

Stockholm School of Economics
Department of Economics
Master's Thesis in International Economics

We Just Ran 17 Regressions

– A gravity analysis of Swedish trade with Eastern Europe

Abstract

After the fall of communism, democracy opened up new opportunities for trade with the former Eastern European bloc. The aim of this paper is to perform a descriptive analysis of the development and current status of Swedish trade with a number of the former centrally planned economic regimes. A thorough examination of available statistics shows that Swedish trade in general, and imports in particular, with these countries has increased substantially over the past decade. This is in line with previous research and findings for other European countries. Using a gravity model, we find for Swedish trade with the Eastern transition economies that: (1) trade is at, or even slightly above, expected levels given GDP, distance and other relevant variables; (2) import levels are significantly above what is predicted by the model; and (3) that Sweden has considerably stronger trade relations with certain Eastern transition economies, most notably the Baltic states.

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I Introduction

I.1 Background

When the Berlin wall came tumbling down in 1989, it was evident that this would leave its mark in European history. Not only would this event have a profound effect on the lives of the people of Eastern Europe, but the economic implications would also be enormous. What had begun in Poland with the Solidarity-movement, culminated in Berlin as Germans from both East and West came out in numbers to celebrate. In the wake of these events, Czechs and Slovaks also took to the streets to demand political reforms in Czechoslovakia, and other countries soon followed suit.

The fall of the Berlin Wall also acted as the beginning of the end for the Soviet Union and marked the start of the transition towards market economies all across Central and Eastern Europe. To the world outside this region, Sweden included, these events were not just a relief in terms of added security; they also opened up an opportunity of economic gains in terms of expanded trade relations. The collapse of the centrally planned economic regimes brought along revolutionary changes to the economic systems in these transition economies. Furthermore, external trade suddenly faced important liberalisation.

Parallel to the establishment of free markets in the transition economies; trade between these countries and the western world began to grow, and it has continued to do so ever since. Given the considerable economic changes these economies had to go through, most of them have integrated remarkably well into the international markets in just over ten years time. And, with a number of these countries already being members of the European Union, and others waiting in line, these countries have become important trading partners to Sweden as well as to the rest of Western Europe.

With the relatively newfound importance of trade with these former members of the Eastern bloc, its relevance as a research topic has increased. In our opinion it would therefore be interesting to, from a Swedish perspective, take a closer look at how trade with this region has evolved over the passed decade. Also, related to this interest is the question of whether one could expect there to be room for additional growth in trade, or if the trade already is up to par when compared to Sweden's general trade pattern.

I.2 Purpose

The scope of this thesis is to perform a descriptive analysis and evaluation of the current status of Swedish trade with a number of the former centrally planned economic regimes, located in the central and eastern parts of Europe. Whether trade with these countries is up to par with Swedish general trade

pattern – given GDP, distance between countries and other relevant factors – or if there is potential for further growth, is of special interest. As a complementary approach to the gravity based analysis, we also provide a statistical overview of Sweden's trade with these countries over the passed decade.

1.3 Delimitations

The former centrally planned economic regimes that are in focus in this thesis are from here on referred to as the Eastern Transition Economies (ETEs). The twenty countries that constitute this group are the independent states formerly under Soviet influence (Poland, Bulgaria, Romania, the Czech Republic, Slovakia, Hungary, Albania¹, Croatia, Bosnia-Herzegovina, Slovenia, FYR Macedonia and Serbia-Montenegro²) and the former Soviet states (Estonia, Latvia, Lithuania, Russia, Belarus, Ukraine, Azerbaijan and Kazakhstan³).

The time period under which trade relations between Sweden and the ETEs are studied is a ten-year period, spanning from year 1995 to year 2004. This choice of time span is partly due to our primary interest in the recent trade developments and partly due to lack of reliable data for earlier years.

We would like to point out that the primary objective of this thesis is to describe the development and current situation of the trade flows between Sweden and the ETEs. This means that it is beyond the scope of this thesis to present any deeper analysis of the results and explain the underlying factors. This would, however, be an interesting topic for further research.

1.4 Contribution

Over the past ten years a number of papers on trade relations with the ETEs after the transition to market economies have been published. Most of these papers present studies on trade relations and potential trade volumes from a European Union perspective. Also, most of them focus on those ETEs that already have entered the European Union, or are about to in a year or two. As far as we are aware of no previous paper has undertaken the task of studying trade relations between the ETEs and Sweden in particular. The primary contribution of this thesis is therefore that it is the first one about trade with the ETEs from a solely Swedish perspective. Furthermore, compared to most other studies, we have chosen to include almost twice as many former socialist countries, which in turn provides us with a richer and more detailed picture of the trade relations with the ETEs.

¹ Although Albania did have relations with the Soviet Union, they were not nearly as solid as those of the other nations. At times, they were as poor as relations with the west.

² As of 2006 Serbia and Montenegro are two independent states. In this study they are, however, treated as one unit.

³ Kazakhstan is the only non-European country included among the ETEs. The country is however a rather large trading partner to Sweden and a bordering country to Europe.

From a more practical standpoint, our results could prove useful to people involved in the Swedish import/export industry. For instance, examining the results could reveal possible trade barriers or favourable trade relations between Sweden and another country. This might warrant further investigation for a company looking to enter these markets, for the Swedish government looking to improve the nation's trade, etc.

1.5 Outline

The structure of the thesis is as follows. In chapter 2 we give an introduction to the ETEs' historical background. Past actions and political events play an important role in determining trade flows. Therefore, this chapter will describe both the ETEs' liberalisation process as well as adopted trade agreements.

In chapter 3 we provide a statistical review of trade volumes between Sweden and the ETEs over the studied time period. This is supplemented with previous research on trade relations between the Western Europe and the ETEs that we review in chapter 4. In chapter 5 we put the findings from the two previous chapters together and arrive on a set of hypotheses to be tested.

To test the hypotheses we use an adapted gravity model, the theoretical framework and design of which is presented in chapter 6. In chapter 7 we use the gravity model to compare trade relations between Sweden and the ETEs with Sweden's general trade pattern. Some the empirical findings are discussed further in chapter 8. Finally, chapter 9 concludes the thesis and present suggestions for further research.

2 Historical Background

In new democracies, historical and political events can play a major role in determining current and future trade relations. This chapter provides the reader with a brief introduction to the liberalisation process of the former socialist countries. Also, as trade agreements are important determinants for trade pattern and trade volumes, a more elaborate description of the different trade agreements adopted between the ETEs and other parties is presented.

2.1 From Central Planning to Market Economy

When we speak about the former socialist countries we often tend to categorise them as one single group, the Eastern European countries. There are, however, large differences between different groups of ETEs. When studying the background of the ETEs and their transition to democracy and market economy it can therefore be useful to divide them into three separate groups: Independent states formerly under Soviet influence, former Soviet states, and former Yugoslavian states.

Among the ETEs in this study, Hungary, Poland, the Czech Republic, Slovakia, Bulgaria, Romania and Albania are all independent states formerly under Soviet influence. Each and every one of these countries, except for Albania, became democracies in 1989 in the movement of change that swept across Central and Eastern Europe at the time. Poland had the solidarity movement, Czechoslovakia its velvet revolution and other countries shared similar experiences. Albania, however, had to wait until 1992 before the new Democratic Party won the elections. In Czechoslovakia the dissolution into two separate states, the Czech Republic and Slovakia, followed in 1993.

The former Soviet states included among the ETEs are Russia, Ukraine, Azerbaijan, Kazakhstan, Estonia, Latvia and Lithuania. These countries all enjoyed independence from the Soviet Union in 1991, although some of them had already declared themselves as independent in 1990. In the Soviet Union itself Gorbachev ceded power to Boris Yeltsin and the Soviet Union dissolved.

