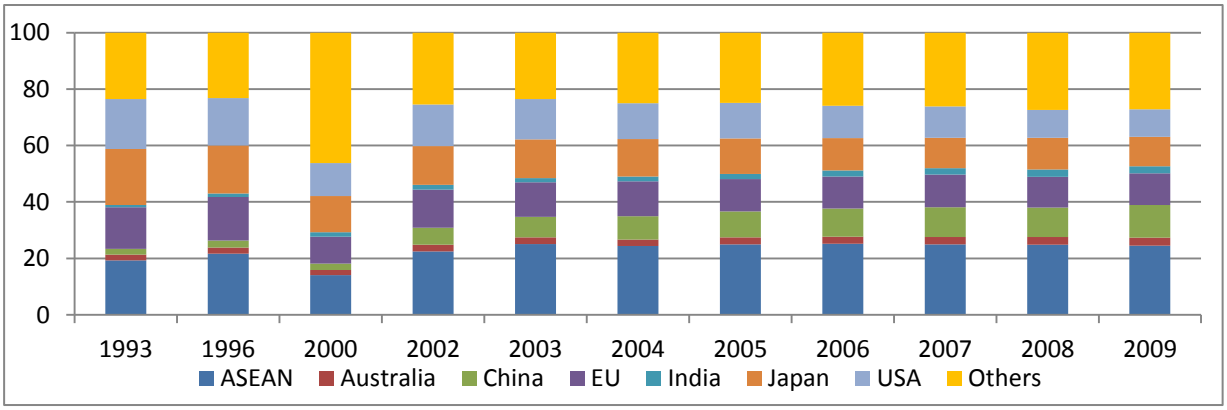
Source: Eurostat

Japan held the highest share of ASEAN trade in 1993-2009, with 13.4%. However, in 2009, China and the EU took over this position. China-ASEAN trade intensity grew by 465%, from 2.1% in 1993 to 11.58% in 2009. USA-ASEAN trade narrowed from 17.7% in 1993 to 9.76% in 2009.

Figure 31 shows that ASEAN intra-trade intensity was the higest share of trade by 22.8%, and increasing. The declining influence of the USA in the recent past might be caused by the recession, as well as loss of competitiveness with commodities traded by China.

The degree of bilateral trade intensity among Eurozone countries is shown in Figure 32. Portugal has the highest degree of dependency with other Eurozone members, with the highest average degree of trade (62.4%), followed by Austria (61.2%). Ireland has the lowest trade intensity with other members at only 27.3%, which might be explained by their geographic position, close relationship with the United Kingdom, and huge investments in high technology.

Figure 31. Percentage Share of ASEAN Trade by Trading Partner (1993-2009)

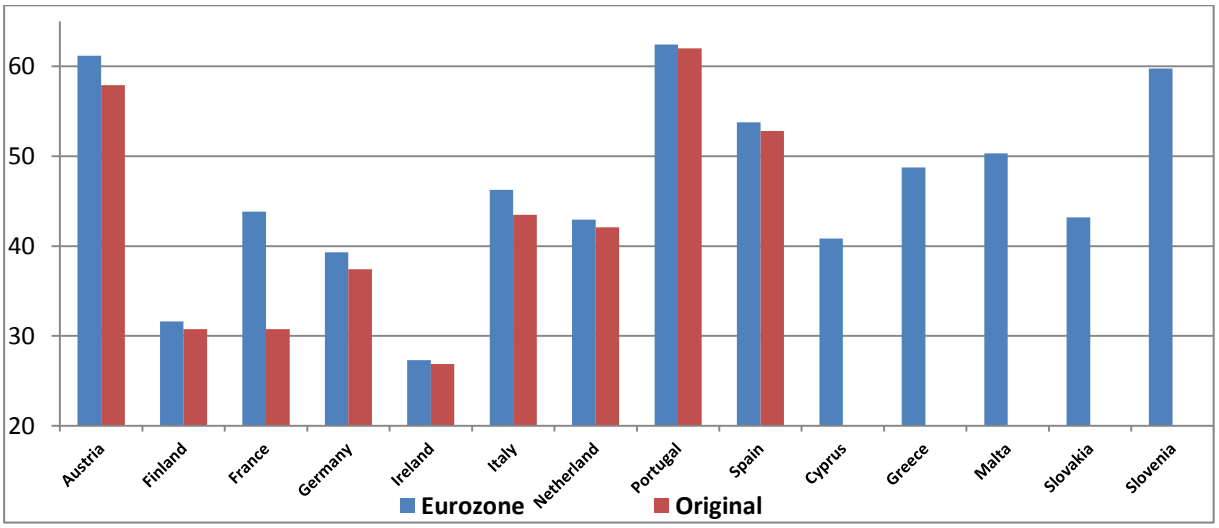


Note: Exclude Laos prior to 2003; Vietnam Prior to 2004; and Cambodia and Myanmar prior to 2002.
Source: ASEAN Trade Statistics Database

Among new member states (NMS), Slovenia has the highest trade relationship with other members, at 59.8%, and Cyprus has the lowest (40.9%). An interesting result was shown by France, where the degree of trade with other original members only accounts for 70%, very different from other member states. Its relative geographical position might be the reason for the different level of trade intensity with other member states.

At the country level, Germany, as the biggest country in term of GDP, dominated bilateral trade with other members within the Eurozone (Appendix 7.1), more than a 10% portion with all members.

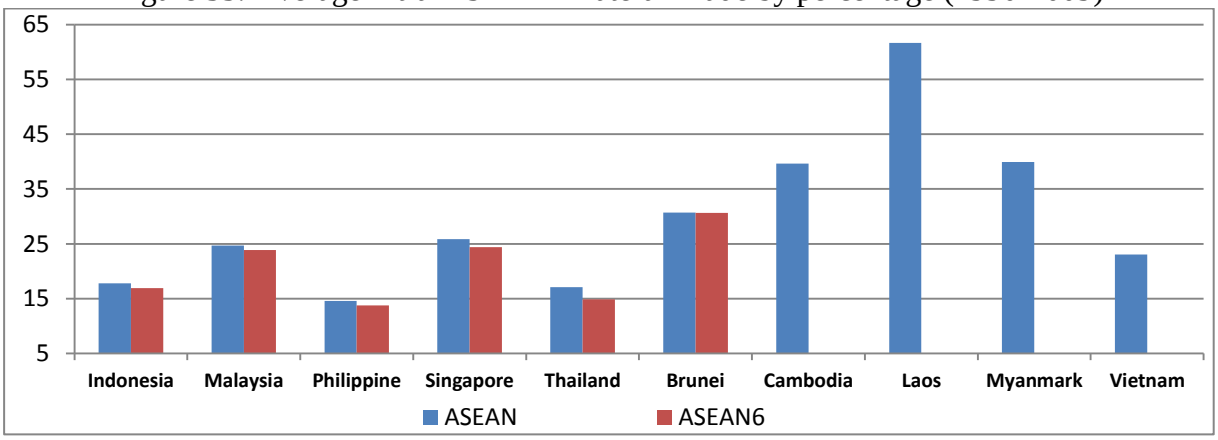
Figure 32. Average Intra-Eurozone Bilateral Trade by percentage (1990-2009)



NMS was: Cyprus, Greece, Malta Slovakia and Slovenia. The ratio may be undervalued due to excluding Belgium and Luxembourg.
Source: DOTS, IMF, Author's calculations, dividing bilateral trade by total trade

For ASEAN, Laos was highly interrelated with other ASEAN, with the highest trade volume, 61.6%, followed by Myanmar (39.9%) and Cambodia (39.6%). The fact that Laos is a land-locked country might explain why the degree of dependency with neighbor countries was so high. Within the ASEAN-6, Brunei did the most trading with other ASEAN members (30.7%), followed by Singapore (25.8%). The Philippines was the country with the lowest relationship with other ASEAN members (14.5%). Clearly, geographical position plays an important role in different degrees of trade intensity with neighboring countries. At the country level, Singapore, which implemented a null tariff, was the primary trading partner for all ASEAN members, except Laos (for details, please see Appendix 2).

Figure 33. Average Intra-ASEAN Bilateral Trade by percentage (1990-2009)



Source: DOTS, IMF
Author's calculation, dividing bilateral trade by total trade

Generally, trading among neighboring countries made the dominant contribution to total trade in both the Eurozone and ASEAN. This suggests that creating regional economic integration might contribute to higher welfare through higher trade intensity. Despite a critique from Elliott and Ikemoto (2004)—arguing that apparent robust economic performance from ASEAN countries stems mainly from extra-regional rather than intra-regional trade—removing trade barriers across borders in ASEAN still played an important role in developing this huge ASEAN market of more than 500 million people.

To stimulate faster economic cooperation among member countries, ASEAN established AFTA in 1992, aiming to eliminate tariff barriers among members. The agreement on the Common Effective Preferential Tariff (CEPT) scheme required that tariffs applied to a wide range of products traded within the region be reduced to no more than 5%. It applied to all products from ASEAN member countries, defined as those products made with at least 40% ASEAN content. New ASEAN members, including Cambodia, Laos, Myanmar, and

Vietnam, have also implemented the CEPT scheme, with 80% of their products included in the CEPT list (ASEAN Secretariat).

Table 36. Average CEPT Rates, By Country, 1993-2003

Country	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Indonesia	17.27	17.27	15.22	10.39	8.53	7.06	5.36	4.76	4.27	3.69	2.17
Malaysia	10.79	10	9.21	4.56	4.12	3.46	3.2	3.32	2.71	2.62	1.95
Philippines	12.45	11.37	10.45	9.55	9.22	7.22	7.34	5.18	4.48	4.13	3.82
Singapore	0	0	0	0	0	0	0	0	0	0	0
Thailand	19.85	19.84	18.16	14.21	12.91	10.24	9.58	6.12	5.67	4.97	4.63
Brunei	3.78	2.64	2.54	2.02	1.61	1.37	1.55	1.26	1.17	0.96	1.04
ASEAN6	**11.44**	**10.97**	**10**	**7.15**	**6.38**	**5.22**	**4.79**	**3.64**	**3.22**	**2.89**	**2.39**
Cambodia								10.39	10.39	8.89	7.94
Laos						5	7.54	7.07	7.08	6.72	5.86
Myanmar						2.39	4.45	4.43	4.57	4.72	4.61
Vietnam				0.92	4.59	3.95	7.11	7.25	6.75	6.92	6.43
ASEAN10				**7.03**	**6.32**	**4.91**	**5.01**	**4.43**	**4.11**	**3.84**	**3.33**

Source: ASEAN Secretariat

ASEAN is well respected for its rapid economic development over the past 25 years. AFTA was fostered upon recognition that most of the region's trade was extra-regional. The preferential tariff reduction schedule was ambitious and rapid, so AFTA had to accelerate the pace of multilateral trade liberalization in ASEAN-6 countries.

7.2 The Significance of Bilateral Trade within Economic Integration

The main benefit of deepening economic integration, primarily through implementing a common currency, is reducing transaction costs. Regardless of limitations, the optimum currency area (OCA) theory was a guide to weigh the potential benefit of joining an economic union against the inevitable cost. Until recently, two main hypotheses come into play regarding OCA endogeneity. The first, proposed by Frankel and Rose (1996), then adopted by the ECB, argues that economic integration will affect the symmetry of output fluctuation by

removal of trade barriers, raising trade, allowing demand shocks to more easily spread, leading to more correlated business cycles, and more correlated policy shocks.

Krugman (1981) proposes a different argument suggesting that economic integration leads to more asymmetric macroeconomic fluctuations through better risk-sharing opportunities, leading to more attractive specialization in production, and rendering macroeconomic fluctuations less symmetric.

Based on the seminal paper by Frankel and Rose (1996), the endogeneity of an OCA became a focus for many economists, with various methods and objects of study. Their research suggests that closer trade relations result in a convergence of business cycles. Furthermore, similar business cycles create good preconditions for policy integration and the creation of a currency area.

Endogeneity of an OCA according to Schiavo (2006), can be defined as a change in the nature of the shocks faced by member countries, triggered by adoption of a single currency. Following OCA theory, the EU set up the MC as a policy guide to avoid risks of asymmetric shock. Further, Warin et.al (2009), using the MC as control variables, suggested that economic convergence ensured by belonging to the common currency are helps double FDI flow.

A single medium of exchange should reduce transaction costs and thereby facilitate international trade (Mundel 1973). Having a common currency eliminates bilateral nominal exchange rate volatility, and thus reduces the uncertainty and risk involved in trade transactions. While there are ways to hedge against this risk, doing so may be costly. Kenen (2003) point out that it is not always possible to fully hedge against large, long-lasting

changes in exchange rates, since producers are uncertain not only about the price they will receive for their exports, but also about the demand for their products. In this case, a producer does not know how much foreign currency will be earned, and how much should be sold in the forward market.

Despite this argument's intuitive appeal, the evidence regarding the impact of exchange rate volatility on trade has not yielded a conclusive result. There is some empirical evidence suggesting that exchange rate volatility has a negative effect, but these effects are generally quite small, have decreased over time, and vary widely in significance, depending on the study in question (Sousa, 2012). The effect of joining a currency union eliminates the transaction costs arising from trading across countries with different currencies, independent of the volatility channel.

Sharing a common currency has an additional effect: it results in irrevocably fixed exchange rates, thus eliminating exchange rate volatility between the currency union partners for the foreseeable future. This may increase market transparency and foster competition among firms in different countries. Finally, in giving up their national currencies and adopting a much more liquid currency, the monetary union may also provide its member countries with a vehicle to hedge exchange rate risk in their trade transactions with non-member countries. In the EU, the euro increased trade flows not only among members, but also with other trading partners as well.

Rose (2000) found that a common currency triggers bilateral trade. Glick and Rose (2001), using panel analysis, found that adopting a common currency doubled trade. Klaasen (2004), and De Nardis and Vicarelly (2003), suggest that the euro has had a positive impact on trade.

There are several transmissions that can increase the effect of common currency on trade. First, efficiency gains include higher price transparency, which stimulates competition and eventually leads to higher trade volume. For instance, the EMU and its pro-competitive effects have served as a catalyst for structural reforms. Second, cost savings related to monetary integration can be viewed like any other reduction of bilateral non-tariff trade barriers. Third, changes in intra- and extra-EMU trade should be interpreted against the background of trade creation and trade diversion.

However, Sousa (2012) found that the effects of currency union on trade indicate a decreasing trend over time. Trade creation implies that lower-cost suppliers inside the currency union substitute higher cost domestic producers as a result of lower trade costs. Trade diversion takes place when low-cost suppliers outside the currency union are replaced by higher-cost producers (Viner 1950). The rise of imports, due to adoption of the euro, is expected to be higher for countries that have not yet exploited their full trade potential with current EMU member states.

In ASEAN, AFTA, established in 1992, was aimed at eliminating tariff barriers among member countries and creating a regional market of 500 million people. Hapsari and Mangunsong (2006) suggested that AFTA might be causing some trade diversion, shifting trade from countries outside the bloc to possibly less efficient countries inside the bloc. Elliott and Ikemoto (2004) found that trade flows were not significantly affected in the year immediately following the signing of the AFTA agreement. But Bun, Klaasen and Tan (2009) showed the positive effect of AFTA on trade. Cuyvers, De Lombaerde, and Verherstraeten (2005), evaluating AFTA in ASEAN, argued multiple problems in AFTA trade:

- Some members are still very unresponsive when they have to lower tariffs.
- Local enterprises do not bother to go through all the necessary formalities
- Authorities are still applying relatively high tariffs to avoid losing tariff revenues
- Non-tariff barriers remain a major obstacle in the process of arriving at a free flow of goods within the region, which lacks supranational institutional and structural mechanisms
- Completely lacks of legal personality,
- Bilateral initiatives by individual members are undermining the relevance of ASEAN.

7.3 Empirical Methodology and Data

To achieve our objectives and answer our research questions, we applied an augmented gravity model, following the work of Tinbergen (1962), who did the first econometric studies of trade flows based on the gravity equation.

In its simplest formulation, the gravity model states that bilateral trade flows depend positively on the product of the GDPs of both economies, and negatively on the distance between them, analogous to Newton's gravitational attraction between two bodies. With imperfect substitutes, the number of differentiated products in each country increases with size and, as a result, the quantity of goods imported from each country is proportional to its GDP. Within this framework, trade barriers (such as transportation and other transaction costs) increase the relative price of imported goods and, therefore, reduce trade. There are many theoretical reasons to include additional variables.

The dependence of bilateral trade on the product of each country's GDP was derived from models of trade, with increasing returns to scale and product differentiation, as has been explained in Helpman (1987) and Helpman and Krugman (1985) in New Trade Theory. Regarding product differentiation, Johnson and Turner (2009) summarized the role of intra-industry trade: it increases the variety of products in the same industry, beneficial to both producer and consumer; gives opportunities for producers to benefit from economies of scale and use their comparative advantages; and stimulates innovation in industry. Linder (1961) hypothesized that nations at similar development levels will have similar preferences, and thus, will trade less with countries possessing different factor endowments.

Heckscher-Ohlin predicted that countries with different factor endowments will trade more with others, under the following assumptions: there are two countries, two homogenous goods, and two homogenous factors of production, relatively different for each country; technology is identical; production is characterized by a constant return to scale for both commodities; the two commodities have different factor intensities; tastes and preferences are the same in both countries; perfect competition exists; factors are perfectly mobile within each country; there are no transportation costs; and there are no restricting policies for mobility between countries.

These assumptions lead to the conclusion that with identical technology in both countries, a constant return to scale, and a given factor-intensity relationship between final products, the country with abundant capital will be able to produce relatively more capital-intensive goods, while the country with abundant labor will be able to produce relatively more labor-intensive

goods. Rose (2000) and Frankel and Rose (2002) included exchange rate volatility, in the form of currency unions, along with thirty other potential independent variables.

