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# Essays on Regional Economic Integration in East Asia

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# **Essays on Regional Economic Integration in East Asia**

BY

**Teerasak Sapwarobol**

A Dissertation submitted to the Faculty of Claremont Graduate University in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Graduate Faculty of Economics

Claremont, California  
2012

Approved by:

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Dr. Arthur T, Denzau

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We, the undersigned, certify that we have read this dissertation of Teerasak Sapwarobol and approve it as adequate in scope and quality for the degree of Doctor of Philosophy.

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Abstract of the Dissertation

**Essays on Regional Economic Integration in East Asia**

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Teerasak Sapwarobol

Claremont Graduate University: 2012

This dissertation seeks to understand the pattern of trade and portfolio investment in East Asian economies and how trade integration can affect the level of bilateral asset holdings. On the trade side, the determinants of bilateral trade flow is examined at the product level, not the aggregate, so as to assess the impact of RTAs across product types as well as the nature of the home market effect and the role of similarity of demand structures. On the financial side, the dissertation synthesizes analyses of the composition of cross-border portfolio holdings in East Asian economies, focusing on the importance of capital market development as well as a linkage between goods and financial markets.

The dissertation begins with a re-examination of the determinants of bilateral trade in differentiated, reference-priced, and homogeneous products over the period of 1983-2000. The results suggest that trade liberalization under the ASEAN PTA and AFTA frameworks played a significant role in promoting intra-regional trade in differentiated and reference-priced, but perhaps not homogeneous products. The weak evidence of trade creation in homogeneous products reflects the fact that the implementation of trade liberalization among ASEAN states has provided limited benefits to its members due to waivers of concessions. Despite the massive increase

in intra-ASEAN trade, nevertheless, the findings reveal that the formation of RTAs in the region did not lead to trade diversion in any product category.

The analysis of the composition of cross-border portfolio holdings in East Asian financial markets employs a panel dataset of the IMF's CPIS over the period of 2001-2009. One key finding from the analysis is that the volume of bilateral imports appeared to play a significant role in spurring cross-border portfolio holdings in East Asian financial markets. In particular, the dissertation shows empirically that the development of the capital markets in East Asia has become one of the key factors in attracting foreign portfolio investment from most regions of the world.

To:

My dad, mom, sister, and brother

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## CHAPTER ONE

### Introduction

The years after the onset of the East Asian financial crises of 1997-98 saw East Asian countries suffer severe economic downturn and a substantial reversal in capital flow. These crises, in turn, marked a major turning point for deepening and widening economic collaboration among East Asian countries. One of the most striking features of the economic rebalancing process in this region has been the rapid proliferation of regional trade agreement (RTAs) among East Asian countries.<sup>1</sup>

The fact that intra-regional trade in the region continues to increase after the formation of the RTAs, indeed, raises some concern of whether the members of these trading blocs have benefited from the RTAs without damaging the trade and welfare of non-members. Although a large body of literature has attempted to assess the degree of trade creation and diversion effects of the RTAs in the region, almost all of the investigations only looked at the aggregate level. Given that the degree of trade liberalization under the ASEAN PTA and AFTA frameworks was different across product types, the assessment at the aggregate level alone would be misleading since the RTAs could play different roles in redirecting trade flows. In this regard, re-examining the effect of RTAs on bilateral trade flows at the product level would be crucial to better understanding the pattern of trade in East Asia.

On the financial side, the post-crisis consensus held that the East Asian financial crises were triggered by the failure of supervision and regulation in the financial sector. The process of financial integration in East Asia has been more

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<sup>1</sup> See Appendix A1.1 for the list of all ASEAN Plus Three PTAs in force.

muted than intra-regional trade integration, and the financial markets in the region are more integrated with Western Europe and the United States than with each other (Eichengreen and Park, 2003). Several studies argued that one key lesson from these crises is perhaps the condition of economic interdependence. East Asian countries have realized that the crisis and panic from Thailand could spread throughout the region as contagion. To forestall future financial crises, deeper financial integration and collaboration to manage external shocks in the region are needed.

Since then, the process of financial cooperation in East Asia has been strengthened consistently through the framework of ASEAN + 3 such as the Chiang Mai Initiative Multilateralization (CMIM) and the Asian Regional Bond Markets Initiative (ABMI).<sup>2</sup> Capital market development in the region has been progressing, with a steady increase in the ratio of market capitalization to GDP. In particular, the efforts to deepen regional financial integration has witnessed a substantial increase in cross-border asset investment among the East Asian countries and the acceleration of this bilateral asset investment seems to coincide with a surge in the volume of intra-regional trade.

This dissertation seeks to understand the pattern of trade and portfolio investment in East Asian economies and how, if any, trade integration can affect the level of bilateral asset holdings. On the trade side, the determinants of bilateral trade flow is examined at the product level, not the aggregate one, so as to assess the impact of the RTAs across product types as well as the nature of the home market effect and the role of similarity of demand structures. On the financial side, the

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<sup>2</sup> The ASEAN Plus Three (APT) countries consists of China, Japan, South Korea, and 10 member states of ASEAN.

dissertation synthesizes analyses of the composition of cross-border portfolio holdings in East Asian economies, focusing on the importance of capital market development as well as a linkage between goods and financial market. This dissertation will be particularly useful for policy makers to better understand the patterns of trade and foreign portfolio investment in East Asia, and therefore be able to deploy resources more efficiently and effectively.

The dissertation begins with the re-examination of the determinants of bilateral trade in differentiated, reference-priced, and homogeneous products using panel data covering 155 countries over the period of 1983-2000. This dissertation employs the gravity model with various different econometric techniques (i.e., year-specific fixed effects, country-pair fixed effects, and country-specific fixed effects) to control for the multilateral resistance terms.

The results suggest that trade liberalization under the ASEAN PTA and AFTA frameworks played a significant role in promoting intra-regional trade in differentiated and reference-priced, but perhaps not homogeneous products. The weak evidence of trade creation in homogeneous products reflects the fact that the implementation of trade liberalization among ASEAN states has provided limited benefits to its members due to a waiver of any concession. Nevertheless, despite the massive increase in intra-ASEAN trade, the findings reveal that the formation of the RTAs in the region did not lead to trade diversion in all product categories.

Indeed, breaking bilateral imports into three categories allow us not only to examine the influence of RTAs on international trade at the product level, but also to test the nature of the home market effect and the Linder hypothesis across product

types. In the former case, the theory of the home market effect asserts that firms tend to choose a location to produce and export goods in a country with high level of domestic demand to gain economies of scale as well as to reduce transaction costs. Once regional trading blocs are established, this theory would be particularly interesting since firms are now able to choose a location even more freely and efficiently. In such circumstances, it seems plausible that trade integration is likely to influence not only bilateral trade flows across countries, but also industries within the trading blocs. This dissertation applies the methodology of Feenstra, Markusen, and Rose (2001) to test the home market effect through the coefficients of importing and exporting countries' GDPs in the gravity equation. In the latter case, the Linder conjecture presumes a positive correlation between similar demand structure (i.e., taste indifferences) and the level of bilateral trade. This conjecture is examined in Chapter 2 to see whether the similarity of demand structures has played a role in determining the pattern of trade both in international trade generally and from the perspective of APT countries in particular, and how this hypothesis varies across product categories.

The analysis of the composition of cross-border portfolio holdings in East Asian financial markets is presented in Chapter 3. This chapter utilizes a panel dataset of the IMF's Coordinated Portfolio Investment Survey (CPIS) covering 10 host countries in East Asia over the period of 2001-2009. The objective of this analysis is to explore the role of capital market development in host countries as well as the link between trade and financial market integration. Although much of the existing empirical literatures on the determinants of cross-border portfolio investment

consider the influence of bilateral trade in goods in spurring financial flows, none has attempted to investigate the role of capital market development in host and investing countries. Incorporating these factors together in the model is particularly interesting because it allows us not only to explore what characteristics tended to encourage bilateral portfolio investments, but also to compare their distinct characteristics.

One key finding from the analysis is that the volume of bilateral imports appeared to play a significant role in spurring cross-border portfolio holdings in East Asian financial markets. This positive correlation can be explained through several mechanisms such as familiarity effects and information transmission. In particular, the dissertation shows empirically that the development of the capital markets in East Asia has become one of the key factors in attracting foreign portfolio investment from most regions of the world.

Concluding remarks are presented in Chapter 4. The chapter begins with a synthesis of the findings from the previous chapters. Thereafter, the chapter discusses the empirical limitations of the dissertation as well as providing recommendations for future research and policy implications.

### Appendix A1.1: List of All ASEAN Plus Three PTAs in Force, as of July 2010

RTA name	Coverage	Type	Date of entry into force
ASEAN - Australia - New Zealand	Goods & Services	FTA & EIA	1 January 2010
ASEAN - China	Goods & Services	PTA & EIA	1 January 2005 (Goods) 1 July 2007 (Services)
ASEAN - Japan	Goods	FTA	1 December 2008
ASEAN Free Trade Area (AFTA) <sup>3</sup>	Goods	FTA	28 January 1992
Asia Pacific Trade Agreement (APTA) <sup>4</sup>	Goods	PTA	17 June 1976
Asia Pacific Trade Agreement (APTA) - Accession of China <sup>5</sup>	Goods	PTA	1 January 2002
Brunei Darussalam - Japan	Goods & Services	FTA & EIA	31 July 2008
Chile - China	Goods	FTA	1 October 2006
Chile - Japan	Goods & Services	FTA & EIA	3 September 2007
China - Hong Kong, China	Goods & Services	FTA & EIA	1 January 2004
China - Macao, China	Goods & Services	FTA & EIA	1 January 2004
China - New Zealand	Goods & Services	FTA & EIA	1 October 2008
China - Singapore	Goods & Services	FTA & EIA	1 January 2009
EFTA - Korea, Republic of <sup>6</sup>	Goods & Services	FTA & EIA	1 September 2006
EFTA - Singapore <sup>7</sup>	Goods & Services	FTA & EIA	1 January 2003
Global System of Trade Preferences among Developing Countries (GSTP) <sup>8</sup>	Goods	PTA	19 April 1989
India - Singapore	Goods & Services	FTA & EIA	1 August 2005
Japan - Indonesia	Goods & Services	FTA & EIA	1 July 2008
Japan - Malaysia	Goods & Services	FTA & EIA	13 July 2006
Japan - Mexico	Goods & Services	FTA & EIA	1 April 2005
Japan - Philippines	Goods & Services	FTA & EIA	11 December 2008
Japan - Singapore	Goods & Services	FTA & EIA	30 November 2002
Japan - Switzerland	Goods & Services	FTA & EIA	1 September 2009
Japan - Thailand	Goods & Services	FTA & EIA	1 November 2007
Japan - Viet Nam	Goods & Services	FTA & EIA	1 October 2009
Jordan - Singapore	Goods & Services	FTA & EIA	22 August 2005

<sup>3</sup> ASEAN members: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

<sup>4</sup> Member countries: Bangladesh, India, Republic of Korea, Laos, and Sri Lanka.

<sup>5</sup> Member countries: Bangladesh, India, Republic of Korea, Laos, Sri Lanka, and China.

<sup>6</sup> Member countries: Iceland, Liechtenstein, Norway, Switzerland, and Republic of Korea.

<sup>7</sup> Member countries: Iceland, Liechtenstein, Norway, Switzerland, and Singapore.

<sup>8</sup> Member countries: Algeria, Argentina, Bangladesh, Benin, Bolivarian Republic of Venezuela, Bolivia, Brazil, Cameroon, Chile, Colombia, Cuba, Ecuador, Egypt, Former Yugoslav Republic of Macedonia, Ghana, Guinea, Guyana, India, Indonesia, Islamic Republic of Iran, Iraq, Democratic People's Republic of Korea, Republic of Korea, Libyan Arab Jamahiriya, Malaysia, Mexico, Morocco, Mozambique, Myanmar, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Singapore, Sri Lanka, Sudan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Viet Nam, and Zimbabwe.

**Appendix A1.1: (cont.)**

<b>RTA name</b>	<b>Coverage</b>	<b>Type</b>	<b>Date of entry into force</b>
Korea, Republic of - ASEAN	Goods & Services	FTA & EIA	1 January 2010 (Goods) 1 May 2009 (Services)
Korea, Republic of - Chile	Goods & Services	FTA & EIA	1 April 2004
Korea, Republic of - India	Goods & Services	FTA & EIA	1 January 2010
Korea, Republic of - Singapore	Goods & Services	FTA & EIA	2 March 2006
Lao People's Democratic Republic - Thailand	Goods	PTA	20 June 1991
New Zealand - Singapore	Goods & Services	FTA & EIA	1 January 2001
Pakistan - China	Goods & Services	FTA & EIA	1 July 2007 (Goods) 10 October 2009 (Services)
Pakistan - Malaysia	Goods & Services	FTA & EIA	1 January 2008
Panama - Singapore	Goods & Services	FTA & EIA	24 July 2006
Peru - China	Goods & Services	FTA & EIA	1 March 2010
Peru - Singapore	Goods & Services	FTA & EIA	1 August 2009
Protocol on Trade Negotiations (PTN) <sup>9</sup>	Goods	PTA	11 February 1973
Singapore - Australia	Goods & Services	FTA & EIA	28 July 2003
Thailand - Australia	Goods & Services	FTA & EIA	1 January 2005
Thailand - New Zealand	Goods & Services	FTA & EIA	1 July 2005
Trans-Pacific Strategic Economic Partnership <sup>10</sup>	Goods & Services	FTA & EIA	28 May 2006
US - Singapore	Goods & Services	FTA & EIA	1 January 2004

Source: WTO

Note: "FTA" is Free Trade Agreement, "EIA" is Economic Integration Agreement, and "PTA" is Preferential Trade Agreement.

<sup>9</sup> Member countries: Bangladesh, Brazil, Chile, Egypt, Israel, Republic of Korea, Mexico, Pakistan, Paraguay, Peru, Philippines, Serbia, Tunisia, Turkey, and Uruguay.

<sup>10</sup> Member countries: Brunei Darussalam, Chile, New Zealand, and Singapore.

## CHAPTER TWO

### The Emergence of East Asian Regionalism: Trade Issues

#### 2.1 Introduction

Recent empirical studies have highlighted the significance of regional economic integration in promoting intra-regional trade in most blocs.<sup>11</sup> Aitken (1973), for instance, found that the formation of the European Economic Community (EEC) and the European Free Trade Association (EFTA) generated a cumulative growth in gross trade creation (GTC) during 1959-67.<sup>12</sup> By 1967, the estimated values of the GTC amounted to approximately \$9.2 billion (EEC) and \$1.3 billion (EFTA). Thornton and Goglio (2002) demonstrated the advantage of being a member of ASEAN in promoting intra-regional trade by 52 percent over non-member countries in the region. These gains resulted from broadening trade liberalization since the late 1980s. Gilbert et al. (2001)'s empirical result illustrated the accomplishment of ASEAN in promoting manufactured trade, while the lack of strong statistical evidence made it difficult to conclude whether agricultural trade has benefited from the AFTA. They also found that trade among the APEC members was roughly 2.7 times higher than that of other similar economies, even though no progress have been made in further strengthening the Asia-Pacific community since its implementation. Note that although several economically-integrated communities have benefited from

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<sup>11</sup> Note that the degree of economic integration can be classified as follows: 1) preferential trading area, 2) free trade area, 3) customs union, 4) single market, 5) economic and monetary union, and 6) complete economic integration.

<sup>12</sup> As noted in Aitken (1973), "*gross trade creation (GTC) will refer to the total increase in trade among members of a trading community brought about through integration, regardless of whether the additional trade replaces domestic production or whether it replaces non-member exports.*"



the trading blocs, NAFTA's effect on trade remained less clear. That is, while Krueger (2000) found the dramatic increase in the share of NAFTA members in the US market and the expansion of Mexican trade was trade creation, Gilbert et al. (2001)'s evidence revealed the negative impact of the bloc on trade.

The significance of the trade creation effect, in turn, has raised concern as to whether the trading blocs actually represent building or stumbling blocks. In theory, although the formation of regional trade agreements (recognized as a second best for international trade) tends to have immediate negative impacts on non-member states, they need not necessarily mean that the volume of trade between member and non-member states will decline over the long run. In the long run, the formation of RTAs can result in several positive dynamic consequences of enlarged market size including economies of scale, economies of specialization, more competitive trade structures, knowledge spillovers, and economic growth.

One of the most striking aspects of economic integration recently has been the impacts of ASEAN integration on trade creation and trade diversion. The fact that intra-ASEAN trade has continued to increase (in terms of both value and the percentage share of total trade) over the past decades raises some concern of whether the bloc has generated extra-regional trade bias. Although recent empirical work (such as Elliott and Ikemoto, 2004; and Magee, 2008) has shown that trade integration in Southeast Asia does not appear to have had a negative impact on extra-ASEAN trade, none of the existing studies has attempted to estimate the impacts of the ASEAN trading bloc on bilateral trade flows at the product level.

In addition, it seems plausible that trade integration between ASEAN plus three (APT) countries is likely to influence not only bilateral trade flows across countries, but also industries within the region due to the “home market effect.”<sup>13</sup> As has been argued in Hanson and Xiang (2002), lowering trade barriers makes large countries more attractive in very high transport cost industries, while moderately high transport cost industries tend to move into well-located small economies. Because of the absence of tariff and non-tariff barriers in the region, firms are able to choose a location more freely and efficiently and they, according to the theory of the home market effect, tend to locate and produce goods in countries with high levels of demand to gain economies of scale as well as to reduce transaction costs.

Accordingly, it is rational for transnational corporations to engage in outsourcing across countries as component production bases to exploit comparative advantage from differences in factor endowments across the region (Arndt, 2001).

Unfortunately, the lack of empirical evidence for the nature of the home market effect in the region and the impacts of ASEAN on bilateral trade at the product level makes it difficult to understand the pattern of trade for APT countries. This chapter tries to close this gap by investigating the role of three particular factors that may influence bilateral trade flows at the product level. Firstly and most importantly, the chapter attempts to measure the magnitude of trade creation and trade diversion (by commodity) under ASEAN framework agreements. Secondly, the nature of the home market effect is examined. And lastly, this chapter tests whether

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<sup>13</sup> Note that APT countries consist of Brunei, Cambodia, China, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, South Korea, Thailand, and Viet Nam.

the similarity of demand structures between APT countries plays a role in determining the pattern of trade.

This chapter is organized as follows. Section 2.2 provides an overview on the development of ASEAN economic integration. The economics of regionalism in Southeast Asia is reviewed in section 2.3. Section 2.4 presents methodology and variables. Section 2.5 reports the empirical results and section 2.6 concludes.

## **2.2 The Development of ASEAN Economic Integration: An Overview**

The success of regional economic communities in many parts of the world along with the increasing global competitiveness during the late 1980s and 1990s induced economists and authorities in East Asia to pay particular attention to the opportunities for both widening and deepening economic collaboration in the region. Despite the regional cooperation in East Asia that started with the establishment of ASEAN in 1967, it was not until the 1970s that the original 5 members (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) agreed upon the program of ASEAN economic cooperation through the ASEAN preferential trading arrangements (ASEAN PTA), following the Bali Summit in 1976.<sup>14</sup> The ASEAN PTA was intended to encourage trade and accelerate industrial development in the Southeast Asian region by providing preferential tariff reduction to products that originate from ASEAN members.

However, as noted in Cuyvers et al. (2005), the ASEAN PTA played only a limited role in promoting intra-ASEAN trade due to the fact that its framework of

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<sup>14</sup> These economic co-operations include the ASEAN industrial projects (AIP), the preferential trading arrangements (PTA), and the ASEAN industrial cooperation (AIC) schemes. See further discussion in [www.aseansec.org](http://www.aseansec.org).

offering preferential tariff treatment to products originating from member states was narrow. Moreover, for many products, the ASEAN PTA framework had limited impact since the tariff rates for these products were already zero (Naya, 2004). At that time, several ASEAN member countries still experienced rapid economic growth. Some even pursued a policy of import substitution. ASEAN members at that time overlooked the possibilities for trade integration and economic cooperation in the region.

