THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT
AND THE MACRO ECONOMY

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In this thesis, I first investigate the relation between the aggregate unemployment rate and foreign direct investment (FDI) inflows and outflows. To study this relationship, I use a panel data set that contains 45 (developed and developing) countries observed from 1987 through 2008, and I employ Arellano and Bond’s generalized methods of moments (ABGMM) estimation method for dynamic panel data. My results show that FDI inflows and outflows are not determinants of the aggregate unemployment rate. In addition, in line with macroeconomic theory, the previous level of aggregate unemployment has a positive impact on the current level of aggregate unemployment. Again, as macroeconomic theory suggests, my results show that per capita real gross domestic product (RGDP) has a negative effect on the current level of aggregate unemployment.

Second, I study the long-run relationship between exports and per capita gross domestic product (instrumented by total population) using a panel data set of 51 countries from 1970 through 2008. To study this relationship, I employ the dynamic ordinary least squares (DOLS) estimation method. I find that the percentage of exports in nominal gross domestic products (GDP) is sensitive to changes in the populations of host countries and, hence, to the changes in their GDP. In addition, my results show that the agreement on trade related investment measures increased the percentage of exports in the nominal GDP of developed host countries more than it did in developing host countries.
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CHAPTER 1
INTRODUCTION

The effect of foreign direct investment (FDI) on various macroeconomic variables in countries receiving FDI (host countries) has been hotly debated in the literature. Some researchers find very minimal, insignificant or only regionally significant spillover effects of FDI on many macroeconomic indicators such as economic growth, imports and exports, technology transfer, and human capital (see Agosin & Mayer, 2000; Saggi, 2002; Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004; and Adams, 2009; for example). On the other hand, some researchers find that FDI is very significant at improving various economic variables in host countries (see Organization for Economic Cooperation and Development (OECD) 2002, for example). Since this issue is, as of yet, unresolved, it would be interesting and informative to provide a comprehensive analysis of the impact of FDI on macroeconomic variables such as unemployment rates and exports.

The purpose of this research is to analyze the effect of FDI in two settings. The first setting explores the effects of FDI inflows and outflows on aggregate unemployment rates in host countries using a dynamic panel data model. The motivation for the use of a dynamic model in this setting is the belief that unemployment rates likely are “state dependent.” That is, once an individual becomes unemployed, they often tend to get “stuck” in this state. The dynamic model accounts for this type of behavior. In the first setting, I also analyze the effect of the Asian financial crisis (AFC) of 1997 on aggregate unemployment rates in host countries.

In the second setting, I first investigate the effects of FDI inflows and outflows on exports in host countries and the impact of the agreement on trade related investment measures (TRIM)
on exports in host countries. This leads to an investigation of the long-run relationship between exports in host countries and nominal GDPs in those countries.

This research is important because it provides information for host countries in both the developing and developed world on how FDI can be used more effectively to reduce aggregate unemployment rates. This research also provides valuable information about how the exports of host countries react to FDI inflows and outflows, and how the agreement on TRIM affected exports. In this way, host countries will have the knowledge they need to adjust their FDI policies so that they can improve their exports and, hence, their current account balances.

The structure of the rest of my thesis is as follows. The next section provides background information on FDI inflows and outflows, the AFC of 1997, and the agreement on TRIM. Section 3 provides a description of the two research questions that comprise this thesis. Section 4 provides a review of the existing literature on FDI and its relationship with aggregate unemployment rates and exports in host countries. Section 5 provides a description of the data used in this analysis. Section 6 provides the regression models and explains the econometric methodology that was employed. Section 7 provides the results of estimation and auxiliary tests, and section 8 presents my concluding remarks, research limitations, and suggestions for future research to improve upon this study.
CHAPTER 2

BACKGROUND

Foreign direct investment (FDI) is an investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. FDI inflows are investments into a country from the rest of the world less disinvestment (retrenchment or downsizing operations realized by foreign investors in that same country). FDI outflows are investments from a country to the rest of the world (World Bank, 2011).

The Asian financial crisis (AFC) of 1997 was a global economic crisis that started due to the shortage of foreign exchange reserves in Indonesia, South Korea, and Thailand. The crisis then spread to other Asian countries such as Brunei, China, Hong Kong, India, Laos, Malaysia, the Philippines, Singapore, and Taiwan. This crisis subsequently affected other countries such as Brazil, Japan, and the US. In most of Southern Asia in 1997, the foreign reserve shortage caused severe instability first in the values of local currencies that were pegged against the US dollar (or against a basket of major trading countries’ currencies) and then in the values of local currencies that were floating. This resulted in a drastic depreciation of local currencies in floating exchange regimes and a devaluation of local currencies in pegged exchange regimes against major foreign currencies like the US dollar. The response of the initially infected economies was to sell available foreign reserves to the market, which resulted in the flow of money from the market to the central banks of the affected economies, resulting in a shrinkage of the money supply in the local currencies of those economies. This shrinkage naturally made the local currencies more valuable and more attractive to invest in, in the short-run. This resulted in an increase in the local
interest rates of those economies (Krugman & Obstfeld, 2003). The increased interest rates were believed to trigger the demand for highly depreciated or devaluated local currencies, then to restore the value of assets in the infected economies, and finally to increase the volume of net investments in those infected economies. However, the rising interest rates bounced back and resulted in a decrease in the volume of net investments into those economies. This also led to more severe economic problems such as economic stagnation (minimal economic growth). Since countries like the US and Japan were major investors in the crisis region, and the value of those currencies were highly appreciated against the currencies of the infected countries, the exports of major investing countries dropped significantly, and their stock markets were hit hard. In short, the other world economies felt the crisis by either increased trade deficits or decreased growth rates (Congressional Research Service-CRS Report, 1998). The AFC had serious effects on many economies’ growth rates, which are negatively correlated with aggregate unemployment rates. As such, it is worth exploring the effect of FDI inflows and outflows and the AFC on aggregate unemployment rates.

The agreement on trade related investment measures (TRIM), which came into existence in 1995, encompasses the elimination of a broad range of performance requirements and incentives that governments may place on foreign investors (United Nations Conference on Trade and Development-UNCTAD, 2007). Many developed countries believe that portions of this agreement resulted in restrictive trade rules that foster non-competitive market behavior, leading to imperfect markets that suffer from inefficient utilization of local and global resources in host countries (see Bhagwati, 1988 and Richardson, 1989). As a result, many developed countries have been in favor of eliminating the restrictive rules of TRIM, such as local content requirements stipulating a certain percentage of usage of local inputs into the production process.
On the other hand, many developing countries have fought against eliminating such rules from TRIM because they can use TRIM to design policies to promote their exports, improve their trade balances by reducing imports, create jobs, and realize technology transfers (UNCTAD, 2007). Thus, the effect of the agreement on TRIM on host economies warrants further study.
CHAPTER 3

STATEMENT OF THE PROBLEMS

In 2010, the United Nations Conference on Trade and Development (UNCTAD) announced that it expected the total volume of foreign direct investment (FDI) inflows in 2010 to exceed $1.2 trillion (UNCTAD, 2010). Despite such a great volume, the impact of FDI inflows and outflows on host economies still is in question, and there are many conflicting views about this subject. Moreover, the impact of FDI inflows and outflows on host economies becomes even harder to predict when one considers factors beyond country-specific variables, such as the Asian Financial Crisis (AFC) of 1997 and the agreement on Trade Related Investment Measures (TRIM). As a result, my thesis addresses the following research questions:

1. What is the effect of FDI inflows and outflows on aggregate unemployment rates in the host countries, and, can FDI be used as an effective tool for reducing aggregate unemployment rates in these countries? In addition, how were aggregate unemployment rates affected, if at all, by the AFC of 1997, and, was there any interaction between this event and FDI inflows when considering the effect of FDI inflows on aggregate unemployment rates in host countries?

2. What is the effect of FDI inflows and outflows on exports in host countries, and, what was the effect of the agreement on TRIM, if any, on the exports of host countries? Is the effect of the agreement on TRIM, if any, different for host countries in the developing world?
CHAPTER 4
LITERATURE REVIEW

4.1 The First Question

This subsection presents a review of the existing literature on the relationship between foreign direct investment (FDI) and unemployment rates in host countries. I use these existing studies to form the framework of my analysis and to choose the regressors that are thought to be relevant for my models.

The effect of FDI on host economies often has been a subject of debate. Although recent research attempts to study the effects of FDI on host economies, empirical and theoretical results are conflicting. Some studies (Chang, 2007; Asiedu, 2004; and Yabuuchi, 1999) state that FDI can stimulate economic development through positive economic spillover effects (e.g. new technologies, capital formation, enhancement of human capital, employment creation, and expanded international trade). On the other hand, some studies find that FDI offsets economic growth and decreases employment rates in host countries or, at best, has no obvious effect on unemployment rates (see Chang, 2005).

In the literature, the views about the impact of FDI on host economies are divided into two camps: the unconditional view and the conditional view. The former investigates the pure effects of FDI on host economies and assumes that FDI is, by itself, a determining factor of many macroeconomic variables, including unemployment. The latter analyzes the effects of FDI on host economies and argues that FDI might improve host economies through its positive spillover effects if certain economic conditions (e.g. certain levels of technological development and infrastructural development) are satisfied.
Both unconditional and conditional studies that analyze the effect of FDI on indicators of economic development find unclear and conflicting results. For example, Lichtenberg and Potterie (2001), supporters of the unconditional view, find zero or even negative correlations between FDI and growth, which implies a positive relationship between FDI and unemployment due to Okun’s law. However, some other researchers supporting the same view find positive unconditional effects of FDI on growth, which implies a negative relationship between FDI and unemployment (see Haddad & Harrison, 1993 and Blomstrom, Lipsey, & Zejan, 1992).