Croatia, together with Serbia, Montenegro, Bosnia and Herzegovina, the Republic of Macedonia and Slovenia are what we call the former Yugoslavian states. In comparison to many of the other ETEs, these countries experienced a much more difficult transition path; marked by civil war and unrest. Croatia, Slovenia and the Republic of Macedonia all declared their independence in 1991. Bosnia and Herzegovina followed suit in 1992, while Serbia and Montenegro constituted the Federal Republic of Yugoslavia from 1992 till 2003. In 2003 they formed the State Union of Serbia and Montenegro and in 2006, after Montenegro voted to leave the state union, Serbia officially declared its independence.

2.2 Trade Agreements between Sweden and the ETEs

In the early transition period, opening up for foreign trade was one of the priorities for the ETEs. The interest in the liberalisation of trade was shared with the Western European countries and it did not take long before various kinds of free trade agreements appeared on the agendas.

2.2.1 EFTA⁴

At the beginning of the 1990's, Sweden was a member state of the European Free Trade Association, EFTA. With the objective of a progressive liberalisation of trade in goods, discussions on free trade agreements between EFTA member states and ETEs were initiated shortly after the collapse of the centrally planned economic regimes. In 1992, EFTA signed free trade agreements with the former Czechoslovakia, now the Czech Republic and Slovakia, Poland and Romania. The agreements were not designed to eliminate all barriers of trade between these countries and EFTA immediately after the time of signature. Rather, the objective was to remove the barriers, e.g. in terms of customs duties, during a ten year transitional period starting from the date when the agreements came into force. This would gradually establish a free trade area with the EFTA member states and the ETEs.

In 1992 EFTA also signed a declaration on cooperation with Albania. In contrast to the other free trade agreements, the intention of the declaration was not to eliminate the trade barriers within a certain period of time. Instead, the aim was for the EFTA states and Albania to seek to create favourable conditions for an expansion of trade between the two parties. Among others this included the removal of technical barriers to trade and the exchange of views on conditions for free and undistorted competition without any government intervention on the market.

The year following the first free trade agreements in 1992, EFTA also signed agreements with Hungary and Bulgaria. In 1995 Estonia, Latvia, Lithuania and Slovenia followed. However, this very year Sweden withdrew from EFTA in favour of the European Union and thereby ceased to be a part to all free trade agreements between EFTA and the ETEs.

2.2.2 The Europe Agreements⁵

Similar to EFTA, the European Union had up to this point signed several agreements on free trade with the ETEs. Already in the late 1980s, the European Community began to establish diplomatic relations with a number of countries of the former Soviet bloc which led to the removal of long-standing import quotas on a number of products. Over the next couple

⁴ Whole section based on information from <http://www.efta.int>

⁵ Whole section, including the two following, based on information from <http://europe.eu>

of years the European Community also concluded the so-called Europe Agreements with the Central and Eastern European Countries (CEECs)⁶. The aim of these agreements was a progressive establishment of a free-trade area with the exception of tariffs on agriculture and some other sensitive products. The liberalisation of trade was implemented in an asymmetric way meaning that the European Union member states opened up their markets more rapidly than what the associated ones had to. In addition to the liberalisation of trade, the Europe Agreements also contained provisions concerning free movement of services, payments and capital. In chronological order, the Europe Agreements were signed with Poland and Hungary in 1991; thereafter followed Romania, Bulgaria, the Czech Republic and Slovakia in 1993; Estonia, Latvia and Lithuania in 1995; and finally Slovenia in 1996. These agreements all entered into force between 1994 and 1998 and ceased to apply on May 1, 2004 for those countries entering the European Union, meaning all countries but Bulgaria and Romania.

2.2.3 Stabilisation and Association Agreements

Based on the experience of the Europe Agreements, the European Union also set out to establish trade relations with the Western Balkan countries in the late 1990s. Due to the unstable situation in the former Yugoslavia and Albania during the 1990s; caused by wars, sanctions and corruption; the Western Balkans were excluded from an integration process similar to the one initiated between the European Union and the CEECs (Montanari, 2005). With the intention of integrating the Western Balkans into the Western Europe the European Union created the Stabilisation and Association Process (SAP), which was launched in year 2000. In this process the European Union signs Stabilisation and Association Agreements (SAAs) with the Western Balkan countries. Trade policies play an important role in these agreements as the objective is to create a free trade area.

With the exception of Slovenia, the process involves all countries of former Yugoslavia: Croatia, Bosnia-Herzegovina, Republic of Macedonia and Serbia-Montenegro, as well as Albania. Given that Slovenia underwent a comparatively successful economic transition during the 1990s, and signed the Europe Agreement as early as 1996 leading to full European Union membership in 2004, the country is not included in the SAP. Up until now the European Union has initiated negotiations with all of the above mentioned Western Balkans, however, only the agreements with Croatia and the Republic of Macedonia have been ratified so far.

The trade policies found in the SAAs are quite similar to the trade policies found in the Europe Agreements in the sense that liberalisation of trade is implemented in an asymmetric way, giving the Western Balkans trade

⁶ Poland, Hungary, Romania, Bulgaria, the Czech Republic, Slovakia, Estonia, Latvia, Lithuania and Slovenia.

advantages. However, the trade measures offered by the European Union appear to be somewhat more generous than those offered in the Europe Agreements as there are less restrictions and precautionary clauses (Montanari, 2005).

2.2.4 Partnership and Cooperation Agreements

In trade relations between the European Union and Russia, the Partnership and Cooperation Agreement (PCA) is the main plank. Signed in 1994 and entering into force in 1997, the agreement aims to promote trade and investment, as well as harmonious economic relations between the parties. It regulates economic, political and cultural relations between the European Union and Russia and is the legal basis for bilateral trade between them. To complement the PCA a number of sectoral and international agreements exist, regulating for example steel products, textiles and energy. The PCA has an initial duration of ten years, but will automatically be extended annually from the year 2007 and on, provided that neither side withdraws from the agreement. Both sides have also committed to establishing a free trade area as soon as circumstances permit, which was manifested in the European Union's common strategy on Russia, adopted in 1999. In this, the integration of Russia into the Common European Economic Space is stressed and at the European Union-Russia summit in 2001, parallel to Russia's WTO accession negotiations, this was made reality.

The PCA also applies to European Union relations with Ukraine, Kazakhstan and Azerbaijan. Belarus is a special case, as the PCA negotiations never were concluded after that the European Union-Belarus relations had stalled in 1996 in the wake of democratic setbacks and the Drazdy conflict.

Summarising the trade relations between Sweden and the ETEs, we see that negotiations on trade agreements have been initiated with all of the ETEs. For some countries the progress with free trade agreements has been greater than for others, but the vision of a free trade area including all the ETEs still remains.

3 Patterns of Trade between Sweden and the ETEs

This chapter presents a statistical description of the development of trade relations between Sweden and the ETEs from 1995 to 2004, both in terms of total trade and divided into exports and imports.

3.1 Total Trade Volumes

During the time period spanning from 1995 to 2004 Swedish trade with the ETEs grew substantially, as can be seen in figure 1. On average, trade increased with nearly 193 percent, see figure 2, but the differences between individual countries were large. The volumes of trade between Sweden and the different ETEs in 1995 and 2004 respectively are depicted in table 2. When studying these figures one should take into consideration that small countries tend to experience great variations in trade on a year to year basis. Therefore, some of the figures should be taken with a grain of salt, such as the staggering increase of Swedish trade with Azerbaijan of 10 930 percent.