The need for deeper regional economic cooperation came in the late 1980s when the global economic environment had dramatically changed. The IMF and the World Bank's efforts to accelerate trade liberalization put pressure on ASEAN countries to further liberalize trade. The region also sought to counterbalance not only the upward influence of NAFTA and the EU as the main export destinations, but also the emergence of China as a major supplier and FDI destination. Furthermore, the reduction of political tensions in the region (e.g., the Vietnam War, the Unification of Vietnam, and the invasion of Cambodia) allowed ASEAN members to pay more attention to economic collaboration (Naya, 2004). As a result, the 6 ASEAN members agreed in January 1992 to implement the Common Effective Preferential Tariff (CEPT) scheme as the framework for the ASEAN Free Trade Area (AFTA). This agreement would act as a goal to boost competitive advantage within ASEAN through the elimination of tariff and non-tariff barriers and to attract more FDI into the region.

The signing of the AFTA agreement in 1992 clearly reflects ASEAN members' efforts to carry out deeper trade integration in the region. Unlike the

ASEAN PTA's framework, the agreement on the CEPT scheme for AFTA consisted of all manufactured products including capital products and processed agricultural products, while raw agricultural products were not subject to the tariff reduction schedule.<sup>15</sup> Products that originate within ASEAN of at least 40 percent value added were also subject to the program for tariff reduction, and the tariff of these products had to be reduced to 0-5 percent by 2010, according to the ASEAN Secretariat, 2002.

Although the members also agreed to remove all quantitative restrictions and other non-tariff barriers, several practical shortcomings have been identified. For instance, the elimination of indefensible non-tariff measures (NTMs) has met with little progress although it was subject to high priority (Cuyvers et al., 2005).

Furthermore, only 5 percent of intra-ASEAN trade has actually benefited from the CEPT scheme due to difficult rules regarding country of origin (Reyes, 2004).

Indeed, the existing literature identified the aftermath of the East Asian financial crises in the late 1990s as the key trigger for the rise of economic integration in the region (Cuyvers et al., 2005, Naya, 2004, and Elliott and Ikemoto, 2004). Back in the early 1990s, the ASEAN members participated in two major RTAs: AFTA and APEC. While the arrangement under AFTA aims to promote intra-regional trade and attract FDI into the region on the one hand, on the other hand ASEAN countries also took part in the APEC initiative as another way to encourage international trade and transnational cooperation. However, unlike the systematic integration in the context of the EU or NATFA, the APEC framework intends to liberalize trade and investment among member countries based upon individual voluntary effort. Consequently, when

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<sup>15</sup> See further discussion in "Agreement on the Common Effective Preferential Tariff Scheme for the ASEAN Free Trade Area, Singapore, 28 January 1992." [www.aseansec.org](http://www.aseansec.org)

the financial crises hit East Asian countries in 1997 and 1998, APEC was unable to manage the crises and contagion. Nor had it provided enough support for the crisis-hit member states since its framework centers on the real side of the economy, not on financial cooperation. It has also been argued that the failure of the IMF and the US in dealing with the crises served as a wake-up call for serious economic integration in the region (Naya, 2004). Although East Asian countries have been pursuing export-oriented strategies, they have realized that the crisis and panic from Thailand could spread throughout the region as contagion. This condition of economic interdependence together with the failure of international institutions in managing the crisis caused the East Asian countries to turn their attention back to intra-regional integration in the form of the ASEAN Economic Community (AEC) and ASEAN +3 frameworks in parallel.

### **2.3 Economics of Regionalism in Southeast Asia**

It is likely that the recent arrangement of the AEC adopted in 2003 will play a major role in transforming Southeast Asia into a single market and production base. In response to the proliferation of RTAs in other regions, especially NATFA and the EU, trade and investment liberalization under the AEC blueprint will be much broader and deeper than those in the context of AFTA and ASEAN Investment Area (AIA) combined. In particular, the whole ASEAN economy shall be seen as an integrated area of free movement of goods, service, investment, skilled labor, and

capital by 2015.<sup>16</sup> This development, on the one hand, will be beneficial to all member states by allowing them to fully exploit their comparative advantages and economies of scale. Given that ASEAN states have different resource endowments, the progress under the AEC framework will also allow its members to concentrate in specializing in the production of certain goods or tasks. On the other hand, the structure of an ASEAN single market and production base *per se* could represent a significant building block towards global free trade.

Ever since the AFTA was launched in the early 1990s, there has been an ongoing debate over the economic implication of the ASEAN community: whether it has actually benefited member states without damaging trade and welfare of non-members. In theory, the removal of trade barriers between member countries usually results in an immediate shift of import structure in favor of RTA partners' products, whereas the welfare effects of forming a trading bloc are ambiguous. That is, the establishment of RTAs usually brings about the elimination of market imperfections or distortions (e.g., tariffs and quotas) within the bloc that can improve members' economic efficiency and welfare. In turn, the simultaneous reflection of RTAs is the creation of other distortions against non-member states (e.g., relatively higher external tariff rates) which worsen the economic welfare of non-member states.

In the well-known analysis of Viner (1950), the welfare implication of a customs union (CU) was demonstrated to be either good or bad depending upon individual circumstances. For instance, the removal of customs duties between CU member countries can enhance economic efficiency of resource allocation if the

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<sup>16</sup> In fact, the ASEAN Community is consisted of three pillars: the ASEAN Economic Community (AEC), the ASEAN Security Community (ASC), and the ASEAN Socio-Cultural Community (ASCC). In dealing with the economic integration, this study, however, centers on the AEC only.

imports of goods produced by high-cost producers outside the CU are substituted by lower-cost products produced within the CU member states. Of course, inefficient resource allocation can also arise as the imports of goods are shifted away from low-cost products made outside the CU to higher-cost products produced by the CU member countries.

Aside from the shift of import structure that can alter resource allocation when tariffs are removed, the economics of customs unions also points to the importance of factor mobility within the CU as it may or may not lead to welfare improvement. In general, the formation of a CU (or RTA) usually leads to a higher degree of market integration that enables firms or industries within the integrated market to exploit product specialization and scale economies. It is true that the net welfare of member states can be improved if those firms or industries' production functions exhibit increasing returns to scale. Nonetheless, once the production functions of those manufacturers have already reached the optimal scale of production, other things constant, further production expansion would lead to decreasing returns to scale unless the free movement of factors of production between members is allowed so that resources can be efficiently relocated.

In addition, most economic analyses of RTAs have recognized the significance of RTA formation as a way to improve members' terms of trade. This benefit of RTAs arises when an integrated community is large enough to influence world prices. The improvement of production processes as a result of scale economies, elimination of market distortions and more efficient resource allocation drives down costs and prices of members' products. In effect, this would increase the



quantity demanded for member products but simultaneously reduce the demand for non-member products. After all, members' terms of trade will improve, whereas that of non-members is worsened.

Indeed, the economics of regionalism also suggests a number of factors that can influence the impact of RTA formation. For example, it is straightforward that the establishment of RTAs can lead to large trade creation when high-level trade barriers initially imposed are removed. In the familiar notion of natural trading partners, geographical proximity can also play a significant role in generating intra-regional trade, especially when transaction costs between them are low. Besides, existing literature suggests that trade creation will be large when member states of RTAs have similar levels of development (e.g., similar technology), and when a large RTA is formed. This is because the integrated economic community seems to provide more opportunity for each member to stay focused on outsourcing manufacturing in the region. In turn, the impact of RTAs on trade diversion is likely to be small if RTA members initially have low levels of trade with non-members.

In spite of the fact that trade and welfare effects of RTAs can vary widely depending upon numerous factors, the general understanding appears to be that the formation of RTAs tends to be an immediately trade-creating and welfare-enhancing among member states at the expense of non-members. Yet, as highlighted by Lawrence (1996), the negative impacts on non-members could be improved since the economic growth effect of RTA members can counterbalance the initial trade diversion effect. In other words, the economic growth results from RTA formation

can stimulate demand for non-members' products and may offset the initial trade diversion in the long run.

In line with these underlying rules, existing empirical findings have exhibited mixed results for AFTA's impact on trade. To begin with, Thornton and Goglio (2002) showed that while ASEAN trade liberalization in the late 1980s led to trade creation, a modest bias towards intra-regional trade was found. In addition, Elliott and Ikemoto's (2004) result highlighted the AFTA arrangement and the recent East Asian financial crisis as having a leading role in spurring intra-regional trade.

In contrast, by using extreme bounds analysis, Ghosh and Yamarik (2004) have shown that the ASEAN arrangement (and most RTAs) could exhibit either trade creation or trade diversion depending upon "the unacknowledged beliefs of the researchers" rather than "the information content of the data" (p. 387). Interestingly, Dee and Gali (2003) have argued that ignorance of country-specific shocks in assessing the impact of PTA formation on international trade can lead to an upward bias. As a result, they have demonstrated that once the specific fixed effects are controlled for, the coefficient of AFTA (and most PTAs) actually exhibit negative trade creation instead of positive.

## **2.4 Methodology and Variables**

### **2.4.1 The Gravity Model of International Trade**

Ever since the introduction of trade creation and diversion effects resulting from a customs union, existing empirical analyses have continually utilized either the general equilibrium model or the gravity model of trade to measure the economic

impacts of RTA formation on trade flows and welfare implications.<sup>17</sup> The difference between the two methods is that the general equilibrium model (also referred to as computable general equilibrium-CGE-model) is employed to provide an *ex ante* simulation of the economic impacts of RTA formation. The gravity model, in contrast, is utilized to provide an *ex post* investigation of the effects of RTA arrangement, especially on trade flows.

The so-called gravity model, which is the focus of this study, has been one of the most successful in explaining the pattern of bilateral trade despite the fact that its theoretical bases were less clear cut in the past. More recently, however, the theoretical justification of the model has been resolved by deriving the gravity equation from several different foundations, including increasing returns to scale (IRS) model, Ricardian models, Armington models, and Hechsher-Ohlin (H-O) models.<sup>18</sup> As has been argued several times, the achievement of the model has emerged from the fact that it has consistently predicted bilateral trade flows as a positive function of economic size and a negative function of distance between them. In this section, it would be more insightful to begin with “the standard gravity equation” following Deardorff’s phrase as follows:

$$X_{ij} = A \frac{Y_i Y_j}{D_{ij}}, \quad (2.1)$$

where  $X_{ij}$  is the value of exports of country  $i$  to country  $j$ ,  $Y_i$  and  $Y_j$  are national incomes of  $i$  and  $j$ , respectively,  $D_{ij}$  is the distance between them, and  $A$  is constant.

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<sup>17</sup> Further discussion of comparison of the gravity and CGE models can be seen in Gilbert et al. (2001) and Piermartini and Teh (2005).

<sup>18</sup> See, for instance, Deardorff (1995), Evenett and Keller (1998), and Silva and Tenreyro (2006).

Nonetheless, unlike Newton's gravity law in physics, equation (2.1) will not predict the bilateral trade precisely since in economics, international trade is usually assumed to be stochastic. Thus, the stochastic version of the gravity equation has the following double-log form as:

$$\ln(X_{ijt}) = \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(Dist_{ij}) + \varepsilon_{ijt}, (2.2)$$

where  $GDP_{it}$  and  $GDP_{jt}$  denote national incomes of  $i$  and  $j$ , respectively,  $Dist_{ij}$  is the distance between them and  $\varepsilon_{ijt}$  represents an error term with

$$E(\varepsilon_{ij} | GDP_i, GDP_j, Dist_{ij}) = 1.$$

Without any extension of the standard gravity model, it is hard to believe that the volume of bilateral trade can be entirely explained completely by economic "mass" (read "national income" following Rose, 2000) and distance. Other factors beyond these two explanatory variables must be taken into account although these factors are not a subject of interest. In general, these variables include colonization, common official language, contiguity, landlocked countries, and island countries. So equation (2.2) is augmented as follows:

$$\begin{aligned} \ln(M_{ijt}) = & \beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(Dist_{ij}) + \\ & \beta_4 \ln(PGDP_{it}) + \beta_5 \ln(PGDP_{jt}) + \beta_6 (Cont_{ij}) + \beta_7 (Lang_{ij}) + \\ & \beta_8 (Linder_{ijt}) + \beta_9 (Landlocked_{ij}) + \beta_{10} (Islands_{ij}) + \\ & \beta_{11} (Colony_{ijt}) + \sum \beta_{rta}^k (RTA_{ijt}^k) + \sum \beta_{td}^k (TD_{ijt}^k) + \varepsilon_{ijt}, (2.3) \end{aligned}$$

where  $i$  and  $j$  denote importing and exporting country, respectively, while the other variables are defined as:

- $M_{ij}$  is the value of imports of country  $i$  from country  $j$ <sup>19</sup>,
- $PGDP_i$  is per capita GDP of country  $i$ ,
- $Cont_{ij}$  is a binary variable equal to unity if  $i$  and  $j$  share a land border and zero otherwise,
- $Lang_{ij}$  is a binary variable equal to unity if  $i$  and  $j$  have a common official language and zero otherwise,
- $Linder_{ij}$  is the difference in per capita GDP between country  $i$  and country  $j$ <sup>20</sup>,
- $Landlocked_{ij}$  is the number of landlocked countries (0/1/2),
- $Islands_{ij}$  is the number of island countries (0/1/2),
- $Colony_{ij}$  is a binary variable equal to unity if  $i$  colonizes  $j$  at time  $t$  (or vice versa) and zero otherwise,
- $RTA_{ij}^k$  is a binary variable of trade creation equal to unity if  $i$  and  $j$  belong to regional trade agreement  $k$  and zero otherwise,
- $TD_{ij}^k$  is a binary variable of trade diversion equal to unity if only  $i$  or  $j$  is a member of regional trade agreement  $k$  and zero otherwise.

#### 2.4.2 Data

In order to conduct the hypothesis tests, this study first obtains the new dataset on bilateral trade by commodity from Robert C. Feenstra's homepage.<sup>21</sup> As illustrated

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<sup>19</sup> Notice that in equation (2.3) the value of imports is employed as dependent variable instead of the value of exports like equation (2.2). Explanation will be discussed in the next section.

<sup>20</sup> Mathematically,  $Linder_{ij} = (\ln PGDP_i - \ln PGDP_j)^2$  following Arnon and Weinblatt (1998)'s term.

<sup>21</sup> <http://cid.econ.ucdavis.edu>

in Feenstra et al. (2005), the original version of this dataset (also referred to as “NBER-UN dataset”) is constructed from the United Nations trade data, and organized by a 4-digit Standard International Trade Classification (SITC), revision 2 so as to fit the Canadian trade classification. However, while the original NBER-UN dataset is based on exporting country reports, the new version is primarily derived from importing country reports, and additional country-pair bilateral trade by commodity (e.g., exports from China and Hong Kong) are also available for years 1962-2000.

Next, this study follows the methodology of Rauch (1999) and Feenstra, Markusen, and Rose (2001) by summing each country’s bilateral imports by commodity into three possible categories: homogeneous, reference-priced, and differentiated products, based on Rauch’s “conservative” classification of goods.<sup>22</sup> As described in Rauch (1999), commodities that trade in an organized exchange (i.e., goods that can be seen in *International Commodity Markets Handbook* and *The Knight-Ridder CRB Commodity Yearbook*) are classified as “homogeneous” products. Commodities whose prices are quoted in trade journals (i.e., *Chemical Marketing Reporter*) are classified as “reference-priced” products. And commodities that neither have quoted prices nor trade in organized exchanges are considered as “differentiated” products.<sup>23</sup> These three categories of bilateral imports, deflated by the

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<sup>22</sup> In fact, Rauch (1999) has launched two versions of classification of goods: conservative and liberal classifications. The former version minimizes the number of homogeneous and reference-priced products that remain unclear, while the latter version maximizes these numbers. Nonetheless, this study believes that by applying a conservative scheme, empirical measurement for each category should be more accurate.

<sup>23</sup> One example of homogeneous products is coffee, not roasted (SITC 0711). Acyclic hydrocarbons (SITC 5111) is an example of reference-priced products, whereas examples of differentiated products include electric rotary converters (SITC 7164) and sports footwear (SITC 8512). Further discussion about the theoretical motivation for these three possible categories can be seen in Rauch (1999).

US GDP deflator, obtained from the IFS (using 2005 as the base year), will be utilized as the dependent variable in equation (2.3).

Real GDP per capita is obtained from the Penn World Table 6.3.<sup>24</sup> For real GDP data, since the Penn World Table does not provide this dataset, real GDP is computed by multiplying real GDP per capita by population obtained from the same source. The geographical distance between two countries is drawn from “*the Great circle distances between capital cities*” and Andrew K. Rose’s home page. This study also exploits Andrew K. Rose’s home page for country-specific binary variables including contiguous neighbors, landlocked countries, islands countries, colony, and official language. Information on preferential trading arrangements is obtained from Eicher, Henn, and Papageorgiou (2008) to construct the *RTA* and *TD* variables (see Appendix Table A2.1).

By exploiting available data from these sources, a comprehensive set of panel data comprises 155 countries between 1983 and 2000. The list of countries is tabulated in Appendix Table A2.2. Because equation (2.3) is estimated using  $\ln(1 + M_{ijt})$  as the dependent variable, the dataset then consists of 174,095 annual observations of bilateral imports for all types of categories equally. Given the period of study, it permits the author to make a comparison between the coefficients estimated in this chapter and Elliott and Ikemoto (2004)’s results. Nonetheless, it should be emphasized here that the difference between the two studies is clear; while they employ bilateral import and export data from the IMF’s Direction of Trade Statistics as dependent variable, this study utilizes bilateral imports “by commodity”

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<sup>24</sup> Indeed, the benefit of using this dataset is the fact that the Penn World Table provides data for Cambodia and Vietnam, while the World Development Indicator (WDI) does not.

from NBER-UN dataset. Summary statistics are reported in Table 2.1 which shows that the means and standard deviations for all types of categories are about the same size.

At this point, two limitations of methodology and data are worth discussing. The first drawback is due to the country coding of NBER-UN dataset. Because both Bhutan and Brunei Darussalam, as documented in Feenstra et al. (2005), are grouped together as “Asia NES”, it is impossible to separate Brunei Darussalam’s imports from the imports of Bhutan.<sup>25</sup> To avoid possible bias when assessing trade creation and trade diversion effects of ASEAN, this study needs to rule out Brunei Darussalam although the state is an ASEAN member.

Another shortcoming concerns potential bias in the estimated coefficients for the trade creation and trade diversion effects of PTAs. Due to the global proliferation of PTAs, it seems quite tedious to include all PTA ties in the model. Thus, the selected PTAs are included, whereas bilateral PTAs and some other PTAs are omitted for parsimony. Although this methodology could result in bias, this study follows existing studies by assuming that such possible bias tends to be small since the major PTAs between the main trading partners (in term of trade volume) are taken into account in the model properly.<sup>26</sup>

### **2.4.3 Econometric Methods and the Underlying Assumptions**

Equation (2.3) is first estimated by OLS using robust standard errors (clustered by country-pair dyads). Yet, in the context of the gravity model of trade,

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<sup>25</sup> NES: Not Elsewhere Specified.

<sup>26</sup> For further discussion, see Elliott and Ikemoto (2004) and Gilbert et al. (2001), for example.



log-linear OLS estimation yields biased estimates due to multilateral resistance and unobserved bilateral heterogeneity, three alternative econometric techniques are also employed in this chapter. First, a set of year-specific fixed effects is added to absorb any shock that is common to all country pairs but specific to a particular year. Second, a set of country-pair fixed effects is included to control for country-pair characteristics that are specific to each pair of countries but constant over the period of study (i.e., distance, sharing a border or a common language, and any unobserved cultural ties). Third, another way to deal with the problem is to incorporate a set of country-specific fixed effects to absorb any time-invariant country-specific factor that influences bilateral trade flows.<sup>27</sup>

As a general rule, this study hypothesizes that bilateral trade between a pair of countries is positively related to their GDP but negatively related to the distance between them. Geographic contiguity is expected to be positively correlated with bilateral trade flows since sharing a land border tends to assist trade. For similar reasons, the coefficients on common language and colony are anticipated to be positive, while being a landlocked or an island country is expected to obstruct trade.