Economic conditions mentioned in the conditional view of FDI are elements of absorptive capacity factors. Absorptive capacity refers to the host country’s ability to absorb FDI and to reap its direct benefits (such as increased growth rates and capital formation) and indirect benefits (such as technology transfer and increased trade) through its spillover effects (United Nations Conference on Trade and Development-UNCTAD, 2007). The empirical literature contains many studies showing that the effects of FDI on host economies depend on their absorptive capacities. Absorptive capacity can be divided into four factors: human capital quality, the level of technology development, the level of infrastructure development, and the degree of trade openness (see Massaud, 2008 and Todoroski, 2008). However, the existing literature emphasizes more the level of technology development and the level of infrastructure development.

Although the majority of the existing research that incorporates the level of technology gap in host economies argues that those host economies benefit from positive spillovers of FDI, there are some studies that find the opposite result. Two important studies are Massaud (2008) and Krogstrup and Matar (2005). Krogstrup and Matar (2005) argue that, if the technology gap between host countries and home countries (countries from which FDI comes) is too big, the
positive externalities of FDI do not spread to host economies. Li and Liu (2005) study the effects of FDI (considering the level of technology gap) on host economies using a panel of 84 host countries over the period from 1970 to 1999. This study employs estimation techniques applied to single and simultaneous equations and finds FDI to be growth enhancing in relatively high-income host countries. That is, the lower the level of technological development of a host country, the more negative the impact of FDI on growth. This study even determines a threshold value of 12.6 for the technology gap, above which FDI is not very beneficial for a developing host economy (see Li & Liu, 2005 page 402 for more detail). That is, if the size (in terms of nominal GDP) of the US economy is, say, 13.6 times the size of a host economy classified as “developing,” FDI loses its power in generating benefits for that host economy.

Massaud (2008) analyzes the effect of FDI inflows into Egypt over the period from 1974 to 2005 and uses both random effects and fixed effects panel data models, with and without an interaction term between the technology gap and FDI inflows. This study concludes that FDI inflows have an insignificant effect on the demand for labor although FDI inflows have a negative impact on the demand for labor if it interacts with the technology gap. Sadik and Bolbol (2001) investigate the effect of FDI through technology spillovers for six developing host countries in the Middle East and Northern Africa over a 20-year period. This study finds that FDI does not have any significant positive spillover effects on productivity and growth. On the other hand, this study shows that FDI crowds out the positive impacts of domestic investment on the productivity and growth of a home country. UNCTAD (2007) provides similar results with a different reasoning. The report argues that, irrespective of the technology levels in host countries, there is a negative effect of FDI on African host countries, and this results from a lack of competition, insufficient regulation, and the shortage of investment incentives. The analysis
reasons that those deficiencies lead to monopolistic structures in host economies, which forces local entrepreneurs out of business and results in higher unemployment rates.

In the above paragraph, I presented empirical evidence for and against the positive spillover effects of FDI on host countries in the developing world, conditional on the level of technology available in those host countries. However, the situation is not different in studies that focus on host countries in the developed world. For example, Seyf (2000) studies the relationship between FDI and jobs in the European Union (EU) by using a sample of 401 Japanese firms in four EU countries (UK, Germany, France, and Spain) in a simple linear regression model. This study finds that FDI’s impact on job creation is very minimal in these developed countries but, nonetheless, insists that the FDI option must be re-examined when considering policies aimed at reducing unemployment in the EU. Glickman and Woodward (1989), Bornschier and Dunn (1985), and UNCTAD (1994) also find results in line with the view of Seyf (2000). On the other hand, Baldwin (1994) presents evidence in favor of the positive spillover effect of FDI in OECD countries conditional on the level of technology.

The other absorptive capacity factor, in addition to the level of technological development, is the level of infrastructure development. The economic literature indicates that the level of infrastructure development is of crucial importance for a host country to benefit from the positive spillover effects of FDI, such as decreased unemployment rates, because the deficiency of infrastructure development in host countries can impede foreign firms from enlarging their distributive network and strengthening their connections with domestic market retailers. In line with this view, Aschauer (1997b and 1997c) shows that public capital (a proxy variable for level of infrastructure development) has a positive relationship with output and employment growth. This study specifically finds that one standard deviation increase in general
public capital increases output growth by about 1.6 percent per year and employment growth by 0.5 percent per year, all other factors constant. Moreover, Kenyon (1997) also supports the significance of the relationship between infrastructure development and unemployment. This study finds that spending on core infrastructure is very influential in private sector performance and investment because it generates positive network externalities like transport and communications systems, sewage systems and so forth, and these externalities facilitate labor mobility and allow firms to hire more workers by decreasing operational costs of production.

The theory of human capital reinforces the appropriateness of including a lagged dependent variable in an equation modeling unemployment rates. This theory argues that unemployed workers lose the opportunity to maintain and update their skills by not working. Particularly for the long term unemployed, the atrophy of skills may combine with disaffection from the labor force associated with the inability to find a job to extend unemployment into the future (Blanchard & Summers, 1986). Heap (1980) and Jimeno and Bentolila (1998) provide detailed theoretical support for this argument. Blanchard and Summers (1986) also show that the unemployment rates in both the United States and the United Kingdom are highly persistent. They note that such persistence is not easily explained by standard theories of the natural unemployment rate and conclude that current unemployment depends highly on past unemployment. Clark and Summers (1982), Bun and Carree (2005), and Lokshin (2008) also reach to similar conclusions for US unemployment rates. Moreover, Bornhorst and Commander (2006) investigate six major transition countries’ unemployment rates in Eastern Europe and conclude that regional unemployment rates are quite persistent. This is because employees in economically less-developed economies, similar to the economies of transition countries, suffer from lack of information about job opportunities.
Lastly, the literature directs us to another variable that is used to explain unemployment rates. Previous studies (see Gabrisch & Buscher, 2006; Wu, 2003; Edwards & Edwards, 2000; and Lee, 2000) show that there exists a statistically significant negative relationship between unemployment and a country’s total production. This relationship is called Okun’s law. Therefore, it is worth including per capita real gross domestic product, RGDP, (a proxy for a country’s total production) when explaining unemployment.

4.2 The Second Question

In this subsection, I review the literature examining the relationship between FDI and exports of host countries.

A prominent benefit attributed to the flow of FDI in developing countries is its effect on international market access. Through a variety of channels, the presence of foreign firms is believed to reduce the costs faced by domestic firms in breaking into international markets and, in turn, boosting their export prospects. Some studies argue that FDI is one of the factors that promotes the exports of host countries by augmenting domestic capital for exports, helping to transfer technology and new products for exports, facilitating access to new and larger foreign markets, providing training for the local workforce, and upgrading technical and management skills. However, it also has been argued that FDI lowers or replaces domestic savings and investment, reduces transfer technologies, and targets primarily the domestic market of a host country—thereby not increasing exports. In addition, this may possibly inhibit the expansion of indigenous firms that might become exporters and impede the development of a host country’s dynamic comparative advantages by actively focusing solely on local cheap labor and raw materials (UNCTAD, 2002). That is, the relationship between FDI and the exports of host countries is unclear.
Some studies find a positive and significant effect of FDI on the exports of a host country in both the developing and developed worlds. These include: Abor, Adjasi, and Hayford (2008); Sjoholm and Takii (2008); Kutan and Vuskic (2007); Wong and Tang (2007); Hsiao and Hsiao (2006); Srivastava (2006); Vuskic (2005); Aitken, Greenaway, Sousa and Wakelin (2004); Lemi (2004); Lopez (2004); Alguacil (2002); Sun (2001); Sjoholm (1999); Smits (1998); and Hanson and Harrison (1994).

Moreover, some studies report the FDI elasticity of exports in a host economy. For example, Xuan and Xing (2008) demonstrate that FDI is one of the major factors driving the rapid export growth of Vietnam and show that a one percent increase in FDI inflows into Vietnam is expected to give rise to a 0.13 percent increase in Vietnam’s exports, all other factors constant (see also AbuAl-Foul & Soliman, 2008).

Some examples of research in favor of the positive relationship between FDI and exports of host countries in the developed world include Kneller and Pisu (2007); Barry and Bradley (1997); Leichenko and Erickson (1997); Pain and Wakelin (1997); Pfaffermayr (1994); O’Sullivan (1993); and Orr (1991).

On the other hand, although the majority of the research conducted on the relationship between FDI and exports of host countries indicates a positive relationship between these variables, some researchers find a negative or neutral relationship (see Wolf, 2007; and Ruane & Sutherland, 2005). For example, Gopinath, Pick, and Vasavada (1998) find a negative relationship between FDI and the exports in the US food processing industry. Furthermore, Josic (2008) detects high inelasticity of exports with regard to FDI in Crotia.

According to macroeconomic theory, the most widely used and empirically successful model to explain exports is the gravity model (Anderson, 1979). The fundamental idea of the
gravity model is that bilateral trade between two countries is directly proportional to their gross domestic products and negatively correlated to the distance between them (Bergstrand, 1985; and Deardorff, 1995). Moreover, over time, this fundamental idea has been modified to better coincide with real life observations. For instance, Bergstrand (1989) proposes an augmented gravity model by using per capita RGDP to account for the income levels of trading countries. Xuan and Xing (2008); Portes and Rey (2005); Eichengreen, Rhee and Tong (2004); Anderson and Van Wincoop (2001); and McCallum (1995) also use the augmented gravity model of Bergstrand (1989) with some additional modifications in their analyses.