In spite of the extraordinary growth in trade between Sweden and the ETEs, it still constitutes a rather limited share of total Swedish trade. In 2004 it accounted for just 7.9 percent of the total trade volume, as is depicted in figure 3. Nevertheless, the share has about doubled compared to the 4 percent back in 1995, and in 2004 it was comparable to Swedish trade with North America. Also, compared to trade with what we choose to label “Rest of the world”⁷, trade with the ETEs has surpassed this volume with a wide margin.

In comparison to the 193 percent increase in trade with the ETEs, Swedish trade in general grew a more moderate 50 percent between 1995 and 2004, as seen in figure 2. While trade with the ETEs remained on the rise throughout the whole time period, total Swedish trade actually declined both in year 2001 and 2002. Also, as depicted in table 1, during the ten-year period, the percentage growth in Swedish trade with the ETEs was in double digits no less than five times, peaking in 1997 with a 29 percent growth.

Table 1. Inflation adjusted growth rates for Swedish trade with the ETEs and total Swedish trade, in percent.

	1996	1997	1998	1999	2000	2001	2002	2003	2004
Trade with the ETEs	3.9	29.3	11.5	4.2	24.0	3.3	13.8	9.6	17.5
Total Swedish trade	0.6	9.5	7.4	3.0	16.2	-3.6	-3.0	2.0	8.9

⁷ “Rest of the world” refers to all countries except for European, Asian, North American and South American countries.

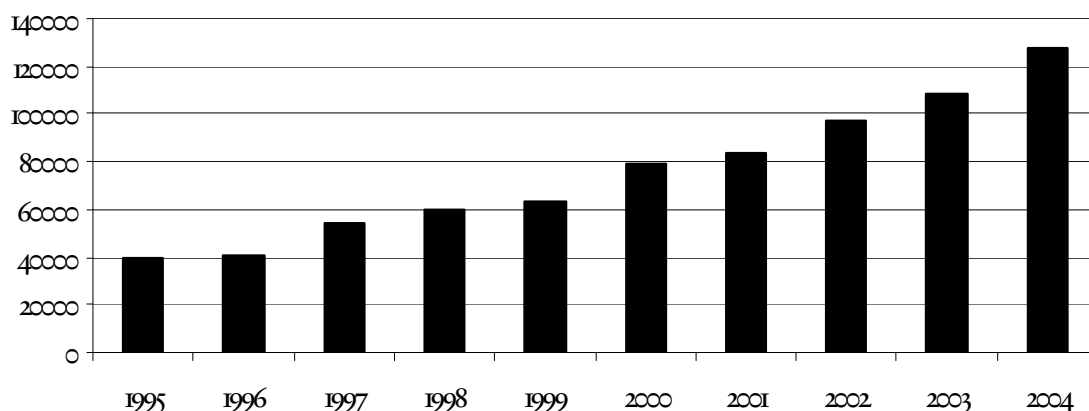


Figure 1. Total trade between Sweden and the ETEs (in MSEK), not adjusted for inflation. Own calculations based on SCB data.

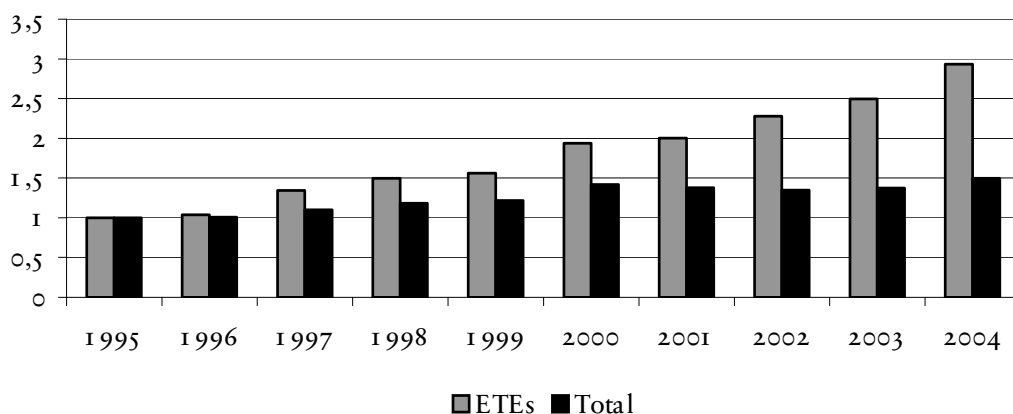


Figure 2. Inflation adjusted accumulated growth in Swedish trade with the ETEs compared to accumulated growth in total Swedish trade. Own calculations based on SCB data.

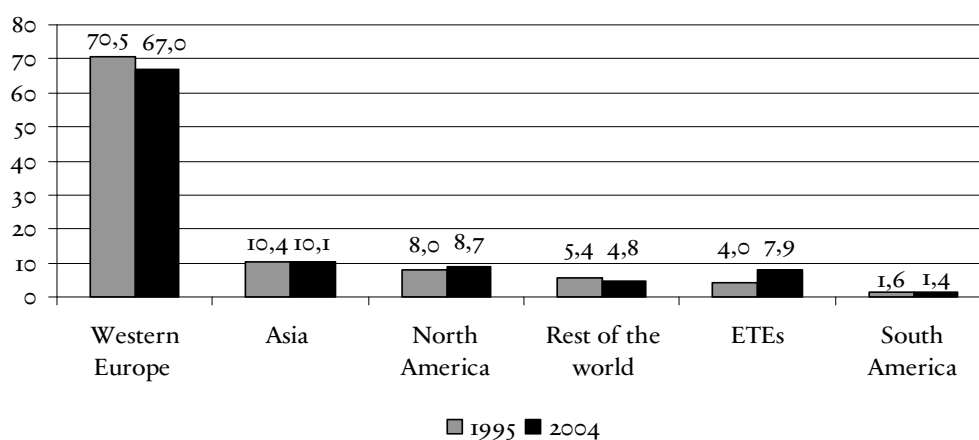


Figure 3. Distribution of Swedish trade given origin region in 1995 and 2004, expressed as percentage of total Swedish trade. Own calculations.

Table 2. Swedish trade with the ETEs in 1995 and 2004 (in thousand current SEK). The percentage figures are adjusted for inflation. Own calculations based on SCB data.

	Imports			Exports			Total Trade		
	1995	2004	Increase in imports (%)	1995	2004	Increase in exports (%)	1995	2004	Increase in total trade (%)
Poland	4,204,251	18,165,806	296	6,602,304	15,585,835	116	10,806,555	33,751,641	186
Russia	3,411,340	16,111,539	332	4,746,538	13,607,323	163	8,157,878	29,718,862	234
Estonia	2,089,091	6,510,543	186	1,686,703	4,998,029	171	3,775,794	11,508,572	179
Hungary	1,058,420	6,024,717	421	2,269,400	438,1191	77	3,327,820	10,405,908	187
Czech Republic	1,161,054	4,337,717	243	2,105,567	479,7861	109	3,266,621	9,135,578	157
Lithuania	534,890	3,937,937	574	843,050	2,679,890	191	1,377,940	6,617,827	340
Latvia	2,888,107	3,592,121	14	1,304,638	2,874,674	102	4,192,745	6,466,795	41
Romania	282,562	1,121,556	264	472,500	2,363,298	358	755,062	3,484,854	323
Slovakia	459,092	1,417,661	183	406,809	1,728,588	289	865,901	3,146,249	233
Ukraine	8,517	192,310	1,964	282,650	2,861,703	827	291,167	3,054,013	861
Croatia	108,020	951,048	706	89,7114	1,346,189	37	1,005,134	2,297,237	110
Slovenia	480,934	1,083,892	106	571,899	1,086,453	74	1,052,833	2,170,345	89
Serbia-Montenegro	1,237	163,996	12,048	23,102	1,336,575	5,201	24,339	150,0571	5,549
Kazakhstan	4,144	176,727	3,808	133,579	943,169	547	137,723	1,119,896	645
Bulgaria	119,700	348,861	167	335,572	733,986	101	455,272	1,082,847	118
Belarus	24,958	253,507	831	123,802	336,184	149	148,760	589,691	263
Azerbaijan	206	131	-41	4,512	567,838	11,431	4,718	567,969	10,930
Bosnia-Herzegovina	724	56,069	6,995	5,626	213,308	3,374	6,350	269,377	3,787
Macedonia	30,853	41,350	23	112,104	137,300	12	142,957	178,650	15
Albany	9,474	41,589	302	22,405	79,634	225	31,879	121,223	248

Throughout the whole time period of interest, Poland remained Sweden's largest trading partner among the ETEs. Its share of Swedish trade with has been reasonably constant over time, accounting for 27.1 percent of Sweden's total trade volume with the ETEs back in 1995 and 26.5 percent in 2004. While Russia fell behind Estonia for a brief period around 1999-2000, the country later on regained its position as Sweden's second largest ETE trading partner as Estonia's share fell in the latter part of the sample period.