Nonetheless, unlike the expected coefficients for importer and exporter GDP that are clearly positive, the expected signs of per capita GDP coefficients are less clear since the effect of population size is indeterminate. Put differently, despite the fact that a growing economy in either the importing or exporting country tends to spur

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<sup>27</sup> Indeed, another method in dealing with multilateral resistance terms is to include a set of exporter-year and importer-year fixed effects together with a set of country-pair fixed effects in the model to absorb as many factors as possible. Nonetheless, since this technique does not allow the estimation of trade creation and trade diversion effects simultaneously, so it is not utilized in this chapter (see discussion about this issue in Magee, 2008).

trade, population size can theoretically play a role in either creating or damaging trade, depending on whether absorption effect dominates the effect of scale economies or vice versa (Martinez-Zarzoso, 2003). The absorption effect is an economic phenomenon when a large country relies less on international trade since a large population tends to provide vast essential resource endowments and potential domestic markets for self sufficiency. In turn, a larger economy means more opportunities for scale economies and product specialization that allows domestic firms to produce lower-cost products and more varied goods for markets worldwide. In spite of these theoretical ambiguities, this study follows a number of existing literatures by hypothesizing a positive relation between per capita income and the volume of bilateral trade.

### ***The Linder hypothesis***

Ever since the appearance of Linder's conjecture in 1961, economists have long been aware of the positive correlation between similar demand structures (e.g., taste indifferences) and the volume of bilateral trade. Indeed, empirical studies have generally found consistent evidence to support the Linder hypothesis from several different perspectives. Arnon and Weinblatt (1998), for instance, have found evidence of the Linder hypothesis for both developed and less developed countries. Choi (2002) found that the Linder effect did exist in international trade among 63 countries and further argued that the global proliferation of RTAs might actually reinforce the Linder hypothesis.

Nevertheless, due to the lack of evidence for APT countries, this chapter attempts to re-estimate the existence of the Linder effect both on international trade generally and from the perspective of APT countries in particular using the new NBER-UN dataset. And because similarity of demand structures is unobservable directly, the difference between two countries' per capita income ( $DPGDP_{ij}$ ) will be employed as a proxy for similarity of preferences. Of course, a negative coefficient on the Linder variable will indicate the validity of the Linder hypothesis.

### ***The home market effect***

Because firms seek to maximize profit by exploiting economies of scale in production and minimizing transaction costs, so it is rational for them to choose a location to produce goods in a country with the largest domestic market for their products. Under such circumstance, the "home market effect" predicts, according to Krugman (1980), that "*countries will tend to export those kinds of products for which they have relatively large domestic demand*" (p.955).

In order to assess the nature of the home market effect across commodities, this study applies the methodology of Feenstra, Markusen, and Rose (2001) who provide a testable hypothesis to test the home market effect through the coefficients of importing and exporting countries' GDPs in the gravity equation. In the presence of the home market effect, the coefficient of the exporting country's GDP in equation (2.3) should be greater than that of the importing country. In turn, the home market effect is reversed if the income elasticity of exporting country is lower than that of importing country.

### ***Trade creation and trade diversion***

As shown in equation 2.3, the impact of regional trade integration on intra-regional trade can be empirically assessed by introducing “*RTA*” as a binary variable. As a general rule, a positive coefficient will indicate that the regional trading bloc has actually benefited its member states by generating more intra-regional trade among members. In the same way, the dummy variable “*TD*” is incorporated into the model to capture whether the formation of regional trading blocs have diverted trade away from non-member countries. Of course, a negative sign is said to be trade diverting.

It is worth noting that in spite of the fact that previous empirical studies have highlighted the role of ASEAN integration (especially AFTA) in generating intra-regional trade without damaging non-members, it does not mean the expected coefficients in this study will be consistent with them. This is simply because, as noted earlier, a different trade dataset is employed; while previous studies employ bilateral imports or exports as dependent variable, this study goes a step deeper by utilizing bilateral imports by commodity. Accordingly, it leads this study to hypothesize that the expected coefficients of *RTA* and *TD* for each type of commodity remain unclear.

## **2.5 Empirical Results**

Tables 2.2 through 2.4 report the empirical results for differentiated, reference-priced, and homogeneous products, respectively. The second column of each table presents the estimated results using the OLS estimation technique, the third column reports the results using year-fixed effects, while column 4 and 5 extend the

model from column 3 by adding country-pair fixed effects and country-specific fixed effects, respectively.

As seen in Table 2.2 through 2.4, the augmented gravity model fits the data relatively well in explaining more than half of the variation in bilateral trade in differentiated products. Interestingly, the fit of the model reduces steadily as it moves from differentiated to homogeneous products. Namely, slightly less than half of the variation in bilateral trade in reference-priced products can be captured by the model while the ability of the model in explaining bilateral trade variation decreases to about one-third in the case of homogeneous products.

The estimated coefficients on the traditional gravity variables in general are economically and statistically significant as expected, regardless of the econometric techniques. To summarize briefly, the estimated coefficients on the log of importer and exporter's GDP as well as their per capita GDP are positively significant in most cases, implying that economically larger and richer economies tend to trade more. Interestingly, some of the estimated signs on these variables turn negative when controlling for country-pair characteristics or country-specific factors (column 4 and 5). Moreover, in line with its theoretical justification, the empirical evidence also appears to suggest that geographical distance plays a significant role as a trade deterrent.

When controlling for the influence of sharing a common language(s) on bilateral trade flows, it turns out that the empirical evidence robustly supports the hypothesis; the estimated coefficients on the common language variable are positively significant at the 1 % level in all cases. Specifically, according to the tables, countries

that share a common official language(s) trade between 53.7 % and 124.7% more than other pairs.<sup>28</sup> Likewise, the estimated results demonstrate that sharing a border and a common colonial history increase bilateral trade between 53.7% and 228.7%, more than other pairs in the former case and 256.1% and 492.9% in the latter case. The evidence also points to the empirical fact that, *ceteris paribus*, being an island country actually assists (not deters) international trade considerably, while being a landlocked country plays a role as trade deterrent.<sup>29</sup>

### ***The Linder hypothesis***

When controlling for country-pair characteristics or country-specific factors to absorb unobserved bilateral heterogeneity or multilateral resistance terms, the results on the Linder variable, reported in the last two columns of Table 2.2 through 2.4, generally support the validity of the proposition. The negative and significant coefficients indicate that, other things constant, the closer the per capita income between a pair of countries, the larger the volume of bilateral trade between them. As can be seen, the magnitudes of the effect vary not only across product types, but also with estimation technique. For example, given that the estimated coefficient for differentiated products using country-pair fixed effects is -0.03, the magnitude of the Linder effect is around -3.05%. By using country-specific fixed effects, the size of the effect decreases to -2.02%. This implies that a 1% reduction in per capita income inequality between a pair of countries, on average, causes the volume of bilateral

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<sup>28</sup> For instance, given that the estimated coefficient on common language for homogeneous products in column 2 is 0.81, so  $e^{0.81} = 2.2479$ . Thus, an increase from 0 to 1 (or in other words, from no common language to sharing a common language) raises bilateral trade flows by 124.7%  $((2.2479-1)*100\%)$ .

<sup>29</sup> It should be noted that, like the case of GDP and per capita GDP, when controlling for country-specific characteristics, the estimated coefficients have an opposite sign in some cases.

imports in differentiated products to increase by between 2.02% and 3.05%, depending on the estimation method.

Notice that the empirical results provide strong support for the Linder hypothesis in the case of differentiated products, as the estimated coefficients remain statistically significant for both estimation techniques. In contrast, the results merely reveal mixed evidence for the proposition in the case of reference-priced and homogeneous products as two-fourths of the estimated coefficients lose significance or even show up with an incorrect sign.

The empirical finding is consistent with the result of the theory that asserts that the level of statistical significance of the Linder effect should decline as it moves away from differentiated and towards homogeneous products. This circumstance can be systematically explained through the quality of production and demand (Hallak, 2006). Namely, among differentiated goods, richer countries tend to produce relatively high-quality products, while low-quality products are manufactured in low-income countries. To enable a country to produce high-quality products, it seems that the import of high-quality intermediate goods is required, and the opposite holds true for the case of low-quality products. After all, it is the similarity of income that drives trade in differentiated products. In contrast, the production of homogeneous products tends to rely heavily on the quality and abundance of natural resources, which is unrelated to per capita income. On the demand side, if the preference of rich countries is to consume high-quality products and the opposite holds true for low-income countries, it seems plausible that rich countries tend to trade more with one another and so do low-income countries.

### *The home market effect*

Now consider the nature of the home market effect. The first point to notice is that the estimated coefficients on exporter and importer GDP, reported in column 2 of Table 2.2 through 2.4, vary systematically across product categories. In moving away from differentiated and toward homogeneous products, it turns out that the coefficients on exporter GDP continue to decrease while the estimates on importer GDP increase steadily. In the case of differentiated products, for example, the estimated coefficient on exporter GDP is around 1.32, whereas the estimate on importer GDP is only 0.70. The estimated coefficient on exporter GDP drops slightly to 1.11, while the coefficient on importer GDP increases to 0.98 for reference-priced products. Although the estimated coefficient on exporter GDP is still above unity for the case of homogeneous products, it turns out that the coefficient on importer GDP goes above unity and becomes greater than the estimated coefficient of exporter GDP (1.04 and 1.01, respectively – not significantly different from 1.0). Observe also that the empirical finding in this study is consistent with the theoretical prediction about the nature of the effects; i.e., that the home market effect exists in the case of differentiated and reference-priced products while the effect is reversed for homogeneous products.

As suggested by Anderson and van Wincoop (2003), the omission of the multilateral resistance terms (as in column 2) can lead to biased estimation. To check, this study takes into account these terms by using three different techniques (as explained in the previous section). The key findings are as follows: When controlling for country-pair characteristics or country-specific factors, about one-third of the



estimated coefficients on exporter and importer GDP lose significance and the magnitude vary more dramatically. Nevertheless, this study finds no difference in the nature of the home market effect between estimation techniques; the occurrence of the home market effect still depends on the type of commodities.

### ***Trade creation and trade diversion***

With regards to trade creation and trade diversion, consider first the estimated effects of the European Union (EU) on bilateral trade flows. When using OLS to estimate the EU coefficients, the results, reported in column 2 of Table 2.2 through 2.4, show that intra-EU trade flows are estimated to increase by 256 %, 103%, and 431% for differentiated, reference-priced, and homogeneous products, respectively. The significant positive coefficients on the EU countries' trade diversion indicate that the formation of the European Union did not divert trade from non-member states for any type of commodities. Nonetheless, as country-pair or country-specific fixed effects are controlled for, the estimated coefficients on the EU countries' trade creation and trade diversion variables decline sharply or even lose significance in many cases. Using differentiated products as an example, the estimated OLS coefficient of 1.27 is statistically significant at the 1 % level. Yet, when country-pair fixed effects are controlled for, the EU coefficient turns negative (-0.11) and becomes insignificant. As country-specific fixed effects are included, the EU coefficient drops to -1.30 at the 1% significance level. This evidence reinforces the idea that the ignorance of multilateral resistance terms or unobserved bilateral heterogeneity tends to result in an upward bias, especially when assessing the impacts of trading blocs on

trade flows (Anderson and van Wincoop, 2003; Silva and Tenreyro, 2006; and Magee, 2008). In addition, another point to notice is that, among the product types, there is strong evidence of trade diversion in the case of reference-priced products, but the magnitudes of the effect are only mild and range between 18.5 % and 39.1%, depending on the estimation technique.

As seen, one of the clearest pieces of evidence of trade creation is in the MERCOSUR framework. Observe that even controlling for country-pair or country-specific fixed effects, the estimated coefficients still remain positively significant for any type of product. In terms of magnitude, the results illustrate that the formation of the Common Market of the South has generated massive intra-regional trade among its members. Specifically, the estimated coefficients for differentiated products range between 0.37 and 2.13. For reference-priced and homogeneous products, the effect values are between 0.59 and 1.85, and 0.77 and 1.49, respectively. And more importantly, the results indicate that the massive trade creation in the region did not divert trade away from the rest of the world for any type of products as the estimated coefficients on trade diversion variable are all positively significant.

In short, no strong evidence of trade creation is found in the case of APEC and NAFTA, except for trade in homogeneous products within APEC. Observe that the estimated coefficients on intra-NAFTA trade in the case of reference-priced and homogeneous products even turn negative at the 5% level of significance when country-specific characteristics are controlled for. In addition, the significant negative coefficients on extra-regional trade bias of NAFTA provide a clear-cut result of trade

diversion for homogeneous products, while there is no evidence that the formation of APEC has actually diverted trade away from the rest of the world.

Now consider the impact of ASEAN integration on bilateral trade flows. The empirical result reveals that ASEAN trade liberalization under the ASEAN PTA and AFTA frameworks has played a large role in promoting intra-ASEAN trade. To summarize briefly, in the case of differentiated products, the estimated coefficients of 0.44 and 1.79 indicate that being a member of ASEAN has raised intra-ASEAN trade in differentiated products by between 55.3% and 498.9%. Similarly, the results show that regional trading arrangements in the region have increased intra-regional trade in reference-priced products between 235.3% and 285.7%. In the case of homogeneous products, the estimated coefficient is significant only when country-pair fixed effects are controlled for. The estimate shows that bilateral trade flows in these products are estimated to increase by 897.4 %. Even more interestingly, although regional trading arrangements in Southeast Asia have generated a sharp increase in intra-ASEAN trade for all product types, the findings reveal that the ASEAN trading bloc did not divert trade away from the rest of the world.

Two issues are worth discussing here. First, the robustly positive and significant coefficients on the trade diversion variable need not mean that there has been no trade-diverting effect at all in the case of ASEAN. Instead, the positive coefficients imply that the diversion effects have actually been offset by a massive increase in imports from non-ASEAN countries. Second, the results of this study reveal that the formation of ASEAN has played a role in promoting intra-regional trade differently across products. As seen, strong evidence of trade creation is found

only in the case of differentiated and reference-priced products. This truly reflects the fact that the implementation of tariff reductions under the AFTA framework has covered all manufactured products (differentiated and reference-priced products) while agricultural raw materials and unprocessed products (homogeneous goods) have usually been subjected to “a waiver of any concession”.<sup>30</sup>

### ***Revisiting East Asian regionalism: A closer look***

Now let's concentrate on the ASEAN plus three (APT) countries. The first point to notice from Table 2.5 is that the insignificance of the exporter's and importer's GDP coefficients makes it difficult to examine the nature of the home market effect in the region. Even though the result using OLS is consistent with the nature of the home market effect, the only strong evidence of a reverse home-market effect is found in the case of reference-priced products when fixed effects are controlled for. Observe also that the estimated coefficients on the Linder variables become insignificant or even turn positive in most cases. This means that there is no relationship between the similarity of demand structures and the pattern of trade among APT countries.

In contrast to the results of the previous section, the PTAs do not appear to have had a significant effect on intra-regional trade expansion among APT countries for all types of commodities.<sup>31</sup> This empirical finding has two complementary implications. First, it indicates that ASEAN's effort to carry out deeper trade integration within the Southeast Asian region has played a limited role in redirecting

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<sup>30</sup> For ASEAN's schedule for tariff reductions, see “ASEAN secretariat” or <http://www.aseansec.org/>.

<sup>31</sup> Note that the PTA variable in Table 2.5 includes ASEAN and APEC.

trade away from East Asian countries (i.e., China, Japan, and South Korea) and toward ASEAN member states. Second, despite the fact that ASEAN countries have paid more attention to the larger markets in East Asian countries rather than the smaller economies in Southeast Asia, trade liberalization under the APEC framework had only a limited impact on intra-regional trade expansion since its framework merely intends to liberalize trade among members based upon individual voluntary effort.

## **2.6 Conclusion**

For more than three decades, ASEAN has made remarkable progress on trade liberalization. Intra-regional trade has increased considerably in terms of both value and as a percentage share of total trade. Nevertheless, even if existing empirical studies have highlighted the importance of ASEAN trade liberalization in generating a massive increase in intra-regional trade, no research has attempted to assess its impact on bilateral trade flows at the product level. This chapter, therefore, tries to close the gap by employing the gravity model to measure the magnitude of trade creation and trade diversion at the product level. The focus of the analysis is also on the roles of the home market effect and the Linder effect in the patterns of trade, centering both on global trade and from the perspective of APT countries in particular.

The findings in this chapter provide a great deal of useful information. First, there is strong evidence that trade liberalization under the ASEAN PTA and AFTA frameworks appears to have had a major impact on the expansion of intra-regional

trade in differentiated and reference-priced products. In turn, the results reveal only weak evidence of trade creation in homogeneous products which reflects the fact that the implementation of the tariff reduction has provided limited benefits to its member states due to “a waiver of any concession.” Second, although ASEAN has been successful in both widening and deepening economic collaboration in the region, the results robustly suggest that the massive increase in intra-regional trade did not lead to trade diversion in all product types. Apparently, the presence of this phenomenon implies that the negative impacts on non-member states have been totally offset by the trade-creating effects resulting from the rapid economic growth in ASEAN countries. Third, the estimation results of re-running the gravity equation for APT countries indicate that trade liberalizations have played no role in promoting trade between APT economies in all product types. This reflects the fact that (1) trade liberalization under the APEC framework had only a limited impact on intra-regional trade expansion since its framework merely intends to liberalize trade among members based upon individual voluntary effort, and (2) during the 1980s, ASEAN countries overlooked the desire for trade integration and economic cooperation in the region due to rapid economic growth and import substitution policies (Cuyvers et al., 2005; Naya, 2004).

Furthermore, the findings appear to suggest that the home market effect varies systematically across product categories and the effects are found to exist in differentiated and reference-priced, but not in homogeneous products. And though the underlying nature of the home market effect remains unchanged when the gravity

equation is re-estimated for APT countries, the clear-cut result indicates that the effect in the region has existed robustly only in reference-priced products.

Finally, the results in this chapter provide significant evidence to support, once again, the Linder hypothesis: bilateral trade in differentiated products tends to increase with the similarity of demand structure, while weak evidence of the Linder effect implies that the conjecture should not apply to homogeneous products.

Nonetheless, the absence of evidence for APT countries indicates that per capita income inequality becomes less important in explaining the bilateral trade structure between APT countries.