Other research turned the traditional, static gravity model into a dynamic model by including lagged values of exports in host countries as an explanatory variable. Bun and Klaassen (2002) and Eichengreen and Irwin (1996) support this dynamic form of the gravity model proposed by Bergstrand (1989) because the dynamic specification better fits real life data.

In a gravity model with a measure of total production such as GDP or RGDP, one econometric problem is that export is regressed on GDP or RGDP. However, it is well known that exports are part of GDP. Therefore, it is very likely that GDP, RGDP or per capita RGDP will be correlated with the error term of the regression in which export is the dependent variable and GDP, RGDP or per capita RGDP is one of the independent variables. If this correlation exists in such a regression, that estimation model would suffer from an endogeneity problem and the estimation results would be biased. Many empirical researchers that use gravity models ignore this possibility. On the other hand, some researchers correct this endogeneity problem by using an instrumental variable. For example, McCallum (1995) addresses this problem by replacing GDP (in natural logs) with total population (again in natural logs) since these variables are very strongly correlated with each other. I also employ this method in my study.
An additional factor that the literature proposes as an explanatory variable for exports is the real effective exchange rate (REER). The International Monetary Fund (2010) defines the REER as the nominal effective exchange rate (one of the measures of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or the index of costs. That is, the REER shows the relative price of the foreign country’s goods and services against the price of goods and services of a home country. For that reason, this variable indicates the level of competitiveness of the country’s exportable goods and services in the international market. An increase in the REER implies that the currency of a home country depreciates. Therefore, that home country’s products and services become cheaper relative to the products and services of other countries, and the demand for that home country’s exports is expected to increase.

Using quarterly data on Tunisian exports to its major European trading partners from 1987 to 2004, Khedhiri and Bouazizi (2007) find that there exists a significant positive relationship between the REER and the demand for Tunisian exports both in the long and short runs. Some other studies in agreement with this positive relationship between exports and the REER are: Kiptiu (2007); Fidan (2006); Thapa (2002); Bayoumi (1999); Arize (1994); and Arslan and Wijnbergen (1993).

On the other hand, there are some studies showing that the relationship between the REER and exports can be negative or insignificant. Abeysinghe and Yeok (1998) show that the REER and the exports of an exporting country can have a negative relationship in the presence of a high import-content in its total production. In the case of an appreciation (a decrease in the REER) of the currency of an exporting country, although the exports of the exporting country initially are adversely affected by its currency’s appreciation, a high import-content induced
decrease in the cost of the production of exports compensates for the additional cost resulting from local currency appreciation. Fang and Miller (2007), Fang, Lai and Miller (2005), and Rose (1991) also find support for the negative relationship between the REER and exports.
CHAPTER 5
DATA DESCRIPTION

5.1 Data Sources

The major data sources of my thesis are the World Bank’s World Development Indicators (WDI) on line, the International Monetary Fund’s International Financial Statistics (September 2010 CD-ROM), and the International Labor Office’s online database LABORSTA. In addition, I referenced the balance of payments (BOP) of the countries in my study, the online databases of the national statistical institutes of these countries, and the online databases of the central banks of these countries. To fill in some missing values\(^1\) in my data set, I employed the cubic spline interpolation method (Moler, 2004). I used three different panel data sets in this study. The first data set is composed of 45 countries observed over the period from 1987 to 2008 for every variable in equation (2), which is presented in the next section. The second data set is composed of 49 countries observed over the period from 1987 to 2008 for each variable in equation (5), as presented in the next section. Finally, the third data set is composed of 51 countries observed over the period from 1970 to 2008 for every variable in equation (13), as presented in the next section.

\(^1\) I interpolated 34 missing values: 24 values for unemployment rate, one value for foreign direct investment (FDI) inflows, one value for FDI outflows, three values for per capita real gross domestic product (RGDP), and five values for the inflation rate.
5.2 Description of the Variables:

Following the existing literature, I used the following variables in my analysis: the aggregate unemployment rate, exports, foreign direct investment (FDI) inflows, FDI outflows, per capita real gross domestic product (RGDP), the level of technology development, the level of infrastructure development, the inflation rate, the real effective exchange rate (REER), the total population, a dummy variable representing developing host countries, a dummy variable representing the Asian financial crisis (AFC) of 1997, and a dummy variable representing the agreement on trade related investment measures (TRIM).

In my analysis, I used an index of the real effective exchange rate as a proxy variable in order to compute an aggregate value representing changes in the value of various real exchange rates of a country with its trading partners (see Khedhiri & Bouazizi, 2007, and Arize, 1994). I also used a ratio of the gap between nominal US gross domestic product (GDP) and the nominal US dollar value of the GDP in a host country to the nominal US dollar value of the GDP in that same host country as a proxy variable for the level of technology development (see Massaud, 2008; Krogstrup & Matar, 2005; and Li & Liu, 2005). Lastly, I used the number of telephone lines per person in a host country as a proxy for the level of infrastructure development (see Arvantis, 2006). Table 1 provides a description of each variable used in this analysis.
Table 1. Variable definitions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
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<tr>
<td>$Unemp_{it}$</td>
<td>the total unemployment rate at time “t” for country “i”.</td>
</tr>
<tr>
<td>$Export_{it}$</td>
<td>nominal exports as a percentage of nominal GDP at time “t” for country “i”; a measure of the volume of exports.</td>
</tr>
<tr>
<td>$Popul_{it}$</td>
<td>the total number of residents (regardless of legal status or citizenship) at time “t” in country “i”; an instrumental variable for nominal GDP.</td>
</tr>
<tr>
<td>$Unemp_{it-1}$</td>
<td>the one-period lagged value of $Unemp_{it}$.</td>
</tr>
<tr>
<td>$Export_{it-1}$</td>
<td>the one-period lagged value of $Export_{it}$.</td>
</tr>
<tr>
<td>$Outflow_{fit}$</td>
<td>the ratio of net nominal FDI outflow to the nominal value of gross domestic product, multiplied by 100, for country “i” at time “t”; a measure of net FDI outflow.</td>
</tr>
<tr>
<td>$Inflow_{fit}$</td>
<td>the ratio of net nominal FDI inflow to the nominal value of gross domestic product, multiplied by 100, for country “i” at time “t”; a measure of net FDI inflow.</td>
</tr>
<tr>
<td>$Pcrgdp_{it}$</td>
<td>the US dollar value (fixed in 2000) of real GDP per person in country “i” at time “t”.</td>
</tr>
<tr>
<td>$Techgap_{it}$</td>
<td>the ratio of the gap between nominal US GDP at time “t” and nominal GDP in country “i” (measured in US dollars) at time “t” to the nominal value of GDP in country “i” at time “t” (measured in US dollars).</td>
</tr>
<tr>
<td>$Infdev_{it}$</td>
<td>the number of telephone lines per person in country “i” at time “t”; a measure of the level of infrastructure development.</td>
</tr>
<tr>
<td>$Inf_{it}$</td>
<td>the inflation rate, as measured by the consumer price index, in country “i” at time “t”.</td>
</tr>
<tr>
<td>$Trim_{it}$</td>
<td>1 in years after 1995, and 0 otherwise.</td>
</tr>
<tr>
<td>$Afc_{it}$</td>
<td>1 in years after 1997, and 0 otherwise.</td>
</tr>
<tr>
<td>$Country_{it}$</td>
<td>1 if country “i” is classified as a developing country in year “t,” and 0 otherwise.</td>
</tr>
<tr>
<td>$Reer_{it}$</td>
<td>the ratio of the real effective exchange rate in country “i” at time “t” to the real effective exchange rate in country “i” in 2005, multiplied by 100.</td>
</tr>
</tbody>
</table>

In Table 2, I present descriptive summary statistics for the variables in Table 1 for each data set used in this study.
Table 2. The summary statistics

The First Data Set: 45 countries, 1987-2008

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemp_{it}</td>
<td>7.4</td>
<td>4.11</td>
<td>0</td>
<td>23.9</td>
</tr>
<tr>
<td>Inflow_{it}</td>
<td>2.67</td>
<td>3.47</td>
<td>-15.04</td>
<td>29.28</td>
</tr>
<tr>
<td>Outflow_{it}</td>
<td>1.79</td>
<td>3.85</td>
<td>-22.82</td>
<td>50.06</td>
</tr>
<tr>
<td>Pcrgd_{it}</td>
<td>13197.61</td>
<td>11118.15</td>
<td>341.02</td>
<td>42132.92</td>
</tr>
<tr>
<td>Techgap_{it}</td>
<td>273.38</td>
<td>517.36</td>
<td>0</td>
<td>2957.07</td>
</tr>
<tr>
<td>Infdev_{it}</td>
<td>32.92</td>
<td>21.18</td>
<td>0.36</td>
<td>74.46</td>
</tr>
<tr>
<td>Inf_{it}</td>
<td>27.13</td>
<td>289.77</td>
<td>-13.85</td>
<td>7481.66</td>
</tr>
<tr>
<td>Country_{it}</td>
<td>0.49</td>
<td>0.5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AfC_{it}</td>
<td>0.54</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