It is important to note that since our sample period starts in 1995, Sweden had adopted the European Union policy concerning imports. This means that a good shipped to Sweden from a country outside the European Union, but entering the European Union in another member state, can be registered in the statistics as originating from that member state instead of the true originating country. This should, however, not affect our main findings in any significant way. For further discussion on the reasons for this please refer to chapter 8.

When shifting perspective from a strictly Swedish viewpoint on trade relations to trade relations at the European level, the development of trade with the ETEs appears to follow a similar pattern. Caetano & Galego (2005) found that exports to the Central and Eastern European countries (CEECs), as percentage of total European Union exports, rose from about 2.5 percent to 5 percent between 1993 and 2001. Similarly, the percentage share for imports from the CEECs also doubled rising from 2.1 percent to 4.3 percent during those years. There are, however, as Caetano & Galego (2005) point out, large differences between the individual European Union member states.

3.2 Export and Import Differences

When taking a closer look at Swedish trade relations, one discovers that there are some important differences between the pattern of Swedish exports and Swedish imports. First, while Western Europe is the undisputable number one trading partner to Sweden, both in terms of import and export, there are some differences in Swedish export and import intensity with different parts of the world. This observation is depicted in figure 4, and as can be seen, North America is Sweden's second largest export region while Asia is the second largest import region. Further, apart from Western Europe, Sweden generally exports considerably more to various regions than it imports from those same regions. As an illustrative example, in 2004 Sweden exported 32 percent more than it imported from South America, 44 percent more from Asia, nearly four times as much from North America and almost fourteen times as much from what we loosely call "Rest of the world". Trade with Western Europe is an exception to this pattern, as Sweden imports considerably more from the Western Europe than it exports. Lately, this same pattern has become visible in the Swedish trade pattern with the ETEs as well, meaning that imports from the ETEs are larger than the exports. This is also

evident when taking a closer look at how the import/export-ratio has evolved from 1995 to 2004, as seen in figure 5.

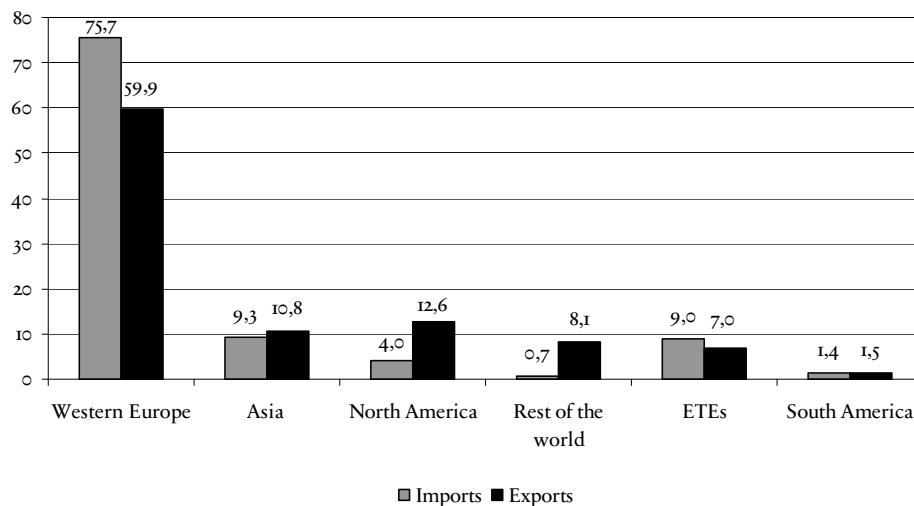


Figure 4. Distribution of Swedish imports and exports after origin region in 2004, expressed as percentage share of total Swedish imports and exports.

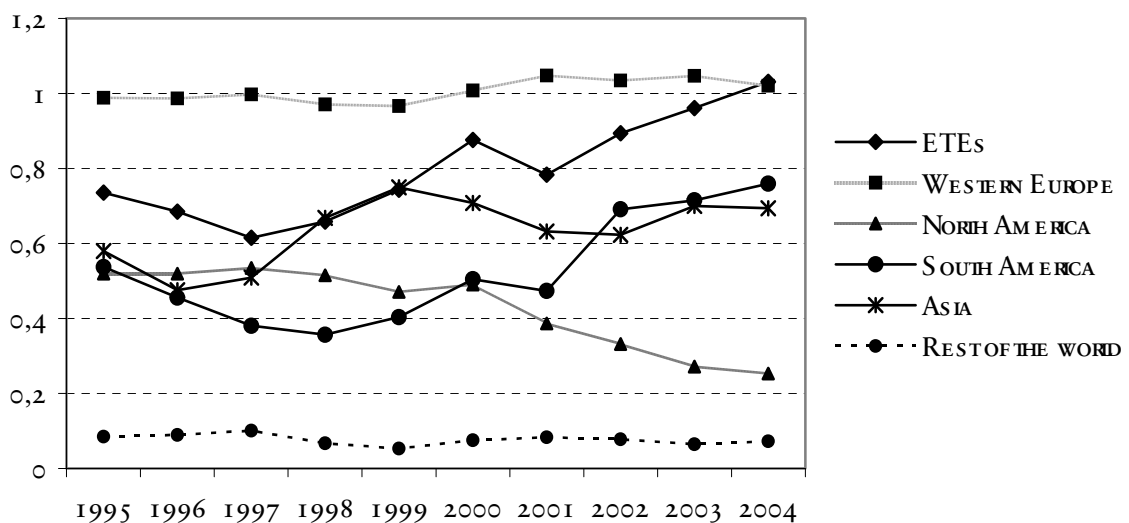


Figure 5. Import/export ratio for Swedish trade with different regions

As late as in 2001, Swedish imports from the ETEs were just 78 percent of the total value of exports to the ETEs, and back in 1997 a mere 61 percent. In 2004, this relationship was reversed, with imports now exceeding exports by 3 percent. The origin of this development is the extraordinary growth in Swedish imports from the ETEs during the studied time period. While Swedish imports in general grew with 51 percent during the time span,

imports from the ETEs grew with approximately 250 percent. Although Swedish exports to the ETEs grew at a slower rate than imports, the total increase was still as large as 151 percent. As a comparison Swedish exports in general grew a more moderate 50 percent between 1995 and 2004. The historical trade development of Swedish exports and imports is depicted in both figure 6 and 7.