Against this benchmark, we study the impact of the euro in Eurozone and AFTA in ASEAN by introducing a dummy variable, which takes a value of one when two countries in the pair belong to Eurozone or to AFTA. In terms of covariate specifications, we stick to Helpman (1987), Egger and Pfaffermayr (2013), and Warin, et al (2008). The general formula is as follows:

$$(7.1) T = f(DI, DK, DifInf, DifInt, DifEr, DifDef, DifPd, G, S, R, D)$$

The dependent variable was T, denoting bilateral trade intensity. We categorized independent variables into three groups. The first is the dummy variable group, consisting of DI, representing dummy integration, in which the Euro Dummy was dummy integration for the Eurozone countries and the AFTA Dummy was dummy integration for ASEAN countries; and DK was the Crisis Dummy.

The second group consists of the variables related with the Maastricht Criteria: DifInf shows the difference in inflation rates between two countries; DifIn is the difference in interest rates; DifEr denotes the difference in nominal exchange rates; DifDef was the difference in deficit-to-GDP ratio; DifPd was the difference in public debt-to-GDP ratio.

The third group accommodates the covariates derived by Helpman's specification, representing H-O theory and New Trade Theory: G represents country size; S is proxy for country similarity; R denotes factor endowment; and D is distance, representative of transportation costs. Detailed information for each variable will be explained further. For the

empirical regression, we augmented with additional variables which interact in dummy integration with Helpman's variables:

$$(7.2) T_{ij,t} = \alpha_0 + \beta' \begin{pmatrix} DI_t \\ DK_t \\ DifInf_{ij,t} \\ DifInt_{ij,t} \\ DifEr_{ij,t} \\ DifDef_{ij,t} \\ DifPd_{ij,t} \\ G_{ij,t} \\ S_{ij,t} \\ R_{ij,t} \\ D_{ij} \end{pmatrix} + \delta' \begin{pmatrix} G_{ij,t} * DI_t \\ S_{ij,t} * DI_t \\ E_{ij,t} * DI_t \end{pmatrix} + \varepsilon_{ijt}$$

The use of a gravity model is applied by aggregate annual bilateral flows of trade (total trade, export, and import) among Eurozone members (all Eurozone countries except Belgium and Luxembourg, and original members), and among ASEAN members (all ASEAN members and ASEAN-6). T, the dependent variable, denotes the average bilateral intensity between country i and country j over time, using the trade intensity concept (corresponding to: a. export weight (EX); b. import weight (IM); and c. total trade weights (TT). Trade data comes from the IMF Direction of Trade Statistics, covering 14 countries in the Eurozone and 10 countries in ASEAN from 1990 through 2009, with measurements following Frankel and Rose (1996):

$$(7.3) TT_{ijt} = \frac{Ex_{ijt} + \mathrm{Im}_{ijt}}{(EX_{it} + EX_{jt} + IM_{it} + IM_{jt})}$$

$$(7.4) EX_{ijt} = \frac{Ex_{ijt}}{(EX_{it} + EX_{jt})}$$

$$(7.5) IM_{ijt} = \frac{\mathrm{Im}_{ijt}}{(IM_{it} + IM_{jt})}$$

Where Ex_{ijt} indicates total nominal exports from country i to country j during period t; EX_{it} denotes total global exports from country i; and Im denotes imports. The higher the value of eg TT_{ijt},the higher the trade intensity between countries i and j.

There are a variety of problems associated with bilateral trade data. Our data measured actual trade intensity, which may understate the potential importance of trade. From a theoretical point of view, it is unclear which weighting is optimal, since some countries may have specialized exports or imports. Thus, we conducted our tests with all three measures of trade intensity.

To capture the effect of deeper regional integration in the Eurozone, we augmented with dummy integration, which takes the value of 1 when a country in pair has the euro as a common currency, and 0 otherwise. For ASEAN we augmented with dummy AFTA membership indicating 0 before joining and 1 afterward. To capture the impact of the crisis experienced by ASEAN, we included a dummy variable, which is 1 for 1998 and afterward; and for the Eurozone, we included a dummy variable for the year 2009, since the global crisis occured in that year.

A simple regression of bilateral trade intensity may be inappropriate. The MC were a policy tool implemented to absorb asymmetric shock in the Eurozone, and was the guiding

policy to ensure the effectiveness of the euro. Therefore, we augmented with policy variables represented by the MC.

Countries are likely to deliberately to link their currencies to their most important trading partners, in order to capture gains associated with greater exchange rate stability. In doing so, they lose the ability to set monetary policy independently of those neighbors. Following Warin, Wunnava, and Janicki (2009), we employed variables associated with the Maastricht Criteria convergence variables as control variables.

$$(7.6) DifInf_{ijt} = \left|\inf_{it} - \inf_{jt}\right|$$
$$(7.7) DifInt_{ijt} = \left|\mathrm{int}_{it} - \mathrm{int}_{jt}\right|$$
$$(7.8) DifEr_{ijt} = \left|ER_{it} - ER_{jt}\right|$$
$$(7.9) DifDef_{ijt} = \left|Def_{it} - Def_{jt}\right|$$
$$(7.10) DifPd_{ijt} = \left|Pd_{it} - Pd_{jt}\right|$$

These criteria account for every aspect necessary for monetary, fiscal, and structural stability. DifInf is the difference in inflation rate between country i and j; DifInt is the difference in interest rate; DifEr is the difference in exchange rate; DifDef is the difference in government deficit-to-GDP ratio and DifPd is the difference in debt-to-GDP ratio between each country pair. These were constructed in as primary variables to capture the policy variables driving convergence in the area.

The model was also estimated using a gravity equation. Following Eggar and Pfaffermayr (2013) and Warin, et. al (2009), we used Helpman's (1987) specification to complete the model. The model controls for a endowment-based New Trade Theory type influence (relative and absolute factor endowments), and for all time-invariant and common

cycle specific effects. The variables' specifications are as detailed by Helpman (1987) as follows:

$$(7.11) G_{ijt} = \ln(Y_{it} + Y_{jt})$$

G is the measure of "market size" or overall economic space. G was a proxy for trade motivated by market-expansion reasons (Helpman, 1987). Market size was the main variable in the gravity model, with positive value for trade flows as an indication of horizontal integration. Y is real gross domestic product (GDP).

$$(7.12) S_{ijt} = \ln\left(1 - \left(\frac{Y_{it}}{Y_{it} + Y_{jt}}\right)^2 - \left(\frac{Y_{jt}}{Y_{it} + Y_{jt}}\right)^2\right)$$

S is market similarity, the index that indicates the relative size of the two economies limited by absolute divergence in size and equality in country size. The expected sign is positive, as the indication of horizontal integration and similarity in preferences. According to the New Trade Theory, similarity in country size is one of the main determinants of multinational expansion to determine market.

$$(7.13) R_{ijt} = \left|\ln\left(\frac{gcf}{N_{it}}\right) - \ln\left(\frac{gcf_{jt}}{N_{jt}}\right)\right|$$

R measures the difference between the two countries in terms of relative "factor endowments. The formula shows the ratio of gross fixed capital formation to population. The factor endowments variable takes a minimum value of 0, representing equality in relative factor endowments, and a maximum value that approaches 1, the largest possible difference in relative factor endowments.

Factor endowment differs significantly depending on the trade theory hypothesis examined. Based on horizontal integration theory, factor endowment differences are irrelevant and should not be significant (or even exist) among developed countries. The Eurozone represented a set of well-developed and relatively wealthy countries, so movement toward equalization of relative factor endowments is expected to yield an increase in bilateral trade flows. gcf is real gross capital formation as a proxy of capital, and N is number of population.

D denotes the log of the "distance" between the economic centers of the two countries. It was a proxy for trade and transportation costs, which exert a negative impact on trade flows. As in the gravity theory, farther distance between countries reduced the incentives for trade.

Table 37. Data and Sources

Name	Abbrev.	Definition	Source
Trade	T	total nominal exports and imports between country i and country j	IMF Direction of Trade Statistics
Export	Ex	total nominal exports from country i to country j	IMF Direction of Trade Statistics
Import	Im	total nominal imports of country i from country j	IMF Direction of Trade Statistics
Inflation	Inf	Percentage of change in CPI	World Bank, WDI
Interest rate	Int	Long-term interest rate	World Bank, WDI for ASEAN and OECD stat for Eurozone
Exchange rate	ER	US$ over Local Currency	Unstat, National Accounts Main Aggregate Database
Public debt	Pd	Public debt ratio over GDP	WEO for ASEAN and OECD. Stat for Eurozone
Size	Q	Market Size derived from GDP data	Unstat,
Similarity	S	Market Similarity derived from GDP data	Unstat,
Endowment	E	Endowment, gross capital formation over population	Unstat,
Distance	D	The distance between central economic activity between two countries	CEPII database
Dummy Integration	DI	1 when both countries in pair are members; and 0 otherwise	Author Calculations
Dummy Crisis	DK	1 when in times of crisis (1998 and afterward for ASEAN; and 2009 for the Eurozone)	Author Calculations

The empirical model in Warin, Wunava, and Janicki (2009) was augmented with interaction terms to test for a structural shift in trade as result of deeper economic integration.

A simple OLS estimate of our model would impose strict restrictions that might not be justifiable given the complicated nature of our dataset. Specifically, we expect both temporally-dependent interactions, as well as interactions between country panels, to contradict OLS assumptions.

Following Warin et. al (2009) concerning autocorrelation, we applied a feasible generalized least squares procedure, because the model assumed an autoregressive error structure of the first-order AR (1), along with contemporaneous correlation among cross-sections. The estimated effect of growth is smaller, and the standard error is also smaller, but it shrunk by less than the coefficient. In the estimate, we applied cross-section weights, allowing different variances for each country. Table 26 shows the data and sources.

7.4 Empirical Results

This paper estimates the gravity model for Eurozone and ASEAN respectively over period of 20 years, from 1990 through 2009 with the following results.

7.4.1 The Eurozone

Based on Equation 7.2, Table 38 shows the results of panel estimation for the Eurozone. We confirmed that having a common currency significantly increased bilateral trade among members once membership was expanded (0.0793), but for the original member states, the result was negligible. Launching a common currency as a part of the final phase of economic integration was beneficial for lowering transaction costs when the New Member States (NMS) were included.

The insignificant impact on original members might be due to implementation of the European Single Market (EMS) in the previous year, which undermined the significance of the euro beside their exchange rate was pegged. This result aligns with the findings of Sousa (2012), who argued that the effect of a common currency on trade would decline over time. Although the impact was not as large as in previous studies, the deepening impact was positive as in Berger and Nitsch (2008), Micco, Stein and Ordonez (2003) and Rose (2000).

The widening impact was also positive shown by positive and significant coefficients for all members, compared with only between origins. Thus, inclusion in the NMS increased the value of the euro in trade. The global financial crisis discouraged bilateral trade only among original members, or by incorporating NMS.

Table 38. Panel Estimates for the Eurozone, 1990-2009

	Trade		**Export**		**Import**	
Variable	**All**	**Original**	**All**	**Original**	**All**	**Original**
Constant	-1.1466*	-1.0677*	-1.2673*	-1.1317*	-1.0380*	-1.0826*
Euro Dummy	0.0793*	0.0056	0.0926***	-0.0223	0.1064*	0.0255
Crisis Dummy	-0.0044*	-0.0030*	-0.0056*	-0.0031*	-0.0027*	-0.0024**
DifInf	0.0003	0.0005	0.0002	0.0003	-0.0003	0.0005
Difint	0.0007*	0.0007**	0.0015*	0.0010*	0.0010*	0.0006**
Difer	-0.0090	0.0162***	-0.0243**	0.0224*	-0.0056	0.0218***
Difdef	0.0002	-0.0003	-0.0003	-0.0005**	0.0002	-0.0004***
Difdebt	-7.57E-05	-4.11E-05	-5.37E-05	-5.40E-05	-0.0001*	-2.02E-05
G (Market Size)	0.0639*	0.0579*	0.0669*	0.0594*	0.0611*	0.0576*
S (Market Similarity)	0.0286*	0.0271*	0.0248*	0.0225*	0.0257*	0.0204*
R (Endowment)	-0.0124*	0.0073	6.72E-05	0.0049	-0.0294*	0.0054
D (Distance)	-0.0369*	-0.0251*	-0.0324*	-0.0222*	-0.0407*	-0.0226*
G*Euro	-0.0033*	-0.0005	-0.0037**	0.0006	-0.0042*	-0.0011
S*Euro	-0.0039*	-0.0037*	-0.0005	0.0011	-0.0022	0.0001
R*Euro	0.0123*	-0.0057	0.0208*	0.0078	0.0190*	0.0045
Observation	2394	1440	2409	1440	2396	1440
R2	0.9605	0.9525	0.9256	0.9517	0.9485	0.9385

*Note: *,**, and *** denote 1%, 5%, and 10% levels of significance, respectively.*

With regard to Maastricht policy variables, divergence in the inflation rate has no trigger effect on higher bilateral trade intensity. Interest rate measures the long-term cost of

borrowing; divergence in interest rate was related with higher trade intensity both among original members, and among all members (0.0007).

Convergence in nominal exchange rate strengthened higher trade intensity between all Eurozone members only in export weight (-0.0243). However, divergence in the exchange rate was more favorable for original members. This result implies that inclusion of new members triggers higher trade intensity due to lower transaction cost. Unfortunately, the reverse was true for original members, implying that inability to control monetary policy discourages competition and trade.

Convergence in the deficit was assumed to be a encouraging effect of fiscal policy, mainly for original members in export weight (-0.0005) and import weight (-0.0004). The results showed that convergence in deficit-to-GDP ratio contributed significantly to higher reciprocal trade intensity. The result also implies that convergence in debt-to-GDP ratio did not encourage trade intensity in all members, nor among only original members.

The total market size was positively significant on bilateral trade (0.0639). Higher coefficients for all members indicated that inclusion NMS into Eurozone induces larger market availability with the same currency (lower transaction costs) comparing only original members (0.0579). This result was in line with new trade theory, Helpman's (1987) results, and the gravity model hypothesis.

Although in total still positive, market size (-0.0033) shrunk to a negative state after the euro was introduced. The result indicates that the euro was a strong currency, attracting non-member trade, and becoming a force in globalization, with the emergence of China as a primary trading partner, as shown in Figure 13.

The coefficient of market similarity (0.0286) was also positive, indicating that bilateral trade occurred mainly between countries of similar size. When interacting with the euro dummy, the coefficient of market similarity (-0.0039) became negative for total trade, but it was insignificant for both export and import weight. Overall impact was still positive, denoting that a common currency encouraged trade with partners of dissimilar size.

The endowment coefficient (-0.0124) was negative, denoting that convergence in factor endowments (capital and labor) leads to a rise in bilateral trade, or an expansion across borders, strictly on the premise of a similar relative price in the partner country when NMS joins Eurozone. However, the result for original members was insignificant, as implied in new trade theory; when the level of development was similar, the endowment factor was not important. Thus, Linder's hypothesis states that gains occur not from specialization, but from similarity in the structure of demand.

When interacting with the euro dummy, different factor endowment encourages higher bilateral trade. Distance, as proxy for transportation cost, was related negatively to bilateral trade, as hypothesized in the gravity model. The coefficient was high when all members were involved (-0.0372), compared with only original members (-0.0231). This could be interpreted to mean that NMS joining the euro were located farther away than original members, leading to higher transportation costs.

7.4.2 ASEAN

Table 39 shows that in ASEAN-6, the impact of AFTA was positive (0.2853), but it was related negatively on bilateral trade in when all members were incorporated (-0.8707). This

result was similar to the findings of Doanh and Heo (2009), showing that AFTA related positively with higher trade intensity for Singapore (representative of ASEAN-6) and negatively for Vietnam (representative of CLMV). The result was also in line with the findings of Bun, Klaassen, and Tan (2009) and Hapsari and Mangunsong (2006), who proposed that AFTA might cause trade diversion, and the commodities traded in ASEAN were complementary.

The potential positive impact of AFTA, aimed at eliminating tariff barriers among member countries, might be cancelled out, as suggested by Cuyvers, De Lombaerde, and Verherstraeten (2005). Commitment to CEPT by participating countries was relatively low, which might undermine the relevance of AFTA.

A widening impact of AFTA membership was a reduction in incentives for bilateral trade, since the main purpose of AFTA was multilateral trade. The emergence of China as a giant rival for market share, also shown in Figure 3, reduced the importance of AFTA. As well, AFTA felt the impact of new industrial and exporting powers of South American and Eastern Europe, and the emergence of other regional trade agreements like the EU and NAFTA. Associated agreements among these various nations and groups of nations may have caused their own trade diversion effects, as indicated by Elliot and Ikemoto (2004).

Other possible causes might be the outward-looking orientation in individual ASEAN countries, which increases extra-regional trade more than intra-regional trade. Despite some limitations, AFTA could be the best hedge against other regional initiatives, although it might be not the best.