The Second Data Set: 49 countries, 1987-2008

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export_{it}</td>
<td>38.16</td>
<td>20.16</td>
<td>7.7</td>
<td>121.31</td>
</tr>
<tr>
<td>Inflow_{it}</td>
<td>2.87</td>
<td>3.87</td>
<td>-15.04</td>
<td>33.56</td>
</tr>
<tr>
<td>Outflow_{it}</td>
<td>1.73</td>
<td>3.75</td>
<td>-22.82</td>
<td>50.06</td>
</tr>
<tr>
<td>Reer_{it}</td>
<td>103.86</td>
<td>22.61</td>
<td>36.29</td>
<td>477.62</td>
</tr>
<tr>
<td>Popul_{it}</td>
<td>54.8 million</td>
<td>176 million</td>
<td>175200</td>
<td>1320 million</td>
</tr>
<tr>
<td>Country_{it}</td>
<td>0.54</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

The Third Data Set: 51 countries, 1970-2008

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export_{it}</td>
<td>31.52</td>
<td>18.74</td>
<td>2.6</td>
<td>121.31</td>
</tr>
<tr>
<td>Popul_{it}</td>
<td>52.9 million</td>
<td>158 million</td>
<td>204000</td>
<td>1320 million</td>
</tr>
<tr>
<td>Country_{it}</td>
<td>0.56</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

From these summary statistics, I note four interesting facts. First, FDI inflows and outflows sometimes take on negative values. For example, if the value of foreign disinvestments from a host country to the world exceeds that of FDI inflows, FDI inflows take on negative values. Similarly, if the value of foreign disinvestments from the world to a host country exceeds that of FDI outflows, FDI outflows take on negative values. Second, in all of the data sets, the number of developed and developing countries is relatively very close. This confirms that, in my study, I am not focusing on only developing or developed countries, which is appropriate for an unbiased analysis. Third, the largest value of the inflation rate is 7481.66. At first glance, this
value might seem extreme. However, this value corresponds to the period of hyperinflation in Peru between 1989 and 1990 (Reinhart & Savastano, 2003), which is quite reasonable for that period. Argentina also had an inflation rate of 3079.8 during that period. Lastly, nominal exports as the percentage of nominal GDP exceeds 100. This shows that, in some years, the nominal values of exports are greater than those of nominal GDPs for some countries.
6.1 Unit Root Test

Before estimating any of the regressions proposed in this research, it is necessary to determine whether or not the (continuous) variables in each equation are stationary. Variables that are not stationary must be differenced the appropriate number of times in order to render them stationary. To investigate this issue, I applied the panel Lagrange multiplier (LM) unit root test of Im, Lee & Tieslau (2010), hereafter ILT. This test is superior to all existing panel unit root tests because it allows for breaks in both the level and trend of a series, under both the null and alternative, and the test statistic is not dependent on the nuisance parameter indicating the break-point location. The choice of the ILT test when checking for unit roots is ideal since Perron (1989) showed that there can be a significant loss of power when testing for a unit root if one ignores existing structural breaks. When compared to other alternative panel unit root tests, the ILT test delivers a significant improvement in power. In addition, the ILT test allows for serially correlated errors and cross-correlation across panels.

The ILT test begins by expressing a time series variable in its unobserved components form, following Schmidt and Phillips (1992): \( Y_t = \delta' Z_t + \varepsilon_t, \) where \( \varepsilon_t = \beta \varepsilon_{t-1} + \varepsilon_t, \) where \( Z_t \) contains deterministic terms such as an intercept and a time trend. ILT extend this model so that \( Z_t \) can include intercept dummy variables to indicate level shifts and slope dummy variables to capture trend shifts. For example, \( Z_{it} = [1, t, D_{1t}, \ldots, D_{Rt}, DT_{1t}^*, \ldots, DT_{Rt}^*] \) where \( D_{jt} = 1 \) for \( t > \) or equal to \( T_{Bj} + 1, j=1,\ldots,R, \) where "R" is the number of breaks, and zero otherwise; \( DT_{jt}^* = t - T_{Bj} \) for \( t > \) or equal to \( T_B + 1 \) and zero otherwise; \( T_B \) denotes the time period of the break; \( D_{jt} \) is the \( j^{th} \) level break term; \( DT_{jt} \) is the \( j^{th} \) trend break term; and \( j = 1, 2, \ldots, R. \) The ILT LM unit root test
utilizes a two-step procedure. In the first step, the de-trended value of $Y_t$ is obtained. Denote this value $\tilde{Y}_t$. Note that the de-trending coefficient in this first step is obtained using first-differenced data. If trend breaks are present in the series, it is necessary to transform the de-trended series using the procedure suggested by Park and Sung (1994) in order to ensure that the unit root test statistic does not depend on the nuisance parameter indicating the location of the break. The transformed value of the de-trended series is denoted $\tilde{Y}_t^*$. In the second step, the univariate LM unit root test is obtained as the t-test for the null hypothesis that $\phi = 0$ in the following equation:

$$\Delta Y_t = \delta' \Delta Z_t + \varphi \tilde{Y}_{t-1}^* + d_1 \Delta \tilde{Y}_{t-1} + d_2 \Delta \tilde{Y}_{t-2} + \ldots + d_k \Delta \tilde{Y}_{t-k} + e_1t,$$  \hspace{1cm} (1)

where $\Delta$ indicates first-difference, $\Delta \tilde{Y}_{t-k}$ is a conventional augmentation term for "k" lags, and "k" is selected so as to ensure there is no serial correlation in the errors.

Extending this procedure to the panel framework, consider the following version of equation (1):

$$\Delta Y_{it} = \delta_i' \Delta Z_{it} + \varphi_i \tilde{Y}_{i,t-1}^* + d_{11} \Delta \tilde{Y}_{i,t-1} + \ldots + d_{1k} \Delta \tilde{Y}_{i,t-k} + d_{21} \Delta \tilde{Y}_{2,t-1} + \ldots + d_{2k} \Delta \tilde{Y}_{2,t-k} + \ldots + d_{N1} \Delta \tilde{Y}_{N,t-1} + \ldots + d_{Nk} \Delta \tilde{Y}_{N,t-k} + e_{1i}t,$$ \hspace{1cm} (1')

where "i" indexes the cross section units such that $i = 1, 2, \ldots, N$, and the unit root null hypothesis is $\varphi_i = 0$ for all "i," versus the alternative that $\varphi_i < 0$ for some "i." Thus, a rejection of the null implies that the series is stationary. After the test statistic is obtained, the standardized version of the test is computed in the usual manner by subtracting the mean and dividing by the square root of the variance, using the appropriate values provided by ILT (2010). The resulting panel LM unit root test statistic has an asymptotic distribution that is standard normal. Therefore, when evaluating the test, the critical values can be obtained from a conventional "Z-score" table of the standard normal distribution.
The procedure for testing for a unit root using the ILT test is summarized as follows. First, I begin by testing for a unit root allowing for up to two trend breaks. If no trend breaks are found to exist, I repeat the testing procedure allowing for up to two level breaks, following Im, Lee and Tieslau (2005). If no level breaks are found to exist, I use the no-break LM unit root test of Schmidt and Phillips (1992). If a variable is found to be non-stationary in levels, the variable is differenced one time and the testing procedure is repeated. If the series does not become stationary after one difference, the variable is differenced again and the testing procedure is repeated until I determine the appropriate number of differences needed to make the series stationary.

6.2 The First Question

After testing for a unit root in the variables in the model for the first research question, if all of the variables are found to be stationary then I can estimate this equation using the levels of these variables, as show in equation (2) below. If any variable is found to contain one unit root then I use the first-difference of this variable instead of the level. For example, if Techgapit is not stationary, I replace it with its first-differenced stationary value and denote that new value as ΔTechgapit. I use the following dynamic, one-way fixed-effects panel model to examine the first research question:

Unempit = a_0 + a_1 Unemp_{it-1} + a_2 Inflowf_{it} + a_3 Outflowf_{it} + a_4 Pcrgd_{it} + a_5 Techgap_{it} + a_6 Infdev_{it} + a_7 Country_{it} + a_8 Afc_{it} + a_9 Inf_{it} + a_{10} Inflowf*Pcrgd_{it} + a_{11} Inflowf*Techgap_{it} + a_{12} Inflowf*Infdev_{it} + a_{13} Inflowf*Country_{it} + a_{14} Inflowf*Afc_{it} + a_{15} Inflowf*Inf_{it} + c_i + e_{2it},

where c_i is an unobservable country-specific fixed effect (for example, work ethic), and e_{2it} is an independent and identically distributed (iid) disturbance term. In addition, let u_{it} = (c_i + e_{2it}).
Note that Unemp_{t-1} is correlated with c_t since it includes c_t. Also note that this correlation automatically results in an endogeneity problem in equation (2). I assume that the other right-hand side variables are exogenous, cov(c_t, e_{it}) = 0, and cov(Unemp_{t-1}, e_{2i(t+j)}) = 0 where j = 1, 2, \ldots 20.

In equation (2), I expect: a_0, a_1, a_3, a_5, a_7, a_9, a_{11}, a_{14}, a_{15} > 0, and a_2, a_4, a_6, a_{10}, a_{12}, a_{13} < 0. It is well known that this type of model suffers from the “initial condition” problem, which leads to biased estimates when the number of time periods is relatively small. I circumvented this problem by using a relatively large number of time periods in my analysis (at least 19 years; see Chao, Kim, & Sul, 2010).