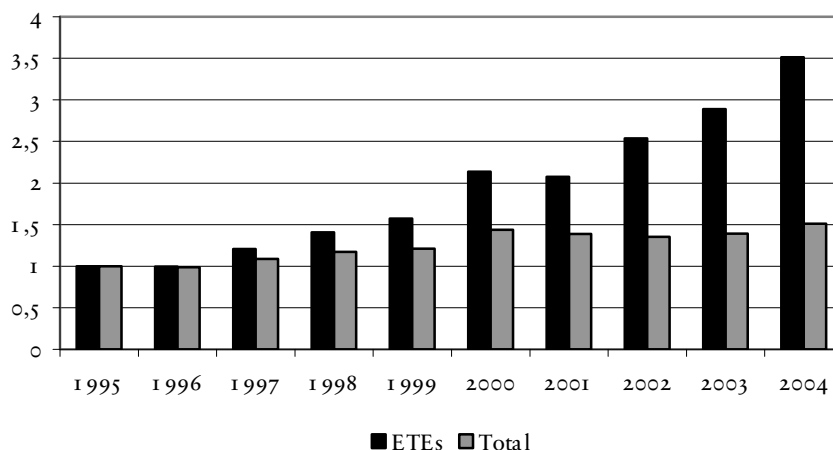


Figure 6. Inflation adjusted accumulated growth in total Swedish imports and imports from the ETEs. Own calculations based on SCB data.

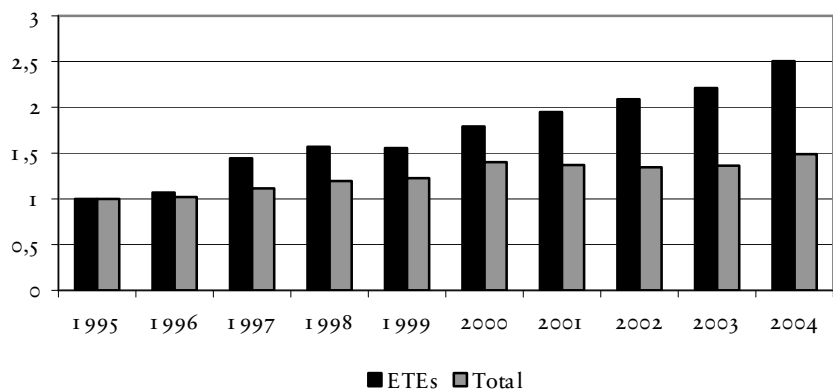


Figure 7. Inflation adjusted accumulated growth in total Swedish exports and exports to the ETEs. Own calculations based on SCB data.

4 Previous Studies

The statistical description in chapter 3 gives us valuable insights into the development of trade between Sweden and the ETEs during the past decade. Not only does it illustrate that Swedish trade with the ETEs have increased at a much higher rate compared to other groups of countries, but also that the pattern of trade between Sweden and the ETEs, in terms of import and export structure, becomes increasingly analogous to that between Sweden and the Western European countries. However, this kind of study does not provide us with any information on the development and current status of trade relations with the ETEs compared to Sweden's trade relations in general.

Even though we have not come across any other papers examining trade relations between the ETEs and Sweden in particular, overall trade among the ETEs, and between the ETEs and the European Union, is a rather well-researched area. This chapter presents previous studies related to these topics, which provide valuable input for the formation of hypotheses on Swedish trade with the ETEs.

4.1 The Outward Orientation of the ETEs

In the direct aftermath of the collapse of the former centrally planned economic regimes, trade relations among the ETEs were still extraordinary intense. As Fidrmuc & Fidrmuc (2003) found, trade among the Baltic States and among Belarus, Russia and Ukraine, was for example more than 40 times larger than what could be expected given these countries' economic and geographic conditions. The favourable trade relations can to some extent be explained by the relative closeness among these countries, but they also, as Fidrmuc & Fidrmuc (2003) point out, reflect the strictly limited trade with Western Europe prior to the collapse of the Eastern bloc.

However, it did not take long before the strong trade bias towards other neighbouring ETEs started to weaken. In the late 1990s, trade intensity was down to about ten times the expected trade level for a number of countries in Fidrmuc & Fidrmuc's (2003) study, such as the Baltic countries and the countries of former Yugoslavia. Still, some former socialist countries seemed to have made greater progress than others in their outward orientation. The former Soviet Union states, for example, with the exception of the Baltic countries, seemed to have maintained their strong bias in trade towards their neighbouring ETEs in the late 1990s. As pointed out by Fidrmuc & Fidrmuc (2003), the fact that countries such as Belarus, Russia and Ukraine are relatively remote from a Western Europe perspective is probably one of the underlying sources for this division. Given its closeness to the Western European market, the ETEs in Central Europe, hand in hand with the Baltic States, have experienced a stronger outward orientation following the abandonment of central planning.

4.2 The ETEs and their Trading Partners

For most countries, geographic proximity, together with different kinds of historical and cultural legacies, act as important determinants for the pattern of trade. Trade between the ETEs and their trading partners is no exception to this. As Caetano & Galego (2005) point out, neighbouring countries experience a stronger intensity of trade. In the case of trade between the Western Europe and the ETEs Caetano & Galego (2005) demonstrate that this results in relatively strong trade relations for Germany and Austria with Hungary, the Czech Republic, Slovenia and Slovakia; Greece with Bulgaria and Romania; and Finland and Sweden with the Baltic countries. In line with this phenomenon, trade between the ETEs and peripheral countries in the European Union; such as Spain, Portugal and Ireland; appears to be limited.

Similarly, trade relations with the Western Balkan countries are dominated by Italy and Germany (Montanari, 2005). Together these two countries accounted for more than 65 percent of the imports from the Western Balkans to the European Union in year 2002. Sweden's share of the total European Union imports from the Western Balkans was less than one percent at this point in time. Together with other peripheral countries such as Portugal, Finland and Denmark, Sweden ranked among the lowest of the European Union countries when it comes to trade with the Western Balkans (Montanari, 2005). Not all former socialist countries seem to have strengthened their trade relations with the Western European countries however. For example, as Bakanova et al. (2001) describe, Belarus still trades almost exclusively with Russia.

4.3 Potential Trade with the ETEs

Given that trade relations with the ETEs were distorted for a considerable time during the 20th century, it is rather difficult to, just by looking at historical trade patterns, estimate the trade levels that would have prevailed today, had it not been for the distortions. To circumvent this problem other studies often apply a gravity model⁸ in which 'normal' trade patterns are estimated based on trade volumes between countries whose trade relations can be considered to be non-distorted. By doing this, one attains an approximation of the trade volumes between the ETEs and other countries had the ETEs experienced full trade liberty. These 'normal' trade patterns are then compared to the ETEs actual trade patterns in order to assess whether there is room for growth or if the trade levels already are as high as could be expected.

In a number of studies over the past twelve years, trade relations between Western European countries and the ETEs have been estimated using a gravity model. Most of the early studies carried out in the wake of the

⁸ A more detailed description to the gravity model is presented in chapter 6

collapse of the socialist countries showed that there was a large potential for growth in trade between the European Union and the ETEs in Central and Eastern Europe, the CEECs. Baldwin (1994), for example, estimated that exports from the European Union to the CEECs on average should have been about twice as large as they actually were in 1989. There were however great differences among particular countries. While the German exports appeared to have reached their potential level by year 1989, Baldwin (1994) found that actual exports from the UK, Finland and Portugal were about 4 to 11 times smaller than what could be expected. In Sweden's case, Baldwin (1994) estimated that actual exports were about half of the predicted value.

Although many of the papers written on this subject in the early 1990s seemed to point in the direction of an unexploited trade potential, there were some who opposed this. Gros & Gonciarz (1995), for example, argued that many of these early studies had been based on strongly overestimated GDP values for the CEECs, which in turn affected the results to indicate large potentials for growth in trade. Instead, using updated material on the CEECs GDP, Gros & Gonciarz (1995) came to the conclusion that already in 1992 there were no remaining signs of any unexploited trade potential between the CEECs and the European Union countries.