Table 39. Panel Estimates for ASEAN, 1990-2009

	Trade		Export		Import	
Variable	**All**	**ASEAN-6**	**All**	**ASEAN-6**	**All**	**ASEAN-6**
Constant	-1.5118*	-0.9030**	-1.7087*	-1.6419*	-1.7523*	-0.5119
AFTA Dummy	-0.8707**	0.2853**	-0.7078**	0.2831**	-0.6385***	0.0831
Crisis Dummy	-0.0162**	-0.0008	-0.0224*	-0.0009	-0.0132**	0.0036***
DifInf	-3.94E-05	-6.06E-05	-0.0002	-3.86E-05	-4.50E-05	-0.0002
Difint	-0.000691	2.46E-05	-0.0004	5.42E-05	-6.62E-08	0.0004
Difer	-4.23E-07	-4.55E-07	3.19E-07	-1.60E-07	-2.30E-07	-7.84E-07
Difdef	0.0018*	-1.50E-05	0.0017*	3.46E-05	0.0014**	7.17E-07
Difdebt	-0.0001	-8.43E-05**	-0.0002**	1.06E-05	-0.0002***	-9.86E-05*
G (Market Size)	0.1011*	0.0593*	0.1070*	0.0825*	0.1094*	0.0436*
S (Market Similarity)	0.0766*	0.0542*	0.0728*	0.0504*	0.0732*	0.0605*
R (Endowment)	0.0159*	-0.0047	0.0152*	-0.0057	0.0124**	-0.0037
D (Distance)	-0.1023*	-0.0333*	-0.0961*	-0.0194**	-0.0983*	-0.0307*
G*AFTA	0.0328**	-0.0113*	0.0267**	-0.0111**	0.0237***	-0.0036
S*AFTA	-0.0136***	-0.0072***	-0.0144***	-0.0029	-0.0134	-0.0142
R*AFTA	-0.0006	-0.0005	-0.0022	0.0021	-0.0002	0.0002
Observation	1509	582	1549	583	1545	583
R2	0.7769	0.9678	0.7184	0.9766	0.7299	0.9705

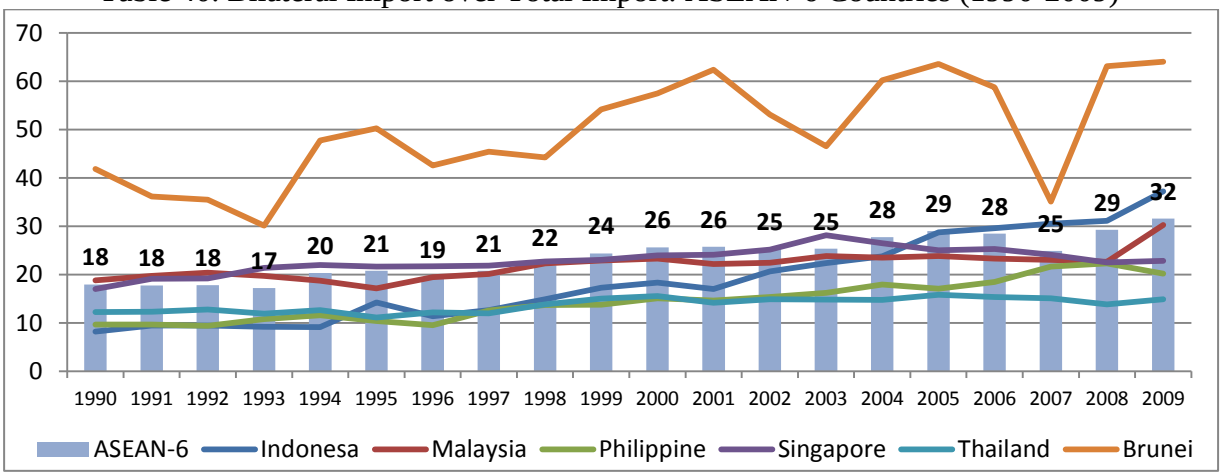
*Note: *,**, and *** denote 1%, 5%, and 10% levels of significance respectively.*

The impact of the Asian crisis in 1998 related negatively to bilateral trade, mainly when the CLMV was incorporated into equation. The result could be relevant, since the crisis was caused by structural and financial difficulties with large currency depreciation. The financial crisis suffered by some countries in ASEAN impacted credibility and confidence in the region. In line with the findings of Elliott and Ikemoto (2004), the impact of the crisis on import weight for ASEAN-6 was positive, which shows the desire to replace imported goods from outside the region with products produced by member countries.

Despite ASEAN's previous successes in trade, based on an export-oriented strategy, the Asian crisis could had been a moment for ASEAN countries to forcefully turn inwards and focus on their regional markets. Figure 17 shows an increasing trend of bilateral import after the crisis. With regard to variables associated with the MC, convergence in inflation, interest, and exchange rates have no impact on bilateral trade intensity. Divergence in deficits (0.0018)

induces higher trade in ASEAN. Convergence in public debt fostered higher bilateral trade intensity, meaning that traders seemed to be reassured by the homogeneity of debt, either among original members or all members.

Table 40. Bilateral Import over Total Import: ASEAN-6 Countries (1990-2009)



Author's calculations, dividing bilateral import by total trade, in percentage.
Source: DOTS, IMF

Market size was important for the bilateral trade of all ASEAN members (0.1011) and ASEAN-6 (0.0593), since traders need larger markets to sell or buy goods and ASEAN membership expansion created a much larger market. After joining AFTA, market size (0.0328) continued to contribute positively for all ASEAN members, but decreased for ASEAN-6. This result implies that more open policies in the CLMV have already had a positive impact on bilateral trade.

The coefficient of market similarity was positive in ASEAN (0.0766) and in ASEAN-6 (0.0542), indicating bilateral trade was plausible between countries of relatively similar size, as Helpman (1987) showed, and it is an indicator of horizontal integration improvement. After AFTA membership, the coefficient (-0.0136 in ASEAN and -0.0072 in ASEAN-6) became

negative, indicating that similarity of market became less important, although the overall impact was still positive.

Factor endowment was positive when the CLMV was incorporated into the Equation (0.159). This result implied that differences in factor endowment were important for higher bilateral trade, and showed the existence of a development gap between ASEAN-6 members with the CLMV. Since the development stages were relatively similar (the only exceptions Singapore and Brunei), the endowment impact was insignificant in ASEAN-6. Interacting with the AFTA dummy, the endowment impact was insignificant in both ASEAN and ASEAN-6. In line with the gravity hypothesis, the impact of distance was negative in ASEAN-6 (-0.0333), and even higher for all ASEAN (-0.1023).

7.4.3 Comparative Results

Based on the results in Tables 38 and 39, we present the following comparisons:

Between the Eurozone and ASEAN

Total Trade Weight

When comparing total trade weight, we measured the impact of independent variables on bilateral trade. We concluded that market size was positively significant in both areas, with higher influence in ASEAN (0.1011 and 0.0639). A similar result was shown in the impact of market similarity (0.0766 and 0.0286); however, the pattern was reversed after deeper integration (-0.0136 and -0.0039). Distance has a negative impact in both regions, higher in ASEAN (-0.1023 and -0.0369), as did the impact of the crisis (-0.0162 and -0.0044). In regard

to other independent variables, differences in inflation, exchange rate, and debt are insignificant in both regions.

The impact of the euro is positively significant in the Eurozone by 0.0793, but the impact of AFTA was in reverse (-0.8707). Divergence in interest rates was a positive influence in the Eurozone (0.0007); while divergence of deficits was only significant in ASEAN by 0.0018. Differences in factor endowment were positive in ASEAN at 0.0159, but negative in the Eurozone at -0.0124. Market size continued positive significance in ASEAN after AFTA (0.0328), but in the Eurozone, after the euro, the result was negative by -0.0033. Further, factor endowment, after deepening regional integration, only has impacted Eurozone by 0.0123.

Export Weight

There is little difference in total trade weight. Based on export weight, the impact of market size (0.1070 and 0.0669) and market similarity (0.0728 and 0.0248) were positive and significant in both regions, with higher impact in ASEAN. However, after deepening the integration process, the impact of market similarity was negative in the Eurozone by -0.0039 and in ASEAN by -0.0136. In line with total trade weight, distance (-0.0961 and -0.0324) was also negative, and higher in ASEAN, as was crisis impact (-0.0224 and -0.0056). The difference in inflation was insignificant in both regions.

The impact of the euro is positive by 0.0926 for reciprocal export in the Eurozone, and the influence of AFTA was negative by -0.7078 in ASEAN. Divergence in interest rates was increased bilateral trade by 0.0015 in the Eurozone. Convergence in exchange rates had a positive influence by -0.0243 only in the Eurozone.

Divergence in deficit (0.0017) and convergence in public debt (-0.0002) are responsible for higher bilateral trade only between ASEAN members. Factor endowment plays an important role on higher bilateral trade in ASEAN at 0.0152, but it was insignificant in the Eurozone. Market size increased bilateral trade by 0.0267 after AFTA in ASEAN, but it disincentived reciprocal trade by -0.0037 in the Eurozone after the euro. The impact of factor endowment after the euro was positive by 0.0208, but factor endowment was insignificant in ASEAN after AFTA.

Import Weight

Related with import weight, the impacts of market size (0.1094 and 0.0611) and market similarity (0.0732 and 0.0257) are positive and significant, with a greater impact in ASEAN. The impact of market similarity became insignificant in both regions after deepening regional economic integration. The impact of distance, as in gravity theory, was negative and significant by -0.0983 in ASEAN and by -0.0407 in the Eurozone. Convergence in inflation and exchange rates were insignificant in both regions, but convergence in debt improved bilateral trade by -0.0002 in ASEAN and by -0.0001 in the Eurozone.

The impact of the euro is positive (0.1064), but the impact of AFTA is negative for ASEAN (-0.7078), and the crisis discouraged bilateral import by -0.0224 in ASEAN and by -0.0056 in the Eurozone. Divergence in interest rates led to higher bilateral import in the Eurozone (0.0010), but it was insignificant in ASEAN. Divergence in deficit increased bilateral trade in ASEAN by 0.0014. Factor endowment played an important role in ASEAN (0.0124) but the result was reversed for the Eurozone (-0.0294). However, after the euro's

launch, the result was positive by 0.0190. Reversed results were also shown in the size of ASEAN after AFTA (0.0237) and by (-0.0042) in the Eurozone after the euro.

Between the Eurozone and Original members

Total Trade

Based on the results in Table 3, we drew comparisons among all members of the Eurozone, and among only original members. The result confirmed that both market size (0.0639 and 0.0579) and market similarity (0.0286 and 0.0271) were positively significant in both equations, and the impact was greater when NMS was incorporated. However, after the euro was introduced, the impact change was negative (-0.0039 and -0.0037). Transportation costs, with distance as a proxy, correlated negatively, -0.0369 between all the Eurozone members and -0.0251 between only original members. The impact of the crisis was more painful when NMS was incorporated (-0.0044 and -0.0030). In regard to variables associated with the MC, differences in inflation, deficit, and debt are insignificant in both equations. Differences in interest rate have a positive impact on bilateral trade among all members, and only among original members.

Overall, the impact of the euro is positive by 0.0793, but it was insignificant among original members. Divergence in exchange rates was influential among original members by 0.0162. Different factor endowment contributes negatively to bilateral trade in the entire Eurozone, but it was insignificant among original members. After the euro was introduced, size and similarity were most influential when NMS incorporated (-0.0033 and 0.0123), but insignificant among original members.

Bilateral Export

Weighting with export measure, market size was positive by 0.0669 for all Eurozone members and by 0.0594 for original members. Market similarity also exhibited a positive influence of 0.0248 for all members, and 0.0225 for original members, but the impact of similarity after the euro launch was insignificant in both estimates. Endowment was insignificant in both equations. Distance was negative in both equations, but with higher significance when NMS was incorporated, by -0.0324, -0.0222 among original members. The crisis was painful whether NMS incorporated or not, but the impact was higher when those countries were incorporated (-0.0056 and -0.0031). Variables related to inflation and debt-to-GDP ratio are insignificant in both estimates. The divergence in interest rate increased bilateral trade by 0.0015 in the Eurozone, and by 0.0010 among original members.

The euro's impact on export weight is different in both estimations: it was positive (0.0926) if NMS was incorporated, but insignificant otherwise. Convergence in exchange rate caused a rise in bilateral exports when NMS incorporated, by -0.0243, but divergence in nominal exchange rates was preferred if bilateral trade was among members, by 0.0224. Differences in deficit were insignificant when all members were incorporated, but convergence in deficits increased bilateral trade among original members by -0.0005. After the euro launched, market size disincentived bilateral trade, when NMS incorporated, by -0.0037, but it was insignificant among original members. Endowment impact after the euro correlated positively when NMS augmented by (0.0208), insignificant among original members.

Bilateral Import

In regard to import weight, market size and market similarity were related positively in both estimates, although the impact was greater when NMS was incorporated (0.0611 and 0.0576 for market size and 0.0257 and 0.0204 for market similarity); however, market similarity became insignificant after the euro was introduced. Distance, as hypothesized, correlated negatively, with greater impact when NMS was augmented (-0.0407 and -0.0226). During the crisis, reciprocal trade diminished among all Eurozone members by -0.0027, compared with -0.0024 among original members. Differences in inflation were insignificant in both estimates, but divergence in interest rates fostered higher bilateral trade in both estimates, higher when NMS was included (0.0010 and 0.0006).

The impact of the euro was positive by 0.1064 when all members are included, but insignificant among original members. The difference in exchange rates was insignificant when NMS is incorporated, but divergence in exchange rates increased bilateral trade by 0.0218. Deficit-to-GDP ratio was insignificant when membership was extended, but convergence in this variable related with higher reciprocal imports, by -0.0004. Convergence in debt-to-GDP ratio increases bilateral import when NMS was included, by -0.0001, but it was insignificant among original members. Different factor endowment correlated negatively by -0.0294 when all members were included, however the endowment impact reversed after the euro was introduced. After the euro launched, market size became negative when NMS incorporated by -0.0042, but insignificant among original members.

Between all ASEAN and ASEAN-6

Total Trade

In regard to total trade weight, market size and market similarity have positive and significant impact on reciprocal bilateral trade, with or without the CLMV incorporated into the equation; however, when CLMV countries were included, the figures were higher (0.1011 and 0.0593 for market size, and 0.0766 and 0.0542 for market similarity). After AFTA was introduced, the impact of market similarity became negative by -0.0136 in all ASEAN countries and -0.0072 in only ASEAN-6 countries. Distance was related negatively by -0.1023 among all ASEAN members and by -0.0333 among ASEAN-6.

The impact of AFTA was negative for bilateral trade when the CLMV countries were included, by 0.8707; however, it increased bilateral trade among ASEAN-6 by 0.2853. The ASEAN economic crisis was influential when CLMV was incorporated by -0.0162. Divergence in deficit-to-GDP ratio fostered higher bilateral trade, by 0.0018, when the CLMV countries were included, but convergence in debt-to-GDP ratio was significant only among original members. Factor endowment was only important for higher bilateral trade intensity when including CLMV, when the result was 0.0159. The size impact after launching AFTA was positive for all ASEAN members, by 0.0328, but negative among original members by -0.0113.

Export Weight

Based on export weight, market size and market similarity impact were positive and significant, higher when CLMV was incorporated into the equation (0.1070 and 0.0825 for market size, and 0.0728 and 0.0504 for market similarity). The impact of distance was higher

among all ASEAN members by -0.0961 than among ASEAN-6 countries, by -0.0194. Diminishing differences in variables related with inflation, interest rate, and exchange rate are insignificant in both ASEAN and ASEAN-6. Factor endowment after AFTA was insignificant in both estimations.

The impact of AFTA was negative by -0.7078 when CLMV was incorporated into the equation, and positive by 0.2831 among ASEAN-6. The impact of the crisis was only painful to bilateral export among all ASEAN members, by -0.0224. Wider differences in deficit were significant in increasing bilateral trade among all ASEAN members by 0.0017, and convergence in debt fostered increased bilateral export in all members by -0.0002. Different factor endowment increases reciprocal trade when the CLMV was incorporated into the estimate. The size impact after AFTA was positive among all ASEAN members, by 0.0267, and negative, by -0.0111, in ASEAN-6. After AFTA, the impact of market similarity was negative in all ASEAN nations, by -0.0144.

Import Weight

Concerning import weight, the impact of market size was positive and significantly higher among all ASEAN members, by 0.1094, and among ASEAN-6 by 0.0436. A similar result was found for market similarity: 0.0732 for all ASEAN countries and 0.0605 among ASEAN-6. Distance was negative, -0.0983 among all ASEAN members and -0.0307 among ASEAN-6. Differences in inflation, interest, and exchange rates had no significant impact among ASEAN-6 countries or when the membership was extended. Convergence in debt increased reciprocal trade by -0.0002 among all ASEAN. After the launch of AFTA, market

similarity and factor endowment are insignificant among ASEAN-6 countries and among all ASEAN members.

The impact of AFTA is negative when CMLV was incorporated, by -0.6385. While the impact of the crisis was negative when trade occurred among all ASEAN members, by -0.0132, it was positive when only accounting for ASEAN-6, by 0.0036. Divergence in deficits fostered higher bilateral imports among all ASEAN members by 0.0014. Factor endowment raised bilateral import by 0.0124 when CLMV was included into the equation. After AFTA, country size correlated positively by 0.0237 when the CLMV was incorporated into the estimation.

7.5 Conclusion and Policy Implication

Using an augmented gravity equation, this paper provides a comparative analysis of different levels of economic integration on bilateral trade, using two examples, one region using a common currency (the Eurozone) and the other a struggling free-trade area (ASEAN). The results show that deepening the level of integration was positive on bilateral trade in all Eurozone members, but insignificant if for only original members. Thus, expanding membership increased reciprocal trade. In ASEAN, the creation of AFTA generated a positive result only among ASEAN-6 members, not when CLMV joined the membership. Thus, the impact of expansion was negative. The financial crisis reduced the incentive to trade bilaterally in both the Eurozone (in 2009) and ASEAN (in 1998).

For the Eurozone, in regard to the MC variables, divergence in interest rates creates incentives for bilateral trade; a similar effect was caused by the divergence of nominal exchange rates among in original members. A reassuring effect was shown in the deficit-to-

GDP ratio for original members, in export and import weight. Thus, it was determined that forcing convergence in MC variables might be not correlate to an increase in bilateral trade. For ASEAN, among variables associated with the MC, divergence in deficits increases bilateral trade, and convergence in debt implies the appearance of the reassuring effect.