The coefficients a_2 and a_3 addressed the question “What are the separate effects of foreign direct investment (FDI) inflows and outflows on unemployment rates in host countries?” The coefficients a_{11}, a_{12}, and a_{13} addressed the question “What are the factors that determine the significance of FDI inflows at reducing unemployment rates, if any, in host countries?” The coefficients a_8 and a_{14} addressed the question “How did the Asian financial crisis (AFC) of 1997 affect aggregate unemployment rates?” and “How did the AFC of 1997 interact with FDI inflows when considering the effect of FDI inflows on unemployment rates in host countries?” For example, if a_2, a_{12} < 0, and a_3, a_{11} > 0, I can conclude that an increase in the weight of FDI inflows in the gross domestic product (GDP) of a host country reduces unemployment rates in that host country, although an increase in the weight of FDI outflows in the GDP of the host country increase its unemployment rate. In addition, I can say that the host countries with high levels of infrastructure development and high levels of technology development benefit from FDI inflows more with regard to reducing unemployment rates.
There are several reasons to prefer the use of panel data over pure cross section or pure time series data. First, panel data provides greater degrees of freedom and, hence, greater accuracy in estimation. Second, panel data can capture possible cross-country spillover effects and cross-time effects that cannot be captured by using only cross section or pure time series data alone (Hsiao, 2005). Additional reasons include greater capacity for capturing complex human behavior (Ben-Porath, 1973) and the ability to expressly model unobservable cross-section heterogeneity through the variable \( c_i \) (MaCurdy, 1981).

To estimate equation (2), I used the Arellano and Bond’s generalized methods of moments-ABGMM (Arellano & Bond, 1991) estimation method with Windmeijer’s finite sample correction which provides ideal estimates in the presence of the lagged dependent variable and heteroskedasticity (Windmeijer, 2000 and Bond, 2002). This estimation method also allows for endogenous variables (in addition to a lagged dependent variable) in the model and controls for possible correlation between the unobserved fixed effect and the explanatory variables. Furthermore, this estimation method results in consistent estimates even when the time dimension of a panel is relatively small, and error terms are heteroskedastic across panels.

In the case of a model with an endogeneity problem such as the model in equation (2), one can use the ordinary least squares (OLS) estimation method with instrumental variables. However, in a dynamic panel model, the OLS estimates with instrumental variables are generally inefficient since the cross-section dimension of the data might cause heteroskedasticity. This is very likely in my study because the cross-section units of my data are developing and developed countries, which are very different in many areas. Furthermore, the traditional random-effects and fixed-effects models with dynamic panel data result in biased estimates, and the maximum likelihood estimation (MLE) method produces inconsistent estimates. On the other hand, the
ABGMM method with Windmeijer’s finite sample correction does not suffer from these problems because it uses the first-differenced version of equation (2) and employs instrument variables (in our case, two-period or more lagged values of the dependent variable \( \text{Unemp}_it \)), as shown in equation (3). Thus, the appropriate way to estimate such a model is to apply the ABGMM method to a transformed version of equation (2), as shown below in equation (3):

\[
\Delta \text{Unemp}_it = d_1 \Delta \text{Unemp}_{i(t-1)} + d_k \Delta X_{it} + \Delta u_{it},
\]

(3)

where, in my case, \( d_k \) is a \((1 \times 14)\) row vector of coefficients, and \( \Delta X_{it} \) is a \((14 \times 1)\) column vector of the first-differenced forms of variables in equation (2).

Note that estimation of equation (3) instead of equation (2) does not change the expectations for and implications of the estimates since equation (3) is just a transformed version of equation (2). Also note that first-differencing removes \( c_i \) and \( a_0 \) since they do not vary over time. Thus,

\[
\Delta u_{it} = \Delta e_{2it}.
\]

(4)

I also estimate the following three variations of equation (2) using the ABGMM estimation method:

\[
\text{Unemp}_{it} = n_0 + n_1 \text{Unemp}_{i(t-1)} + n_2 \text{Inflow}_{it} + n_3 \text{Outflow}_{it} + n_4 \text{Pergdp}_{it}
\]

(2a)

\[+ n_5 \text{Techgap}_{it} + n_6 \text{Infdev}_{it} + n_7 \text{Country}_{it} + n_8 \text{Afc}_{it} + n_9 \text{Inf}_{it} + w_i + \varepsilon_{it},\]

where \( w_i \) is an unobservable country-specific fixed effect (for example, work ethic), and \( \varepsilon_{it} \) is an \( iid \) disturbance term. The assumptions in equation (2) apply to equation (2a).

\[
\text{Unemp}_{it} = k_0 + k_1 \text{Unemp}_{i(t-1)} + k_2 \text{Inflow}_{it} + k_3 \text{Outflow}_{it} + k_4 \text{Pergdp}_{it} + k_5 \text{Inf}_{it}
\]

(2b)

\[+ x_i + \xi_{it},\]

where \( x_i \) is an unobservable country-specific fixed effect (for example, work ethic), and \( \xi_{it} \) is an \( iid \) disturbance term. Again, the assumptions in equation (2) apply to equation (2b).
\[ \text{Unemp}_it = u_0 + u_1 \text{Unemp}_{it-1} + u_2 \text{PerGdp}_{it} + u_3 \text{Inf}_{it} + v_i + \text{III}_{it}, \]  

(2c)

where \( v_i \) is an unobservable country-specific fixed effect (for example, work ethic), and \( \text{III}_{it} \) is an \( iid \) disturbance term. Once again, the assumptions in equation (2) apply to equation (2c).

6.3 The Second Question

Again I first test if the variables in the model of the second research question are stationary, as explained in the subsection 6.1. Non-stationary variables are differenced in order to make them stationary and then the estimation method described in subsection 6.2 is applied. Assuming, for the moment, that all variables are stationary, the following dynamic, one-way fixed-effects panel model is used to address the second research question:

\[ \text{Export}_it = s_0 + s_1 \text{Export}_{it-1} + s_2 \text{Inflow}_{it} + s_3 \text{Outflow}_{it} + s_4 \text{Reer}_{it} + s_5 \text{Popul}_{it} + s_6 \text{Trim}_i + s_7 \text{Country}_{it} + s_8 \text{Country}_{it} \times \text{Trim}_i + z_i + e_{5it}, \]  

(5)

where \( z_i \) is unobservable country-specific fixed effect (for example, geostrategic importance) and \( e_{5it} \) is an independent and identically distributed \( (iid) \) disturbance term. In addition, let \( \Omega_{it}=z_i + e_{5it} \). Note that \( \text{Export}_{it-1} \) is correlated with \( z_i \) since it includes \( z_i \). This correlation automatically results in an endogeneity problem in equation (5). I also assume that the other right-hand side variables are exogenous, \( \text{cov}(z_i, e_{5it}) = 0 \), and \( \text{cov}(\text{Export}_{it-1}, e_{5it+j}) = 0 \) where \( j = 1, 2, \ldots 20 \).

In equation (5), I expect: \( s_0, s_1, s_2, s_4, s_5, s_6, s_7, s_8 > 0 \), and \( s_3 < 0 \). This model also suffers from the “initial condition” problem and I circumvented this problem as prescribed in the subsection 6.2.

The coefficients \( s_2 \) and \( s_3 \) addressed the question: “What are the separate effects of FDI inflows and outflows on exports in host countries?” The coefficient \( s_6 \) addressed “How did the agreement on trade related investment measures (TRIM) directly influence the exports of host countries?” The coefficient \( s_8 \) addressed “Is the effect of the agreement on TRIM, if any,
different in host countries in the developing world?” For example, if \( s_2, s_6, s_8 > 0 \) and \( s_3 < 0 \), I can conclude that FDI inflows increase the weight of exports in the nominal GDPs of host countries, although FDI outflows reduce it. I also can conclude that the agreement of TRIM increased the weight of exports in the nominal GDPs of developing host countries more than it did in developed host countries.

As explained in the subsection 6.2, I used the ABGMM estimation method with Windmeijer’s finite sample correction for the aforementioned reasons. Hence, the transformed version of equation (5) is as follows:

\[
\Delta \text{Export}_{it} = r_1 \Delta \text{Export}_{i(t-1)} + r_2 \Delta P_{it} + \Delta \Omega_{it},
\]

(6)

where \( r_2 \) is a \((1 \times 7)\) row vector of coefficients, and \( \Delta P_{it} \) is a \((7 \times 1)\) column vector of the first-differenced form of the variables in equation (5).

Again note that estimation of equation (6) instead of equation (5) does not change the expectations for and implications of the estimates as explained in subsection 6.2. Also note that first-differencing removes \( z_i \) and \( s_0 \). Thus,

\[
\Delta \Omega_{it} = \Delta e_5_{it}.
\]

(7)

On the other hand, if the dependent variable \( \text{Export}_{it} \) is not stationary, then I have to use a different estimation method to answer the second research question because conventional estimation techniques that are appropriate for stationary variables are not appropriate for nonstationary variables. The seminal work of Engle and Granger (1987) provided the cointegration method to determine the long-run relationship among nonstationary variables, and over years this method was extended to the panel data framework.

The cointegration analysis of \( \text{Exports}_{it} \) is important because it can show how, in the long-run, the weight of exports in the nominal GDP of a host country responds to changes in its
nominal GDP. From this, I also can learn the nominal GDP elasticity of the weight of exports in the nominal GDP of a host country. With this elasticity information, policy makers and economic planners in host countries can make more reliable projections on some items (such as tax revenues from export industries) of local and national budgets.