**Table 2.1: Summary Statistics**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Log of bilateral trade in:					
Differentiated products	174095	7.465898	4.208042	0	18.91376
Referenced-priced products	174095	6.730111	4.269952	0	17.57038
Homogeneous products	174095	5.487428	4.684872	0	17.26624
Log of exporter's GDP	164700	18.66341	1.880958	11.47511	23.1277
Log of importer's GDP	164372	18.50619	1.957503	11.47511	23.1277
Log of exporter's GDP per capita	164700	9.075011	1.08344	5.031514	11.02498
Log of importer's GDP per capita	164372	9.040404	1.111904	5.031514	11.02498
Linder	155346	2.976356	3.593524	0	29.59527
Log of distance	161417	8.178429	0.775534	3.684131	9.421514
Common Border	161417	0.023858	0.152606	0	1
Common Language	161417	0.179554	0.383816	0	1
Landlocked	163607	0.232582	0.454404	0	2
Islands	163607	0.253534	0.473749	0	2
Colony	161417	0.026453	0.160479	0	1
EU	174095	0.012556	0.11135	0	1
APEC	174095	0.016784	0.128461	0	1
MERCOSUR	174095	0.000574	0.02396	0	1
NAFTA	174095	0.000316	0.017771	0	1
ASEAN	174095	0.002717	0.052053	0	1
EU_td	174095	0.151682	0.358713	0	1
APEC_td	174095	0.112416	0.315878	0	1
MERCOSUR_td	174095	0.016491	0.127354	0	1
NAFTA_td	174095	0.026273	0.159947	0	1
ASEAN_td	174095	0.053092	0.224217	0	1



**Table 2.2: The Estimation of the Gravity Model for Differentiated Products**

Independent Variable:	OLS	Year-fixed effects	Country-pair fixed effects	Country-specific fixed effects
Log of exporter's GDP	1.32*** (.01)	1.34*** (0.01)	2.31*** (0.18)	1.67*** (0.18)
Log of importer's GDP	0.70*** (0.02)	0.70*** (0.02)	0.04 (0.16)	-0.50*** (0.18)
Log of exporter's GDP per capita	1.05*** (0.03)	1.06*** (0.03)	-0.88*** (0.18)	-0.42** (0.18)
Log of importer's GDP per capita	0.52*** (0.03)	0.52*** (0.03)	1.14*** (0.16)	1.54*** (0.17)
Linder	0.10*** (0.01)	0.10*** (0.01)	-0.03** (0.02)	-0.02*** (0.01)
Log of distance	-1.25*** (0.03)	-1.26*** (0.03)		-1.58*** (0.03)
Common Border	0.77*** (0.14)	0.76*** (0.14)		0.63*** (0.14)
Common Language	0.47*** (0.06)	0.47*** (0.06)		0.70*** (0.05)
Landlocked	-0.30*** (0.05)	-0.28*** (0.05)		-1.72*** (0.38)
Islands	0.54*** (0.06)	0.53*** (0.06)		-4.45*** (1.21)
Colony	1.73*** (0.11)	1.71*** (0.12)		1.35*** (0.10)
<i>Intra-regional trade bias</i>				
EU	1.27*** (0.10)	1.28*** (0.10)	-0.11 (0.07)	-1.30*** (0.14)
APEC	1.59*** (0.10)	1.70*** (0.10)	0.12 (0.08)	0.59*** (0.09)
MERCOSUR	2.09*** (0.26)	2.18*** (0.26)	0.37* (0.22)	2.13*** (0.35)
NAFTA	-0.10 (0.47)	-0.16 (0.48)	0.26 (0.24)	-0.73 (0.53)
ASEAN	1.46*** (0.24)	1.44*** (0.24)	1.79*** (0.32)	0.44* (0.25)
<i>Extra-regional trade bias</i>				
EU_td	0.75*** (0.08)	0.79*** (0.08)	0.07 (0.09)	0.21*** (0.08)
APEC_td	0.04 (0.08)	0.17** (0.08)	0.17*** (0.06)	0.04 (0.06)
MERCOSUR_td	0.17 (0.15)	0.28* (0.15)	1.17*** (0.12)	0.88*** (0.12)
NAFTA_td	1.32*** (0.13)	1.29*** (0.13)	-0.02 (0.10)	0.11 (0.10)
ASEAN_td	0.10 (0.12)	0.06 (0.12)	0.58*** (0.18)	0.77*** (0.19)
R <sup>2</sup>	0.52	0.52	0.84	0.69
RMSE	2.9200	2.9138	1.7800	2.3606

Dependent variable: log of real imports of differentiated products. In each case, Data covers 149,623 observations. Intercepts are not reported and robust standard errors (clustered by country-pairs dyads) in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.

**Table 2.3: The Estimation of the Gravity Model for Reference-Priced Products**

Independent Variable:	OLS	Year-fixed effects	Country-pair fixed effects	Country-specific fixed effects
Log of exporter's GDP	1.11*** (0.02)	1.13*** (0.02)	3.20*** (0.20)	2.31*** (0.20)
Log of importer's GDP	0.98*** (0.02)	0.97*** (0.02)	1.02*** (0.18)	0.25 (0.19)
Log of exporter's GDP per capita	0.77*** (0.03)	0.79*** (0.03)	-1.97*** (0.20)	-1.29*** (0.20)
Log of importer's GDP per capita	0.39*** (0.03)	0.39*** (0.03)	0.12 (0.18)	0.71*** (0.19)
Linder	0.05*** (0.01)	0.05*** (0.01)	-0.04*** (0.02)	0.00 (0.01)
Log of distance	-1.46*** (0.03)	-1.49*** (0.03)		-1.89*** (0.03)
Common Border	0.64*** (0.13)	0.60*** (0.13)		0.19 (0.14)
Common Language	0.69*** (0.06)	0.67*** (0.06)		0.65*** (0.06)
Landlocked	-1.10*** (0.05)	-1.06*** (0.05)		0.30 (0.52)
Islands	0.47*** (0.06)	0.45*** (0.06)		-1.08 (1.29)
Colony	1.44*** (0.13)	1.39*** (0.13)		1.27*** (0.13)
<i>Intra-regional trade bias</i>				
EU	0.71*** (0.10)	0.77*** (0.10)	0.05 (0.07)	-1.54*** (0.16)
APEC	1.42*** (0.11)	1.76*** (0.11)	0.13 (0.09)	0.65*** (0.09)
MERCOSUR	1.80*** (0.35)	2.07*** (0.35)	0.59*** (0.21)	1.85*** (0.41)
NAFTA	-1.27*** (0.30)	-1.37*** (0.32)	0.17 (0.14)	-0.78** (0.32)
ASEAN	0.79*** (0.22)	0.69*** (0.22)	1.21*** (0.36)	1.35*** (0.29)
<i>Extra-regional trade bias</i>				
EU_td	0.39*** (0.08)	0.50*** (0.08)	-0.33*** (0.09)	-0.17** (0.09)
APEC_td	0.12 (0.08)	0.46*** (0.08)	0.19*** (0.06)	0.12** (0.06)
MERCOSUR_td	0.06 (0.14)	0.36*** (0.14)	1.05*** (0.14)	0.82*** (0.14)
NAFTA_td	0.00 (0.14)	-0.07 (0.14)	0.22* (0.13)	0.27** (0.12)
ASEAN_td	0.44*** (0.11)	0.32*** (0.11)	1.21*** (0.26)	1.39*** (0.26)
R <sup>2</sup>	0.46	0.47	0.80	0.59
RMSE	3.1229	3.1044	2.0049	2.7107

Dependent variable: log of real imports of reference-priced products. In each case, Data covers 149,623 observations. Intercepts are not reported and robust standard errors (clustered by country-pairs dyads) in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.

**Table 2.4: The Estimation of the Gravity Model for Homogeneous Products**

Independent Variable:	OLS	Year-fixed effects	Country-pair fixed effects	Country-specific fixed effects
Log of exporter's GDP	1.01*** (0.02)	1.04*** (0.02)	0.65*** (0.24)	-0.21 (0.23)
Log of importer's GDP	1.04*** (0.02)	1.04*** (0.02)	1.24*** (0.21)	0.32 (0.20)
Log of exporter's GDP per capita	-0.24*** (0.03)	-0.22*** (0.03)	-0.07 (0.24)	0.74*** (0.23)
Log of importer's GDP per capita	0.58*** (0.04)	0.58*** (0.04)	-0.61*** (0.21)	0.39** (0.20)
Linder	0.07*** (0.01)	0.07*** (0.01)	-0.09*** (0.02)	-0.01 (0.01)
Log of distance	-1.17*** (0.04)	-1.22*** (0.04)		-1.84*** (0.04)
Common Border	1.19*** (0.17)	1.14*** (0.17)		0.43** (0.18)
Common Language	0.81*** (0.08)	0.77*** (0.08)		0.43*** (0.08)
Landlocked	-0.70*** (0.07)	-0.65*** (0.07)		1.96*** (0.56)
Islands	0.27*** (0.08)	0.23*** (0.08)		-0.95 (1.33)
Colony	1.62*** (0.18)	1.55*** (0.18)		1.78*** (0.15)
<i>Intra-regional trade bias</i>				
EU	1.67*** (0.13)	1.77*** (0.12)	0.22* (0.13)	-0.91*** (0.16)
APEC	1.83*** (0.16)	2.31*** (0.16)	0.52*** (0.10)	1.42*** (0.12)
MERCOSUR	2.56*** (0.42)	2.95*** (0.42)	0.77*** (0.18)	1.49*** (0.43)
NAFTA	-0.38 (0.41)	-0.52 (0.43)	-0.26 (0.23)	-1.55** (0.69)
ASEAN	2.06*** (0.35)	1.89*** (0.35)	2.30*** (0.54)	0.58 (0.37)
<i>Extra-regional trade bias</i>				
EU_td	1.01*** (0.10)	1.17*** (0.10)	-0.30*** (0.10)	-0.15 (0.09)
APEC_td	-0.33*** (0.10)	0.17* (0.11)	0.44*** (0.07)	0.22*** (0.07)
MERCOSUR_td	-1.04*** (0.18)	-0.60*** (0.18)	0.91*** (0.17)	0.83*** (0.17)
NAFTA_td	-0.37* (0.19)	-0.46** (0.19)	-0.46*** (0.14)	-0.46*** (0.14)
ASEAN_td	0.85*** (0.15)	0.67*** (0.15)	0.65** (0.28)	1.14*** (0.29)
R <sup>2</sup>	0.35	0.36	0.78	0.54
RMSE	3.7792	3.7521	2.2934	3.1913

Dependent variable: log of real imports of homogeneous products. In each case, Data covers 149,623 observations. Intercepts are not reported and robust standard errors (clustered by country-pairs dyads) in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.

**Table 2.5: Gravity Model Estimates of the Linder Effect on the ASEAN Plus Three (APT) Countries**

Independent Variable:	OLS			Country-pair fixed effects			Country-specific fixed effects		
	Differentiated	Reference-priced	Homogeneous	Differentiated	Reference-priced	Homogeneous	Differentiated	Reference-priced	Homogeneous
Log of exporter's GDP	1.12*** (0.11)	0.99*** (0.13)	0.63*** (0.17)	5.99*** (2.05)	5.12** (2.38)	0.80 (2.95)	3.57** (1.75)	4.38** (2.19)	0.68 (2.66)
Log of importer's GDP	0.65*** (0.10)	0.82*** (0.11)	0.71*** (0.15)	3.59 (2.26)	6.32** (2.75)	5.79* (3.48)	0.82 (2.26)	5.12* (2.71)	4.74 (2.96)
Log of exporter's GDP per capita	1.69*** (0.14)	1.22*** (0.16)	0.91*** (0.24)	-5.67** (2.35)	-4.35* (2.50)	-1.46 (3.46)	-2.72 (1.96)	-3.45 (2.33)	-1.05 (2.99)
Log of importer's GDP per capita	1.36*** (0.15)	0.97*** (0.16)	1.28*** (0.23)	-3.90 (2.39)	-5.52* (3.07)	-4.81 (3.90)	-0.85 (2.34)	-3.97 (3.00)	-3.55 (3.30)
Linder	0.00 (0.06)	-0.07 (0.08)	-0.07 (0.12)	-0.10 (0.17)	0.06 (0.20)	-0.03 (0.27)	0.12** (0.05)	0.08 (0.07)	0.19*** (0.07)
Log of distance	-1.16*** (0.36)	-0.76** (0.37)	-1.33** (0.62)				-0.77*** (0.28)	-0.54* (0.29)	-1.04*** (0.38)
Common Border	1.46*** (0.53)	0.79 (0.56)	1.18 (0.74)				1.65*** (0.51)	1.02* (0.57)	1.43** (0.66)
Common Language	0.95*** (0.24)	0.40 (0.29)	1.12*** (0.43)				-0.48 (0.39)	-0.75* (0.40)	-0.88** (0.45)
Landlocked	-0.83 (0.69)	-0.72 (0.81)	-3.36*** (1.08)				(dropped)	(dropped)	(dropped)
Islands	0.11 (0.21)	0.00 (0.22)	-0.16 (0.32)				1.87 (6.42)	12.71* (7.73)	11.93 (8.45)
PTA	0.41* (0.22)	0.13 (0.24)	1.20*** (0.34)	0.23 (0.20)	-0.18 (0.21)	0.28 (0.30)	0.03 (0.20)	-0.37 (0.24)	0.12 (0.32)
R <sup>2</sup>	0.76	0.64	0.56	0.8897	0.84	0.83	0.81	0.73	0.72
RMSE	1.8284	2.0899	2.7664	1.2945	1.4336	1.7707	1.6681	1.8151	2.2601

Dependent variable: log of real imports by commodity covering 1,555 observations equally. Intercepts are not reported and robust standard errors (clustered by country-pairs dyads) in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively. PTA variable includes ASEAN and APEC.

**Appendix Table A2.1: List of Preferential Trading Arrangements**

<b>Abbreviation</b>	<b>Name of PTA</b>	<b>Start</b>	<b>Member countries (year joined)</b>
<i>ANZCERTA</i>	Australia – New Zealand Closer Economic Relations Trade Agreement	1983	Australia, New Zealand
<i>APEC</i>	Asia Pacific Economic Community	1989	Australia, Brunei, Canada, China (1991), Chile (1994), Taiwan (1991), Hong Kong (1991), Indonesia, Japan, South Korea, Malaysia, Mexico (1993), New Zealand, Papua New Guinea (1993), Peru (1998), Philippines, Singapore, Thailand, United States, Vietnam (1998).
<i>AP</i>	Andean Community / Andean Pact	1969	Bolivia, Colombia, Ecuador, Peru, Venezuela (1973), Former: Chile (1969-76).
<i>AFTA</i>	Association of South East Asian Nations (ASEAN) Free Trade Area	1967	Brunei (1984), Cambodia (1998), Indonesia, Laos (1997), Malaysia, Myanmar (1997), the Philippines, Singapore, Thailand, Vietnam (1995).
<i>EU</i>	European Union	1958	Austria (1995), Belgium, Denmark (1973), Finland (1995), France, Germany, Greece (1981), Luxembourg, Ireland (1973), Italy, Netherlands, Portugal (1986), Spain (1986), Sweden (1995), United Kingdom (1973).
<i>LAIA/LAFTA</i>	Latin America Integration Agreement	1960	Argentina, Bolivia (1967), Brazil, Chile, Colombia (1961), Ecuador (1961), Mexico, Paraguay, Peru, Uruguay, Venezuela (1966).
<i>MERCOSUR</i>	Southern Cone Common Market	1991	Argentina, Brazil, Paraguay, Uruguay
<i>NAFTA</i>	Canada-US Free Trade Arrangement / North America Free Trade Agreement	1988	Canada, United States, Mexico (1994).

Source: Eicher, Henn and Papageorgiou (2008).

## Appendix Table A2.2: Countries in Sample

Afghanistan	Congo	Haiti
Albania	Costa Rica	Honduras
Algeria	Cote Divoire	Hungary
Angola	Croatia	Iceland
Argentina	Cuba	India
Armenia	Cyprus	Indonesia
Australia	Czechoslovak	Iran
Austria	Democratic Republic of the	Iraq
Azerbaijan	Congo	Ireland
Bahamas	Denmark	Israel
Bahrain	Djibouti	Italy
Bangladesh	Dominican Republic	Jamaica
Barbados	Ecuador	Japan
Belarus	Egypt	Jordan
Belgium	El Salvador	Kazakhstan
Belize	Equatorial Guinea	Kenya
Benin	Estonia	Kiribati
Bermuda	Ethiopia	Korea, the Republic of
Bolivia	Falkland Islands	Kuwait
Brazil	Fiji	Kyrgyzstan
Bulgaria	Finland	Lao People's Democratic Republic
Burkina Faso	France	Latvia
Burundi	Gabon	Lebanon
Cambodia	Gambia	Liberia
Cameroon	Georgia	Libya
Canada	Germany	Lithuania
Central African Republic	Ghana	Luxembourg
Chad	Gibraltar	Madagascar
Chile	Greece	Malawi
China	Guatemala	Malaysia
China, Hong Kong SAR	Guinea	Mali
China, Macao SAR	Guinea-Bissau	Malta
Colombia	Guyana	Mauritania

**Appendix Table A2.2: Countries in Sample (cont.)**

Mauritius	Qatar	Syria
Mexico	Romania	Taiwan
Monaco	Russia	Tajikistan
Mongolia	Rwanda	Tanzania
Morocco	Samoa	Thailand
Mozambique	Saudi Arabia	Togo
Nepal	Senegal	Trinidad and Tobago
Netherlands	Seychelles	Tunisia
New Zealand	Sierra Leone	Turkey
Nicaragua	Singapore	Turkmenistan
Niger	Slovakia	Uganda
Nigeria	Slovenia	United Kingdom
Norway	Somalia	Ukraine
Oman	South Africa	United Arab Emirates
Pakistan	Spain	Uruguay
Panama	Sri Lanka	United States
Papua New Guinea	St. Helena	Uzbekistan
Paraguay	St. Kitts and Nevis	Venezuela
Peru	Sudan	Viet Nam
Philippines	Suriname	Yemen
Poland	Sweden	Zambia
Portugal	Switzerland	Zimbabwe
	Liechtenstein	

## CHAPTER THREE

### The Emergence of East Asian Regionalism: Financial Issues

#### 3.1 Introduction

In the aftermath of the recent East Asian financial crises, the process of the regional economic integration among the ASEAN Plus Three (APT) countries has witnessed a rapid surge in the volume of intra-regional trade and investment. This phenomenon has caught the attention of scholars in the fields of both international trade and finance in several respects. On the trade side, the fact that intra-regional trade continued to increase after the proliferation of the preferential trade agreements (PTA) between East Asian countries makes it less interesting to explore as to whether trade liberalization in this region has generated a substantial expansion of intra-regional trade. Instead, a large body of empirical literature has been devoted to assessing whether the trading blocs in the region represented building or stumbling blocks (e.g., Elliott and Ikemoto, 2004; Magee, 2008; and Eicher, Henn, and Papageorgiou, 2008).

On the financial side, however, despite the broader and deeper regional financial integration, special attention still has been paid to the question of why Asian portfolio investors invest so little in Asia (e.g., Eichengreen and Park, 2003; Eichengreen and Luengnaruemitchai, 2006; and García-Herrero et al., 2009). This pattern is not surprising. It reflects the fact that investors from APT countries have been heavily engaged in financial markets outside the region—in 2001 alone, for example, investors from APT economies devoted only 5.4 percent of their



international portfolios to the capital markets within the region, while almost 70 percent of the resources were invested in the Euro area, the United States, and the United Kingdom, according to the IMF's Coordinated Portfolio Investment Survey (CPIS).

In the view of García-Herrero et al. (2009), the fact that Asian investors do not invest in their neighboring countries seems puzzling in several aspects. First, in contrast to the prediction of neo-classical growth theory, Asian financial resources tended to flow away from emerging markets and towards developed economies, where the average rate of return is lower. Second, geographical proximity did not seem to affect portfolio asset allocations across the region, contradicting the theoretical conjecture of the gravity model. And third, although some existing empirical studies suggest a link between trade and financial flows, the degree of financial integration in Asia still remained relatively low compared with the intra-regional trade integration.

Nonetheless, as data became available over a longer period of time, this study observed a shifting pattern of foreign portfolio investments. The first stylized fact is that East Asian investors have increasingly devoted more resources to the financial markets in their neighboring countries, from only 5.4 percent of their foreign portfolio investments in 2001 to about 10.3 percent at the end of 2009. Similarly, Euro area and US investors also allocated more financial resources to the East Asian capital markets, both in terms of volume and as a percentage share of their total portfolio holdings. Moreover, the acceleration of cross-border portfolio investment across the region seemed to coincide with a surge in the volume of intra-regional trade. These

developments raise the question of what has been happening in the East Asian financial markets recently.

This study seeks to understand the recent development of financial market integration in East Asia, paying particular attention to the cross-border portfolio investment. It should be noted that although the degree of regional financial integration can be measured from various angles (e.g., bilateral bank loans and foreign direct investment), the focus on the cross-border portfolio holdings is aimed at fitting into Lane and Milesi-Ferretti (2004)'s theoretical framework. In seeking to understand the composition of the cross-border portfolio investment in APT economies, special attention must be paid to the role of the specific characteristics both at the bilateral level as well as in the host country. This work first explores the role of the various factors at the bilateral level using country-specific fixed effects to absorb any time-invariant country-specific characteristic that influence cross-border portfolio holdings. These include the influence of asymmetric information and informational costs, the correlation between growth rates, and the link between trade and financial integration. Thereafter, this empirical specification is relaxed to assess the importance of country-specific characteristics in host countries, paying particular attention to the role of the capital market development and financial center, as well as the effect of capital controls.

The remainder of the chapter is organized as follows. Section 3.2 provides stylized facts about the cross-border portfolio holdings of selected investing countries, while the composition of international portfolio holdings is reviewed in

section 3.3. Section 3.4 presents methodology and data. Section 3.5 reports the empirical findings and section 3.6 concludes.