Related to H-O variables, the impact of market size, income similarity, and distance were as expected. Market size and income similarity were important factors for higher flow of bilateral trade, indicating horizontal linkage creation based predominantly on market access and consumer income. We found various results for factor endowment impact. Intra-trade industry was a phenomenon in all Eurozone countries, shown by the negative impact of factor endowment on bilateral trade, but it was insignificant among original members, due to similar level of development. For ASEAN, differences in factor endowment were determinant for higher bilateral trade when CLMV countries were included, as shown by a positive result for factor endowment; however, among original members, the impact was insignificant.

These results show less impact from the euro, compared to Rose's (2000) findings, but in line with the findings of Sousa (2012). This demonstrates the need for greater economic integration, as well as measures to decrease trade disputes and friction in the area, especially regarding trade imbalances. For ASEAN, the result was in line with the problems denoted by Cuyvers, De Lombaerde, and Verherstraeten (2005), most notably, ASEAN needs to realize their commitment to lower tariffs based on CEPT scheme, in order to accelerate the realization of the ASEAN Economic Community by 2015.

Appendix 7.1 Bilateral Trade Intensity between the Eurozone Countries

Bilateral Trade Intensity Index, Austria as Reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Finland	0.74	0.65	0.65	0.59	0.61	0.67	0.64	0.60	0.78	0.78	0.76	0.71	0.67	0.70	0.58	0.56	0.57	0.51	0.48	0.44	0.63
France	4.43	4.36	4.41	4.48	4.64	4.70	4.56	4.42	4.63	4.61	4.10	4.36	4.17	4.25	4.05	3.95	3.46	3.36	3.39	3.54	4.19
Germany	40.98	41.24	41.52	40.83	39.15	41.16	40.35	38.25	39.48	40.47	38.73	38.03	37.01	37.50	39.19	38.51	37.77	37.64	37.04	38.16	39.15
Ireland	0.27	0.31	0.35	0.37	0.37	0.40	0.39	0.34	0.47	0.44	0.45	0.42	0.40	0.38	0.69	0.35	0.41	0.35	0.36	0.40	0.40
Italy	9.34	9.09	8.70	8.65	8.51	8.81	8.59	8.29	8.50	7.88	7.81	7.68	7.97	8.19	7.84	7.64	7.99	7.97	7.81	7.40	8.23
Netherland	2.85	2.82	2.80	2.96	3.00	3.16	2.92	3.00	2.99	3.55	3.38	3.53	3.45	3.27	2.91	2.78	2.95	3.06	2.96	2.92	3.06
Portugal	0.52	0.53	0.56	0.54	0.54	0.49	0.54	0.51	0.49	0.34	0.35	0.37	0.36	0.37	0.31	0.27	0.29	0.29	0.26	0.29	0.41
Spain	1.50	1.61	1.76	1.71	1.70	1.68	1.81	1.84	2.09	1.98	1.86	1.81	2.28	1.94	1.81	1.91	1.95	1.96	1.70	1.53	1.82
Cyprus	0.04	0.04	0.05	0.03	0.02	0.03	0.02	0.02	0.03	0.02	0.03	0.03	0.07	0.03	0.04	0.04	0.06	0.06	0.05	0.06	0.04
Greece	0.49	0.49	0.51	0.45	0.40	0.43	0.36	0.32	0.33	0.31	0.30	0.33	0.35	0.40	0.34	0.29	0.33	0.38	0.37	0.36	0.38
Malta	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.10	0.02	0.02	0.02	0.02
Slovakia	-	-	-	0.71	0.76	0.88	1.08	1.18	1.17	1.16	1.23	1.31	1.71	1.82	1.69	1.60	1.66	1.98	2.10	2.17	1.42
Slovenia	-	-	-	1.00	1.06	1.21	1.19	1.31	1.29	1.43	1.48	1.51	1.56	1.69	1.82	1.38	1.50	1.64	1.66	1.69	1.44
Eurozone	61.17	61.15	61.31	62.33	60.77	63.63	62.46	60.11	62.27	63.00	60.49	60.10	60.00	60.56	61.27	59.31	59.03	59.22	58.21	58.97	60.77

Bilateral Trade Intensity Index, Finland as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	1.23	1.26	1.26	1.10	1.08	1.11	0.97	1.00	1.25	1.21	1.15	1.09	1.10	1.15	0.98	0.85	0.82	0.79	0.76	0.81	1.05
France	5.21	5.07	5.76	5.00	4.62	4.36	4.33	4.47	5.04	4.70	4.49	4.55	4.42	4.02	3.87	3.56	3.31	3.51	3.35	3.93	4.38
Germany	15.21	16.11	16.36	14.52	14.01	14.16	13.36	12.52	13.19	14.28	13.59	13.21	12.96	13.76	13.17	13.35	13.34	13.21	12.77	13.03	13.81
Ireland	0.54	0.63	0.67	0.58	0.58	0.64	0.68	0.80	0.74	0.75	0.69	0.91	0.87	0.66	0.59	0.69	0.67	0.60	0.56	0.60	0.67
Italy	3.90	3.86	3.84	3.47	3.38	3.37	3.19	3.44	3.95	3.58	3.74	3.57	3.45	3.74	3.30	3.16	3.13	2.97	3.00	2.76	3.44
Netherland	3.73	4.21	4.52	4.46	4.45	4.17	3.76	4.05	4.40	5.25	4.94	3.78	4.20	5.48	5.69	5.47	5.77	6.13	5.72	6.43	4.83
Portugal	0.99	1.07	0.99	0.83	0.69	0.64	0.60	0.63	0.62	0.60	0.55	0.52	0.54	0.49	0.48	0.48	0.40	0.35	0.45	0.53	0.62
Spain	1.65	1.96	1.99	1.91	1.87	2.08	1.86	1.85	2.20	2.07	2.01	2.20	2.08	2.14	2.04	1.93	1.91	2.11	2.00	1.70	1.98
Cyprus	0.05	0.04	0.03	0.14	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.07	0.14	0.05	0.03	0.15	0.23	0.06
Greece	0.47	0.46	0.53	0.43	0.44	0.43	0.41	0.45	0.66	0.55	0.59	0.52	0.56	0.58	0.45	0.37	0.39	0.45	0.38	0.37	0.47
Malta	0.04	0.06	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.03	0.03	0.08	0.02	0.02	0.01	0.06	0.06	0.03	0.05	0.03
Slovakia	-	-	-	0.12	0.14	0.14	0.15	0.14	0.16	0.16	0.14	0.16	0.17	0.17	0.17	0.17	0.22	0.23	0.36	0.22	0.18
Slovenia	-	-	-	0.08	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.09	0.07	0.09	0.10	0.15	0.14	0.15	0.14	0.10
Eurozone	33.02	34.73	35.99	32.66	31.40	31.23	29.44	29.46	32.32	33.28	32.03	30.64	30.54	32.28	30.92	30.28	30.22	30.58	29.68	30.79	31.57

Bilateral Trade Intensity Index, France as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	0.86	0.86	0.88	0.93	0.97	0.97	0.94	0.90	0.96	0.93	0.84	0.98	1.05	0.99	0.98	0.92	0.90	0.90	0.89	0.89	0.93
Finland	0.64	0.53	0.57	0.47	0.52	0.56	0.56	0.58	0.63	0.56	0.60	0.57	0.55	0.56	0.52	0.48	0.49	0.51	0.47	0.45	0.54
Germany	17.91	18.00	17.83	17.13	16.96	17.73	16.93	15.69	16.36	17.32	15.32	16.82	17.18	17.48	17.17	16.91	17.30	17.41	17.55	17.78	17.14
Ireland	0.64	0.66	0.77	0.81	0.88	0.87	0.92	1.04	1.22	1.14	1.32	1.18	1.15	1.08	1.07	1.13	1.03	1.02	0.92	1.03	0.99
Italy	11.25	10.84	10.59	9.46	9.46	9.63	9.36	9.23	9.39	9.24	8.83	8.55	8.90	9.19	8.89	8.49	8.61	8.65	8.34	8.06	9.25
Netherland	5.23	5.01	4.90	4.88	4.68	4.86	4.76	4.69	4.76	5.74	5.90	5.51	5.43	5.40	5.31	5.28	5.46	5.62	5.48	5.68	5.23
Portugal	1.27	1.28	1.37	1.30	1.28	1.24	1.22	1.24	1.28	1.33	1.49	1.87	1.51	1.67	1.60	1.08	1.07	1.06	1.02	1.06	1.31
Spain	5.42	5.92	6.20	5.95	6.45	6.81	7.25	7.13	7.82	7.73	7.98	7.62	7.87	8.47	8.40	8.26	8.24	8.12	7.42	7.20	7.31
Cyprus	0.04	0.03	0.06	0.05	0.04	0.04	0.04	0.03	0.03	0.09	0.13	0.12	0.09	0.08	0.05	0.04	0.06	0.05	0.04	0.04	0.06
Greece	0.54	0.51	0.53	0.51	0.46	0.49	0.50	0.51	0.49	0.52	0.54	0.47	0.48	0.57	0.55	0.47	0.49	0.51	0.48	0.48	0.51
Malta	0.05	0.05	0.07	0.07	0.07	0.07	0.11	0.11	0.11	0.11	0.13	0.10	0.11	0.12	0.13	0.10	0.11	0.11	0.10	0.08	0.10
Slovakia	-	-	-	0.04	0.05	0.08	0.10	0.11	0.14	0.11	0.10	0.12	0.15	0.16	0.16	0.19	0.25	0.41	0.45	0.55	0.19
Slovenia	-	-	-	0.24	0.27	0.27	0.30	0.27	0.35	0.24	0.24	0.24	0.28	0.32	0.31	0.31	0.28	0.27	0.27	0.30	0.28
Eurozone	43.86	43.69	43.78	41.85	42.08	43.62	42.99	41.53	43.56	45.04	43.42	44.15	44.76	46.09	45.13	43.64	44.30	44.65	43.42	43.59	43.76

Bilateral Trade Intensity Index, Germany as Reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	5.03	5.06	5.26	5.77	5.39	4.58	4.76	4.48	4.66	4.75	4.61	4.50	4.66	4.71	4.86	4.80	5.00	4.99	5.01	5.30	4.91
Finland	1.06	0.95	0.94	0.90	0.97	0.97	0.94	0.93	1.01	1.11	1.09	1.10	1.04	1.01	1.03	1.11	1.04	1.06	0.95	0.82	1.00
France	12.29	12.68	12.62	11.48	11.51	11.18	10.76	10.58	11.10	11.04	10.55	10.30	10.15	9.95	9.72	9.54	9.13	9.00	8.86	9.29	10.59
Ireland	0.61	0.63	0.70	0.70	0.74	0.79	0.75	0.76	0.80	1.18	1.28	1.73	1.46	1.47	1.48	1.44	0.88	0.86	0.74	0.69	0.98
Italy	9.20	9.24	9.34	7.67	7.88	7.88	7.80	7.57	7.58	7.45	7.16	7.01	6.93	6.91	6.67	6.38	6.22	6.29	6.10	6.11	7.37
Netherland	9.11	9.05	9.03	7.84	7.69	7.86	7.97	7.68	7.40	7.26	7.59	7.21	7.05	7.16	7.13	7.17	8.84	8.92	9.25	9.40	8.03
Portugal	0.88	1.00	1.01	0.93	0.87	0.96	1.10	1.11	1.13	1.12	1.07	1.00	1.02	0.96	0.87	0.81	0.70	0.71	0.68	0.66	0.93
Spain	3.00	3.42	3.48	2.92	2.99	3.28	3.46	3.57	3.78	3.88	3.65	3.71	3.88	4.10	4.13	4.14	3.78	3.91	3.54	3.40	3.60
Cyprus	0.05	0.06	0.08	0.09	0.09	0.06	0.05	0.04	0.04	0.05	0.05	0.04	0.04	0.05	0.05	0.05	0.07	0.09	0.06	0.06	0.06
Greece	0.81	0.78	0.87	0.78	0.67	0.60	0.58	0.56	0.57	0.59	0.55	0.57	0.56	0.60	0.59	0.58	0.54	0.55	0.55	0.57	0.62
Malta	0.06	0.06	0.06	0.07	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.04	0.05	0.05	0.04	0.04	0.04	0.05	0.04	0.05
Slovakia	-	-	-	0.25	0.33	0.46	0.49	0.53	0.69	0.64	0.59	0.68	0.78	1.05	1.01	0.92	0.93	1.00	0.97	0.97	0.72
Slovenia	-	-	-	0.48	0.48	0.50	0.47	0.47	0.47	0.48	0.43	0.42	0.42	0.41	0.38	0.39	0.40	0.44	0.45	0.42	0.44
Eurozone	42.10	42.94	43.39	39.86	39.68	39.18	39.17	38.33	39.28	39.61	38.66	38.34	38.04	38.44	37.97	37.37	37.58	37.87	37.20	37.70	**39.14**

Bilateral Trade Intensity Index, Ireland as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	0.51	0.52	0.48	0.50	0.59	0.44	0.39	0.31	0.41	0.46	0.43	0.37	0.37	0.40	0.38	0.42	0.40	0.46	0.41	0.40	0.43
Finland	0.67	0.71	0.61	0.51	0.64	0.64	0.60	0.61	0.60	0.69	0.52	0.46	0.46	0.41	0.38	0.43	0.50	0.42	0.46	0.39	0.54
France	7.73	7.12	7.38	7.03	6.83	7.02	6.46	6.46	6.50	6.61	6.40	5.57	4.58	5.23	5.36	5.38	4.95	5.15	5.08	5.29	6.11
Germany	10.13	10.63	10.86	10.78	11.08	11.28	10.59	9.60	11.81	9.61	9.17	10.29	7.10	8.24	8.18	8.05	8.50	8.32	7.62	6.08	9.40
Italy	3.53	3.47	3.34	2.96	3.17	2.98	2.99	2.65	2.71	2.98	3.26	2.94	3.04	3.62	3.60	3.34	3.45	3.00	2.98	2.82	3.14
Netherland	5.00	5.62	5.86	4.71	4.36	5.17	5.16	5.33	4.53	5.04	4.77	4.30	3.69	4.73	4.49	4.60	4.19	4.39	4.38	4.31	4.73
Portugal	0.50	0.50	0.46	0.38	0.40	0.34	0.39	0.36	0.35	0.30	0.26	0.28	0.34	0.33	0.35	0.36	0.39	0.36	0.38	0.38	0.37
Spain	1.76	1.84	1.80	1.65	1.82	1.82	1.88	1.90	2.00	2.09	2.05	1.95	1.94	2.28	2.28	2.61	2.85	2.80	3.12	3.12	2.18
Cyprus	0.07	0.08	0.07	0.07	0.06	0.05	0.04	0.05	0.03	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.04
Greece	0.32	0.36	0.33	0.35	0.33	0.38	0.36	0.21	0.18	0.23	0.23	0.24	0.25	0.27	0.27	0.26	0.28	0.31	0.28	0.30	0.29
Malta	0.03	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
Slovakia	-	-	-	0.01	0.03	0.05	0.03	0.03	0.04	0.04	0.03	0.04	0.04	0.04	0.03	0.04	0.07	0.07	0.07	0.97	0.10
Slovenia	-	-	-	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03
Eurozone	30.24	30.90	31.24	29.05	29.36	30.24	28.96	27.58	29.21	28.14	27.22	26.52	21.89	25.62	25.40	25.55	25.65	25.36	24.86	24.16	27.36

Bilateral Trade Intensity Index, Italy as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	2.35	2.34	2.34	2.37	2.36	2.39	2.33	2.28	2.34	2.42	2.26	2.28	2.45	2.61	2.59	2.49	2.55	2.47	2.30	2.34	2.39
Finland	0.58	0.53	0.54	0.46	0.48	0.52	0.50	0.55	0.62	0.63	0.65	0.56	0.58	0.59	0.53	0.55	0.56	0.54	0.54	0.45	0.55
France	15.24	14.67	14.62	13.36	13.30	13.50	12.96	12.65	12.95	13.01	11.99	11.71	11.73	11.95	11.67	11.13	10.49	10.29	9.87	10.22	12.37
Germany	20.25	20.94	21.12	19.40	19.11	19.09	17.88	17.11	17.60	17.92	16.29	16.13	15.69	16.08	15.80	15.29	15.05	15.03	14.40	14.68	17.24
Ireland	0.48	0.50	0.52	0.53	0.62	0.65	0.67	0.66	0.74	0.94	1.04	0.96	0.95	1.04	0.98	0.91	0.80	0.71	0.60	0.70	0.75
Netherland	4.46	4.50	4.59	4.16	4.20	4.19	4.31	4.39	4.43	4.54	4.30	4.38	4.18	4.13	4.14	4.06	4.05	3.96	3.86	4.05	4.24
Portugal	0.88	0.93	0.99	0.86	0.88	0.93	0.95	0.92	0.96	1.01	0.89	0.91	0.88	0.88	0.83	0.77	0.78	0.69	0.66	0.85	0.87
Spain	4.12	4.36	4.30	3.90	4.31	4.49	4.60	4.97	5.21	5.45	5.20	5.21	5.48	6.01	5.97	5.86	5.77	5.90	5.23	5.01	5.07
Cyprus	0.10	0.10	0.13	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.08	0.08	0.09	0.12	0.13	0.13	0.12	0.16	0.13	0.10
Greece	1.34	1.31	1.33	1.30	1.32	1.36	1.36	1.34	1.32	1.42	1.28	1.24	1.29	1.39	1.40	1.25	1.29	1.33	1.26	1.27	1.32
Malta	0.31	0.36	0.44	0.44	0.47	0.41	0.24	0.19	0.18	0.17	0.18	0.18	0.20	0.17	0.15	0.15	0.16	0.14	0.19	0.21	0.25
Slovakia	-	-	-	0.15	0.21	0.24	0.28	0.28	0.33	0.36	0.37	0.40	0.42	0.40	0.43	0.48	0.55	0.61	0.60	0.65	0.40
Slovenia	-	-	-	0.58	0.65	0.70	0.66	0.71	0.68	0.65	0.68	0.69	0.70	0.75	0.72	0.73	0.75	0.83	0.81	0.76	0.71
Eurozone	50.12	50.55	50.94	47.60	48.00	48.58	46.82	46.12	47.43	48.60	45.21	44.74	44.64	46.08	45.32	43.80	42.92	42.62	40.47	41.33	46.09