In order to apply the cointegration methodology, all of the (continuous) variables of an equation must be integrated of the same order (more than zero). Thus, I use the ILT panel unit root test to find the order of integration of the continuous variables in equation (5) and then I test if a cointegrating relationship exists among the I(1) variables. If the order of integration of a variable is higher than one, I difference that variable until its order of integration is one. Then, I use Westerlund’s error correction model (ECM) test to determine if there is a cointegrating relationship among the I(1) variables. This test is superior to many other tests because it is consistent and robust. It extends to various sample sizes and has better power properties in finite samples than the residual based tests. Furthermore, it is able to include cross-section specific intercepts, slope parameters, and trend terms (Westerlund, 2007). Another advantage of the test is that it can account for serial correlation and endogeneity problems in the estimation model.

The fundamental model I postulate to examine this issue is:

\[ \text{LogExport}_{it} = l_{0i} + l_{1i}x_{it} + \Omega_{it}, \]  

(8)

where \( \text{LogExport}_{it} \) is the natural log of \( \text{Export}_{it} \), \( l_{0i} \) is a country-specific initial value for \( \text{Export}_{it} \), \( l_{1i} \) is the row vector of the coefficients of the continuous I(1) variables in equation (5), \( x_{it} \) is the column vector of natural logs of those variables, and \( \Omega_{it} \) is a possibly serially correlated error term. \( x_{it} \) also might not be strictly exogenous.

To find if a cointegrating relationship exists, I convert equation (8) into the following error correction model:
\[ \Delta \text{LogExport}_{it} = k_{0i} + k_{1i} \Delta x_{it} + \gamma_i k_{2i} z_{i(t-1)} + \epsilon_{it}, \quad (9) \]

where \( \Delta \text{LogExport}_{it} \) is the first-differenced LogExport\(_{it}\), \( k_{0i} \) is a country-specific initial value for Export\(_{it}\), \( k_{1i} \) is the row vector of the coefficients of co-integrated variables in equation (5), \( \Delta x_{it} \) is the column vector of the natural logs of the first-differenced values of those variables, \( \gamma_i \) is the cointegration parameter that I test, \( k_{2i} \) is the cointegrating row vector, \( z_{i(t-1)} \) is a column vector that contains the previous values of LogExport\(_{it}\) and of \( x_{it} \), and \( \epsilon_{it} \) are possibly serially correlated error terms. \( x_{it} \) also might not be strictly exogenous.

Equation (9) is problematic because it assumes the existence of a cointegrating relationship, and the parameters from this relationship are required in order to conduct tests on \( \gamma_i \). However, Banerjee, Dolado, and Mestre (1998) solve this problem by normalizing \( k_{2i} \) with respect to LogExport\(_{it}\) and then estimating the following version of equation (9) via OLS:

\[ \Delta \text{LogExport}_{it} = k_{0i} + k_{1i} \Delta x_{it} + \gamma_i \text{LogExport}_{i(t-1)} + \alpha_i x_{i(t-1)} + \epsilon_{10i}, \quad (10) \]

where LogExport\(_{i(t-1)}\) and \( x_{i(t-1)} \) are respectively the previous values of LogExport\(_{it}\) and \( x_{it} \), \( \gamma_i \) is the same cointegration parameter in equation (9), and \( \epsilon_{10i} \) is a possibly serially correlated error term. \( x_{it} \) also might not be strictly exogenous. Lastly, I add lags and leads of \( \Delta x_{it} \) to equation (10) so that the asymptotic properties of ECM test in equation (10) are similar to the asymptotic properties of ECM test under no serial correlation and the strict exogeneity of the cointegrating variables in equation (10). Hence, the estimation equation to determine if there is a cointegrating relationship between the variables in equation (8) is as follows:

\[ \Delta \text{Logexport}_{it} = k_{0i} + k_{1i} \Delta x_{it} + \gamma_i \text{LogExport}_{i(t-1)} + \alpha_i x_{i(t-1)} + a_1 \Delta x_{i(t-1)} + a_2 \Delta x_{i(t-2)} + \ldots + a_p \Delta x_{i(t-p)} \]

\[ + b_1 \Delta x_{i(t+1)} + b_2 \Delta x_{i(t+2)} + \ldots + b_p \Delta x_{i(t+s)} + \epsilon_{11i}, \quad (11) \]
where $\Delta x_{i(t-p)}$ is the $p^{th}$ lagged value of $\Delta x_{it}$, $\Delta x_{i(t+s)}$ is the $s^{th}$ leaded value of $\Delta x_{it}$, and $e_{11it}$ is a possibly serially correlated error term. I determine “p” and “s” by minimizing the AIC. After running the OLS regression on equation (11), I test the null hypothesis that $\gamma_i = 0$ versus the alternative hypothesis that $\gamma_i < 0$. If the null is rejected, there is a cointegrating relationship. Otherwise, there is no cointegration.

If cointegration exists, then I estimate the parameters in equation (8) using dynamic OLS (DOLS), as explained in Kao and Chiang (2001). The DOLS estimator is superior to other estimators such as the OLS and fully modified OLS (FMOLS) estimators. There are two reasons for its superiority. The first one is that, in finite samples, the OLS and FMOLS estimators have non-negligible biases. The second one is that the DOLS estimator allows for serially correlated errors and endogeneity.

The DOLS estimation is, in fact, the OLS regression on a one-way fixed effect panel model augmented by adding the lagged and leading values of the first-differenced right-hand side cointegrating variables. Hence, the estimation equation for the cointegrated variables in equation (8) is as follows:

$$\text{LogExport}_{it} = f_{0i} + f_{1i} x_{it} + c_{i1} \Delta x_{i(t-1)} + c_{i2} \Delta x_{i(t-2)} + \ldots + c_{ip} \Delta x_{i(t-p)}$$
$$+ d_{i1} \Delta x_{i(t+1)} + d_{i2} \Delta x_{i(t+2)} + \ldots + d_{is} \Delta x_{i(t+s)} + e_{12it},$$

where $f_{0i}$ is the country-specific intercept, $f_{1i}$ is the row vector of the coefficients of the cointegrated variables, $x_{it}$ is the column vector of the cointegrated variables, $c_{ip}$ is the row vector of the coefficients of the lagged values of the first-differenced cointegrated variables ($\Delta x_{it}$), $\Delta x_{i(t-p)}$ is the $p^{th}$ lagged value of $\Delta x_{it}$, $d_{is}$ is the row vector of the coefficients of the lagged values of $\Delta x_{it}$, $\Delta x_{i(t+s)}$ is the $s^{th}$ leaded value of $\Delta x_{it}$, and $e_{12it}$ is a possibly serially correlated error term. $x_{it}$ also might not be strictly exogenous.
In equation (12), I determine “p” and “s” by minimizing the Bayesian information criterion (BIC). After determining those numbers, I include the non-continuous variables Trim, Country*Trim in (12) to see if the effect of the agreement on TRIM on exports, if any, is different in developing host countries and estimate the following equation:

\[
\text{LogExport}_{it} = j_{0i} + j_{1i} x_{it} + r_{1i} \Delta x_{i(t-1)} + r_{2i} \Delta x_{i(t-2)} + \ldots + r_{pi} \Delta x_{i(t-p)} + t_{1i} \Delta x_{i(t+1)} + \ldots + t_{si} \Delta x_{i(t+s)} + f_{1i} \text{Trim}_{i} + f_{2i} \text{Country}_{it} + f_{3i} \text{Country}_{it}^* \text{Trim}_{i} + e_{13it},
\]

where \(j_{0i}\) is the country-specific intercept, \(j_{1i}\) is the row vector of the coefficients of the cointegrated variables, \(x_{it}\) is the column vector of the cointegrated variables, \(r_{pi}\) is the row vector of the coefficients of the lagged values of the first-differenced cointegrated variables (\(\Delta x_{it}\)), \(\Delta x_{i(t-p)}\) is the \(p^{th}\) lagged value of \(\Delta x_{it}\), \(t_{si}\) is the row vector of the coefficients of the lagged values of \(\Delta x_{it}\), \(\Delta x_{i(t+s)}\) is the \(s^{th}\) leaded value of \(\Delta x_{it}\), and \(e_{13it}\) is a possibly serially correlated error term. \(x_{it}\) also might not be strictly exogenous.
CHAPTER 7
ESTIMATION RESULTS

7.1 The First Question

Table 3 shows the estimation results of the unit root test for the continuous variables in equation (2).

Table 3. ILT unit root test results for the continuous variables in equation (2)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>ILT Test Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemp_{it}</td>
<td>−3.09</td>
<td>0.001</td>
</tr>
<tr>
<td>Inflow_{it}</td>
<td>−5.12</td>
<td>0.0001</td>
</tr>
<tr>
<td>Outflow_{it}</td>
<td>−6.21</td>
<td>0.0001</td>
</tr>
<tr>
<td>Pergdp_{it}</td>
<td>−3.17</td>
<td>0.0001</td>
</tr>
<tr>
<td>Techgap_{it}</td>
<td>−3.67</td>
<td>0.0001</td>
</tr>
<tr>
<td>Infdev_{it}</td>
<td>−3.92</td>
<td>0.0001</td>
</tr>
<tr>
<td>Inf_{it}</td>
<td>−8.12</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

The null and alternative hypotheses for this test are: $H_0$: the variable being tested contains a unit root, versus $H_a$: the variable being tested is stationary. The results in Table 3 show that all of the variables in equation (2) are stationary at 0.01 level or better. Therefore, I can estimate equation (2) and its variations using the Arellano and Bond’s generalized methods of moments (ABGMM) estimation method with Windmeijer’s finite sample correction.