### **3.2 Stylized Facts of the Cross-Border Portfolio Holdings among APT Countries**

There are two comprehensive datasets on cross-border financial positions: the IMF's Coordinated Portfolio Investment Survey (CPIS) and the BIS consolidated banking statistics. The CPIS dataset provides information on cross-border portfolio holdings of short- and long-term debt securities as well as equity securities. Currently, there are more than 75 economies that participate in the survey, including 9 economies from the APT countries. In the latter case, the BIS consolidated banking statistics provide unique information on cross-border bank claims for some 24 creditor countries. Nevertheless, this study intends to focus solely on the IMF's cross-border portfolio holdings so as to fit into Lane and Milesi-Ferretti (2004)'s theoretical framework.<sup>32</sup>

Table 3.1 provides the geographical distribution of total cross-border portfolio holdings across the major regions at the end of 2001, as well as the preliminary data for 2009. The first stylized fact emerging from the 2001 data is that Japan, Hong Kong SAR and Singapore were the three largest portfolio investors in the region, with a total investment of approximately \$1.6 trillion. Interestingly, these portfolio holdings accounted for more than 98.9 percent of the total cross-border portfolio assets held by APT countries.

Another noteworthy feature is that investors from the ASEAN + 3 economies at that time devoted only 5.4 percent of their portfolios to the capital markets within

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<sup>32</sup> This issue will be discussed in the next section.

the region, while almost 70 percent of the resources were invested in the Euro area, United States, and United Kingdom. In contrast to the investment pattern among APT economies that heavily invested in other regions, Euro area investors devoted more than 53.8 percent of their portfolio assets to the capital markets in the Euro area and 3.2 percent in APT countries.

Although the total value of foreign portfolio investments among APT countries has increased rapidly to \$4.2 trillion at the end of 2009, the geographical distribution patterns of international portfolio holdings generally remained unchanged. Namely, Japan, Hong Kong SAR, and Singapore still remained the three largest portfolio investors in the region, with a total portfolio investment of approximately \$4 trillion, or around 95.8 percent of the total foreign portfolio assets held by investors in APT economies. Euro area and US investors have allocated slightly more resources to the financial markets in this region, from 3.2 and 13.2 percent of their portfolios in 2001 to 3.4 and 13.8 percent in 2009, respectively.

Even so, there still have been some significant changes in the structure of portfolio holdings among APT countries that are worth noting. First, investors from the APT economies have increasingly allocated more resources to the capital markets within the region, from only 5.4 percent of their foreign portfolio investments in 2001 to about 10.3 percent at the end of 2009. By contrast, the shares of Euro area, US, and UK portfolio securities held by APT countries have declined considerably to 21.3, 26.8, and 8.1 percent at the end of 2009 in relation to 24.9, 34.3, and 9.8 percent in 2001. Second, the size of each APT member countries' international portfolio holdings has grown remarkably over the past decade. For instance, the Republic of

Korea held foreign portfolio assets of approximately \$102 billion at the end of 2009, compared with only \$8 billion in 2001. Likewise, the size of Thai portfolio holdings has also increased substantially from less than \$1 billion to around \$23 billion over the period.

Tables 3.2 through 3.4 report the geographical allocation of cross-border portfolio holdings classified by type of securities at the end of 2001, as well as the preliminary data for 2009. Focus first on the distribution of portfolio equity holdings reported in Table 3.2. The three largest portfolio equity investors among APT countries still were Japan, Hong Kong SAR, and Singapore, with the total investment of approximately \$353 billion in 2001 and \$1.2 trillion in 2009. These holdings accounted for around 99 and 92 percent of the total foreign equity assets held by APT countries in 2001 and 2009, respectively. Although the equity securities held by APT economies were heavily skewed towards the U.S. stock markets in 2001, this bias has vanished in recent years as investors from ASEAN + 3 economies have increasingly devoted their resources to the stock markets in the region. Another noteworthy feature emerging from the 2009 data is that there was cross-country heterogeneity in the geographical distribution of equity holdings among APT countries; that is, while Japan appeared to be a country with a strong bias towards the US stock markets, the portfolio holdings of Hong Kong SAR and Singapore were heavily skewed towards the markets within the region.

Next, consider jointly the geographical breakdown of long- and short-term debt securities reported in Table 3.3 and 3.4. One interesting fact emerging from these tables is that investors from ASEAN + 3 economies devoted sizeable resources to

long-term debt securities rather than investing in short-term debt securities during the past decade. Specifically, the share of long-term debt securities held by APT countries in 2001 and 2009 accounted for more than 70.7 and 63.4 percent of the total portfolio holdings, compared to only 7.3 and 4.2 percent in the case of short-term ones. However, if Japan is excluded, the share of long-term debt securities only amounted to 42.2 and 31.8 percent of the total portfolio holdings, compared with 18.3 and 11.1 percent in the case of short-term debt during the same period. Again, cross-country heterogeneity in the geographical distribution of both short- and long-term debt securities is found to exist among APT countries. Korea and Philippines, for example, appeared to be countries with a strong bias towards U.S. debt securities, while Japan's debt securities holdings were skewed towards the markets in Euro area countries and the United States.

Taken together, the structures of cross-border asset holdings highlighted so far exhibit a number of stylized facts regarding the behavior of international portfolio investors. First, like the Euro area, there was considerable heterogeneity in the geographical distribution of portfolio holdings among the individual APT member states.<sup>33</sup> Second, Japan was the only country among ASEAN + 3 members that allocated substantial resources to the long-term debt securities issued by Euro area and US residents, whereas the others increasingly invested in the stock markets in the neighboring member countries. And lastly, the investment patterns appear to suggest that Western portfolio investors also increasingly devoted their resources to the risky

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<sup>33</sup> See Lane and Milesi-Ferretti (2004, 2005) for the patterns of cross-border portfolio holdings of the Euro area countries.

securities (especially equity securities) issued by the entities residents in the ASEAN + 3 economies.

### **3.3 Literature Review on the Determinants of International Portfolio Holdings**

As discussed in the previous chapter, the gravity model has become the workhorse model of international trade for understanding the determinants of bilateral trade flows. Along with its strong theoretical validation that can be derived from a variety of different foundations, the model has been successful in predicting bilateral trade flows as a positive function of economic size and a negative function of distance between them.<sup>34</sup> More recently, a developing literature has also attempted to explain variations in international capital flows using the gravity model. This seems interesting given that, unlike commodities, distance is less likely to be related to transportation costs since financial assets are weightless. Furthermore, what is particularly puzzling is that a substantial number of empirical studies have indeed found a strong negative correlation between trade in financial assets and distance, which may contradict the theory of portfolio diversification.<sup>35</sup>

With regards to the puzzles above, Portes and Rey (2005) have clarified the role of geographical distance in the context of financial assets as a proxy for information frictions. The explanation is quite simple: distance tends to deter economic agents from interacting with one another; the longer the distance, the lower

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<sup>34</sup> These include the increasing returns to scale (IRS) model, Ricardian models, Armington models, and Heckscher-Ohlin (H-O) models.

<sup>35</sup> Imbs (1999) and Baxter and Kouparitsas (2004) have found that business-cycle comovement tends to be negatively correlated with distance. So according to the idea of portfolio diversification, one way investors can minimize idiosyncratic risks is to hold portfolio securities issued by residents of distant economies where the degree of business-cycle comovement is relatively low. In this regard, cross-border trade in financial assets should increase with distance.

the volume of information flows and the greater the information asymmetries and information costs. Portes et al. (2001) compared the role of distance as a proxy for informational asymmetries across different types of financial securities between the U.S. and 40 other economies. They found that the estimated coefficients on the distance variables are much larger in the case of transactions in corporate bonds and equities than that in treasury bonds. This empirical evidence, together with the fact that government bonds are less subject to information asymmetries than the corporate securities, leads the authors to confirm that a negative relationship between bilateral trade in financial assets and distance is a result of informational frictions.

Besides the standard gravity variables (i.e., economic masses of source and destination countries, as well as distance), numerous additional hypotheses were proposed in order to explain variation in cross-border portfolio holdings. These determinants can be classified into two broad categories: (1) international portfolio diversification and return-chasing behavior and (2) information costs and informational asymmetries.

### **3.3.1 International Portfolio Diversification and Return-Chasing Behavior**

In finance, international portfolio diversification has long been widely recognized as an efficient method for reducing idiosyncratic risks as well as improving portfolio performance. Grubel (1968), for example, illustrated mathematically that, given an equal expected rate of return, investors can reduce variance by diversifying investments across countries. Likewise, with equal variances, international portfolio diversification can lead to higher expected rates of



return, compared to non-diversified investments. De Santis and Sarno (2008) found that US investors can be better off by diversifying their portfolio investments across countries, in which return co-movements are low, compared with relying entirely on either domestic or worldwide markets.<sup>36</sup> In line with these findings, the benefits of portfolio diversification have also been noted in a substantial academic literature (see, e.g., Rowland and Tesar, 2004; Driessen and Laeven, 2007; Gerard et al., 2002; and Brandt et al., 2006).

Given the empirical findings regarding the gains from international portfolio diversification mentioned above, it is sensible to relate trade in financial assets to the degree of business cycle comovement between home and foreign countries. This relationship is, indeed, in line with the work of Faruquee et al. (2004), who conjectured that bilateral equity holdings should be positively correlated with the returns of foreign securities, but negatively associated with the comovement between the asset returns of home and foreign markets. By including these variables in the gravity model, they found that the correlation of the stock market returns played a robust role in explaining international portfolio holdings, while the empirical support for a return-chasing behavior was surprisingly weak.<sup>37</sup> García-Herrero et al. (2009) made a similar argument by highlighting some important features of the return variables (i.e., asset returns and currency returns) as the key determinants of cross-border portfolio

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<sup>36</sup> It is interesting to note here that, in general, the gain from international portfolio diversification tends to decrease with the increase in the degree of financial market integration. See De Santis and Sarno (2008) for a discussion on this issue.

<sup>37</sup> Note that a return-chasing behavior refers to investor's strategy of chasing performance.

holdings.<sup>38</sup> Other existing empirical literatures providing evidence of a return-chasing behavior include Brennan and Cao (1997) and Froot et al. (2001).

In contrast to the above findings, Portes and Rey (2000) studied bilateral transactions in the equity securities of 14 countries and found, at best, only weak evidence of return-chasing and portfolio diversification incentives. Focusing on the international investment positions at the end of 2001, Lane and Milesi-Ferretti (2004) found that investors from source countries prefer investing in economies with similar underlying economic fundamentals, instead of devoting their resources to the stock markets in distinctly different countries. In their study, the cross-border equity holdings are significantly and positively associated with (1) the correlation between growth rates, (2) the correlation between stock market returns, and (3) the correlation between economic growth of a source country and host-country stock returns. Among others, weak empirical support for a portfolio diversification motive has also been noted (see, e.g., Eichengreen and Luengnaruemitchai, 2006; French and Poterba, 1991; and Portes and Rey, 2005).

### **3.3.2 Information Costs and Informational Asymmetries**

Despite large potential gains from international diversification, several existing literatures find that investors indeed forgo the potential benefits of risk sharing and choose to hold domestic and/or foreign securities over and above the amount predicted by traditional portfolio theory. Faruquee et al. (2004), for instance, showed that investors in all selected sample countries held much more domestic

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<sup>38</sup> One of the most striking results emphasized in García-Herrero et al. (2009) is the empirical fact that the lack of market liquidity in Asian capital markets is a significant reason why investors did not invest in the region.

equities than the benchmark share predicted by the capital asset pricing model (CAPM). This home bias ranged from 14 percent in the case of Ireland to 96 percent for Malaysia. Lane and Milesi-Ferretti (2004; 2005) compared the actual share of foreign portfolio equity holdings in the major developed countries with “a simple predictive benchmark.”<sup>39</sup> Their results indicated that equity holdings of the Euro area and Japan at the end of 2001 were 11.6 and 3.2 percent overweight in the United Kingdom, respectively. The United States, on the contrary, was 7.5 percent underweight in Japan during the same period.

In response to this, a large body of literature has attempted to explain the home bias puzzle in financial markets from various different angles. Davis et al. (2000), in one respect, pointed out that the reason investors prefer not to diversify their portfolios internationally is partly because the hedging cost considerably exceeds the benefits of portfolio diversification. Beside the role of return-chasing and diversification motives, the work of Portes and Rey (2000) also conjectured that the volume of bilateral equity flows might be driven by information transmission or informational asymmetries. In their experiments, they found that telephone calls and bank branches (information transmission variables) were positively correlated with cross-border equity flows. The degree of insider trading (as proxy for informational asymmetry), in contrast, had a negative effect on the flows.<sup>40</sup> This evidence appeared to suggest that, as Portes and Rey stated, “International capital markets are not

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<sup>39</sup> According to Lane and Milesi-Ferretti (2004), “the predicted share is the ratio of host country's stock market capitalization to the stock market capitalization of the world minus the source country. The actual share: ratio of source country's equity investment in host country to total source country foreign equity investment.”

<sup>40</sup> See Warnock (2002) for a discussion on the drawbacks of using flow data to measure bilateral portfolio holdings.

frictionless: they are segmented by informational asymmetries...Countries have different information sets, which heavily influence their international transactions (p.27).”

Another form of information asymmetry takes place as investors know much more about firms and the economic outlook in their home country than they do about those in foreign economies. In Gordon and Bovenberg (1996)’s view, this informational disadvantage can hamper international capital mobility since investors are vulnerable to a significant loss when trying to acquire assets in foreign countries. Gehrig (1993) made a similar argument by stating that asymmetric information can result in domestic bias since foreign securities (in domestic investor sentiment) appear to be more risky than domestic assets, even in the absence of foreign exchange risk. He further added that, with the assumption that information is symmetric across countries, home bias in the asset markets should continue to exist because investors still face a variety of risks when investing abroad (e.g., foreign exchange risk, purchasing power risk, and capital market restrictions).

For this reason, some of the existing literatures on the determinants of cross-border portfolio investment have also attempted to take into account the role of capital controls in the model. In the perspective of Lane and Milesi-Ferretti (2004), the volume of international portfolio holdings is presumed to be artificially small when capital controls are imposed or have recently been in place. Nonetheless, their empirical results indicated that capital controls turned out to be insignificant in explaining the composition of the aggregate portfolio holdings. Balli et al. (2009) studied the patterns of foreign portfolio inflows into the Gulf Corporation Council

countries (GCC) and found, in contrast, a statistically significant correlation between capital controls in host countries and the level of foreign portfolio holdings. In the work of García-Herrero et al. (2009), capital controls in source countries appeared to play an effective role in restricting capital outflows during the period 2001-2005. The controls in host countries, on the contrary, were found to be ineffective in curbing hot capital inflows; or simply put, controls on capital inflows were found to be positively related to the volume of cross-border portfolio holdings. This positive correlation, as the authors pointed out, may simply reflect the fact that capital controls in destination countries are typically imposed in response to a surge in capital inflows and such controls might fail to stop the influx of speculative money.

Another potential influence on cross-border investment is the degree of trade integration between host and source countries. Theoretically, bilateral trade in goods may encourage cross-border portfolio flows for a number of reasons. More generally, international commodity trading can act as a conduit for information transmission, which may help reduce the degree of informational asymmetry through some forms of familiarity effects. Furthermore, investment in equity securities issued by a resident of a trading partner country can be exploited to hedge against consumption risk from importation due to country-specific shocks in that economy (Lane and Milesi-Ferretti, 2005). Moreover, lending money to importing countries with closer trade linkages can prevent a creditor country's export from shrinking (Rose and Spiegel, 2002). Empirically, a large body of recent studies suggested that bilateral trade in goods, indeed, helped encourage cross-border portfolio investment. These

literatures include Lane and Milesi-Ferretti (2004, 2005), García-Herrero et al. (2009), Balli et al. (2009) and Lee (2008).

In addition, as generally found in related empirical studies, portfolio investments have also been modeled as a function of cultural, historical, or economic links. Two common informational dummies include colonization and official language that enter the model as a proxy for both information costs and information asymmetry. The idea for these dummies is quite straightforward: sharing a common language or a colonial relationship helps spur bilateral portfolio investment since the costs of acquiring information between these markets are likely to be lower, compared with other economies. Besides these two variables, the regional trading bloc or economic community has also been employed to model cross-border portfolio holdings for similar reasons (see, Lane and Milesi-Ferretti (2005) for “Euro culture” dummy variable, Lee (2008) for intra-East Asia dummy, and Balli et al. (2009) for GCC and religion dummy variables).

### **3.4 Methodology and Data**

#### **3.4.1 The Gravity Model of Cross-Border Portfolio Holdings**

The empirical model in this chapter is developed for assessing the determinants of cross-country portfolio inflows into APT countries, based on Lane and Milesi-Ferretti (2004)’s theoretical framework. In its original version, Obstfeld and Rogoff (2000) first constructed this model in a two-country setting. Recently, the framework was further extended to an N-country setting by Lane and Milesi-Ferretti (2004) so as to draw out the implications of theoretical conjecture for the composition

of cross-border asset holdings among developed and emerging market economies. The basic idea of the model assumes that the heterogeneity in consumer preferences and international trade costs in commodity markets can influence bilateral equity portfolios. In particular, the presence of these factors can naturally lead to a home bias in portfolio investments despite the completeness of international financial markets. Mathematically, the model has the following logarithmic form<sup>41</sup>:

$$\ln(X_{ij}) = \alpha_i + \alpha_j + (\theta - 1)\ln(1 - \tau_{ij}) + \theta\ln(\omega_{ij}) + (v_{ij}), \quad (3.1)$$

where  $X_{ij}$  is the volume of equity holdings of source country  $i$  in host country  $j$ ,  $\alpha_i$  and  $\alpha_j$  are constant terms for country  $i$  and  $j$ ,  $\theta$  represents the elasticity of substitution between commodities,  $\tau_{ij}$  is iceberg shipping costs,  $\omega_{ij}$  denotes the relative preferences of consumers in country  $j$ , and  $v_{ij}$  is the ratio of source country  $j$ 's wealth in world economy.

Because information on consumer preferences and iceberg shipping costs is not readily accessible, Lane and Milesi-Ferretti (2004) employed the volume of imports as a proxy for these variables. Hence, the composition of bilateral equity investments can be written as:

$$\ln(X_{ij}) = \Phi_i + \Phi_j + \sigma\ln(IMP_{ij}) + \gamma F_{ij} + \varepsilon_{ij}, \quad (3.2)$$

where  $\Phi_i$  and  $\Phi_j$  are a couple set of source- and host-country fixed effects,  $IMP_{ij}$  is the imports of country  $i$  from country  $j$ ,  $F_{ij}$  represents a vector of the country-pair characteristics that drive the volume of equity investments from source country  $i$  to

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<sup>41</sup> Note that this equation is derived from the utility function for consumption. See Lane and Milesi-Ferretti (2004) for details.

host economy  $j$ , and  $\varepsilon_{ij}$  denotes the error term. Intuitively, this empirical framework implies that with the existence of preference heterogeneity and transportation costs, economic agents in source country  $i$  naturally face heterogeneous country-specific risk profile (e.g., productivity shocks) when importing products from their trading partners. And, one effective way to reduce the risk (or more specifically, to maximize utility) is to devote substantial financial resources to investing in the capital markets of their major trading partners. Thus, the volume of cross-country equity holdings, in this sense, is assumed to be a positive function of the level of bilateral imports.

It is also important to note that the inclusion of country-specific fixed effects is aimed at absorbing any time-invariant country-specific factor that influences cross-border portfolio investments. Thus, all country-specific variables (e.g., GDP, per capita GDP, stock market capitalization, etc.) are automatically excluded from equation (3.2). In common with the existing literatures, a set of the gravity-type variables at a bilateral level ( $F_{ij}$ ) is incorporated into the model as follows:

$$\ln(X_{ijt}) = \beta_0 + \beta_1 \ln(IMP_{ijt}) + \beta_2 \ln(Dist_{ij}) + \beta_3 (Lang_{ij}) + \beta_4 (Colony_{ij}) + \beta_5 (Timezone_{ij}) + \beta_6 (APT_{ij}) + \beta_7 (Correl_{ijt}) + \varepsilon_{ijt}, \quad (3.3)$$

where  $t$  is time,  $i$  and  $j$  denote source and host country, respectively. The other variables are defined as:

- $X_{ijt}$  is the total cross-country portfolio holdings of source country  $i$  in host country  $j$ ,
- $IMP_{ijt}$  is the imports of country  $i$  from country  $j$ ,
- $Dist_{ij}$  is the distance between country  $i$  and  $j$ ,



- $Lang_{ij}$  is a binary variable equal to unity if  $i$  and  $j$  have a common official language and zero otherwise,
- $Colony_{ij}$  is a binary variable equal to unity if  $i$  colonizes  $j$  (or vice versa) and zero otherwise,
- $Timezone_{ij}$  is the time zone difference between country  $i$  and  $j$ ,
- $APT_{ij}$  is a binary variable equal to unity if both  $i$  and  $j$  are APT countries and zero otherwise,
- $Correl_{ijt}$  is the correlation between GDP growth rates of country  $i$  and  $j$ ,
- $\varepsilon_{ijt}$  denotes the error term.