Bilateral Trade Intensity Index, Netherland as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	1.05	1.03	1.08	1.11	1.07	1.16	1.17	1.12	1.27	1.07	1.05	1.16	1.07	1.12	1.08	0.99	0.99	1.01	0.97	0.95	1.08
Finland	0.91	0.79	0.75	0.79	0.88	0.90	0.84	0.89	0.93	0.92	0.96	0.95	0.97	0.98	1.04	1.02	1.03	1.01	0.91	0.86	0.92
France	9.52	9.18	9.32	8.80	9.01	9.03	8.94	8.77	8.82	8.45	8.09	8.18	7.99	7.79	7.56	7.16	6.66	6.53	6.76	6.97	8.18
Germany	26.20	27.62	27.50	25.51	25.53	25.12	24.57	22.88	21.84	22.35	21.63	22.23	21.69	21.84	21.72	20.99	21.49	21.25	21.24	21.59	23.24
Ireland	0.73	0.69	0.85	0.90	0.88	0.96	0.85	1.04	1.08	1.25	1.18	1.30	1.24	1.43	1.21	1.12	1.01	1.01	0.89	0.90	1.03
Italy	5.19	5.10	5.07	4.52	4.55	4.47	4.60	4.49	4.36	4.39	4.32	4.53	4.49	4.42	4.32	4.09	3.75	3.69	3.68	3.64	4.38
Portugal	0.69	0.69	0.71	0.73	0.65	0.66	0.66	0.66	0.70	0.70	0.67	0.70	0.69	0.71	0.66	0.66	0.57	0.54	0.53	0.57	0.66
Spain	2.10	2.10	2.21	2.24	2.27	2.48	2.52	2.69	2.84	2.74	2.71	2.84	2.84	3.00	3.07	3.00	2.73	2.75	2.56	2.60	2.61
Cyprus	0.04	0.04	0.04	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.06	0.06	0.05	0.06	0.07	0.04
Greece	0.59	0.60	0.64	0.61	0.61	0.56	0.50	0.46	0.47	0.47	0.50	0.50	0.53	0.52	0.50	0.47	0.43	0.44	0.44	0.46	0.51
Malta	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.05	0.03
Slovakia	-	-	-	0.07	0.08	0.09	0.10	0.12	0.14	0.11	0.10	0.12	0.14	0.14	0.19	0.21	0.24	0.35	0.34	0.36	0.17
Slovenia	-	-	-	0.11	0.10	0.10	0.09	0.10	0.12	0.09	0.10	0.10	0.11	0.11	0.10	0.10	0.12	0.12	0.12	0.12	0.11
Eurozone	47.05	47.87	48.19	45.48	45.72	45.60	44.91	43.27	42.62	42.60	41.36	42.66	41.80	42.13	41.52	39.89	39.10	38.78	38.52	39.16	42.91

Bilateral Trade Intensity Index, Netherland as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	1.05	1.03	1.08	1.11	1.07	1.16	1.17	1.12	1.27	1.07	1.05	1.16	1.07	1.12	1.08	0.99	0.99	1.01	0.97	0.95	1.08
Finland	0.91	0.79	0.75	0.79	0.88	0.90	0.84	0.89	0.93	0.92	0.96	0.95	0.97	0.98	1.04	1.02	1.03	1.01	0.91	0.86	0.92
France	9.52	9.18	9.32	8.80	9.01	9.03	8.94	8.77	8.82	8.45	8.09	8.18	7.99	7.79	7.56	7.16	6.66	6.53	6.76	6.97	8.18
Germany	26.20	27.62	27.50	25.51	25.53	25.12	24.57	22.88	21.84	22.35	21.63	22.23	21.69	21.84	21.72	20.99	21.49	21.25	21.24	21.59	23.24
Ireland	0.73	0.69	0.85	0.90	0.88	0.96	0.85	1.04	1.08	1.25	1.18	1.30	1.24	1.43	1.21	1.12	1.01	1.01	0.89	0.90	1.03
Italy	5.19	5.10	5.07	4.52	4.55	4.47	4.60	4.49	4.36	4.39	4.32	4.53	4.49	4.42	4.32	4.09	3.75	3.69	3.68	3.64	4.38
Portugal	0.69	0.69	0.71	0.73	0.65	0.66	0.66	0.66	0.70	0.70	0.67	0.70	0.69	0.71	0.66	0.66	0.57	0.54	0.53	0.57	0.66
Spain	2.10	2.10	2.21	2.24	2.27	2.48	2.52	2.69	2.84	2.74	2.71	2.84	2.84	3.00	3.07	3.00	2.73	2.75	2.56	2.60	2.61
Cyprus	0.04	0.04	0.04	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.06	0.06	0.05	0.06	0.07	0.04
Greece	0.59	0.60	0.64	0.61	0.61	0.56	0.50	0.46	0.47	0.47	0.50	0.50	0.53	0.52	0.50	0.47	0.43	0.44	0.44	0.46	0.51
Malta	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.05	0.03
Slovakia	-	-	-	0.07	0.08	0.09	0.10	0.12	0.14	0.11	0.10	0.12	0.14	0.14	0.19	0.21	0.24	0.35	0.34	0.36	0.17
Slovenia	-	-	-	0.11	0.10	0.10	0.09	0.10	0.12	0.09	0.10	0.10	0.11	0.11	0.10	0.10	0.12	0.12	0.12	0.12	0.11
Eurozone	47.05	47.87	48.19	45.48	45.72	45.60	44.91	43.27	42.62	42.60	41.36	42.66	41.80	42.13	41.52	39.89	39.10	38.78	38.52	39.16	42.91

Bilateral Trade Intensity Index, Portugal as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	0.90	0.95	0.82	0.96	0.90	0.77	0.86	0.81	0.74	0.76	0.69	0.67	0.73	0.72	0.67	0.61	0.58	0.73	0.54	0.70	0.76
Finland	1.03	1.02	0.87	0.78	0.70	0.71	0.64	0.68	0.70	0.67	0.50	0.47	0.49	0.54	0.58	0.64	0.50	0.49	0.58	0.62	0.66
France	12.95	12.48	13.11	13.60	13.52	12.74	12.33	11.96	12.43	12.38	11.37	11.19	11.17	11.15	11.15	10.28	9.64	9.92	9.21	9.90	11.62
Germany	15.30	16.20	16.34	16.71	15.84	17.53	17.85	16.84	16.82	16.65	15.19	15.97	16.35	14.69	13.95	12.87	13.04	12.87	12.00	12.63	15.28
Ireland	0.45	0.42	0.40	0.50	0.60	0.50	0.51	0.56	0.60	0.64	0.55	0.58	0.63	0.66	0.71	0.78	0.74	0.67	0.81	0.73	0.60
Italy	7.58	7.58	7.69	6.44	6.46	6.33	6.40	6.26	6.40	6.39	5.85	5.90	5.86	5.76	5.38	4.85	4.93	4.76	4.45	4.86	6.01
Netherland	5.70	5.78	6.23	5.01	4.78	4.88	4.62	4.55	4.86	4.64	4.44	4.59	4.23	4.32	4.36	4.14	4.11	4.06	3.91	4.65	4.69
Spain	14.20	15.08	15.70	16.52	17.75	18.74	19.14	19.06	20.67	22.51	23.03	23.44	24.97	27.58	27.55	27.80	27.99	28.54	27.67	29.54	22.37
Cyprus	0.05	0.04	0.05	0.05	0.04	0.03	0.03	0.00	0.03	0.02	0.03	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.04	0.03	0.03
Greece	0.27	0.21	0.24	0.27	0.25	0.26	0.30	0.23	0.24	0.28	0.27	0.28	0.28	0.29	0.26	0.27	0.24	0.25	0.25	0.25	0.26
Malta	0.02	0.02	0.03	0.02	0.03	0.12	0.02	0.02	0.02	0.01	0.03	0.04	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.03
Slovakia	-	-	-	0.02	0.02	0.03	0.05	0.04	0.03	0.02	0.04	0.08	0.08	0.08	0.08	0.08	0.10	0.16	0.14	0.19	0.07
Slovenia	-	-	-	0.04	0.03	0.03	0.04	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.04
Eurozone	58.47	59.78	61.47	60.92	60.92	62.67	62.79	61.04	63.56	65.01	62.03	63.26	64.88	65.89	64.79	62.44	61.96	62.58	59.69	64.19	62.42

Trade Intensity Index, Spain as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	0.78	0.73	0.81	0.95	0.96	0.85	0.93	0.95	0.97	1.06	0.97	1.02	1.07	1.04	0.97	0.84	0.83	0.90	0.84	0.84	0.91
Finland	0.62	0.57	0.57	0.60	0.64	0.66	0.57	0.58	0.61	0.63	0.65	0.57	0.55	0.59	0.54	0.50	0.54	0.58	0.54	0.41	0.58
France	17.01	16.65	17.60	17.90	18.64	18.59	18.88	17.88	18.88	18.87	18.36	17.91	17.83	17.87	17.39	16.55	15.50	15.22	14.56	15.60	17.38
Germany	15.33	15.76	16.14	15.41	14.42	15.29	14.68	14.18	14.68	14.87	13.87	14.12	14.30	14.72	14.65	13.72	13.28	14.01	13.04	13.33	14.49
Ireland	0.55	0.59	0.65	0.67	0.71	0.75	0.69	0.84	0.97	1.04	1.11	1.04	1.09	1.03	1.00	1.10	1.13	1.05	1.04	1.13	0.91
Italy	10.69	10.21	10.26	9.17	9.06	9.12	9.18	9.59	9.36	8.88	8.59	8.57	8.89	9.40	9.12	8.49	8.39	8.81	8.04	7.63	9.07
Netherland	4.09	3.74	3.80	3.73	3.99	4.03	3.70	3.81	4.07	4.38	4.21	4.14	4.09	4.29	4.31	4.23	4.28	4.21	4.05	4.27	4.07
Portugal	3.87	4.14	4.60	4.84	5.00	5.31	5.52	5.61	5.74	5.68	5.29	5.66	5.82	6.01	6.00	5.81	5.53	5.44	5.69	6.02	5.38
Cyprus	0.03	0.06	0.06	0.04	0.03	0.05	0.05	0.08	0.08	0.05	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.08	0.06	0.06
Greece	0.44	0.44	0.42	0.50	0.55	0.63	0.64	0.56	0.51	0.55	0.56	0.59	0.63	0.69	0.63	0.58	0.60	0.63	0.64	0.58	0.57
Malta	0.02	0.03	0.03	0.06	0.03	0.06	0.07	0.05	0.06	0.04	0.07	0.04	0.08	0.05	0.04	0.03	0.03	0.04	0.04	0.06	0.05
Slovakia	-	-	-	0.03	0.05	0.06	0.08	0.08	0.09	0.10	0.14	0.17	0.24	0.23	0.16	0.20	0.27	0.27	0.27	0.32	0.16
Slovenia	-	-	-	0.06	0.06	0.12	0.10	0.11	0.13	0.14	0.13	0.15	0.16	0.14	0.13	0.16	0.16	0.19	0.16	0.15	0.13
Eurozone	53.43	52.92	54.95	53.97	54.13	55.54	55.09	54.30	56.15	56.29	54.01	54.05	54.82	56.12	54.98	52.25	50.59	51.37	48.99	50.41	53.72

Bilateral Trade Intensity Index, Cyprus as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	0.93	1.11	1.25	0.80	0.54	0.68	0.52	0.49	0.79	0.70	0.67	0.57	0.62	0.62	0.68	0.53	0.60	0.60	0.55	0.61	0.69
Finland	0.34	0.54	0.35	0.36	0.49	0.35	0.42	0.46	0.43	0.61	0.45	0.59	0.65	0.62	1.25	2.69	0.82	0.35	0.29	0.36	0.62
France	5.21	3.18	6.30	4.73	3.60	3.44	3.25	3.41	4.14	4.40	3.90	5.41	4.47	4.41	5.61	6.35	4.83	4.78	3.64	3.59	4.43
Germany	7.79	7.92	7.74	7.30	7.37	7.10	6.34	5.27	7.36	6.14	6.42	5.73	7.72	6.72	8.27	7.88	8.32	8.98	7.97	8.84	7.36
Ireland	0.70	0.81	0.67	0.78	0.74	0.71	0.58	0.62	0.76	0.79	0.84	0.67	0.70	0.69	0.58	0.56	0.58	0.54	0.42	0.45	0.66
Italy	7.69	7.92	7.56	8.05	7.75	7.69	7.16	6.48	7.46	7.40	7.58	6.97	8.07	8.39	9.02	8.55	10.15	9.21	9.69	9.48	8.11
Netherland	2.33	1.93	2.15	2.26	2.60	1.89	1.60	1.62	2.00	2.18	2.12	1.92	2.20	2.45	3.17	3.62	3.84	3.73	3.72	4.38	2.59
Portugal	0.30	0.39	0.36	0.35	0.34	0.32	0.31	0.30	0.39	0.34	0.39	0.29	0.35	0.47	0.42	0.33	0.40	0.40	0.44	0.36	0.36
Spain	1.86	1.41	1.68	1.96	2.05	1.85	1.88	2.07	2.96	2.54	3.21	3.28	3.16	3.49	3.16	2.77	2.53	3.15	3.42	3.19	2.58
Greece	7.76	7.27	6.96	8.14	7.07	6.90	6.82	7.16	8.55	8.45	8.83	8.53	9.33	11.49	14.63	16.33	17.01	18.13	17.42	20.69	10.87
Malta	1.84	1.62	1.80	1.92	2.36	1.56	1.28	1.37	1.63	1.74	1.79	1.66	1.82	2.07	2.85	3.27	3.65	3.56	3.57	4.24	2.28
Slovakia	-	-	-	-	0.11	0.18	0.12	0.11	0.11	0.12	0.15	0.19	0.13	0.20	0.18	0.14	0.19	0.21	0.13	0.09	0.15
Slovenia	-	-	-	0.08	0.09	0.09	0.20	0.08	0.27	0.41	0.00	0.13	0.13	0.09	0.22	0.41	0.06	0.09	0.09	0.07	0.15
Eurozone	36.74	34.10	36.82	36.73	35.11	32.77	30.48	29.45	36.85	35.83	36.34	35.94	39.35	41.70	50.04	53.43	52.98	53.72	51.37	56.34	40.80

Bilateral Trade Intensity Index, Greece as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	1.39	1.35	1.49	1.21	1.22	1.07	1.18	1.05	1.07	1.01	0.84	0.76	0.76	0.96	1.05	1.01	1.06	1.18	1.17	1.27	1.11
Finland	0.77	0.73	0.61	0.62	0.81	0.74	0.72	0.78	0.94	1.13	1.48	0.87	0.79	1.07	0.95	0.83	0.98	0.85	0.89	0.80	0.87
France	8.53	7.70	7.76	6.70	7.10	7.41	7.03	7.55	7.58	7.79	5.95	5.68	5.14	6.15	5.88	5.34	5.56	5.23	4.85	5.50	6.52
Germany	21.20	20.70	21.33	18.65	17.64	18.30	15.48	15.41	16.15	15.26	13.21	13.10	11.69	12.73	13.25	12.70	12.24	12.53	11.61	13.06	15.31
Ireland	0.48	0.45	0.51	0.56	0.60	0.82	0.70	0.61	0.61	0.68	0.86	0.75	0.55	0.73	0.74	0.75	0.75	0.80	0.75	0.91	0.68
Italy	15.91	14.94	15.53	13.47	15.04	17.47	15.74	15.65	15.08	15.03	12.04	11.14	10.74	12.15	12.22	11.89	11.43	11.47	11.49	12.28	13.54
Netherland	5.79	5.25	5.74	5.41	5.77	5.71	5.20	5.12	5.42	5.47	5.17	4.80	4.79	4.69	4.88	4.74	4.41	4.29	4.25	5.15	5.10
Portugal	0.37	0.31	0.36	0.31	0.34	0.39	0.49	0.38	0.37	0.38	0.39	0.39	0.34	0.35	0.37	0.34	0.31	0.32	0.34	0.36	0.36
Spain	1.86	2.04	2.28	2.33	2.71	3.43	3.34	3.08	3.39	3.36	3.39	3.32	3.52	3.66	3.69	3.85	3.67	3.56	3.39	3.68	3.18
Cyprus	0.93	0.98	1.14	1.49	1.22	1.10	1.18	1.11	1.15	1.21	1.53	1.44	1.36	1.30	1.41	1.75	1.95	2.39	2.26	2.91	1.49
Malta	0.16	0.19	0.19	0.67	0.46	0.27	0.28	0.32	0.27	0.31	0.35	0.42	0.32	0.12	0.08	0.04	0.04	0.05	0.08	0.09	0.24
Slovakia	-	-	-	0.14	0.10	0.11	0.13	0.13	0.12	0.10	0.11	0.20	0.17	0.17	0.18	0.15	0.24	0.30	0.19	0.26	0.16
Slovenia	-	-	-	0.08	0.09	0.19	0.10	0.11	0.11	0.11	0.11	0.15	0.13	0.14	0.17	0.15	0.42	0.41	0.44	0.32	0.19
Eurozone	57.37	54.64	56.94	51.64	53.10	57.01	51.57	51.29	52.25	51.83	45.45	43.01	40.30	44.23	44.88	43.54	43.04	43.38	41.70	46.58	48.69