Throughout the 1990s, trade between the European Union and the CEECs increased sharply. Accordingly, at the end of the 1990s, most studies on this topic found that the actual CEEC trade volumes were about as large as expected and that the growth potential had been exhausted. Egger (2002), for example, found that actual trade between the European Union countries and Hungary, Poland and the Czech Republic, more or less had reached its potential volume in 1997. For Sweden, however, the results seemed to indicate that there could still be some room for growth in trade with these three CEECs.

Similar to Egger (2000), Nilsson (2000) found that there was no significant difference between CEEC-OECD trade and trade among OECD countries in 1996. This meant that the CEECs appeared to be just as integrated in the international trade market as the OECD countries on average. Yet, similar to what other studies witnessed there were large differences between individual countries. A case in point was Sweden, which on average imported almost 70 percent more than predicted from the CEECs. However, while Sweden's potential-to-actual trade ratio was between 0.2 to 0.4 for Estonia, Latvia and Lithuania, it was above one for both the Czech Republic and Slovenia as well as for Romania which peaked with values as high as between 1.4 and 1.8. This meant that Swedish trade with the Baltic countries, both in terms of exports and imports, was much larger than predicted, while it was much lower than predicted for some of the other CEECs.

The relatively strong trade relations between Sweden and the Baltic countries, as evident in Nilsson (2000), are also observed by Laaser & Schrader (2002).

In their analysis of the Estonian, Lithuanian, and Latvian trade patterns during the late 1990s, they found strongly preferential trade relations with the Scandinavian countries, Iceland excluded. This led to that trade volumes were about 7 times larger than expected given the estimated gravity model. Other countries round the Baltic Sea, such as Germany, and countries with important ports, such as the Netherlands and Belgium, experienced similar strong trade relations with the Baltics. Given these observations Laaser & Schader (2002) draw the conclusion that the efficient transport system across the Baltic Sea acted as an important integration device for the Baltics, and was one of the reasons behind these countries' quick assimilation into the international trade market.

Even though most papers throughout the 1990s indicated unexploited trade potentials with the CEECs, there were some contradictory results. According to Caetano & Galego (2005), this could be attributed both to the extraordinarily rapid growth in CEEC trade as well as the usage of different forms of econometrical analysing methods. In most recent studies on trade between the European Union and the CEECs, though, there seems to be consensus on that actual trade either equalled or exceeded estimated potential volumes after year 2000. The Europe Agreements, which were signed with a number of the CEECs during the 1990s, appear to have affected trade relations in a positive way, leading to this relatively quick trade integration with the European Union (Montanari, 2005).

In May 2004, most of the CEECs became full members of the European Union. As this occurred quite recently, it is difficult to give an accurate estimate of the actual effect that this has had on trade relations. However, entering a preferential trade area, such as the European Union, usually has a positive effect on trade, and as Caetano & Galego (2005) point out, there are possibilities of further trade expansion between the earlier member countries and the newly entered ones.

Moving from the CEECs to the Western Balkan countries, the overall picture is somewhat different. Given the difficulties these countries experienced during the 1990s, with the exception of Slovenia, the establishment of trade relations with the European Union appears to have had a somewhat slower start compared to the CEECs. According to Montanari (2005), there is still considerable room for growth in trade volumes between the Western Balkans and the European Union. Whether trade with the Western Balkans will evolve at the same pace as with the CEECs is yet to be proved, but, as Montanari (2005) writes, the implementation of the SAP can play an important role for the progress of trade relations with the European Union.

4.4 Differences in Export and Import

Most studies on trade relations between the Western and Eastern parts of Europe note that there is a difference in trade patterns between imports to the ETEs and exports from the ETEs. Generally, imports from the ETEs appear to have increased at a higher rate than exports to these countries. In particular, imports from the CEECs to the European Union member countries seemed to have increased much more rapidly than exports to the CEECs, see for example Crespo et al. (2004). Montanari (2005) concludes that the Europe Agreements, which favour exports from the CEECs to the European Union, probably played a significant role for this phenomenon. However, not all European countries have experienced the same changes in export and import patterns. When studying Ireland's trade relations with the CEECs, Brühlhart & Kelly (1999) actually found that exports to the CEECs had grown twice as much as imports from the CEECs.

5 Initial Conclusions and Hypotheses

Before moving on to our own study on the potential of trade between Sweden and the ETEs, we chose to formulate hypotheses for the outcome. This is based on the statistical conclusions from chapter 3 along with the results from previous studies.

From the statistical material we could observe that Swedish trade with the ETEs grew at a higher rate than Swedish trade in general throughout the whole time period. However, this fact in itself does not give us any indication as to whether Swedish trade with the ETEs is at 'normal' trade level. The higher rate of growth could for example merely be a result of the relatively high growth rates in GDP for the ETEs. When looking at recent studies, there are in fact some indications that this could be the case, as it is often concluded that the growth potential for trade with the ETEs, given their current GDPs, is exhausted.

Furthermore, it appears that Swedish imports from the ETEs have been growing at a higher rate than Swedish exports to the same countries. This shows that in recent years Swedish trade relations with the ETEs seem to have become more similar to Swedish trade relations with Western Europe, at least in terms of the import/export ratio. Most studies also seem to confirm this pattern, even though there are exceptions.

Both the statistics on Swedish trade with the different ETEs and previous studies indicate that there might be large regional differences within the ETEs as a group. The fact that there are separate trade agreements in place for different ETEs also supports this conclusion. Previous studies indicate that the ETEs' trade intensities with neighbouring countries are greater than the gravity model would predict. One might speculate that this stems from the fact that less developed economies generally tend to trade relatively more with neighbouring economies. Previous studies also seem to show that Sweden has a relatively strong positive bias towards the Baltic countries.

When taking these conclusions into account, we formulate the following hypotheses on Swedish trade with the ETEs:

1. Swedish trade with the ETEs has developed over the years and is now at, or above, the 'normal' trade level which could be expected given Sweden's general trade pattern.
2. Swedish import from the ETEs is more up to par compared to Swedish export. This pattern grows stronger with time.
3. Sweden has considerably stronger trade relations with some of the ETEs (e.g. the Baltic countries) and weaker with others (e.g. the Balkan countries).

6 The Gravity Model Approach

To test the hypotheses we will use an adapted gravity model. This chapter introduces the gravity model and its application as an analytical tool for trade related issues. A description of the model's theoretical framework is followed by an introduction to our gravity model approach.

6.1 The Gravity Model in Theory

Originally introduced in the early 1960s by Linder (1961) and Tinbergen (1962)⁹, the gravity model is now a frequently used instrument for analysing international trade flows. Despite its simplicity the model has proved to explain trade patterns remarkably well. Traditionally the model has had a bad reputation, given the absence of a firm theoretical background. However, starting with work by Anderson (1979) and Bergstrand (1989)¹⁰ there is now a solid theoretical underpinning of the gravity equation. Today the gravity model is regarded as a respected instrument for analysing volumes of trade between different countries and regions (Ekholm et al., 2001).

The idea behind the model stems from Newton's law of gravitation, hence the name. However, instead of calculating the gravitational force between two masses, the gravity model estimates the trade flows between different regions or countries. In the standard gravity framework the assumption is that bilateral trade between two countries or regions is determined by export-supply factors in the one country and import-demand factors in another (Gros & Gonciarz, 1996). The factors are believed to be a function of the countries' GDP and geographical distance between them. The gravity equation can be written in the following logarithmic form:

$$\ln X_{ij} = \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln Dist + \sum_k \beta_k D_k + \varepsilon, \quad (\text{Eq. 1})$$

where X stands for bilateral imports, GDP_i and GDP_j are the aggregate outputs of the exporting and importing country respectively, $Dist$ is the geographical distance between the two countries, and ε is the disturbance term. All these variables are in logs. This basic specification is often augmented with a set of dummies, D_k , which are included to capture the existence of special economic or cultural links between two trading countries.