Because the purpose of this chapter is to examine the composition of cross-country portfolio investments in APT countries, the sample of host countries is restricted to the 10 economies in the region. The list of source and host countries is reported in Appendix Table A3.1. In the standard gravity model of commodity trade, geographical distance is entered into the model as a good proxy for transaction costs. In the gravity model of bilateral portfolio investments, however, distance is treated as a proxy for information costs in the financial market. Yet, despite the difference in conjectures, distance is consistently assumed to be negatively correlated with the volume of both trade in goods and trade in financial assets.

Among the other conventional gravity-type variables, common language and colonial ties are expected to encourage the volume of portfolio investments since communicating a common language or having a colonial relation can help reduce the cost of acquiring information. Similar to the gravity model of commodity trade, the regional dummy variable (APT) can be employed to assess the existence of regional

bias in bilateral portfolio investments. If the APT dummy variable turns out to be positive and significant, it would indicate that investors from the ASEAN Plus Three countries, indeed, have been disproportionately investing within the region relative to others.

In contrast to the standard model of commodity trade, which ignores real-time trading, the overlap between operating hours of capital markets in any two countries can create difficulties in communication between economic agents in the markets. To check this, the variable for time zone difference is incorporated into equation (3.3) as a proxy for interaction difficulties. If this variable turns out to be negatively significant, it will indicate that the overlap between business hours in any two economies, indeed, has hampered cross-border portfolio investments.

Furthermore, to investigate the role of international diversification in explaining the variation of bilateral portfolio holdings, the correlation between economic growth is utilized to capture this motive. If the motivation for international diversification exists, this coefficient will be negatively significant. In addition, perhaps what is particularly interesting in equation (3.3) is the link between the level of bilateral trade in goods and portfolio investments. In the previous chapter, it has been found that the regional trade integration within ASEAN Plus Three economies has actually played an essential role in generating the volume of bilateral trade between its member states. In this chapter, this study further investigates whether trade liberalization in the region can help promote cross-country portfolio investments between them. One way to investigate this connection is to apply the methodology of Lane and Milesi-Ferretti (2004) by introducing an import variable into the model. If

the coefficient of import variable turns out to be positively significant, it would imply that deeper trade integration in the region, indeed, has played an indirect role in encouraging portfolio investments between APT member states, or a common factor affects both.

### **3.4.2 Data**

The dataset of total bilateral asset holdings is collected from the IMF's Coordinated Portfolio Investment Survey (CPIS). This survey provides new information on cross-border portfolio holdings of equity securities as well as short- and long-term debt securities that are not a component of foreign direct investment, foreign reserves, or financial derivatives. Initially, the preliminary panel data consists of 74 investing countries over the period of 2001 to 2009. Yet, since offshore and small financial centers are typically treated as pure financial intermediaries and considered as neither true investing countries nor final destinations for investments, these countries are ruled out.<sup>42</sup> In addition, because China and Vietnam do not currently participate in the survey, these countries are entered in the regression only as host countries, but not as investing economies.<sup>43</sup> Thus, the ultimate dataset of total cross-border portfolio holdings consists of 58 source countries and 10 destination economies. This dataset is then converted to real terms using the US GDP deflator that was obtained from the IFS. And, in common with the previous empirical

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<sup>42</sup> The list of the offshore and small financial centers is drawn from Lane and Milesi-Ferretti (2004). These economies include Aruba, The Bahamas, Bahrain, Bermuda, The Cayman Islands, Cyprus, Guernsey, The Isle of Man, Jersey, Lebanon, Luxembourg, Macao SAR, Malta, Mauritius, the Netherlands Antilles, Panama, and Vanuatu.

<sup>43</sup> Brunei Darussalam, Cambodia, Lao, and Myanmar are also excluded from the model since these countries do not currently have a capital market.

literatures, the log of (1 + real portfolio holdings) is utilized as the dependent variable in equation (3.3) to account for the great number of observations that are equal to zero.

Bilateral import data is collected from the IMF's Direction of Trade Statistics (DOTS). This dataset is also converted to real terms. So in this chapter, bilateral import variable is defined as log of (1 + real bilateral imports). The geographical distance between two countries is drawn from "the Great circle distances between capital cities" and Andrew K. Rose's home page. This work also exploits the same source for information on colonization and common language, while the time zone data is obtained from [worldtimezone.com](http://worldtimezone.com).<sup>44</sup> And lastly, the dataset for annual GDP growth rates is collected from the World Development Indicators (WDI) so as to calculate the 5-year rolling correlation between GDP growth rates of source and host countries. Summary statistics for all variables used in this chapter are presented in Table 3.5.

### **3.5 Empirical Results**

Table 3.6 reports the benchmark results for the composition of total cross-border portfolio holdings in APT economies. To reduce any potential bias as much as possible, a set of source- and host- country fixed effects are incorporated in all regressions. The determinants of bilateral asset holdings are first examined by using the OLS method. The estimated results obtained from this method are reported in column 2 and 3. Nonetheless, since more than one-fourth of the dataset of the cross-border portfolio holdings are equal to zero, OLS regression may provide biased

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<sup>44</sup> <http://www.worldtimezone.com/>

results when this dependent variable is censored. To deal with such possible inconsistent estimates, the determinants of cross-country portfolio holdings are also explored by using the Tobit method (as shown in column 4 and 5).

The empirical assessment in this section begins with an examination of Lane and Milesi-Ferretti (2004)'s conjecture by regressing cross-border asset holdings only on imports. As can be seen in column 2 and 4, the results indicate that the volume of cross-border portfolio holdings is positively associated with the level of bilateral imports at the 1% level of significance, regardless of the econometric technique. To be specific, the estimated coefficient obtained from OLS method is only about 0.26 (s.e. = 0.05); however, as the dependent variable is censored using the Tobit technique, the coefficient of imports indeed increases to 0.48 (s.e. = 0.01). Or simply put, this empirical evidence appears to suggest that a 1% increase in the level of bilateral imports of source country  $i$  from host country  $j$ , other things constant, has resulted in an increase in the volume of the asset investments in APT economies by between 29.7% and 61.6%, depending on the estimation methods.<sup>45</sup>

Evidently, this positive relationship is consistent with the views that bilateral trade in goods can encourage portfolio investments through several mechanisms. As discussed earlier, one of the most common perceptions is that international trade can act as a conduit for information transmission, which helps reduce the degree of information asymmetry through some forms of familiarity effects. A more complicated view is that source countries tend to allocate substantial financial

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<sup>45</sup> For example, given that the estimated coefficient on imports in column 2 is 0.26, so  $e^{0.26} = 1.2969$ . Thus, a 1% increase in the level of bilateral imports raises the volume of cross-border portfolio holdings by about 29.7%  $((1.2969-1)*100\%)$ .

resources to their largest trading partners to hedge against consumption risks due to country-specific shocks in exporting countries (Lane and Milesi-Ferretti, 2004). In addition, despite the difference in the country sample, the empirical results in column 2 and 4 are also in line with the works of Lane and Milesi-Ferretti (2005) and Balli et al. (2009), reinforcing this study's finding that bilateral trade has, indeed, played an important role in encouraging cross-border portfolio investments in the APT markets.

Column 3 and 5 of Table 3.6 present the estimated results when the influence of other bilateral factors affecting cross-country portfolio holdings are controlled for. The first thing to notice is that the coefficients of import variable still remain positively significant at the 1% level. And, even though a set of other bilateral factors are included, the sizes of the estimated import coefficient decrease only slightly. Among the other explanatory variables, geographical distance appears to play an essential role in discouraging the cross-border asset investments in APT economies. The coefficients for common language are statistically insignificant, as are the coefficient for colonial relationship. Although time-zone difference and APT dummy enter the OLS regression with the correct signs at the 5 % level of significance, neither is statistically significant when estimating with the Tobit technique. Interestingly, the estimated coefficients for the correlation between economic growth rates have a positive sign and are highly significant, suggesting that investors actually prefer investing in APT economies, where the underlying economic fundamentals are similar, rather than pursuing international diversification motives.

So far, this chapter has shown that some bilateral characteristics (i.e., imports, geographical distance, and correlation in growth rates) are the key factors driving the

portfolio investments into APT countries. Yet, these determinants alone do not seem to provide a sufficient explanation for the variation in cross-border portfolio holdings in the region, given the existing empirical findings discussed in section 3.3; it is most likely that other country-specific characteristics of both host and source country can also influence this variation. Nevertheless, since the purpose of this study is to draw out policy implications regarding the development of the capital markets in APT countries, the rest of this section will pay special attention to the role of host-country specific factors in encouraging portfolio investments. The ignorance of the role of source-country specific characteristics is, of course, a limitation of this study.

In terms of econometric methods, although the inclusion of both source- and host-country fixed effects can provide unbiased results (Anderson and van Wincoop, 2003), this methodology indeed does not allow for the exploration of the vital host-country specific characteristics that may encourage portfolio investments. It is because the effects of these country-specific factors (e.g., market capitalization, capital controls, and financial center) are already absorbed by the host-country dummies. Thus, one way to examine the influence of host-country specific characteristics is to relax the specification used in equation (3.3) by controlling only for source-country fixed effects. In doing so, nonetheless, it would probably lead to the bias resulting from the omission of unobserved country-specific factors in the host country, and this study acknowledges such possible bias. The extended model is set up as follows:

$$\ln(X_{ijt}) = \beta_0 + \beta_1 \ln(IMP_{ijt}) + \beta_2 \ln(Dist_{ij}) + \beta_3 (Lang_{ij}) + \beta_4 (Colony_{ij}) \\ + \beta_5 (Timezone_{ij}) + \beta_6 (APT_{ij}) + \beta_7 (Correl_{ijt}) + \beta_8 \ln(GDP_{jt})$$

$$\begin{aligned}
& + \beta_9(\text{Financialcenter}_j) + \beta_{10}(\text{prbond}_{jt}) + \beta_{11}(\text{pubond}_{jt}) \\
& + \beta_{12}(\text{stmktcap}_{jt}) + \beta_{13}(\text{KAOPEN}_{jt}) + \varepsilon_{ijt}, \quad (3.4)
\end{aligned}$$

where the host-country variables are defined as:

- $GDP_{jt}$  is GDP of host country  $j$ ,
- $\text{Financialcenter}_j$  is a binary variable equal to unity if the host country or territory is a large international financial center and zero otherwise,
- $\text{prbond}_{jt}$  is the ratio of private bond market capitalization to GDP,
- $\text{pubond}_{jt}$  is the ratio of public bond market capitalization to GDP,
- $\text{stmktcap}_{jt}$  is the ratio of stock market capitalization to GDP,
- $\text{KAOPEN}_{jt}$  is the Chinn-Ito index of financial openness.

GDP data is extracted from the World Bank's World Development Indicators (WDI). The dataset is converted to the real terms using the US GDP deflator that is obtained from the IFS. Similar to the basic form of the gravity model of commodity trade, the host-country GDP is incorporated into equation (3.4) in order to capture the importance of economic size in attracting foreign portfolio investment. A common perception of this factor is that such bilateral portfolio holdings should be directly proportional to the market size of the host country. Furthermore, in some countries or territories, such as Hong Kong SAR and Singapore, the financial sectors are relatively large, which helps attract larger foreign portfolio investment than other country-specific characteristics would warrant. For this reason, a dummy variable for large international financial centers is introduced in the model to isolate the influence of this factor. Information for countries with a large international financial center is



gathered from Lane and Milesi-Ferretti (2004). Following their classification, only Hong Kong SAR and Singapore will be defined as the large international financial centers in the region.<sup>46</sup>

Still, it is arguable that the development of capital markets is one of the critical driving forces behind the growing portfolio investments in APT economies. To check this possibility, this study adds three different proxies to capture the importance of financial market developments in attracting portfolio investments. As seen in equation (3.4), these variables include the ratio of private bond market capitalization to GDP, the ratio of public bond market capitalization to GDP, and the ratio of stock market capitalization to GDP. The source of these datasets is the World Bank. And for the capital restriction variable, this study uses the Chinn-Ito index (also referred to as KAOPEN) to examine the impact of capital controls in the region. As discussed in Chinn and Ito (2008), the KAOPEN index provides several advantages over the use of a binary variable based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). In particular, the exploitation of the Chinn-Ito index can help capture the concentration of the capital controls more accurately, when compared with the use of a binary dummy variable based on the IMF's AREAER.<sup>47</sup>

In Table 3.7, columns 2 and 4 present the results only when the bilateral factors and a set of source-country dummies are controlled for. Comparing these to the results in columns 3 and 5 of Table 3.6, we see that the omission of host-country

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<sup>46</sup> Unlike countries or territories with offshore and small financial centers that are already ruled out, both Hong Kong SAR and Singapore have domestic stock markets and are considered as the real final destination for portfolio investments. See Lane and Milesi-Ferretti (2004) for more detail.

<sup>47</sup> See Chinn and Ito (2008) for further discussion on the advantages of the KAOPEN over other indexes as well as the construction of the index.

specific characteristics generally leads to inconsistent estimates, regardless of the econometric technique; all estimated coefficients, except geographical distance, are upward biased.

Columns 3 and 5 report the results from the estimating equation (3.4), with solely source-country fixed effects. Again, the estimated coefficients on the bilateral factors are pretty similar to the results reported in Table 3.6. To summarize briefly, it is found that the inclusion of the host-country explanatory variables reduces the magnitude of the import variable considerably although the estimated coefficients still remain positively significant. In consonance with the prior results, geographical distance enters the regressions as the strongest factor that discourages the cross-border portfolio investments in the APT countries. On the contrary, the estimated coefficients for the common language dummy are positive and modestly significant, as are the coefficients on the correlation between economic growths. Furthermore, the coefficient for the APT dummy provides evidence suggesting that the APT investors, indeed, have been disproportionately investing within the region relative to others.

Now consider the influence of host-country characteristics in encouraging cross-country portfolio investments. Observe that the coefficients of real GDP in the host country are always of the expected sign and robustly significant, regardless of the estimation technique; the magnitudes of the effect range tightly between 0.38 and 0.43. This finding appears to suggest that countries with relatively large economies tend to attract more foreign portfolio investments than others. In addition, there is strong empirical evidence that in some countries like Hong Kong SAR and Singapore, the large international financial centers helped attract about 90 to 127

percent of foreign portfolio investments greater than other country-specific characteristics would warrant.

Perhaps what is even more interesting in this table is the robust evidence of the importance of the capital market developments. Specifically, the estimated coefficients on the ratio of private bond market capitalization to GDP are found to range between 1.02 and 1.13, whereas those of public bond market and stock market value between 1.05 and 1.22, and 0.23 and 0.29, respectively. In terms of statistical significance, the coefficients of these ratios are all positively significant at the 1% level, regardless of the econometric methods. Apparently, this empirical finding lends some support to the perception that sound capital market development can help attract foreign portfolio investments through several mechanisms. For example, the widening of the capital markets straightforwardly increases the variety of financial products in the markets, allowing investors to allocate financial resources more efficiently. Moreover, the development of sound market institutions can help reduce price fluctuations, making the markets more stable.

In addition, although the coefficients on KAOPEN enter the regression with a positive sign as expected, none is statistically significant even at the 10 % level. This appears to suggest that during the 2000s the relaxation of the financial market restrictions in the region has actually played an insignificant role in encouraging foreign portfolio investments. In addition, the finding also contradicts the evidence of Balli et al. (2009), who found that the relaxation of capital controls in host country (proxied by the Chinn-Ito index) indeed enhanced foreign portfolio holdings in the GCC markets.

For the sake of comparison, this study also re-estimates equation (3.4) for five sub-samples, including APT countries, the Euro area, Europe and North America, Middle East, and South America.<sup>48</sup> As can be seen in Table 3.8, the augmented gravity model still fits the data relatively well in explaining more than 80-90 percent of the variation in cross-border asset holdings of APT countries, Europe and North America, and the Euro area. It is quite interesting, however, that the fit of the model to explain the variation decreases considerably for the cases of the Middle East and South America.

Clearly, the most striking result in this table is perhaps a strong correlation between cross-border portfolio holdings and the capital market developments in the host countries. In particular, there is robust evidence that bilateral asset holdings substantially increase with (1) the ratio of public bond market capitalization to GDP, and (2) the ratio of stock market capitalization to GDP in the cases of APT countries, Europe and North America, and the Euro area. There are a number of other important findings worth noting. First, the results appear to suggest that the development of the private bond markets in the region, indeed, played a significant role in attracting foreign portfolio investments from Europe, North America, and APT countries. Second, it is found that the bilateral portfolio holdings of South American countries increased with the development of the equity markets in the region. And third, the

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<sup>48</sup> Note that APT source countries include Hong Kong SAR, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, and Thailand. The euro area consists of Austria, Belgium, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Slovakia, Slovenia, and Spain. Middle East investing countries include Egypt, Kuwait, Israel, and Turkey. Europe and North America include Canada, Denmark, Iceland, Norway, Sweden, Switzerland, United Kingdom, and United States. And finally, South America consists of Argentina, Brazil, Chile, Colombia, Uruguay, and Venezuela.

results indicate that the development of the public bond markets is the vital driving force behind the growing portfolio investments from Middle Eastern countries.

Considering the influence of international financial centers on bilateral portfolio investments, observe that the financial center variable is statistically significant at the 1 % level only in the case of APT countries and its effects are quite large (2.16 and 2.22). This evidence appears to suggest that, aside from the capital market developments, the large financial centers have become one of the key determinants of foreign portfolio holdings of APT member countries. Although the link between the level of bilateral trade in goods and portfolio investments still stands, the evidence is only weak: cross-border portfolio holdings are found to be positively correlated with the level of imports, at best, at the 10% level of significance in the cases of the Euro area and APT countries (0.14 and 0.21 using Tobit technique).<sup>49</sup>

Another piece of clear evidence in this table is the contrasting patterns of investment behavior among source countries. As can be seen, the correlation in growth rates variable enters the regression with a positive and significant sign only for the cases of Europe and North America, and the Euro area. In the case of APT countries, on the contrary, the estimated coefficients are negative and highly significant. This seems to suggest that investors from North America and Europe (including the Euro area), indeed, invested in the APT markets where the underlying

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<sup>49</sup> Again, for the sake of comparison between the relative strength of the independent variables within the model, this dissertation also provides the unstandardized and standardized regression coefficients, reported in Table 3.9. The overall results show that (1) the country-specific factors in a host country, in general, played a greater role in attracting foreign portfolio investments, compared to the bilateral variables, and (2) the development of the public bond markets and stock markets in East Asia has turned out to be one of the most critical driving forces in encouraging foreign portfolio investment from most regions of the world, both in terms of statistical significance and the relative strength of the influence.

economic fundamentals are more similar, whereas APT countries preferred investing within the region to pursue international diversification. Consequently, the understanding of these behaviors can help explain the negative correlation between cross-border portfolio holdings and the degree of financial openness in the case of APT countries. With the financial markets in the host countries becoming more liberalized, investors from APT countries tended to reallocate and rebalance their portfolio assets away from the markets in the region to mitigate the risk of asset-price boom-bust cycles in the short run.<sup>50</sup> If anything, the finding of these distinct patterns of investment behaviors also helps explain the reason why the degree of financial openness in Table 3.7 is insignificant in all specifications: it is because foreign investors across regions responded differently when the degree of financial openness had changed.

### **3.6 Conclusion**

This chapter seeks to understand the composition of cross-border portfolio holdings in East Asian countries. Special attention has been paid to several characteristics of host countries as well as at the bilateral level.