Trade Intensity Index,Malta as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	0.87	0.43	0.35	0.33	0.34	0.35	0.35	0.40	0.42	0.36	0.39	0.42	0.44	0.48	0.43	0.51	0.56	0.62	0.82	0.44	0.47
Finland	0.16	0.09	0.19	0.08	0.09	0.07	0.12	0.11	0.07	0.18	0.40	0.35	0.26	0.26	0.27	0.16	1.01	0.90	0.55	0.70	0.30
France	7.18	7.36	7.40	9.14	8.94	9.87	15.47	17.57	12.68	17.52	14.33	9.64	14.87	15.35	14.08	11.70	12.93	12.02	9.69	9.50	11.86
Germany	15.03	13.54	12.12	14.81	16.26	13.28	11.32	11.32	8.92	11.05	8.80	8.75	8.78	8.88	9.65	10.52	9.64	10.41	10.07	10.32	11.17
Ireland	0.49	0.66	0.66	0.68	0.51	0.55	0.64	0.72	0.57	0.55	0.62	0.26	0.55	0.47	0.48	0.46	0.33	0.53	0.53	0.66	0.55
Italy	33.35	36.47	38.94	29.11	30.73	28.59	16.77	14.52	15.99	11.87	11.17	13.35	13.94	14.79	16.28	21.41	18.51	16.87	19.26	16.74	20.93
Netherland	2.41	2.50	2.65	2.59	2.18	2.00	2.33	2.48	1.71	2.04	1.62	1.82	1.78	1.65	2.41	2.44	2.47	2.11	2.87	2.83	2.24
Portugal	0.24	0.20	0.34	0.20	0.24	0.30	0.21	0.25	0.22	0.18	0.20	0.34	0.30	0.34	0.32	0.29	0.98	0.28	0.25	0.26	0.30
Spain	1.12	1.07	1.14	1.02	1.23	1.35	1.21	1.46	2.73	1.35	1.22	1.58	1.77	1.91	2.16	2.33	2.19	1.96	2.23	2.64	1.68
Cyprus	0.06	0.08	0.07	0.06	0.09	0.04	0.06	0.05	0.04	0.04	0.06	0.26	0.05	0.06	0.08	0.12	0.14	0.14	0.24	0.18	0.10
Greece	0.64	0.57	0.47	0.52	0.56	0.50	0.48	0.47	0.41	0.35	0.28	2.51	0.39	0.31	0.43	0.42	0.44	0.54	0.62	0.77	0.58
Slovakia	-	-	-	0.08	0.03	0.03	0.04	0.06	0.04	0.02	0.02	0.12	0.05	0.04	0.04	0.03	0.03	0.06	0.03	0.07	0.05
Slovenia	-	-	-	0.08	0.06	0.06	0.13	0.04	0.03	0.04	0.03	0.09	0.05	0.05	0.07	0.05	0.06	0.40	0.06	0.12	0.08
Eurozone	61.53	62.97	64.35	58.69	61.26	57.00	49.14	49.44	43.83	45.55	39.14	39.49	43.22	44.59	46.71	50.44	49.28	46.83	47.22	45.24	50.30

Bilateral Trade Intensity Index, Slovakia as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	-	-	-	5.67	5.52	5.04	5.25	5.92	5.86	6.27	5.97	5.88	5.74	8.03	7.35	6.67	5.78	5.56	5.43	5.47	5.97
Finland	-	-	-	0.10	0.17	0.23	0.18	0.17	0.17	0.20	0.20	0.18	0.23	0.13	0.18	0.36	0.52	0.38	0.69	0.18	0.25
France	-	-	-	1.55	1.97	2.24	2.73	3.09	3.67	4.27	3.94	3.90	4.31	3.00	2.69	3.50	3.74	5.27	5.16	6.24	3.60
Germany	-	-	-	13.08	15.19	16.40	17.36	21.40	27.01	26.81	25.84	25.71	24.11	31.76	29.93	24.98	22.78	21.14	19.66	18.91	22.48
Ireland	-	-	-	0.10	0.15	0.14	0.18	0.22	0.23	0.24	0.21	0.25	0.25	0.15	0.13	0.20	0.24	0.22	0.18	0.15	0.19
Italy	-	-	-	2.88	4.35	4.72	5.50	5.90	6.78	7.89	7.57	7.48	8.61	5.49	5.55	5.53	5.36	5.07	4.77	5.18	5.80
Netherland	-	-	-	1.43	1.72	1.74	1.85	2.03	2.16	2.34	2.05	2.06	2.32	1.85	2.32	2.89	3.20	2.86	2.71	2.82	2.26
Portugal	-	-	-	0.03	0.07	0.08	0.06	0.10	0.11	0.10	0.12	0.21	0.26	0.14	0.13	0.15	0.16	0.24	0.23	0.25	0.14
Spain	-	-	-	0.38	0.60	0.71	0.76	0.88	1.02	1.18	1.63	1.89	2.47	1.99	1.34	1.69	1.98	2.14	1.69	1.73	1.42
Cyprus	-	-	-	0.04	0.06	0.07	0.05	0.04	0.03	0.03	0.03	0.05	0.03	0.02	0.02	0.11	0.07	0.13	0.07	0.08	0.05
Greece	-	-	-	0.29	0.22	0.21	0.21	0.22	0.19	0.21	0.19	0.37	0.24	0.22	0.21	0.24	0.35	0.39	0.34	0.44	0.27
Malta	-	-	-	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Slovenia	-	-	-	0.54	0.56	0.82	0.72	0.71	0.69	0.73	0.79	0.77	0.92	0.84	0.74	0.80	0.69	0.70	0.89	0.78	0.75
Eurozone	-	-	-	26.13	30.59	32.39	34.87	40.70	47.93	50.29	48.54	48.78	49.48	53.63	50.61	47.13	44.88	44.11	41.84	42.24	43.18

Bilateral Trade Intensity Index,Slovenia as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Austria	-	-	-	6.53	7.40	8.06	7.81	7.64	7.41	7.72	7.90	7.95	7.67	8.01	13.44	9.96	10.08	9.60	9.43	9.55	8.60
Finland	-	-	-	0.27	0.38	0.32	0.33	0.33	0.32	0.38	0.43	0.43	0.44	0.43	0.30	0.27	0.33	0.32	0.33	0.30	0.35
France	-	-	-	8.01	7.86	8.20	8.58	8.14	10.48	8.56	8.82	8.83	8.49	7.94	9.01	7.49	6.04	5.44	5.16	6.17	7.84
Germany	-	-	-	26.12	24.92	26.14	25.87	24.81	24.31	25.10	22.78	22.65	21.86	21.14	19.23	19.35	19.31	18.38	17.89	17.95	22.22
Ireland	-	-	-	0.30	0.16	0.20	0.19	0.18	0.21	0.26	0.27	0.26	0.23	0.28	0.15	0.18	0.17	0.16	0.14	0.22	0.21
Italy	-	-	-	13.79	14.30	15.65	15.20	15.81	15.41	15.43	15.66	15.23	15.07	15.83	15.96	15.50	15.17	14.82	14.25	13.67	15.10
Netherland	-	-	-	1.62	1.75	1.80	1.80	1.82	1.92	1.91	1.92	1.82	1.87	1.93	2.18	2.46	2.47	2.44	2.30	2.27	2.02
Portugal	-	-	-	0.14	0.07	0.08	0.10	0.13	0.14	0.12	0.15	0.15	0.18	0.18	0.13	0.29	0.26	0.22	0.19	0.19	0.16
Spain	-	-	-	0.91	0.99	1.48	1.21	1.42	1.58	1.58	1.85	1.83	2.09	1.76	1.86	2.38	2.19	2.00	1.84	1.78	1.69
Cyprus	-	-	-	0.20	0.08	0.03	0.04	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.04	0.04	0.02	0.03	0.03	0.04	0.04
Greece	-	-	-	0.18	0.15	0.24	0.20	0.22	0.22	0.26	0.24	0.32	0.39	0.33	0.36	0.32	0.72	0.54	0.72	0.57	0.35
Malta	-	-	-	0.02	0.09	0.08	0.09	0.01	0.01	0.01	0.01	0.04	0.02	0.01	0.01	0.00	0.01	0.01	0.04	0.01	0.03
Slovakia	-	-	-	0.41	0.58	0.74	0.84	0.90	0.85	0.77	1.07	1.17	1.31	1.39	1.22	1.40	1.50	1.66	1.80	2.04	1.16
Eurozone	-	-	-	58.48	58.73	63.03	62.26	61.44	62.89	62.13	61.12	60.69	59.65	59.25	63.90	59.64	58.27	55.64	54.12	54.75	59.76

Appendix 7.2. Bilateral Trade Intensity between ASEAN Countries

Bilateral Trade Intensity Index, Indonesia as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Malaysia	0.01	1.36	1.65	1.69	1.83	4.16	2.08	2.33	2.60	2.67	3.24	3.19	3.47	3.74	3.98	3.89	4.51	6.10	5.77	5.82	3.21
Philippine	0.45	0.45	0.38	0.52	0.60	0.78	0.84	0.97	1.01	1.03	0.98	1.04	1.01	1.20	1.24	1.21	1.04	1.17	1.05	1.29	0.91
Singapore	6.68	7.45	8.13	7.92	8.36	7.12	8.02	9.33	10.84	10.26	10.82	9.75	10.68	10.20	10.23	12.07	11.71	10.79	13.01	16.71	10.00
Thailand	0.78	0.99	1.14	1.08	1.12	1.67	2.07	1.80	2.34	2.40	2.23	2.35	2.73	3.30	4.02	3.97	3.51	3.89	3.75	3.58	2.44
Brunei	0.02	0.02	0.04	0.07	0.00	0.00	0.03	0.05	0.05	0.09	0.04	0.07	0.08	0.16	0.28	0.86	1.02	1.01	0.93	1.00	0.29
Cambodia	0.02	0.01	0.04	0.06	0.06	0.10	0.07	0.07	0.08	0.10	0.05	0.08	0.08	0.09	0.06	0.07	0.06	0.07	0.07	0.09	0.07
Laos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myanmar	0.01	0.02	0.04	0.08	0.10	0.19	0.12	0.18	0.23	0.13	0.09	0.10	0.10	0.06	0.07	0.06	0.10	0.16	0.11	0.09	0.10
Vietnam	0.15	0.41	0.32	0.32	0.45	0.52	0.58	0.53	1.01	1.29	0.69	0.57	0.74	0.94	0.86	0.78	1.17	1.25	0.90	0.91	0.72
ASEAN	8.13	10.71	11.75	11.76	12.51	14.54	13.80	15.27	18.17	17.97	18.16	17.15	18.88	19.71	20.74	22.92	23.13	24.44	25.59	29.50	17.74

Bilateral Trade Intensity Index, Malaysia as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	1.12	1.42	1.42	1.36	1.40	1.44	1.69	1.70	1.89	1.99	2.20	2.35	2.52	2.70	3.15	3.02	3.10	3.53	3.79	3.44	2.26
Philippine	0.94	0.65	0.89	0.75	0.79	0.73	1.11	1.30	1.93	1.95	2.06	1.94	2.27	2.42	2.06	2.04	1.74	1.67	1.41	1.06	1.49
Singapore	18.88	19.28	19.42	18.52	17.37	16.23	16.91	16.65	15.43	15.42	16.53	14.98	14.75	14.03	13.30	13.92	13.76	13.19	13.10	16.60	15.91
Thailand	2.96	2.79	3.08	3.05	3.12	3.24	3.70	3.77	3.47	3.48	3.73	3.89	4.12	4.50	5.12	5.35	5.38	5.13	5.15	5.67	4.04
Brunei	0.15	0.17	0.19	0.21	0.25	0.19	0.21	0.19	0.18	0.15	0.14	0.17	0.15	0.19	0.14	0.14	0.14	0.15	0.15	0.17	0.17
Cambodia	0.03	0.02	0.03	0.03	0.06	0.06	0.04	0.07	0.04	0.03	0.05	0.05	0.04	0.04	0.04	0.05	0.04	0.05	0.05	0.06	0.04
Laos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00
Myanmar	0.12	0.12	0.13	0.17	0.21	0.18	0.17	0.27	0.27	0.19	0.17	0.17	0.18	0.12	0.11	0.15	0.10	0.11	0.14	0.12	0.16
Vietnam	0.09	0.12	0.22	0.25	0.23	0.26	0.30	0.31	0.39	0.42	0.52	0.49	0.57	0.64	0.75	0.86	1.09	1.29	1.34	1.45	0.58
ASEAN	24.28	24.57	25.37	24.34	23.43	22.34	24.13	24.27	23.59	23.65	25.40	24.05	24.61	24.63	24.67	25.54	25.39	25.14	25.15	28.57	24.66

Bilateral Trade Intensity Index, Philippines as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	1.23	1.01	0.91	1.35	1.31	1.63	0.00	1.53	1.19	1.25	1.21	1.37	1.37	1.52	1.57	1.67	1.37	1.67	2.01	1.75	1.35
Malaysia	1.96	2.42	2.21	1.79	1.96	2.05	2.81	2.57	3.50	3.71	3.69	3.36	4.17	5.18	4.84	4.78	4.79	4.52	4.14	3.44	3.39
Singapore	3.53	3.23	3.29	4.69	6.10	4.97	5.54	6.07	6.05	6.35	7.49	6.72	6.77	6.74	7.23	7.26	7.92	8.83	8.05	8.04	6.24
Thailand	1.45	1.47	0.97	1.20	0.59	2.67	2.58	2.67	2.42	2.51	2.87	3.50	3.02	3.52	3.15	3.10	3.46	3.47	4.11	4.54	2.66
Brunei	0.54	0.46	0.39	0.18	0.11	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.00	0.01	0.01	0.01	0.01	0.08	0.08	0.10
Cambodia	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01
Laos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myanmar	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Vietnam	0.58	0.31	0.17	0.17	1.23	0.36	0.00	0.59	0.80	0.41	0.32	0.53	0.54	0.61	1.34	1.23	1.04	1.21	1.99	2.11	0.78
ASEAN	9.29	8.90	7.95	9.38	11.30	11.72	10.94	13.52	13.97	14.26	15.60	15.50	15.94	17.60	18.15	18.07	18.61	19.72	20.42	19.99	14.54

Bilateral Trade Intensity Index, Singapore as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.13	7.74	7.57	7.76	7.83	8.09	7.81	2.75
Malaysia	13.29	15.07	13.66	15.38	17.92	17.27	16.46	16.21	15.32	16.07	17.56	17.32	17.79	14.95	14.06	13.43	13.04	12.97	11.99	11.51	15.06
Philippines	0.86	0.76	0.83	1.18	1.18	1.25	1.44	1.91	2.30	2.55	2.47	2.37	2.29	2.04	2.19	2.06	2.10	2.12	1.85	1.97	1.79
Thailand	4.53	4.63	4.89	4.85	5.13	5.46	5.56	4.88	4.28	4.55	4.28	4.40	4.60	3.94	3.89	3.94	3.92	3.71	3.71	3.54	4.43
Brunei	0.59	0.59	0.68	0.53	0.51	0.70	0.75	0.62	0.37	0.28	0.28	0.25	0.28	0.21	0.17	0.15	0.16	0.15	0.16	0.18	0.38
Cambodia	0.00	0.00	0.19	0.24	0.21	0.22	0.22	0.19	0.17	0.20	0.18	0.18	0.18	0.13	0.11	0.09	0.11	0.09	0.10	0.22	0.15
Laos	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Myanmar	0.25	0.29	0.27	0.28	0.27	0.35	0.36	0.34	0.27	0.23	0.20	0.23	0.26	0.25	0.19	0.16	0.12	0.15	0.21	0.19	0.24
Vietnam	0.00	0.00	0.38	0.84	0.89	0.92	0.84	0.86	0.92	0.89	1.07	1.24	1.25	1.16	1.22	1.45	1.39	1.54	1.69	1.79	1.02
ASEAN	19.53	21.33	20.91	23.30	26.12	26.19	25.65	25.02	23.64	24.80	26.04	25.99	26.66	30.82	29.58	28.87	28.61	28.57	27.81	27.24	25.83

Bilateral Trade Intensity Index, Thailand as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	0.62	0.65	0.78	0.85	0.87	1.05	1.33	1.83	1.87	1.91	2.02	2.15	2.42	2.59	2.90	3.10	2.61	2.99	3.28	2.96	1.94
Malaysia	3.01	2.80	3.33	3.24	4.20	3.40	4.20	4.46	3.95	4.26	4.70	4.56	4.85	5.40	5.69	6.08	5.84	5.61	5.57	5.68	4.54
Philippine	0.49	0.30	0.38	0.45	0.56	0.71	0.90	1.01	1.38	1.60	1.67	1.80	1.76	1.90	1.77	1.72	1.81	1.72	1.57	1.68	1.26
Singapore	7.39	7.96	7.92	8.86	9.37	8.59	8.04	7.74	7.04	7.40	7.19	6.40	6.33	5.86	5.86	5.70	5.43	5.40	4.84	4.64	6.90
Brunei	0.37	0.32	0.33	0.26	0.22	0.25	0.22	0.13	0.07	0.18	0.40	0.33	0.37	0.23	0.23	0.12	0.08	0.07	0.06	0.08	0.22
Cambodia	0.02	0.02	0.22	0.32	0.38	0.35	0.31	0.32	0.32	0.34	0.27	0.38	0.39	0.45	0.39	0.41	0.49	0.48	0.60	0.58	0.35
Laos	0.19	0.18	0.22	0.28	0.35	0.30	0.32	0.36	0.40	0.43	0.35	0.39	0.37	0.36	0.37	0.44	0.59	0.61	0.68	0.73	0.40
Myanmar	0.31	0.01	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.47	0.58	0.92	0.93	0.86	1.03	1.09	1.19	1.11	1.45	1.51	0.58
Vietnam	0.20	0.21	0.21	0.24	0.29	0.36	0.41	0.58	0.82	0.74	0.89	0.88	0.89	1.03	1.21	1.42	1.53	1.68	1.80	2.11	0.88
ASEAN	12.60	12.45	13.40	14.51	16.28	15.05	15.73	16.42	15.87	17.32	18.08	17.81	18.32	18.68	19.45	20.08	19.58	19.68	19.84	19.97	17.06