The economic interpretation of the equation and variables is as follows. The trade flow between two countries depends on the one country's export supply of goods and the other country's import demand of goods. Exports from country i is assumed to depend on the income level in country i (using the income level as a proxy for the supply of exportables), and the income level in country j (using the income level as a proxy for the demand of exportables from country i). Supply and demand are therefore measured in terms of the countries' aggregate output (GDP) and both β_1 and β_2 in equation (1) are expected to have positive signs. In

⁹ As referenced in Fidrmuc & Fidrmuc (2003) and Montanari (2005) among others.

¹⁰ As referenced in Ekholm et al. (1996) and Montanari (2005).

addition to the pure GDP variables, variables measuring aggregate output per capita are sometimes also included in the model. The idea behind taking income per capita into account is that richer countries are assumed to trade more than poorer ones.

Trade costs, in terms of transport and transaction costs, are proxied by the distance between the two trading countries. Hence, the larger the distance, the higher the cost of engaging in trade. The expected sign of β_3 in equation (1) is therefore negative as larger geographical distances between trading partners are assumed to have a negative impact on trade volumes.

In case dummy variables (D_k) are included in the model they are most commonly used to identify potential effects of for example being a member of preferential trade areas such as EU, or sharing a common border, currency or language. A dummy variable that is estimated with a positive sign implies that there exist preferential trade relations and vice versa.

Given its simplicity and empirical robustness the gravity model has been used in a number of papers focusing on trade relations between Western and Eastern Europe, see for example Gros & Conciarz (1995), Fidrmuc & Fidrmuc (2003), Montanari (2005), Brühlhart & Kelly (1999), and Caetano & Galego (2005).

Although the gravity model is a widely adopted framework, it has received criticism for not being able to make accurate predictions about future trade flows. In a study by Ryrfeldt & Sundblad (2006) it was suggested that the coefficients produced by the gravity model may be inconsistent over time, which in turn makes the predictive power poor. This will, however, not pose an obstacle for this thesis. Our ambition is to perform a regression analysis for each specific year in the chosen time span, not to build a model aimed at making predictions over longer time periods.

6.2 Our Gravity Model Approach

6.2.1 *The Basic Model*

In line with previous papers on trade relations between Western and Eastern Europe, we have chosen to estimate a gravity equation. Most of these papers study whether there is room for growth in trade. In doing that the authors usually estimate 'normal' or 'potential' volumes of trade using the gravity model and then compare these to actual volumes of trade between West and East. Typically, the gravity equations are estimated using bilateral trade observations from all countries included in the model, even when the focus is on determining individual trade relations between the Eastern transition economies and a particular country in the West. However, given the scope of this paper, which is to study trade with the ETEs from a strictly Swedish perspective, we have adopted a somewhat different approach. Our objective is to estimate a gravity equation singularly based on Swedish trade patterns, and we include a dummy variable

indicating trade with a ETE country. In doing this we hope to identify if there is any significant difference between Swedish trade with the ETEs compared to Sweden's general trade pattern. Meaning, if there possibly are any preferential or non-preferential trade relations between Sweden and the ETEs. Also, the development of these trade relations over the period 1995 to 2004 is of interest.

The estimated gravity model takes the following form:

$$\ln(X_{ij}) = \beta_0 + \beta_1 \ln(GDP_j) + \beta_2 \ln(GDPCap_j) + \beta_3 \ln(Dist_{ij}) + \beta_4 Border_{ij} \\ + \beta_5 EU_{ij} + \beta_6 EFTA_{ij} + \sum_{k=7, l=1995}^{15, 2003} \beta_k Year_l + \sum_{m=16, n=1995}^{25, 2004} \beta_m ETE_n + \varepsilon$$

where X_{ij} represents the bilateral trade flow between Sweden and its trading counterpart. Given that Sweden's export and import patterns in general are quite dissimilar, as was noted in chapter 3, three different regressions will be run where X_{ij} equals the value of:

- (1) total trade volume between Sweden and country j ,
- (2) Swedish exports to country j , and
- (3) Swedish imports from country j .

GDP_j and $GDPCap_j$ stands for gross domestic product in total and per capita for country j . $Dist_{ij}$ is the geographical distance between the two trading countries.

In addition to the variables described above a number of dummy variables are also included in the regression equation. First, as sharing a common border has proved to reduce transaction costs we have included a dummy, $Border_{ij}$, to capture potential positive trade relations between Sweden and its neighbouring countries¹¹. Similar to sharing the same border, speaking the same language has also proved to have a positive effect on trade volumes. We have, however, not decided to include such a dummy as the countries speaking languages similar to Swedish are the very same as the ones sharing the Swedish border. Therefore, the language effect, if such exists, should be captured by the border dummy. Second, we include two dummies, EU_{ij} and $EFTA_{ij}$, for those countries that are members of these formal preferential trade areas.

Further, given that the model estimates trade relations from a Swedish perspective, and therefore only includes observations where Sweden is one of the trading parties, the sample size for each year is smaller than had all trade flows between the European countries been included. For that reason, the regression is run including all observations from year 1995 to 2004, resulting in dummy variables, $\beta_k Year_l$, for year 1995 to 2003 using year 2004 as the base year.

Last, but not least, the dummy variable ETE_n is included to capture the potential existence of preferential or non-preferential trade relations between Sweden and

¹¹ Border countries are Norway, Finland and Denmark

the ETEs. A negative coefficient would in this case indicate that Swedish trade with the ETEs, on average, is lower than what could be expected given GDP, distance, and other relevant factors. The opposite holds for positive coefficients. As there is one ETE-dummy for each year spanning from 1995 to 2004 it opens up for the opportunity to detect how the Swedish-ETE trade relation has developed over those years.

6.2.2 The Extended Model

When analyzing Swedish trade with the ETEs as a compound dummy variable a couple of aspects are lost in the process. While it is an appealing approach considering its simplicity and overall descriptive features, it treats the ETEs as a homogenous group of countries; a view that many would argue is far from the truth. There are large regional differences among the ETEs, not only in terms of cultural and historical ties to Sweden, but also through various trade agreements with the European Union that allow for different degrees of free trade. One approach to solve this problem would be to include dummies for all these different trade agreements, and possibly also for future membership in the European Union. The problem with this approach is the difficulty of determining when these factors have an actual impact on trade relations. For example, if a country joined the European Union in 2004, the decision to join was made years earlier; thus possibly influencing trade flows long before the actual joining date. One could even argue that the mere expectation of a European Union accession could have impacted trade volumes even further back in time.

Therefore, instead of constructing dummies for these factors, we chose to separate the compound ETE dummy into four separate ones: Baltic country, former Soviet state, Central and Eastern European country and Western Balkan country. As the countries within each group all share a similar background in terms of trade agreements this allows us to capture the effect of these agreements, as well as the development of Swedish trade with the different regions over time. The ETEs are divided such that Estonia, Latvia and Lithuania are Baltic countries (*Baltic_{ijt}*); Russia, Ukraine, Belarus, Azerbaijan and Kazakhstan are former Soviet states (*Soviet_{ijt}*); Hungary, Poland, the Czech Republic, Slovakia, Bulgaria, Romania and Slovenia¹² are the Central and Eastern European countries (*CEEC_{ijt}*); and Croatia, Serbia and Montenegro, Bosnia and Herzegovina, and the Republic of Macedonia are the Western Balkan countries (*Balkan_{ijt}*). Dividing the ETE dummy in this way opens up for the opportunity to test our hypotheses of regional differences in trade relations between Sweden and different groups of ETEs.