Table 4 shows the estimation results of equations (2), (2a), (2b), and (2c). In equation (2), many of the coefficients are statistically insignificant at any reasonable confidence level, and many of the estimated coefficients have unexpected signs. This model has 15 variables and, hence it is not parsimonious. Furthermore, all of the interaction variables are insignificant. From a statistical perspective, if a group of variables are not statistically significant at explaining Unemp_{it}, it might be reasonable to consider excluding them from my model. Tables 5, 6, and 7
present the Wald tests results that indicate whether or not certain variables as a group are significant at explaining Unemp$_{it}$.

Table 4. Test results for equations (2), (2a), (2b), and (2c), dependent variable: Unemp$_{it}$

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model (2)</th>
<th>Model (2a)</th>
<th>Model (2b)</th>
<th>Model (2c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemp$_{it(t-1)}$</td>
<td>0.58/0.0001</td>
<td>0.63/0.0001</td>
<td>0.77/0.0001</td>
<td>0.77/0.0001</td>
</tr>
<tr>
<td>Inflow$_{it}$</td>
<td>−0.02/0.7</td>
<td>−0.008/0.3</td>
<td>−0.003/0.68</td>
<td></td>
</tr>
<tr>
<td>Outflow$_{it}$</td>
<td>0.004/0.6</td>
<td>−0.006/0.3</td>
<td>−0.01/0.53</td>
<td></td>
</tr>
<tr>
<td>Pcrgd$_{it}$</td>
<td>−0.0005/0.0001</td>
<td>−0.0004/0.0001</td>
<td>−0.0002/0.0001</td>
<td>−0.0002/0.0001</td>
</tr>
<tr>
<td>Techgap$_{it}$</td>
<td>0.001/0.12</td>
<td>0.0011/0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infdev$_{it}$</td>
<td>0.088/0.019</td>
<td>0.07/0.021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country$_{it}$</td>
<td>0.44/0.6</td>
<td>0.19/0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afc$_{t}$</td>
<td>−0.045/0.8</td>
<td>−0.08/0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inf$_{it}$</td>
<td>0.0002/0.0001</td>
<td>0.0002/0.0001</td>
<td>0.0002/0.0001</td>
<td>0.0002/0.0001</td>
</tr>
<tr>
<td>Inflow$<em>{it}$*Pcrgd$</em>{it}$</td>
<td>0.000002/0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflow$<em>{it}$*Techgap$</em>{it}$</td>
<td>0.00003/0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflow$<em>{it}$*Infdev$</em>{it}$</td>
<td>0.001/0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflow$<em>{it}$*Country$</em>{it}$</td>
<td>−0.014/0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflow$<em>{it}$*Afc$</em>{t}$</td>
<td>0.012/0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflow$<em>{it}$*Inf$</em>{it}$</td>
<td>0.00007/0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Wald test result for interaction variables in model (2)

<table>
<thead>
<tr>
<th>Wald Test Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.27</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Table 5 presents the results of the test of whether or not all of the interaction variables in equation (2) jointly have an effect on the dependent variable. The result shows that the interaction variables as a group do not explain Unemp$_{it}$. Therefore, I estimate equation (2a), which excludes these variables. In equation (2a), the results are not much improved in terms of the statistical significance of several coefficients at any reasonable confidence level. Thus, I test for the significance of the variables Techgap$_{it}$, Infdev$_{it}$, Country$_{it}$, and Afc$_{t}$ as a group.
Table 6. Wald test result for Techgap$_{it}$, Infdev$_{it}$, Country$_{it}$, and Afct in (2a)

<table>
<thead>
<tr>
<th>Wald Test Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3</td>
<td>0.18</td>
</tr>
</tbody>
</table>

The results shown in Table 6 test whether or not $n_5 = n_6 = n_7 = n_8 = 0$ in equation (2a). The result shows that Techgap$_{it}$, Infdev$_{it}$, Country$_{it}$, and Afct, as a group, do not explain Unemp$_{it}$. Therefore, I exclude them in my specification and estimate equation (2b). In equation (2b), the model does not improve in terms of statistical significance of the coefficients and in terms of expected signs on the estimated coefficients. Thus, I test for the significance of the variables Inflow$_{it}$ and Outflow$_{it}$ as a group.

Table 7. Wald test result for Inflow$_{it}$ and Outflow$_{it}$ in equation (2b)

<table>
<thead>
<tr>
<th>Wald Test Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.95</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Table 7 shows the results of the test of $H_0: k_2 = k_3 = 0$ versus $H_a: \text{not } H_0$. The result shows that Inflow$_{it}$ and Outflow$_{it}$ as a group do not explain Unemp$_{it}$. Therefore, I exclude them in my specification and estimate equation (2c). The model in (2c) is indeed a specification that many previous researchers also employed to explain unemployment rate. All of the variables in this specification are statistically significant at all conventional significance levels, and the signs of the estimated coefficients are as expected.

Table 8. The Arellano-Bond test for autocorrelation of the first-differenced error terms in equation (2c)

<table>
<thead>
<tr>
<th>Test Statistic for First-Order Autocorrelation</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>–2.65</td>
<td>0.008</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Statistic for Second-Order Autocorrelation</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>–1.51</td>
<td>0.131</td>
</tr>
</tbody>
</table>

Table 8 presents the results of tests for first- and second-order autocorrelation. Since the Arellano-Bond test for autocorrelation is applied to the first-differenced version of the error terms in equation (2c), the first-differenced error terms must be autocorrelated if the model is
correctly specified. Therefore, it is normal to reject the null hypothesis in the first-order autocorrelation test. The test for the second-order autocorrelation shows if the error terms in equation (2c) are autocorrelated. If the model is correctly specified, I should not reject the null hypothesis for the second-order autocorrelation (Arellano & Bond, 1991). The test results indeed show that there is no autocorrelation in the error terms of equation (2c).

Table 9. Hansen test of over-identified restrictions in (2c)

<table>
<thead>
<tr>
<th>Hansen J Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.49</td>
<td>0.279</td>
</tr>
</tbody>
</table>

Table 9 provides the results of Hansen’s test of over-identified restrictions in equation (2c). The null and alternative are: \( H_0: \) The instrumental variables for Unemp\(_{it(t-1)}\) used to estimate equation (2c) are exogenous, versus \( H_a: \) The instrumental variables for Unemp\(_{it(t-1)}\) used to estimate equation (2c) are not exogenous. The test result shows that my instrumental variables are exogenous and, hence, valid (Arellano & Bond, 1991). This also implies that equation (2c) is correctly specified. Equation (2c) has the specification suggested by macroeconomic theory, it is relatively parsimonious, all of its coefficients are statistically significant, its error terms are not autocorrelated, and its instrumental variables are valid. Therefore, I choose equation (2c) as the correct specification to explain Unemp\(_t\).

7.2 The Second Question

Table 10 shows the estimation results of the unit root test for the continuous variables in equation (5). Again, the null hypothesis of this test states that the variable being tested contains a unit root, versus the alternative that the variable being tested is stationary. Thus, the results indicate that Export\(_{it}\) and Popul\(_{it}\) are not stationary while all other variables are stationary. Hence, Inflow\(_{it}\), Outflow\(_{it}\), Reer\(_{it}\), Popul\(_{it}\), ΔExport\(_{it}\) and ΔPopul\(_{it}\) are stationary I(0) variables while Export\(_{it}\) and Popul\(_{it}\) are non-stationary I(1) variables. Consequently, if there is a cointegrating
relationship, it only can exist between $\text{Export}_{it}$ and $\text{Popul}_{it}$ (or their natural logs). I next test for the existence of such a relationship.

Table 10. ILT unit root test results for the continuous variables in equation (5)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>ILT Test Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{Export}_{it}$</td>
<td>$-0.97$</td>
<td>0.166</td>
</tr>
<tr>
<td>$\text{Inflow}_{it}$</td>
<td>$-4.12$</td>
<td>0.0001</td>
</tr>
<tr>
<td>$\text{Outflow}_{it}$</td>
<td>$-3.98$</td>
<td>0.0001</td>
</tr>
<tr>
<td>$\text{Reer}_{it}$</td>
<td>$-5.24$</td>
<td>0.0001</td>
</tr>
<tr>
<td>$\text{Popul}_{it}$</td>
<td>$-0.24$</td>
<td>0.405</td>
</tr>
<tr>
<td>$\Delta \text{Export}_{it}$</td>
<td>$-9.77$</td>
<td>0.0001</td>
</tr>
<tr>
<td>$\Delta \text{Popul}_{it}$</td>
<td>$-7.61$</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Note: $\Delta \text{Export}_{it}$ and $\Delta \text{Popul}_{it}$ are the first-differenced values of $\text{Export}_{it}$ and $\text{Popul}_{it}$, respectively.

Table 11. Westerlund’s test for cointegration results in equation (11)

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-3.746$</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Table 11 presents the results of the null hypothesis that there is no cointegrating relationship between $\text{Export}_{it}$ and $\text{Popul}_{it}$, versus the alternative that there is a cointegrating relationship. The results indicate that $\text{Export}_{it}$ and $\text{Popul}_{it}$ are indeed cointegrated. Since a cointegrating relationship exists, I can estimate the parameters in equation (13) by dynamic ordinary least squares (DOLS). Before I estimate equation (13), I determine the necessary number of lagged and leaded values (p and s, respectively) of $\Delta \text{Popul}_{it}$ in equation (12). The grid search is performed allowing for up to 9 values of “p” and “s.” As I increase “s” up through 7, the lowest Bayesian information criterion (BIC) values with fixed “p” always decrease. However, after s=7, the lowest BIC values start increasing, and this indicates that the optimum value for “s” is 7. In addition, I detect that the versions of equation (12) with 7 leaded values of $\Delta \text{Popul}_{it}$ have decreasing BIC values until p=8. However, after p=8, those versions have increasing BIC values. Hence, this indicates that the optimum value for “p” is 8. As a result, the
optimum version of equation (12) is the one with p=8 and s=7. Hence, I estimate equation (13) with p=8 and s=7.