Trade Intensity Index, Brunei as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	0.59	0.52	0.66	1.38	1.65	1.16	0.80	0.91	0.91	3.27	1.12	1.24	1.32	2.57	4.93	15.50	16.58	15.78	17.62	7.01	4.78
Malaysia	4.05	3.69	4.34	4.65	7.46	6.92	6.47	7.56	6.01	9.26	6.03	6.55	5.64	7.43	5.87	5.48	4.95	4.80	4.57	5.87	5.88
Philippine	3.42	2.71	2.36	1.28	1.04	0.45	0.23	0.22	0.10	0.19	0.09	0.10	0.49	0.07	0.08	0.15	0.08	0.06	0.67	0.34	0.71
Singapore	12.93	11.47	15.95	12.76	18.45	19.69	16.95	15.03	19.39	13.53	15.54	13.25	13.72	8.06	11.02	9.32	9.18	8.09	8.75	11.56	13.23
Thailand	6.47	6.50	6.28	6.12	7.40	7.07	7.31	8.00	1.79	8.79	11.04	8.46	9.02	8.17	6.78	3.55	2.30	1.83	1.65	2.56	6.05
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00
Laos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myanmar	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.05	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Vietnam	12.45	5.72	2.86	3.58	3.53	4.76	3.58	0.89	1.39	2.26	2.75	0.38	2.48	2.39	1.88	1.51	1.33	1.28	1.06	1.69	2.89
ASEAN	39.90	30.61	32.45	29.76	39.53	40.06	35.35	32.64	29.64	37.31	36.59	29.98	32.67	28.70	30.56	35.52	34.42	31.84	34.32	29.04	33.54

Bilateral Trade Intensity Index, Cambodia as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	12.45	5.72	2.86	3.58	3.53	4.76	3.58	0.89	1.39	2.26	2.75	0.38	2.48	2.39	1.88	1.51	1.33	1.28	1.06	1.69	2.89
Malaysia	15.33	9.52	2.46	2.06	5.42	5.10	3.39	0.66	0.36	2.47	2.90	1.07	2.57	2.69	2.03	1.82	1.48	1.58	1.38	1.64	3.30
Philippine	1.76	0.00	0.07	0.00	0.02	0.02	0.15	0.02	0.19	0.15	0.14	0.24	0.00	0.00	0.15	0.14	0.14	0.09	0.07	0.16	0.18
Singapore	0.00	0.00	30.94	34.01	32.31	30.49	31.71	4.60	6.61	12.29	4.87	15.54	4.71	4.25	3.64	3.70	4.52	5.28	4.37	7.78	12.08
Thailand	9.69	13.04	17.14	23.40	28.76	26.60	22.98	18.92	11.90	9.36	9.60	18.59	7.79	6.50	5.83	5.50	6.57	14.51	7.44	5.48	13.48
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00
Laos	0.00	0.00	0.00	0.22	0.17	0.13	0.14	0.00	0.00	0.01	0.12	0.03	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.04
Myanmar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
Vietnam	17.40	9.77	1.43	9.03	7.25	6.50	6.50	15.19	12.92	8.43	4.36	4.87	4.14	4.52	4.95	4.09	5.27	12.58	6.71	6.86	7.64
ASEAN	56.63	38.05	54.90	72.30	77.47	73.59	68.45	40.31	33.37	34.99	24.75	40.74	21.69	20.35	18.49	16.78	19.32	35.33	21.04	23.63	39.61

Bilateral Trade Intensity Index, Laos as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	0.04	0.04	0.07	0.00	0.00	0.00	0.00	0.02	0.20	0.15	0.19	0.16	0.08	0.28	0.11	0.10	0.17	0.20	0.10	0.08	0.10
Malaysia	0.30	0.07	0.05	0.00	0.00	0.00	0.00	0.11	0.17	0.12	0.19	0.20	0.32	0.28	0.18	0.95	1.80	1.24	0.27	0.22	0.32
Philippine	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.02	0.02	0.04	0.02	0.01	0.02	0.01	0.01
Singapore	0.00	0.00	1.41	2.89	1.71	1.76	1.75	0.14	2.24	3.51	3.12	2.67	2.67	1.82	2.70	2.31	1.61	1.29	0.65	0.93	1.76
Thailand	52.89	53.74	47.11	35.63	40.20	41.23	40.26	61.77	43.35	39.61	45.13	48.64	47.74	47.81	46.75	53.42	56.56	54.62	56.42	51.21	48.20
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cambodia	0.00	0.00	0.00	0.45	0.30	0.31	0.30	0.00	0.00	0.02	0.32	0.08	0.00	0.00	0.00	0.02	0.04	0.04	0.02	0.02	0.10
Myanmar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vietnam	9.93	2.94	6.80	6.37	12.00	12.40	18.15	4.20	19.72	28.41	16.08	12.11	11.55	9.00	8.98	8.38	9.04	9.11	9.32	8.52	11.15
ASEAN	63.17	56.83	55.45	45.33	54.20	55.70	60.46	66.24	65.68	71.84	65.04	63.87	62.37	59.20	58.73	65.22	69.25	66.52	66.80	61.00	61.65

Trade Intensity Index, Myanmar as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	1.23	0.62	1.48	2.68	2.93	4.57	2.99	4.56	5.50	2.53	1.82	1.79	1.54	1.06	1.24	1.36	2.01	3.03	2.23	1.76	2.35
Malaysia	3.74	5.60	6.69	7.77	10.83	8.19	7.23	11.48	10.71	7.90	6.32	5.44	5.81	3.78	3.95	5.38	3.50	3.43	3.74	2.94	6.22
Philippine	0.08	0.05	0.04	0.02	0.06	0.06	1.13	0.26	0.20	0.27	0.26	0.18	0.10	0.11	0.16	0.15	0.12	0.11	0.11	0.11	0.18
Singapore	15.37	23.63	22.38	21.89	22.51	25.24	25.51	23.40	17.45	14.04	11.54	10.73	11.77	13.21	11.82	10.37	8.10	8.73	11.00	8.77	15.87
Thailand	6.38	0.26	0.00	0.00	1.16	1.03	0.00	0.00	0.00	13.72	15.69	21.29	20.73	21.85	28.66	32.97	35.26	30.27	36.00	34.27	14.98
Brunei	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.05	0.06	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00
Laos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vietnam	0.06	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.09	0.07	0.19	0.18	0.23	0.51	0.50	0.75	0.91	0.89	0.77	0.74	0.30
ASEAN	26.86	30.17	30.58	32.36	37.49	39.11	36.90	39.83	34.01	38.55	35.84	39.63	40.19	40.53	46.33	50.99	49.89	46.46	53.87	48.59	39.91

Trade Intensity Index, Vietnam as reporter

Partner	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Indonesia	0.45	1.41	0.85	1.55	1.53	1.74	1.04	1.16	2.78	3.04	1.97	1.78	1.91	2.24	1.91	1.69	2.33	2.25	1.76	1.37	1.74
Malaysia	0.11	0.44	1.76	1.17	1.32	2.15	1.48	1.72	1.77	2.41	2.67	2.57	2.83	3.04	3.15	3.30	3.23	3.45	3.17	2.70	2.22
Philippine	1.13	0.24	0.03	0.05	0.19	0.47	0.86	1.30	2.27	1.89	1.80	1.35	1.14	1.06	1.18	1.50	1.33	1.24	1.54	1.23	1.09
Singapore	12.88	24.56	20.58	20.82	17.60	15.13	17.72	15.66	13.12	11.83	11.89	11.27	9.59	8.59	8.73	9.25	9.54	8.85	8.40	6.88	13.14
Thailand	1.29	1.54	1.90	2.48	3.27	3.87	3.21	3.79	4.70	3.76	3.93	3.57	3.24	3.56	4.06	4.68	4.68	4.29	4.36	4.51	3.53
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Cambodia	0.31	0.25	0.22	1.50	0.96	0.85	0.62	0.63	0.57	0.44	0.59	0.54	0.67	0.80	0.88	1.03	1.12	1.12	1.14	0.90	0.76
Laos	0.37	0.15	0.40	0.81	1.25	0.75	0.50	0.39	0.99	1.56	0.59	0.42	0.35	0.25	0.24	0.24	0.31	0.29	0.29	0.29	0.52
Myanmar	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.03	0.03	0.04	0.07	0.06	0.08	0.10	0.09	0.08	0.07	0.03
ASEAN	16.55	28.59	25.73	28.39	26.14	24.96	25.44	24.66	26.22	24.94	23.47	21.53	19.77	19.61	20.21	21.77	22.63	21.57	20.76	17.95	23.04

Chapter 8 General Conclusions

The primary objective of this dissertation is to compare the effectiveness of regional economic integration between a developed, economically integrated area (the Eurozone, at the sixth stage of full economic integration) and a developing one (ASEAN, at the third stage of full economic integration), using convergence, trade, and crisis measures.

In other words, it tries to find out what form of regional integration performs better in nominal convergence, in terms of the Maastricht Criteria, real convergence, trade performance, and the recent financial crisis in the Eurozone. To serve the objective, this dissertation makes a more comprehensive analysis than previous studies.

Table 41. Comparing this Research with Previous Studies

	Common Aspects	**Different Aspects**	
		Previous Studies	**This Study**
Sample Size		Varies depending on studies	26 members
Time Period		Varies depending on studies	1990-2010
Sample Classification	Classified in developed and developing regions	Some studies estimate with whole sample	Classified into the Eurozone and ASEAN
Methodology	- Panel Estimation - Gravity Equation		- DiD - Decomposition - Panel Estimation

Table 41 shows elements that this studies shares, or does not share, with the previous literature. In my analysis, for non-technical aspects, we apply the samples of 16 Eurozone countries and 10 ASEAN countries. The analysis covers the period from 1990-2010, or a decade before the launch of the euro and a decade after, in order to establish a comparable

picture of policy implications of the euro after implementation of the Maastricht Criteria. Empirical analyses are conducted in Chapter 4, 5, 6, and 7. The following sections are summaries of the findings from our empirical analyses.

8.1 Overall Summary

8.1.1 Analysis of Eurozone Crisis in Comparison with Asian Crisis

In study of the recent crisis in the Eurozone, we find that having a common currency, with Maastricht Criteria as a guideline, contributed to slower growth in countries situated in the periphery of the European Continent. The result, in Chapter 4, shows that the pure effect on the peripheries of having a common currency has been positive, mainly in terms of a convergence of low inflation rates, interest rates, deficits, and debt-to-GDP ratios, as well as lower unemployment rates.

Table 42. Comparative DiD Results: Impact of the Euro on the Peripheries

	GGDPC	**LP**	**Unemp**	**Inf**	**Int**	**Def**	**Debt**	**TB**
Descriptive	-1.13	-0.27	-1.96	-1.91	-2.93	-0.93	-6.20	-9.78
Fixed effects	-2.22***	-1.18*	-2.78*	-2.24*	-2.78*	0.02	-4.84	-7.12*
Fixed effects[a)]	-2.44*	-0.88*	-1.58*	0.45	-0.03	-0.46	-5.08*	-6.34*

Note:,**, and *** indicate significance at the 1%, 5%, and 10% significant levels, respectively; [a)]With control variables.*

Thus, the euro itself was not the main culprit of the recession in the Eurozone. Unfortunately, the crisis contributed to lower per-capita GDP, higher unemployment rates, higher deficit and debt-to-GDP ratios, and higher deficit trade balances. The crisis mainly derived from the toxic US derivative market, and was more serious in those countries unable to meet the fiscal MC. The crisis was also more severe in the peripheries, due to a large trade deficit compared to the core countries' surpluses.

The following table describes some similarities and differences between the ASEAN economic crisis and the Eurozone crisis.

Table 43. Indicators of Crisis: Asian Crisis versus the Eurozone Crisis

Asian	The Eurozone
High inflation	Negative growth
Slow capital inflow and sudden capital outflow	High deficit and debt-to-GDP ratio
Property bubbles	High unemployment
Private debt	High trade deficit
Exchange rate collapse	Property bubbles

8.1.2 Applying Maastricht Convergence Criteria in ASEAN

In the Chapter 4 analysis , we find that ASEAN has high convergence in terms of interest rate, but in all other criteria, the level of convergence was lower than the Eurozone. Comparing countries satisfying adapted MC, conditions were not much different in the EU prior to adoption of the MT. Applying the MC in ASEAN, results show that Thailand met all criteria, and most countries satisfied budget criteria, indicating fiscal sustainability in ASEAN countries.

Regarding the EU, results showed that seventeen countries have joined the EMU, and it continues expanding as more countries determine the benefits outweigh the costs of membership. The level of nominal convergence based on the MC is very high (Cronbach's coefficient above 0.9). Despite some limitations in facing the current crisis (Darvas, 2010), the success of the euro's launch, its evolution to become a strong currency, and price stability in the Eurozone were signs that the monetary and fiscal stability provided by the MC are surely steps in the right direction.

Table 44. Comparing the Eurozone and ASEAN Related to MC Variables and Cronbach's Coefficient

Countries	Inflation	Interest	Deficit	Debt
Eurozone	**2.09**	4.11	-2.66	69.92
Austria	1.82	4.13	-1.86	61.03
Belgium	2.01	4.15	-1.28	92.03
Finland	1.57	4.08	2.75	40.70
France	1.89	4.06	-3.73	65.75
Germany	1.64	3.93	-2.42	39.53
Ireland	2.52	4.30	-1.98	34.93
Italy	2.30	4.33	-3.40	98.32
Luxemburg	2.20	3.73	1.08	8.53
Netherlands	1.92	4.06	-1.37	43.50
Portugal	2.35	4.23	-2.35	67.67
Spain	2.93	4.13	-1.43	37.88
Cyprus	2.46	4.90	-2.54	62.55
Greece	3.22	4.47	-6.37	100.59
Malta	2.45	4.81	-4.48	66.04
Slovakia	4.15	4.85	-3.83	35.58
Slovenia	3.96	5.12	-1.44	26.45
ASEAN	**8.75**	**6.48**	**-0.94**	**57.90**
Indonesia	13.82	14.66	-0.96	53.77
Malaysia	2.43	3.74	-3.31	42.67
Philippines	5.62	6.58	-3.43	58.98
Singapore	1.20	1.21	5.64	91.86
Thailand	2.73	3.38	-1.79	48.93
Brunei	0.52	5.59	6.11	6.80
Cambodia	5.21	3.65	-1.64	35.33
Laos	25.77	8.17	-4.72	107.48
Myanmar	23.48	10.56	-2.05	85.84
Vietnam	6.75	7.25	-3.22	47.33
MC for the Eurozone	**3.18**	**6.05**	**-3.00**	**60.00**
MC for ASEAN	**2.88**	**5.51**	**-3.00**	**60**
Cronbach's Coefficient (1983-1992, EMU-11)	**0.92**	**0.84**	**0.57**	**0.90**
Cronbach's Coefficient (2002-2009, EMU-16)	**0.94**	**0.95**	**0.93**	**0.85**
Cronbach's Coefficient ASEAN (1998-2009)	**0.60**	**0.84**	**0.40**	**0.50**

Source: Author's calculation

Adapting the MC can impose stable macroeconomic performance, if ASEAN intents to create deeper integration through a common currency. Some difficulty arises in implementation, due to weaker institutions, huge differences in GDP per capita, financial systems, and degree of market liberalization (Vanderon, 2005). In the current situation, ASEAN should not rush into a deeper regional integration, as the EU did at stage I of the MT. Previous studies' findings have some similarities and differences, as seen in following table.

Table 45. Comparing Previous Studies: Applying Maastricht Convergence Criteria

Study	Country (time period)	Analysis Method	Result
Green (1994)	ASEAN-4 (Indonesia, Malaysia, Philippines, Thailand) EC-4 (France, Germany, Italy, UK) 1970-1990	Crobach's Coefficient	Convergence in nominal exchange rate, few convergence trends for interest rates, more convergence in money supply growth, 3 of ASEAN-4 appear to pass the kind of tests for MC in EU.
Azali (2007)	ASEAN-5 1978-2004	The Bound Testing Approach (ARDL)	Interest rate, inflation rate, and debt-ratio criteria satisfy the Maastricht criteria, while exchange rate and surplus criteria didn't comply. The findings showed ASEAN-5 countries have the potential to form a single currency.
Artus 1993	EC Countries	The Maastricht Criteria	Three countries pass the criteria. By the end of 1992, much convergence progress had been achieved in a majority of EC countries.
This study	Comparing the Eurozone and ASEAN countries	The Maastricht Criteria and Cronbach's Coefficient	ASEAN has high convergence in term of interest rates, but in all criteria, the level of convergence was lower than the Eurozone. Comparing countries satisfying adapted MC criteria, conditions were not much different than EU countries prior to signing of the MT. Applying the MC in ASEAN, results show that Thailand met all criteria, and most countries satisfy budget criteria, indicating fiscal sustainability in ASEAN countries.

8.1.3 Assessing Determinants of Macroeconomic Policy and Demographic Conditions on Real Convergence and Growth

In the section above, we see ASEAN conditions regarding the Maastricht Criteria were not much different than EU countries prior to signing of the MT; the level of convergence in the Eurozone was very high, indicating that monetary and fiscal stability provided by the MC is positive.

Other important aspects of this study are the analysis of regional integration of membership and policy variables (mainly the MC) on growth and convergence. Studying these issues can show whether these policies work effectively.