At the bilateral level, geographical distance remains a critical factor in discouraging cross-border asset investments into East Asia. Despite a strong link between imports and bilateral portfolio holdings, this study only finds some evidence that trade integration in East Asia helped encourage intra-regional trade in financial assets. The investigation also reveals two distinct patterns of investment behavior

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<sup>50</sup> See Kaminsky and Schmukler (2003) for the discussion on financial liberalization and the boom-bust cycles in the short run.

among source countries: APT countries invested overseas for diversification reasons, while investors from Europe and North America pursued a higher rate of return in East Asian markets.

At the country-specific level, there is robust evidence that the pattern of cross-border asset holdings in East Asia is strongly correlated with the attractiveness of host-country specific characteristics. In particular, it has shown that the development of public bond as well as stock markets in East Asian economies helped attract foreign portfolio investment from most regions of the world.

**Table 3.1: Geographical Distribution of Total Cross-Border Portfolio Holdings by Selected Regions (in millions of U.S. dollars)**

Host country Source country	2001					2009*				
	ASEAN + 3	Euro area	United States	United Kingdom	Total	ASEAN + 3	Euro area	United States	United Kingdom	Total
Hong Kong SAR	30,256	20,422	39,253	31,070	205,600	202,474	82,931	92,398	89,600	810,780
Indonesia	153	142	249	74	717	803	743	470	476	4,696
Japan	21,077	364,562	490,200	110,356	1,289,754	61,644	754,410	919,346	182,501	2,845,894
Korea, Rep. of	1,731	740	3,763	431	8,035	25,094	9,523	32,764	10,072	102,372
Macao SAR	1,289	539	320	266	3,331	6,140	2,809	1,128	1,285	14,560
Malaysia	818	129	208	411	2,280	9,203	1,378	6,010	1,679	27,054
Philippines	112	50	1,844	25	2,135	441	172	2,315	300	4,995
Singapore	31,286	16,604	18,011	16,141	105,241	109,367	34,849	65,630	50,437	347,024
Thailand	255	147	292	31	825	16,200	2,052	1,999	324	23,410
ASEAN + 3	86,977	403,335	554,140	158,805	1,617,918	431,366	888,867	1,122,060	336,674	4,180,785
	(5.4)	(24.9)	(34.3)	(9.8)	(100)	(10.3)	(21.3)	(26.8)	(8.1)	(100)
Euro area	143,896	2,402,514	838,062	401,962	4,467,793	502,458	8,617,914	1,928,151	1,383,235	14,756,616
	(3.2)	(53.8)	(18.8)	(9.0)	(100)	(3.4)	(58.4)	(13.1)	(9.4)	(100)
United States	303,016	641,662	....	512,975	2,303,603	822,878	1,389,554	--	958,256	5,952,867
	(13.2)	(27.9)		(22.3)	(100)	(13.8)	(23.3)		(16.1)	(100)
United Kingdom	146,770	544,633	308,986	--	1,304,044	289,121	1,191,602	840,541	--	3,057,983
	(11.3)	(41.8)	(23.7)		(100)	(9.5)	(39.0)	(27.5)		(100)

Source: IMF, Coordinated Portfolio Investment Survey; Author's calculation.

Note: -- indicates a zero value or a value less than US\$ 500,000, while .... indicates an unavailable datum. Regional allocation is in parentheses. \* denotes preliminary data.



**Table 3.2: Geographical Distribution of Cross-Border Holdings of Equity Securities by Selected Regions (in millions of U.S. dollars)**

Host country Source country	2001					2009*				
	ASEAN + 3	Euro area	United States	United Kingdom	Total	ASEAN + 3	Euro area	United States	United Kingdom	Total
Hong Kong SAR	11,460	6,129	11,458	22,698	94,615	147,824	27,619	18,501	53,009	498,880
Indonesia	16	1	....	--	17	57	16	12	1	852
Japan	7,834	38,237	123,511	29,480	227,351	40,723	99,837	230,339	48,045	594,069
Korea, Rep. of	385	110	454	52	1,300	23,817	5,619	19,738	8,651	76,889
Macao SAR	604	75	54	121	1,032	4,218	1,020	211	662	7,647
Malaysia	692	30	68	24	1,332	6,800	748	4,965	1,439	20,150
Philippines	4	14	92	....	111	2	11	10	--	26
Singapore	14,303	2,493	6,034	2,688	31,319	63,122	5,947	24,252	13,181	153,639
Thailand	38	8	14	--	82	476	1,251	483	13	3,323
ASEAN + 3	35,336 (9.9)	47,097 (13.2)	141,685 (39.7)	55,063 (15.4)	357,159 (100)	287,039 (21.2)	142,068 (10.5)	298,511 (22.0)	125,001 (9.2)	1,355,475 (100)
Euro area	104,317 (6.0)	834,272 (48.1)	407,028 (23.4)	199,239 (11.5)	1,735,977 (100)	310,593 (7.0)	2,295,328 (51.8)	673,360 (15.2)	346,834 (7.8)	4,430,024 (100)
United States	261,515 (16.2)	461,583 (28.6)	....	350,014 (21.7)	1,612,667 (100)	744,044 (18.6)	892,432 (22.3)	--	561,670 (14.1)	3,995,298 (100)
United Kingdom	81,752 (14.6)	231,820 (41.5)	129,190 (23.1)	--	558,379 (100)	214,057 (19.3)	311,977 (28.1)	299,813 (27.0)	--	1,109,924 (100)

Source: IMF, Coordinated Portfolio Investment Survey; Author's calculation.

Note: -- indicates a zero value or a value less than US\$ 500,000, while .... indicates an unavailable datum. Regional allocation is in parentheses. \* denotes preliminary data.

**Table 3.3: Geographical Distribution of Cross-Border Holdings of Long-Term Debt Securities by Selected Regions (in millions of U.S. dollars)**

Host country Source country	2001					2009*				
	ASEAN + 3	Euro area	United States	United Kingdom	Total	ASEAN + 3	Euro area	United States	United Kingdom	Total
Hong Kong SAR	14,109	12,440	22,902	6,712	85,877	29,220	45,690	67,189	30,549	246,458
Indonesia	131	136	249	74	687	406	727	458	342	2,615
Japan	12,925	312,666	347,168	70,655	1,004,878	20,443	647,306	681,610	131,469	2,224,756
Korea, Rep. of	1,221	550	2,154	366	5,284	1,270	3,879	12,881	1,396	25,032
Macao SAR	652	440	263	145	2,123	1,579	1,628	863	581	6,247
Malaysia	122	89	115	34	551	2,352	626	728	237	6,493
Philippines	108	36	1,371	23	1,641	301	141	1,413	253	3,829
Singapore	9,251	10,125	11,269	2,487	41,960	33,474	17,693	24,188	10,296	120,999
Thailand	56	92	98	31	327	8,857	770	1,480	277	12,988
ASEAN + 3	38,575	336,574	385,589	80,527	1,143,328	97,902	718,460	790,810	175,400	2,649,417
	(3.4)	(29.4)	(33.7)	(7.0)	(100)	(3.7)	(27.1)	(29.8)	(6.6)	(100)
Euro area	39,262	1,469,099	321,153	156,713	2,436,391	104,216	5,768,443	1,053,812	866,270	9,201,505
	(1.6)	(60.0)	(13.2)	(6.4)	(100)	(1.1)	(62.7)	(11.5)	(9.4)	(100)
United States	40,528	145,001	....	80,868	555,358	70,420	401,966	--	240,252	1,570,340
	(7.3)	(26.1)		(14.6)	(100)	(4.5)	(25.6)		(15.3)	(100)
United Kingdom	64,074	268,529	160,994	--	667,303	49,249	815,470	532,626	--	1,815,134
	(9.6)	(40.2)	(24.1)		(100)	(2.7)	(44.9)	(29.3)		(100)

Source: IMF, Coordinated Portfolio Investment Survey; Author's calculation.

Note: -- indicates a zero value or a value less than US\$ 500,000, while .... indicates an unavailable datum. Regional allocation is in parentheses. \* denotes preliminary data.

**Table 3.4: Geographical Distribution of Cross-Border Holdings of Short-Term Debt Securities by Selected Regions (in millions of U.S. dollars)**

Host country Source country	2001					2009*				
	ASEAN + 3	Euro area	United States	United Kingdom	Total	ASEAN + 3	Euro area	United States	United Kingdom	Total
Hong Kong SAR	4,687	1,853	4,893	1,660	25,108	25,430	9,622	6,708	6,042	65,442
Indonesia	6	5	....	....	13	340	....	....	133	1,229
Japan	318	13,659	19,521	10,221	57,525	478	7,267	7,397	2,987	27,069
Korea, Rep. of	125	80	1,155	13	1,451	7	25	145	25	451
Macao SAR	33	24	3	--	176	343	161	54	42	666
Malaysia	4	10	25	353	397	51	4	317	3	411
Philippines	....	....	381	2	383	138	20	892	47	1,140
Singapore	7,732	3,986	708	10,966	31,962	12,771	11,209	17,190	26,960	72,386
Thailand	161	47	180	--	416	6,867	31	36	34	7,099
ASEAN + 3	13,066 (11.1)	19,664 (16.7)	26,866 (22.9)	23,215 (19.8)	117,431 (100)	46,425 (26.4)	28,339 (16.1)	32,739 (18.6)	36,273 (20.6)	175,893 (100)
Euro area	317 (0.1)	99,143 (33.6)	109,881 (37.2)	46,010 (15.6)	295,425 (100)	87,649 (7.8)	554,143 (49.3)	200,979 (17.9)	170,131 (15.1)	1,125,087 (100)
United States	973 (0.7)	35,078 (25.9)	....	82,093 (60.6)	135,578 (100)	8,414 (2.2)	95,156 (24.6)	--	156,334 (40.4)	387,229 (100)
United Kingdom	944 (1.2)	44,284 (56.5)	18,802 (24.0)	--	78,362 (100)	25,815 (19.4)	64,155 (48.3)	8,102 (6.1)	--	132,925 (100)

Source: IMF, Coordinated Portfolio Investment Survey; Author's calculation.

Note: -- indicates a zero value or a value less than US\$ 500,000, while .... indicates an unavailable datum. Regional allocation is in parentheses. \* denotes preliminary data.

**Table 3.5: Summary Statistics**

Variable	Obs.	Mean	Std. Dev.	Min	Max
Log of total bilateral asset holdings	3830	3.699284	3.329652	0	13.24829
Log of imports	3799	6.409784	2.270321	0	12.70091
Log of distance	3830	8.481064	0.637698	6.00351	9.403454
Common Language	3830	0.177285	0.381959	0	1
Colony	3830	0.013838	0.116834	0	1
Time zone difference	3830	5.895039	3.495036	0	15
APT dummy	3830	0.162663	0.369106	0	1
Correlation in growth rates – 5 year	3777	0.341684	0.488847	-0.98955	1
Log of GDP – host	3830	12.76331	1.399413	10.48737	15.37568
Financial center – host	3830	.2167102	.4120573	0	1
Size of private bond market/GDP – host	3519	.2492151	.2057127	.0043425	.6922473
Size of public bond market/GDP – host	3519	.4303117	.4015099	.0757536	1.722642
Size of stock market/GDP – host	3569	1.31681	1.402985	.0044496	7.425013
KAOPEN – host	3830	.7130527	1.387999	-1.14816	2.477618

**Table 3.6: Determinants of Total Bilateral Asset Holdings in APT Countries, Controlling for Source- and Host-Country Fixed Effects**

Explanatory Variable:	Panel FE	Panel FE	Tobit	Tobit
Log of imports	0.26*** (0.05)	0.21*** (0.05)	0.48*** (0.01)	0.42*** (0.07)
Log of distance		-0.85*** (0.25)		-1.01*** (0.31)
Common Language		0.12 (0.17)		-0.07 (0.18)
Colony		-0.39 (0.35)		-0.21 (0.18)
Time zone difference		-0.27** (0.04)		-0.003 (0.15)
APT		1.20** (0.59)		1.37 (2.15)
Correlation in growth rates – 5 year		0.31*** (0.07)		0.27*** (0.08)
Observations	3799	3777	3799	3777
No. of source countries	57	57	57	57
Adjusted R <sup>2</sup>	0.83	0.84		
Pseudo R <sup>2</sup>			0.38	0.38

Note: the dependent variable is the log of (1 + real total portfolio holdings). Intercepts are not reported. Robust standard errors (clustered by country-pairs dyads) are in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.

**Table 3.7: Determinants of Total Bilateral Asset Holdings in APT Countries, Controlling only for Source-Country Fixed Effects**

Explanatory Variable:	Panel FE	Panel FE	Tobit	Tobit
Log of imports	0.42*** (0.05)	0.08* (0.04)	0.62*** (0.07)	0.16*** (0.06)
Log of distance	-0.36 (0.28)	-0.81*** (0.23)	-0.45 (0.31)	-0.91*** (0.26)
Common Language	0.54** (0.22)	0.27* (0.14)	0.69*** (0.23)	0.33** (0.15)
Colony	-0.65 (0.62)	-0.10 (0.11)	-0.55 (0.58)	-0.02 (0.11)
Time zone difference	0.71*** (0.10)	-0.06 (0.10)	0.98*** (0.12)	0.07 (0.11)
APT	(dropped)	(dropped)	3.13*** (1.05)	7.89*** (1.73)
Correlation in growth rates – 5 year	0.56*** (0.08)	0.13** (0.06)	0.68*** (0.10)	0.13* (0.08)
Log of GDP – host		0.38*** (0.06)		0.43*** (0.06)
Financial center – host		0.64*** (0.17)		0.82*** (0.19)
Size of private bond market/GDP – host		1.02*** (0.24)		1.13*** (0.27)
Size of public bond market/GDP – host		1.05*** (0.17)		1.22*** (0.18)
Size of stock market/GDP – host		0.23*** (0.04)		0.29*** (0.04)
KAOPEN – host		0.06 (0.05)		0.05 (0.06)
Observations	3777	3369	3777	3369
No. of source countries	57	57	57	57
Adjusted R <sup>2</sup>	0.78	0.86		
Pseudo R <sup>2</sup>			0.31	0.40

Note: the dependent variable is the log of (1 + real total portfolio holdings). Intercepts are not reported. Robust standard errors (clustered by country-pairs dyads) are in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.

**Table 3.8: Determinants of Bilateral Portfolio Holdings in APT Countries for Selected Country Groups**

Explanatory Variable:	APT		The Euro area		Europe and North America		Middle East		South America	
	Panel FE	Tobit	Panel FE	Tobit	Panel FE	Tobit	Panel FE	Tobit	Panel FE	Tobit
Log of imports	0.21*	0.21*	0.11*	0.14*	0.12	0.12	0.22	0.18	0.10	0.35
	(0.11)	(0.11)	(0.06)	(0.08)	(0.08)	(0.08)	(0.26)	(0.32)	(0.10)	(0.28)
Log of distance	-0.66***	-0.68***	-0.93	-0.60	-0.54	-0.60	2.85	4.75	-0.59	-4.44
	(0.23)	(0.23)	(0.79)	(0.89)	(0.60)	(0.61)	(2.28)	(3.80)	(1.57)	(3.70)
Common Language	-0.17	-0.19	0.22	0.25	0.46***	0.46***	-1.06	-1.02	(dropped)	
	(0.24)	(0.24)	(0.16)	(0.16)	(0.16)	(0.16)	(0.64)	(0.83)		
Colony	(dropped)		0.05	0.16	-0.02	-0.02	(dropped)		(dropped)	
			(0.18)	(0.20)	(0.16)	(0.16)				
Time zone difference	0.07	0.09	0.53***	0.65***	0.25	0.24	-0.17	-0.48	0.23	1.10
	(0.22)	(0.23)	(0.14)	(0.16)	(0.19)	(0.20)	(0.56)	(0.93)	(0.26)	(0.68)
Correlation in growth rates – 5 year	-0.64***	-0.69***	0.22**	0.23**	0.29***	0.29***	0.17	0.22	0.20	0.61
	(0.16)	(0.17)	(0.11)	(0.12)	(0.09)	(0.09)	(0.23)	(0.31)	(0.16)	(0.41)
Log of GDP – host	0.10	0.09	0.34***	0.38***	0.57***	0.56***	0.12	0.37	0.09	0.32
	(0.09)	(0.09)	(0.10)	(0.11)	(0.12)	(0.12)	(0.46)	(0.65)	(0.14)	(0.34)
Financial center – host	2.16***	2.22***	0.09	0.12	0.62*	0.63*	1.52	2.97*	-0.36	0.13
	(0.49)	(0.50)	(0.35)	(0.39)	(0.36)	(0.35)	(0.97)	(1.51)	(0.44)	(1.16)
Size of private bond market/GDP – host	1.36***	1.35***	-0.22	-0.43	0.94*	0.96*	0.96	2.44	0.21	0.27
	(0.45)	(0.45)	(0.42)	(0.47)	(0.53)	(0.54)	(1.41)	(2.14)	(0.52)	(1.31)
Size of public bond market/GDP – host	1.07***	1.14***	0.92***	0.98***	1.08***	1.09***	1.08*	1.55**	0.83	1.53
	(0.35)	(0.37)	(0.23)	(0.25)	(0.27)	(0.27)	(0.55)	(0.74)	(0.58)	(0.95)
Size of stock market/GDP – host	0.33***	0.34***	0.24***	0.29***	0.27***	0.27***	0.22	0.24	0.22*	0.61***
	(0.08)	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)	(0.15)	(0.17)	(0.11)	(0.20)
KAOPEN – host	-0.30**	-0.31**	0.17	0.15	0.17*	0.17*	-0.31	-0.61	-0.05	-0.40
	(0.14)	(0.15)	(0.12)	(0.14)	(0.10)	(0.10)	(0.25)	(0.38)	(0.11)	(0.35)
Observation	552	552	916	916	607	607	185	185	363	363
No. of source countries	8	8	14	14	8	8	4	4	6	6
Adjusted R <sup>2</sup>	0.82		0.83		0.91		0.48		0.38	
Pseudo R <sup>2</sup>	0.35		0.36		0.51		0.20		0.25	

Note: the dependent variable is the log of (1 + real total portfolio holdings). Intercepts are not reported. Robust standard errors (clustered by country-pairs dyads) are in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.

**Table 3.9: Unstandardized and Standardized Estimates: The Beta Coefficients**

Explanatory Variable:	APT		The Euro area		Europe and North America		Middle East		South America	
	Panel FE	Beta	Panel FE	Beta	Panel FE	Beta	Panel FE	Beta	Panel FE	Beta
Log of imports	0.21*	0.10	0.11*	0.07	0.12	0.10	0.22	0.18	0.10	0.12
	(0.11)		(0.06)		(0.08)		(0.26)		(0.10)	
Log of distance	-0.66***	-0.11	-0.93	-0.05	-0.54	-0.04	2.85	0.23	-0.59	-0.03
	(0.23)		(0.79)		(0.60)		(2.28)		(1.57)	
Common Language	-0.17	-0.03	0.22	0.02	0.46***	0.08	-1.06	-0.30	(dropped)	
	(0.24)		(0.16)		(0.16)		(0.64)			
Colony	(dropped)		0.05	0.002	-0.02	-0.002	(dropped)		(dropped)	
			(0.18)		(0.16)					
Time zone difference	0.07	0.02	0.53***	0.16	0.25	0.24	-0.17	-0.08	0.23	0.14
	(0.22)		(0.14)		(0.19)		(0.56)		(0.26)	
Correlation in growth rates – 5 year	-0.64***	-0.10	0.22**	0.04	0.29***	0.05	0.17	0.05	0.20	0.06
	(0.16)		(0.11)		(0.09)		(0.23)		(0.16)	
Log of GDP – host	0.10	0.05	0.34***	0.15	0.57***	0.26	0.12	0.09	0.09	0.08
	(0.09)		(0.10)		(0.12)		(0.46)		(0.14)	
Financial center – host	2.16***	0.32	0.09	0.01	0.62*	0.09	1.52	0.38	-0.36	-0.09
	(0.49)		(0.35)		(0.36)		(0.97)		(0.44)	
Size of private bond market/GDP – host	1.36***	0.10	-0.22	-0.02	0.94*	0.07	0.96	0.11	0.21	0.03
	(0.45)		(0.42)		(0.53)		(1.41)		(0.52)	
Size of public bond market/GDP – host	1.07***	0.14	0.92***	0.13	1.08***	0.15	1.08*	0.28	0.83	0.21
	(0.35)		(0.23)		(0.27)		(0.55)		(0.58)	
Size of stock market/GDP – host	0.33***	0.16	0.24***	0.12	0.27***	0.13	0.22	0.19	0.22*	0.19
	(0.08)		(0.06)		(0.06)		(0.15)		(0.11)	
KAOPEN – host	-0.30**	-0.14	0.17	0.08	0.17*	0.08	-0.31	-0.24	-0.05	-0.04
	(0.14)		(0.12)		(0.10)		(0.25)		(0.11)	
Observation	552		916		607		185		363	
No. of source countries	8		14		8		4		6	
Adjusted R <sup>2</sup>	0.82		0.83		0.91		0.48		0.38	
Pseudo R <sup>2</sup>										

Note: the dependent variable is the log of (1 + real total portfolio holdings). Intercepts are not reported. Robust standard errors (clustered by country-pairs dyads) are in parentheses. \*\*\*, \*\*, and \* denote 1%, 5%, and 10% level significance, respectively.