<table>
<thead>
<tr>
<th>p/s</th>
<th>BIC Value</th>
<th>p/s</th>
<th>BIC Value</th>
<th>p/s</th>
<th>BIC Value</th>
<th>p/s</th>
<th>BIC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1</td>
<td>–38.31</td>
<td>1/3</td>
<td>–115.28</td>
<td>1/5</td>
<td>–225.19</td>
<td>1/7</td>
<td>–279.35</td>
</tr>
<tr>
<td>2/1</td>
<td>–112.5</td>
<td>2/3</td>
<td>–183.61</td>
<td>2/5</td>
<td>–292.59</td>
<td>2/7</td>
<td>–343.34</td>
</tr>
<tr>
<td>7/1</td>
<td>–357.89</td>
<td>7/3</td>
<td>–373.72</td>
<td>7/5</td>
<td>–453.15</td>
<td>7/7</td>
<td>–460.84</td>
</tr>
<tr>
<td>1/2</td>
<td>–57.03</td>
<td>1/4</td>
<td>–173.65</td>
<td>1/6</td>
<td>–249.46</td>
<td>1/8</td>
<td>–290.8</td>
</tr>
<tr>
<td>2/2</td>
<td>–123.51</td>
<td>2/4</td>
<td>–241.48</td>
<td>2/6</td>
<td>–316.12</td>
<td>2/8</td>
<td>–347.63</td>
</tr>
<tr>
<td>3/2</td>
<td>–180.38</td>
<td>3/4</td>
<td>–293.98</td>
<td>3/6</td>
<td>–363.03</td>
<td>3/8</td>
<td>–383.32</td>
</tr>
<tr>
<td>5/2</td>
<td>–267.59</td>
<td>5/4</td>
<td>–369.15</td>
<td>5/6</td>
<td>–417.81</td>
<td>5/8</td>
<td>–420.86</td>
</tr>
<tr>
<td>7/2</td>
<td>–327.6</td>
<td>7/4</td>
<td>–417.21</td>
<td>7/6</td>
<td>–454.56</td>
<td>7/8</td>
<td>–443.77</td>
</tr>
<tr>
<td>9/2</td>
<td>–346.74</td>
<td>9/4</td>
<td>–424.21</td>
<td>9/6</td>
<td>–450.58</td>
<td>9/8</td>
<td>–428.06</td>
</tr>
</tbody>
</table>

Table 13. The estimation results of equation (13), dependent variable = LogExport_{it}

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LogPopul_{it}</td>
<td>0.53</td>
<td>0.0001</td>
</tr>
<tr>
<td>Trim_{it}</td>
<td>0.13</td>
<td>0.0001</td>
</tr>
<tr>
<td>Country_{it}</td>
<td>0.24</td>
<td>0.030</td>
</tr>
<tr>
<td>Country_{it}*Trim_{it}</td>
<td>–0.05</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Note: The lagged and leaded values of ∆LogPopul_{it} together with the estimated value of the constant term in (13) were not included in this table since the main focus is to determine the long-run relationship between exports and GDP through population and to see if the effect of the agreement on trade related investment measures (TRIM) on exports in developing countries is different from that in developed countries.

Table 13 shows the results of estimation of equation 13. Because of the log-log specification of this model, the estimated coefficient of LogPopul_{it} can be interpreted as the population elasticity of the weight of exports in the nominal gross domestic product (GDP) of a
host country. The sign of the estimated coefficient is as expected, and the estimated coefficient is statistically significant at all conventional levels of significance. Since $Popul_{it}$ is the instrumental variable for nominal GDP in this study, this elasticity is a good approximation to the nominal GDP elasticity of the weight of exports in the nominal GDP of a host country. The positive and statistically significant sign on $Country_{it}$ indicates that the unconditional (autonomous) weight of exports in the nominal GDP of a developing host country is higher than that of a developed host country. In addition, the positive and statistically significant sign on $Trim_t$ indicates that the unconditional (autonomous) weight of exports in nominal GDP during years in which this agreement was in place is higher than in years in which it was not. Furthermore, because the coefficient on the variable $Country_{it} \times Trim_t$ is negative and statistically significant at all conventional levels, I can say that this agreement increases the weight of exports in the nominal GDPs of developed host countries more than it does for developing host countries.
CHAPTER 8
CONCLUSION AND COMMENTS

My analysis showed that, contrary to expectations, foreign direct investment (FDI) inflows and outflows are not statistically significant determinants of aggregate unemployment rates in host countries. Thus, it would be wrong to regard FDI inflows and outflows as tools to curb aggregate unemployment rates in host countries. In addition, I found that factors such as the levels of technology and infrastructure development, and development status of a host country do not affect aggregate unemployment rates in that host country. These factors do not influence the impact of FDI inflows on aggregate unemployment rates. Furthermore, the Asian financial crisis (AFC) of 1997 does not have an impact on aggregate unemployment rates in the host countries. Thus, I conclude that, in the host countries, aggregate unemployment rates depend on the previous levels of aggregate unemployment rates and the volume of real aggregate economic activity, as macroeconomic theory suggests. I also showed that the negative relationship between inflation and the unemployment rate, as suggested by the Phillips curve, does not hold in the long-run in host countries since the coefficient on Inf in my analysis is positive. Specifically, I found that, in the host countries, each one percent increase in the previous period’s aggregate unemployment rate increases the current aggregate unemployment rate by 0.77 percent, other factors constant. In addition, each $1,000 increase in per capita real gross domestic product (RGDP) decreases the current aggregate unemployment rate by 0.2 percent in the host countries, all else constant.
I also found that the percentage of exports in nominal gross domestic product (GDP) and total population are cointegrated in host countries. In the long run, the percentage (weight) of exports in the nominal GDP of a host country and its nominal GDP have a predictable relationship since total population is the instrument for nominal GDP. Specifically, the nominal GDP elasticity of the weight of exports in the nominal GDP of a host country is 0.53. Hence, I can infer that the volume of exports in the nominal GDP of a host country is sensitive to changes in its nominal GDP. From a policy perspective, national budget planners can take this elasticity information and use it to project, for example, potential tax revenues from exports industries. Furthermore, the percentage of exports in the nominal GDP of a developing host country is greater than that of a developed host country. Specifically, the weight of exports in the nominal GDP of a developing host country is nearly 27 percent (since Export$_{it}$ is in natural log, I consider the exponentiated value of the coefficient on the linear variables in (13)) higher than that of a developed country. Therefore, policymakers in developing host countries should be very careful when they make regulations that directly or indirectly affect exports because developing host countries are more dependent on exports in their total production, as shown in my results.

As mentioned in the literature review, the effect of the agreement on the trade related investment measures (TRIM) is highly questionable. My results showed that the agreement on TRIM has a statistically significant impact on the weight of exports in the nominal GDP of a host country. In particular, it increases the weight of exports in nominal GDP of a developed host country by nearly 13.9 percent and a developing host country by nearly 8.3 percent. That is, after the agreement on TRIM, the role of exports in the economies of both developing and developing host countries increased.
In Figures 1 and 2, I show that the overall trend of RGDP in the developing host countries used to address the second research question is upward. The RGDP trend of the developed economies similarly is upward (Kitov, 2006). Therefore, based on this increasing trend:

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2 In Figure 1, the series CAR represents the Central African Republic.
behavior of RGDP in the developing and developed host countries, I conclude that not only the weights of exports in the nominal GDP in the developing and host countries increase in the long run, but also the real export values increase in those countries. As a result, my study supports the developed countries’ view (presented in the Uruguay round of general agreement on tariffs and trade in 1994) that restrictive trade rules should be eliminated to increase exports.

On the other hand, the agreement on TRIM seems more beneficial to the developed host countries in terms of exports volume. Thus, there must be some way to improve this situation in favor of the developing host countries. One way might be to reconsider some of the rules eliminated (such as, export performance requirements (EPRs) stipulating that a certain proportion of production should be exported) and to reenact them for a certain period of time. Another way might be to levy taxes on foreign firms that sell to the domestic host markets heavily and, hence, endanger the existence and/or growth of the indigenous firms in those markets by shrinking the volume of the sales of the indigenous firms. These additional taxes can also be forwarded to the indigenous firms in developing host economies as subsidies while not causing extra burden to the national budgets. So not only those foreign firms are urged to export but also the domestic firms get stronger and even might start exporting.

One of the major constraints in this study is the availability of data. In general, it is always better to use a large sample in both time and cross-section dimensions. However, I was not able to enlarge my data sets especially in time dimension owing to the unavailability of data for some variables such as Unempit. Furthermore, I have interpolated 34 missing values to complete my data sets. To measure the level of infrastructure development, I used a proxy (the number of telephone lines) because of its availability. However, this might not be the best proxy variable, and this might be the reason for the insignificance of infrastructure development in this
work. Therefore, further studies might obtain different results by using more refined and proper data sets.
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