The issues analyzed in Chapter 5 have received little attention in previous studies. We use various approaches to capture recent conditions of regional integration. The assumptions used in Chapter 5 show whether regional economic integration membership, macroeconomic policy variables, demographics, and crises contribute to growth and real convergence.

As also supported by DiD and decomposition computation, the results confirmed that ASEAN member countries have no macroeconomic policy restrictions, and they performed better in terms of income, productivity growth, and low levels of unemployment. However, in terms of the business cycle, the Eurozone was more stable. The increase in GDP per hours worked—wages—was responsible for the increase in productivity, especially in ASEAN, which experienced high annual growth.

Based on regression results, convergence was found to be conditional rather than unconditional, except in the case of unemployment and productivity in the Eurozone. The ability to explain variations in dependent variables improved substantially when the condition factor was included as the magnitude of convergence.

The inclusion of a dummy-membership variable showed mixed results. It was positive in inducing the growth of per-capita GDP in both regions. It was also beneficial in terms of productivity in ASEAN, but insignificant for the Eurozone. It was reduced ASEAN unemployment growth, these figures increased in the Eurozone. Crisis was painful for both regions, as suspected; however, it had no impact on unemployment.

Table 46. Comparing the Eurozone and ASEAN: Real Convergence

Convergence in	Income		Productivity		Unemployment	
	Eurozone	**ASEAN**	**Eurozone**	**ASEAN**	**Eurozone**	**ASEAN**
Speed of Convergence						
Unconditional	Insig	Insig	–0.0201[a]	Insig	–0.1744[a]	–0.4274[a]
With Dummy	–0.2055[a]	–0.0216[b]	–0.0125[b]	–0.0743[a]	–0.1547[a]	–0.4483[a]
Input Variables	–0.2719[a]	Insig	–0.0214[a]	–0.1385[a]	–0.1258[a]	–0.4450[a]
Maastricht Variables	–0.3563[a]	–0.0386[b]	–0.0930[a]	–0.1972[a]	–0.1224[a]	–0.5759[a]
Demographic Variables	–	–	-0.0630[a]	-0.3314[a]	-0.2404[a]	-0.6267[a]
Dummy Variables						
Membership	+	+	Insig	+	Insig	–
Crisis	–	–	–	–	+	Insig
Input Variables						
GK	+	+	+	+	–	–
GP			–	–	Insig	Insig
Openness	Insig	Insig	+	+	–	Insig
Gov	–	–	Insig	Insig	+	Insig
Maastricht Variables						
Inflation	Insig	Insig	–	+	Insig	Insig
Interest Rate	Insig	Insig	Insig	–	+	Insig
Exchange Rate	Insig	+	Insig	Insig	Insig	+
Deficit	+	Insig	–	+	–	Insig
Public Debt	Insig	Insig	–	Insig	Insig	+
Demographic Variables						
Working-Age	–	+	+	Insig	Insig	Insig
Dependency Ratio	–	Insig	Insig	Insig	Insig	Insig
Density	+	Insig	–	–	Insig	+
Urban	Insig	Insig	+	Insig	Insig	+

Note: [a]Significance in 1%, [b] in 5%, and [c] in 10%

The augmentation of input variables was essential for all equations. Positive growth in the fixed capital formation aligned with the neoclassical assumption. The negative impact of population growth on productivity and working age in per-capita income indicates that increases in population diminish growth and induce responses in the form of technological progress and capital accumulation. Unfortunately, population growth was found to have no influence on unemployment volatility. Going deeper into the specific impact of macroeconomic policy (i.e., those relating to the MC) on growth and real convergence, results were mixed in different estimations. In the per-capita GDP equation, only deficit had a positive influence on growth in the Eurozone, and depreciation had a positive impact on growth in ASEAN.

The Eurozone's productivity estimation results indicated that inflation, deficits, and public debt had negative effects on productivity growth, and on the control of convergence. By contrast, in ASEAN, inflation and deficit each had a positive impact, and interest rates discouraged growth.

Looking at unemployment convergence, the interest rate had a positive influence, and deficits reduced unemployment. For ASEAN, the exchange rate and debt contributed positively to unemployment growth. Due to limitations inherent in the panel estimation, care should be taken with the interpretation of results, since country-specific effects should differ. Therefore, country-specific investigations are needed to obtain a more robust interpretation.

Demographic variables were important to productivity in the Eurozone; however, among variables included, only density had an impact on unemployment. For the MC variables, Eurozone's policies designed to keep inflation low were relevant, since these variables had the power to reduce productivity and increase unemployment.

For ASEAN, investment was a very important factor, inducing productivity and reducing unemployment. Density had negative impact for productivity, and also increased unemployment, especially for urban dwellers. In the case of ASEAN, public debt should be lowered, to reduce the impact of negative productivity and an increase in unemployment. While the MC as policy variables in both areas appears to play a major role in shaping productivity and unemployment patterns, demographic conditions also matter (although in unemployment equations, the individual effects are so determinant). The results of demographic change in both regions supported the "population neutralist" view, that

population growth in the short run had no effect, but improved economic performance in long run.

On the question of convergence, this study had similarities and differences when compared to previous studies' findings, as seen in the following table.

Table 47. Comparing with Previous Studies: Real Convergence

Study	Country (time period)	Analysis Method	Result
Soukiazis and Castro (2005)	EU-15 1971-2005	Panel Estimation using β convergence.	MC couldn't be ignored in growth studies, since they reflect some restrictive rules. The joint effect of MC is significant in all cases of real convergence. - Income convergence runs at a slower rate. - Productivity is influenced positively. - MC was negative for investment and unemployment. - Individual influences are mixed - Convergence is conditional rather than absolute.
Vojinovic and Prochniak (2009)	10 New Accession Countries of EU in 2004 (1992-2006)	Panel Estimation	-1992-2006 is diverged and insignificant -1995-2006 is converged -1996-2006 is converged -2002-2006 is converged -2004-2006 is converged
Chowdhury (2005)	(ASEAN except Myanmar) 1960-2001	Pooled OLS	-No absolute Convergence -No unconditional and conditional convergence during 1960-2001 period of study.
Kaitila (2005)	(EU-15) 1993-2002 (CEECs) 1960-2002	Pooled Mean Group Estimation	For EU-15: Conditional Convergence in GDP per labor, investment (+), public consumption (-), inflation (-), customs union member (+) For CEES: Conditional convergence exists, investment (+), public consumption (-), population growth have a negative impact
Haider, Hamid, and Wajid (2010)	South and East Asian Economies 1973-2009	Pooled-OLS and Theil Inequality Index	-Unable to find absolute convergence -Found the existence of conditional income convergence for both eastern and southern Asian economies
Cuaresma, Jesus C, et, al (2006)	EU-15 Countries 1961-1998	Panel Regression	Conditional Convergence, Investment (+), Education (+), INF (-), Government, Openness (+), Years in EU (-)
Ismail (2008)	ASEAN-5 1960-2004	Pooled Mean Group Estimation	- Unconditional convergence exists at about 3.8% - ASEAN-5 converged conditionally - Formation of ASEAN has s positive impact on growth - AFTA has no impact on growth - The speed of convergence is between 1.6%-16.6%
This study	Comparing the Eurozone and ASEAN	Panel Regression	- Convergence was conditional rather than unconditional, except for unemployment and productivity in Eurozone. - Dummy membership was positive on the growth of per-capita GDP in both regions, and beneficial for productivity in ASEAN, but insignificant for the Eurozone. It was beneficial for reducing ASEAN unemployment growth, but increased the Eurozone's unemployment. - Crisis was painful for both regions.

8.1.4 Augmented Analysis of Economic Integration Impact on Trade

This paper investigates the impact of different levels of economic integration on bilateral trade in these two regions, one with a common currency (the Eurozone), and the other struggling as a free-trade area (ASEAN). Chapter 7 addresses this important issue.

We found that that the effects of deepening integration increased bilateral trade for all Eurozone members, but insignificant for original members. Thus, widening membership positively induced higher reciprocal trade. In ASEAN, the deepening impact of creating AFTA generated positive results among ASEAN-6 countries, but not when CLMV joined. Thus, inclusion of the CLMV in AFTA was negative. The financial crises reduced the incentive to trade bilaterally in both the Eurozone and ASEAN.

Table 48. Comparing the Eurozone and ASEAN: Regional Integration on Trade

	Eurozone		**ASEAN**	
Variable	**All**	**Original**	**All**	**ASEAN-6**
Euro Dummy	+	Insig	-	+
Crisis Dummy	-	-	-	-
DifInf	Insig	Insig	Insig	Insig
Difint	+	+	Insig	Insig
Difer	Insig	+	Insig	Insig
Difdef	Insig	Insig	+	Insig
Difdebt	Insig	Insig	Insig	-
G (Market Size)	+	+	+	+
S (Market Similarity)	+	+	+	+
R (Endowment)	-	Insig	+	Insig
D (Distance)	-	-	-	-
G*Euro	-	Insig	+	-
S*Euro	-	-	-	-
R*Euro	+	Insig	Insig	Insig

For the Eurozone, in regard to MC variables, divergence in interest rates creates an incentive for higher bilateral trade. A similar effect was caused by divergence in nominal exchange rates among original members, and a reassuring effect was created by convergence

in deficit-to-GDP ratio for original EU members, in export and import weight. This shows that forcing convergence in the Maastricht criteria might not have an influence on higher bilateral trade. For ASEAN, among variables associated with the MC, divergence in deficit induced higher bilateral trade, and convergence in debt created the reassuring effect.

Related to H-O variables, the impact of market size, income similarity, and distance were as hypotesised. Market size and income similarity were important factors for a higher flow of bilateral trade, which indicated horizontal linkage creation, based predominantly on market access and consumer income.

We found various results for factor endowment impact. Intra-trade industry increased dramatically among all Eurozone countries, shown by the negative impact of factor endowment on bilateral trade, but it was insignificant among original members, due to a similar level of development among these nations. For ASEAN, differences in factor endowment were determinant for higher bilateral trade when CLMV countries were included, as shown by a positive result for factor endowment; however, among original members, the impact was insignificant. This study found some similarities and differences with previous studies' findings, as seen in following table.

Table 49. Comparing with Previous Studies: The Impact of Regional Integration on Trade

Study	Country (time period)	Analysis Method	Result
Frankel and Rose (1998)	1959-1993 21 OECD Countries	Panel-OLS and IV	Distance related negatively to bilateral trade. Income, common language, and regional trade among members related positively to bilateral trade. Countries with closer trade links tended to have more tightly correlated business cycles.
Warin, Wunnava and Janicki (2009)	EU-15 members 1994-2005	Panel Estimation	H-O variables were robust for bilateral FDI, convergence in debt was important, as were interaction variables.
Egger and Pfaffermayr (2013)	EU countries (1960-2001)	ANCOVA Regression Model	Substantial trade creation through the formation/enlargement of EU. Smaller trade creation effects of southern enlargement. Significant intra-trade diversion of EU membership. Core-periphery trade showed strong positive effects from integration.
Yamarik and Ghosh (2005)	186 Countries 1970, 1975, 1980, 1985, 1990, 1995	Cross Section	Level of development, trade policy, linguistics, colonial ties, geographic factors, relative population density, common currency, and membership in trade arrangements, are robust in a gravity equation.
Micco, Stein, and Ordonez (2003)	22 OECD Members 1992-2002	Panel Fixed Effect	Common membership in the Eurozone contributed positively on bilateral trade.
Sousa (2012)	203 Countries 1948-2009	PPML Technique	With globalization, currency unions become less and less important for promoting trade.
Belke and Spies (2008)	All OECD members 1991-2004	Panel Data	Poland, Latvia, and Lithuanian, all CEES, can expect increases in the EMU-12 import share.
Berger and Nitsch (2008)	22 OECD members 1948-2003	Panel OLS estimation	A gradual increase of trade intensity between European countries over time, due to trade integration and policy changes.
Elliott and Ikemoto (2004)	35 countries 1983-1999	Panel Estimation	Trade flows were not significantly affected in the years immediately following the signing of AFTA, and countries with outward-looking economies were stimulated by AFTA.
Bun, Klaassen, and Tan (2009)	11,178 country-pairs 1948-1997	Panel Estimation	Negative impact of AFTA on trade.
Doanh and Heo (2009)	Vietnam and Singapore 1990-2005	Panel Estimation	AFTA, with other ASEAN countries, was negative for Vietnam and positive for Singapore.
This Study	The Eurozone and ASEAN 1990-2009	Panel Estimation	Deepening integration on bilateral trade was positive among all Eurozone members, but insignificant among original members. Membership expansion was positive, inducing higher reciprocal trade. In ASEAN, the impact of deepening the economic union, creating AFTA, generated positive results only among ASEAN-6, not when the CLMV joined the membership.

8.2 Overall Conclusions and Policy Recommendations

8.2.1 Findings

We can draw some findings from this research:

- The pure effect of a common currency on the EU peripheries has shown a positive convergence of low inflation rates, interest rates, deficits, and debt-to-GDP ratios, as well as lower unemployment rates. Unfortunately, the 2009 crisis contributed to lower per-capita GDP, higher unemployment rates, higher deficit and debt-to-GDP ratios, and higher deficit trade balances. The crisis mainly derived from the toxic US derivative market, and was more serious in those countries unable to meet the fiscal MC.
- ASEAN has high convergence in terms of interest rates, but in all other criteria, the level of convergence was lower than the Eurozone. Comparing countries satisfying the adapted MC, conditions were not much different than EU countries prior to signing of the MT. Our results show that Thailand met all criteria, and most countries satisfied budget criteria, indicating fiscal sustainability in ASEAN countries.
- Convergence was found to be conditional rather than unconditional, except unemployment and productivity in the Eurozone. The ability to explain variations in dependent variables improved substantially when the condition factor was included as the magnitude of convergence.
- The inclusion of a dummy-membership variable brought mixed results. It was positive for growth of per-capita GDP in both regions. It was also beneficial in terms of productivity

in ASEAN, but insignificant for the Eurozone. It reduced ASEAN unemployment growth, but increased it in the Eurozone.

- Macroeconomic policy variables relating to the MC, applied growth and real convergence, showed mixed results in different estimates. In the per-capita GDP equation, only deficit had a positive influence on growth in the Eurozone, and depreciation had a positive impact on growth in ASEAN. The Eurozone's productivity estimates indicated that inflation, deficit, and public debt had negative effects on productivity growth and on control of convergence. By contrast, in ASEAN, inflation and deficit both had a positive impact, and interest rates discouraged growth. Looking at unemployment convergence in the EU, the interest rate had a positive influence and deficit reduced unemployment. For ASEAN, the exchange rate and debt increased unemployment.
- The MC as policy variables appeared to play a major role in shaping productivity and unemployment patterns. Demographic conditions were also important, although in the unemployment equation, individual effects were not so determinant.
- We found that that deepening the union positively impacted bilateral trade among all Eurozone countries, but was insignificant among original members. The euro's membership expansion was positive in inducing reciprocal trade. In ASEAN, AFTA generated positive results only among ASEAN-6, not when the CLMV joined the membership. Thus, inclusion of the CLMV into AFTA was negative.
- Forcing convergence in variables associated with Maastricht criteria had little influence on higher bilateral trade in both regions.

- Related with H-O variables, the impact of market size, income similarity, and distance were as expected. Market size and income similarity were important factors for increased bilateral trade, indicative of horizontal linkage, based predominantly on market access and consumer income.
- Intra-trade industry was dramatic in all Eurozone countries, shown by the negative impact of factor endowment on bilateral trade, but it was insignificant among original members, due to similar levels of development. For ASEAN, differences in factor endowment were determinant for higher bilateral trade when the CLMV countries were included, as shown by a positive result for factor endowment.

8.2.2 Limitations

- Data availability constrained analysis.
- Data quality for ASEAN countries may not be as good as figures from the Eurozone. This should be considered when evaluating the results.
- Although it fair to evaluate the euro a decade before and after as an empirical lesson for ASEAN, analyzing a 20-year period might lead to less-robust results.

8.2.3 Policy Recommendations

- In the long-term, to preclude the systemic vulnerability associated with Minsky's cycle of excessive risk in the Eurozone, the MC and SGP should be revised, thus creating more unified fiscal policy in the Eurozone. The ECB should be entrusted with a larger budget, so that it may act as a "lender of last resort" and as a "checks and balances" institution.

- Regardless of limitations, adapting the MC can be useful to create stable macroeconomic performance. From the Maastricht Treaty, ASEAN can learn how to implement suitable criteria for stronger guarantees of economic stability, and determine nominal convergence as a necessary condition for adopting a common currency
- It was difficult to bring about a political union in the Eurozone with asymmetrical monetary and fiscal-policy structures. Therefore, both the MC and SGP criteria were needed, as were incentives for compliant member countries and clear sanctions for noncompliance.
- To ensure a stronger Euro, a decade after its introduction, some criteria were set forth in tandem with policy coordination—especially that which imposed price-stability tasks for the ECB, pushed growth, and mitigated unemployment.
- In the Eurozone, greater economic integration was necessary to decrease trade disputes and friction in the area, especially regarding trade imbalances among member countries.
- ASEAN needs to meet their commitment to lower tariffs based on the CEPT scheme, in order to accelerate the realization of an ASEAN Economic Community by 2015.
- Although austerity compresses public expenditures and weakens private consumption, to solve the current crisis in the Eurozone, it may steer the peripheries away from collapse in the short term. The transfer of some funds from the surplus (core) countries, in order to create job opportunities in the peripheries, will help reduce negative effects in the short term.

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We hereby recommend that the dissertation by Mr. ZAENAL MUTAQIN entitled "Comparative Analysis of Convergence on Regional Economic Integration: The Eurozone and ASEAN" be accepted in partial fulfillment of the requirements for DOCTOR OF PHILOSOPHY.

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