**Appendix Table A3.1: Countries in Sample**

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Argentina	Greece	Philippines *
Australia	Hong Kong SAR of China *	Poland
Austria	Hungary	Portugal
Barbados	Iceland	Romania
Belgium	India	Russian Federation
Brazil	Indonesia *	Singapore *
Bulgaria	Ireland	Slovak Republic
Canada	Israel	Slovenia
Chile	Italy	South Africa
China *	Japan *	Spain
Colombia	Kazakhstan	Sweden
Costa Rica	Korea, Republic of *	Switzerland
Czech Republic	Kuwait	Thailand *
Denmark	Latvia	Turkey
Egypt	Malaysia *	Ukraine
Estonia	Mexico	United Kingdom
Finland	Netherlands	United States
France	New Zealand	Uruguay
Germany	Norway	Venezuela
Gibraltar	Pakistan	Vietnam *

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Note: \* denotes the host countries in the sample. All countries in the sample are included in the regression as the source countries except China and Vietnam because these two nations do not currently participate in the survey.

## **CHAPTER FOUR**

### **Concluding Remarks**

While it seems clear that ASEAN member states have benefited from trade liberalization under the ASEAN PTA and AFTA frameworks, this is not the case for all industries. The empirical evidence here illustrates that the formation of the RTAs among ASEAN countries has generated a substantial increase in intra-regional trade in manufactured (i.e., differentiated and reference-priced) products. However, the lack of strong evidence makes it difficult to conclude whether homogeneous (i.e., agricultural raw material and unprocessed) products have actually gained from the RTAs.

This evidence should serve as a reminder that assessing the impact of RTAs on intra-regional trade at the aggregate level alone can lead to misinterpretation if the degree of trade liberalization is widely different across product categories. The recent process of trade liberalization among ASEAN member states is a good example. While the agreement on the CEPT scheme for AFTA consisted of all manufactured products, agricultural raw materials and unprocessed products have usually been subjected to “a waiver of any concession.” Under such circumstances, the formation of RTAs indeed played different roles in redirecting trade flows across product types since the degree of trade liberalization was different, and thus should be examined across each industry separately.

In emerging-market economies, trade diversion is less likely to occur, compared to the trading blocs between developed countries. This is because the trade-

creating effects resulting from the rapid economic growth tend to counterbalance the initial trade diversion effects on non-member states over the long run. This perception is supported by the empirical evidence here that while trade diversion took place in the EU and NAFTA, the phenomenon did not exist in ASEAN and MERCOSUR economies for all product categories. After all, it can be shown that the establishment of the RTAs between emerging-market countries has unambiguously improved world welfare, regardless of the product category.

The empirical findings on the determinants of bilateral trade flows also reinforce the existing literature in two respects. First, the analysis of the nature of the home market effect emphasizes that the home market effect tends to vary systematically across product categories; i.e., the home market effect is found to exist in differentiated and reference-priced products while the effect is reversed for homogeneous products. Second, the results indicate that similarity of demand structures between a pair of countries plays a significant role in determining the trading patterns in differentiated products, while weak evidence of the Linder hypothesis implies that the conjecture should not apply to homogeneous products. Despite that, however, neither the home market effect nor the Linder effect is found to exist robustly within the East Asian region.

It should be noted here that although the analysis of trade patterns at the product level provides a great deal of insightful information, the lack of bilateral trade data from 2000 onwards has limited our assessment in some respects. As mentioned in Chapter 1, the past decade has seen the rapid proliferation of RTAs as well as a surge in intra-regional trade in the East Asian region. However, because of the limited

dataset, the impact of the recent RTAs on intra- and extra-regional trade in each product category cannot be examined. In addition, it is likely that the recent economic cooperation in East Asia, especially in the context of the AEC framework, will play a major role in transforming the region into a more integrated area of free movement of goods, service, and investment. This development would enable transnational cooperation to fully exploit their competitive advantages and economies of scale. In this regard, the nature of the home market effect could become more pronounced in explaining the patterns of trade across the region. Unfortunately, the lack of trade data prevents us from testing the home market effect in the aftermath of the East Asian financial crises. Once the bilateral trade data at the product level are readily available, of course, these issues will be particularly interesting areas for future research.

Another lesson we have learned from the experiment is that the regional trade integration not only generated a surge in intra-regional trade, but also played an indirect role in encouraging the regional financial integration in East Asia. This positive correlation between bilateral trade and portfolio holdings can be explained through several mechanisms. On the one hand, widening and deepening trade collaboration in the region helped reduce the degree of asymmetric information through some form of familiarity effects, spurring the cross-border portfolio investments. On the other hand, holding the financial securities issued by a resident of neighboring countries can be exploited to hedge against consumption risk from importation due to country-specific shocks in that economy (Lane and Milesi-Ferretti, 2004).

Along with the importance of the bilateral factors, the results show that the country-specific characteristics in host countries also played an essential role in attracting international portfolio investments. In particular, the development of the public bond markets and stock markets in East Asia has turned out to be one of the key driving forces in encouraging foreign portfolio investment from most parts of the world.

Ever since the East Asian financial crises of the late 1990s, there has been remarkable progress in the development of the capital markets and regional financial integration in East Asia. Above all, the region had learned several lessons from these crises. Some critics have argued that the failure of financial regulation and supervision indeed played a crucial role in triggering the crises and suggested that the financial regulatory system in the region must be reformed. While there is some truth to this, it is also clear that the financial crises in some countries could have been limited or even prevented if East Asian regional cooperation to manage the crisis had been in place. A key lesson from the crises is, therefore, the need to strengthen regional collaboration to manage financial contagion and other external shocks in times of crisis.

Over the years, the processes of capital market development and regional financial cooperation in East Asia have been moving ahead. Several indicators demonstrating these improvements include a substantial increase in market capitalization as well as the ratio of market capitalization to GDP, improved capital market infrastructure, and improved financial regulation and supervision. In terms of regional cooperation, East Asian countries have agreed to establish two main regional

initiatives -- the Asian Bond Markets Initiative (ABMI) and the Chiang Mai Initiative Multilateralization (CMIM). The former is designed to bolster liquidity and efficiency of the domestic bond markets in the region while the latter aims at providing financial support for member states in times of liquidity difficulties.

Despite substantial improvement, it is clear that further efforts are required to ensure sustainable development of the capital market and deeper regional financial integration. In this dissertation, it is found that capital market development can deepen financial integration in East Asia. Thus, policymakers should implement policies that help develop bigger and well-functioning equity and bond markets. These priority areas include (1) increasing the variety of the financial products in the markets and (2) developing sound market institutions and infrastructures. Greater financial product variety would allow investors to allocate financial resources more efficiently, while the development of sound market institutions will help reduce price fluctuations, making the markets more stable. Furthermore, asymmetric information tends to deter cross-border portfolio investment; therefore, policymakers should also implement policies that help improve the information flows to international portfolio investors. A larger conduit for information transmission would reduce the degree of information asymmetry, encouraging cross-border portfolio investment.

The general consensus seems to be that the lack of liquidity in the East Asian capital markets is one reason why international portfolio investors invest so little in East Asia. Despite that, however, there is no empirical evidence using the CPIS dataset to support this.<sup>51</sup> Therefore, further studies on the determinants of cross-border portfolio holdings in East Asia should also pay attention to the role of market

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<sup>51</sup> One exception is the work of García-Herrero et al. (2009).

liquidity. Once the empirical evidence becomes clear, policy implications on this point can be deduced.

## REFERENCES

- Aitken, Norman D.** 1973. "The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis." *American Economic Review*, 63(5): 881-892.
- Anderson, James E. and Eric van Wincoop.** 2003. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review*, 93(1): 170-192.
- Arndt, Sven W.** 2001. "Production Networks in an Economically Integrated Region." *ASEAN Economic Bulletin*, 18(1): 24-34.
- Arnon, A. and J. Weinblatt.** 1998. "Linder's Hypothesis Revisited: Income Similarity Effects for Low Income Countries." *Applied Economics Letters*, 5(10): 607-611.
- Balli, Faruk, Rosmy J. Louis, and Mohammad A. Osman.** 2009. "International Portfolio Inflows to GCC Markets: Are there any General Patterns?" *Review of Middle East Economics and Finance*, 5(2): 3.
- Baltagi, Badi H., Peter Egger, and Michael Pfaffermayr.** 2003. "A Generalized Design for Bilateral Trade Flow Models." *Economics Letters*, 80(3): 391-397.
- Baxter, Marianne and Michael A. Kouparitsas.** 2004. "Determinants of Business Cycle Comovement: A Robust Analysis." National Bureau of Economic Research Working Paper 10725.
- Bergstrand, Jeffrey H.** 1990. "The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade." *The Economic Journal*, 100(403): 1216-1229.
- Brandt, Michael W., John H. Cochrane, and Pedro Santa-Clara.** 2006. "International Risk Sharing is Better than You Think, Or Exchange Rates are Too Smooth." *Journal of Monetary Economics*, 53(4): 671-698.
- Brennan, Michael J. and Henry H. Cao.** 1997. "International Portfolio Investment Flows." *Journal of Finance*, 52(5): 1851-1880.
- Chinn, Menzie D. and Hiro Ito.** 2008. "A New Measure of Financial Openness." *Journal of Comparative Policy Analysis*, 10(3): 309-322.
- Choi, Changkyu.** 2002. "Linder Hypothesis Revisited." *Applied Economics Letters*, 9(9): 601-605.



- Cuyvers, Ludo, Philippe De Lombaerde, and Stijn Verherstraeten.** 2005. "From AFTA Towards an ASEAN Economic Community and Beyond." Centre for ASEAN Studies Discussion paper 46.
- Dalgin, Muhammed, Devashish Mitra, and Vitor Trindade.** 2004. "Inequality, Nonhomothetic Preferences, and Trade: A Gravity Approach." National Bureau of Economic Research Working Paper 10800.
- Davis, Steven J., Jeremy Nalewaik, and Paul Willen.** 2000. "On the Gains to International Trade in Risky Financial Assets." National Bureau of Economic Research Working Paper 7796.
- De Santis, A. Roberto, and Sarna. Lucio.** 2008. *Assessing the Benefits of International Portfolio Diversification in Bonds and Stocks*. Frankfurt am Main, Germany: European Central Bank.
- Deardorff, Alan V.** 1995. "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?" National Bureau of Economic Research Working Paper 5377.
- Dee, Philippa and Jyothi Gali.** 2003. "The Trade and Investment Effects of Preferential Trading Arrangements." National Bureau of Economic Research Working Paper 10160.
- Driessen, Joost and Luc Laeven.** 2007. "International Portfolio Diversification Benefits: Cross-Country Evidence from a Local Perspective." *Journal of Banking & Finance*, 31(6): 1693-1712.
- Eichengreen, Barry and Pipat Luengnaruemitchai.** 2006. "Bond Markets as Conduits for Capital Flows: How does Asia Compare?" International Monetary Fund Working Paper 06/238.
- . 2004. "Why Doesn't Asia have Bigger Bond Markets?" National Bureau of Economic Research Working Paper 10576.
- Eichengreen, Barry and Yung C. Park.** 2003. "Why has there been Less Financial Integration in Asia than in Europe?" Institute of European Studies Working Paper 4679.
- Eicher, Theo S., Christian Henn, and Chris Papageorgiou.** 2008. "Trade Creation and Diversion Revisited: Accounting for Model Uncertainty and Natural Trading Partner Effects." International Monetary Fund Working Paper 08/66.
- Elliott, Robert J. R. and Kengo Ikemoto.** 2004. "AFTA and the Asian Crisis: Help or Hindrance to ASEAN Intra-Regional Trade?" *Asian Economic Journal*, 18(1): 1-23.

- Evenett, Simon J. and Wolfgang Keller.** 1998. "On Theories Explaining the Success of the Gravity Equation." National Bureau of Economic Research Working Paper 6529.
- Faruqee, Hamid, Shujing Li, and Isabel K. Yan.** 2004. "The Determinants of International Portfolio Holdings and Home Bias." International Monetary Fund Working Paper 04/34.
- Feenstra, Robert C., James R. Markusen, and Andrew K. Rose.** 2001. "Using the Gravity Equation to Differentiate among Alternative Theories of Trade." *Canadian Journal of Economics*, 34(2): 430-447.
- Feenstra, Robert C., Robert E. Lipsey, Haiyan Deng, Alyson C. Ma, and Hengyong Mo.** 2005. "World trade Flows: 1962 -2000." National Bureau of Economic Research Working Paper 11040.
- French, Kenneth R., and James M. Poterba.** 1991. "Investor Diversification and International Equity Markets." National Bureau of Economic Research Working Paper 3609.
- Froot, Kenneth A., Paul G. J. O'Connell, and Mark S. Seasholes.** 2001. "The Portfolio Flows of International Investors." *Journal of Financial Economics*, 59(2): 151-193.
- García-Herrero, Alicia, Philip Wooldridge, and Doo Yong Yang.** 2009. "Why Don't Asians Invest in Asia? The Determinants of Cross-Border Portfolio Holdings." *Asian Economic Papers*, 8(3): 228-246.
- Gehrig, Thomas.** 1993. "An Information Based Explanation of the Domestic Bias in International Equity Investment." *The Scandinavian Journal of Economics*, 95(1): 97-109.
- Gerard, Bruno, Pierre Hillion, and Frans de Roon.** 2002. "International Portfolio Diversification: Industry, Country, and Currency Effects Revisited." *Unpublished manuscript*.
- Ghosh, Sucharita and Steven Yamarik.** 2004. "Are Regional Trading Arrangements Trade Creating?: An Application of Extreme Bounds Analysis." *Journal of International Economics*, 63(2): 369-395.
- Gilbert, John, Robert Scollay, and Bijit Bora.** 2001. *Assessing Regional Trading Arrangements in the Asia-Pacific*. Policy Issues in International Trade and Commodities Study Series 15. Geneva: United Nations.

- Gordon, Roger H. and A. L. Bovenberg.** 1996. "Why is Capital so Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation." *American Economic Review*, 86(5): 1057-1075.
- Grubel, Herbert G.** 1968. "Internationally Diversified Portfolios: Welfare Gains and Capital Flows." *American Economic Review*, 58(5): 1299-1314.
- Imbs, Jean.** 1999. "Co-fluctuations." CEPR Discussion Paper 2267.
- Hallak, Juan Carlos.** 2006. "A Product-Quality View of the Linder Hypothesis." National Bureau of Economic Research Working Paper 12712.
- Hanson, Gordon H. and Chong Xiang.** 2002. "The Home Market Effect and Bilateral Trade Patterns." National Bureau of Economic Research Working Paper 9076.
- Hossain, Md Zakir, M. Ishaq Bhatti, and Md Zulficar Ali.** 2004. "An Econometric Analysis of some Major Manufacturing Industries: A Case Study." *Managerial Auditing Journal*, 19(6): 790-795.
- Kaminsky, Graciela and Sergio Schmukler.** 2003. "Short-Run Pain, Long-Run Gain: The Effects of Financial Liberalization." National Bureau of Economic Research Working Paper 9787.
- Kreinin, Mordechai E.** 1964. "On the Dynamic Effects of a Customs Union." *The Journal of Political Economy*, 72(2): 193-195.
- Krueger, Anne O.** 2000. "NAFTA's Effects: A Preliminary Assessment." *The World Economy*, 23(6): 761-775.
- Krugman, Paul R.** 1993. Regionalism versus Multilateralism: Analytical Notes, in Jaime De Melo and Arvind Panagariya (eds.), *New Dimensions in Regional Integration*. Cambridge: World Bank and Cambridge University Press (1993): 58-79.
- 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade." *American Economic Review*, 70(5): 950-959.
- Lane, Philip and Gian M. Milesi-Ferretti.** 2005. "The International Equity Holdings of Euro Area Investors." Institute for International Economics Discussion Paper 104.
- 2004. "International Investment patterns." International Monetary Fund Working Paper 04/134.

- Lawrence, Robert Z.** 1996. *Regionalism, Multilateralism, and Deeper Integration*. Washington, DC: Brookings Institution Press.
- Lee, Jong-Wha.** 2008. "Patterns and Determinants of Cross-Border Financial Asset Holdings in East Asia." Working Papers on Regional Economic Integration 13.
- Magee, Christopher S. P.** 2008. "New Measures of Trade Creation and Trade Diversion." *Journal of International Economics*, 75(2): 349-362.
- Martinez-Zarzoso, Inmaculada.** 2003. "Gravity Model: An Application to Trade between Regional Blocs." *Atlantic Economic Journal*, 31(2): 174-187.
- Naya, Seiji F.** 2004. "Japan in Emerging East Asian Regionalism." *East Asian Economic Perspectives*, 15(2): 1-16.
- Obstfeld, Maurice and Kenneth Rogoff.** 2000. "The Six Major Puzzles in International Macroeconomics. Is There a Common Cause?" National Bureau of Economic Research Working Paper 7777.
- Piermartini, Roberta and Robert R. Teh.** 2005. *Demystifying Modelling Methods for Trade Policy*: World Trade Organization.
- Portes, Richard and Hélène Rey.** 2005. "The Determinants of Cross-Border Equity Flows." *Journal of International Economics*, 65(2): 269-296.
- , 2000, "The Determinants of Cross-Border Equity Flows: The Geography of Information." Center for International and Development Economics Research, Working Paper Series 175.
- Portes, Richard, Hélène Rey, and Yonghyup Oh.** 2001. "Information and Capital Flows: The Determinants of Transactions in Financial Assets." *European Economic Review*, 45(4-6): 783-796.
- Rauch, James E.** 1999. "Networks Versus Markets in International Trade." *Journal of International Economics*, 48(1): 7-35.
- Reyes, Romeo A.** 2004. "The ASEAN Model of Economic Integration." *The Jakarta Post*, July, 19.
- Rose, Andrew K.** 2000. "One Market, One Money: Estimating the Effect of Common Currencies on Trade." *Economic Policy*, 30(1): 7-45.
- Rose, Andrew K. and Mark M. Spiegel.** 2009. "The Olympic Effect." National Bureau of Economic Research Working Paper 14854.

- , 2002. "A Gravity Model of Sovereign Lending: Trade, Default and Credit." National Bureau of Economic Research Working Paper 9285.
- Rowland, Patrick F. and Linda L. Tesar.** 2004. "Multinationals and the Gains from International Diversification." *Review of Economic Dynamics*, 7(4): 789-826.
- Silva, J. M. C. Santos and Silvana Tenreyro.** 2006. "The Log of Gravity." *The review of economics and statistics*, 88(4): 641-658.
- Thornton, John and Alessandro Goglio.** 2002. "Regional Bias and Intra-Regional Trade in Southeast Asia." *Applied Economics Letters*, 9(4): 205-208.
- Viner, Jacob.** 1950. *The Customs Union Issues*, Reprint. Originally Published: Washington, D.C: Anderson Kramer Associates, 1961.
- Warnock, Francis E.** 2002. "Home Bias and High Turnover Reconsidered." *Journal of International Money and Finance*, 21(6): 795-805.
- Yu, Eden S. H.** 1981. "Trade Diversion, Trade Creation and Factor Market Imperfections." *Review of World Economics*, 117(3): 546-561.