6.3 Data

The gravity regressions in our model are run on trade observations between Sweden and 92 of its trading counterparts. These countries were selected among

¹² Since Slovenia is more comparable to the Central European countries in terms of trade agreements, EU accession and general economic performance, we choose to deviate from the strict geographical division.

Sweden's roughly one hundred largest trading partners ranked by total trade volume in year 2004. We chose not to include all of Sweden's trading partners as the inclusion of relatively small countries in the data set can add considerable noise to a gravity model, as is pointed out in TradeSim (2003). All the trade observations were gathered from Statistics Sweden (SCB).

Data on total GDP and GDP per capita for all countries, including Sweden, were collected from World Development Indicators, WDI. However, for some countries and years, data on GDP and GDP per capita was not available. Due to this we chose to exclude 11 countries: Bahrain, Cuba, Greenland, Gibraltar, Iraq, Libya, North Korea, Oman, Qatar, Taiwan and the United Arab Emirates. All in all, this left us with 92 acceptable countries resulting in 92 bilateral trade flows for each year.

The time span chosen for the regressions starts in year 1995 and ends in year 2004. As there are a number of GDP figures missing for some of the European Transition Economies prior to 1995, we chose not to extend the time span further. Also, in excluding the very first years after the break down of the central planning regimes, we hope to avoid inaccurate GDP statistics.

Data for the distance variable were gathered from CEPII¹³. In favour of the straight-line distance we chose to use geographical distances based on bilateral distances between the biggest cities in Sweden and in its trading partners, where the inter-city distances are weighted by the share of the city in the overall country's population.

The twenty ETEs studied in this thesis were all, except for Albania, included among the 92 selected countries. During a first experimental regression it turned out that Albania could be classified as an outlier¹⁴ and was therefore excluded from the model. As Albania is a rather minor trading partner to Sweden we did not see that this exclusion would have any major effects on the explanatory power of the model.

¹³ www.cepii.fr

¹⁴ For a number of years Albania deviated more than three standard deviations, reaching extreme values in 1998 deviating over eleven standard deviations.

7 Empirical Findings

In this chapter we present the results from the regressions run with our gravity model. The first section provides the results from the basic regressions where the ETE-effect is captured in one single dummy, whereas the second section presents the results from the extended regressions where the ETE-dummy is divided into four separate variables. A discussion on the robustness of the regressions is presented at the end of the chapter.

7.1 Basic Regressions

The results from the basic regression, with total trade as the dependent variable and the “ETE” effect analyzed as a compound dummy variable, are presented in table 3. All the coefficients have the expected signs and the standard gravity variables, e.g. GDP, GDP per capita and distance, are all of reasonable size¹⁵. They are all significant at the 1 per cent level, including the dummies for European Union membership, EFTA membership and border countries. As is to be expected from the gravity specification, the model also has a good fit with an R^2 of 0.88 and standard error of the estimate of 0.69.

When taking a closer look at the ETE dummies, the evolution of Swedish trade relations with Eastern Europe becomes visible. In 1995 the coefficient for the ETE dummy was -0.56 and statistically significant at the 1 per cent level. This means that trade with the ETes was about 40 percent lower than what could have been expected had the countries not been ETes. Only one year later we observe a substantial change in this coefficient, with the 1996 value being -0.12. Already in 1998, the coefficient is slightly positive and ends up being strongly positive and significant at the 5 percent level in 2004. The first declining and then increasing significance level is an important result, clearly indicating that while Swedish trade with the ETes was smaller than expected in the beginning of our sample period, it seems to be about 50 percent greater than expected at the end of the period.

7.1.1 Import and Export

In section “Trade patterns between Sweden and the ETes” we observed that there were significant differences in the trade patterns for Swedish export and import with different parts of the world. In order to examine this phenomenon further and obtain a more complete picture of Swedish trade with the ETes, we decided to run regressions with export and import respectively as the dependent variable.

Starting with the regression with Swedish export as the dependent variable we observe that R^2 remains high at 0.87 and that the standard error of the estimate is 0.70. As can be seen from table 3, all the other standard gravity coefficients still have the expected size and magnitudes and are significant at the 1 per cent level. The exception is the EU dummy that is significant at the 5 percent level. Turning

¹⁵ We compare with the sizes given in Head’s Gravity for beginners from 2003.

Table 3. Results from the basic regressions. One asterisk denotes a significance level of 10 percent, two a level of 5 percent, and three a level of one percent.

	Total trade		Exports		Imports	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	2.13	3.80***	2.29	4.05***	-5.86	-4.93***
lnGDP	0.83	51.29***	0.82	50.24***	1.08	31.44***
lnGDPCap	0.14	6.81***	0.14	6.73***	0.15	3.26***
lnDist	-0.56	-11.50***	-0.59	-11.94***	-0.61	-5.89***
Border	0.88	5.58***	0.83	5.22***	1.05	3.14***
EU	0.54	5.16***	0.21	1.97**	1.06	4.82***
EFTA	0.60	3.76***	0.51	3.19***	0.95	2.83***
ETE95	-0.56	-2.89***	-0.57	-2.93***	-0.19	-0.45
ETE96	-0.12	-0.60	-0.15	-0.77	-0.17	-0.41
ETE97	-0.13	-0.69	-0.14	-0.72	0.13	0.31
ETE98	0.14	0.73	0.13	0.68	0.39	0.96
ETE99	0.13	0.69	0.09	0.44	0.40	0.99
ETE00	0.15	0.75	0.05	0.24	0.62	1.51
ETE01	0.19	1.01	0.06	0.30	0.91	2.23**
ETE02	0.24	1.25	0.14	0.70	0.82	2.01**
ETE03	0.38	1.94*	0.24	1.23	0.99	2.40**
ETE04	0.43	2.22**	0.25	1.29	0.89	2.15**

to the ETE coefficient it appears to follow a pattern quite similar to the coefficient for total trade. It starts off in 1995 as significantly negative, -0.57, only to lose its significance and turn positive as time passes by. With export as the dependent variable the ETE coefficient is however not as positive as the one for total trade, nor as significant. By 2004 it is up to 0.25 but only significant at the 20 percent level.

When choosing import as the dependent variable the regression still shows a rather good fit with a R^2 of 0.73. This is, however, somewhat lower than for the export regression. The standard error of the estimate is also higher for imports, in this case reaching 1.46. All the standard gravity coefficients, including the EU dummy, are significant at the 1 per cent level and they all have the expected signs and sizes.

Compared to both total trade and export the development of the ETE coefficient for import follows a different pattern. Even though it starts out on the negative side it is not significant even for the early years. Already in 2001 the coefficient is in fact as large as 0.91 and significant at the 5 per cent level. This means that export was almost 150 percent larger than expected this particular year. It continues at the same high and significant level throughout the sample period.

To summarise the results from the basic regressions, trade between Sweden and the ETEs seem to have gone from being lower than expected to above the expected

level. Also, imports from the ETEs appear to have been the dominating factor to this evolution.

7.2 Extended Regressions

When running the extended regression on total trade, with the ETE dummy separated into four different ones, we note a number of differences to the basic specification. For the basic regression the coefficient of determination, R^2 , reaches 0.91, with a standard error of the estimate of 0.61. The results are summarised in table 4. As can be seen, the coefficients for GDP, GDP per capita, distance, EU, EFTA and border are still significant, have the expected signs and are of plausible sizes, even though the sizes differ somewhat from the previous basic specification.

Turning to the four separate ETE dummies there are a number of important and interesting features worth mentioning. The coefficient for the Baltic countries is significant at the 1 per cent level the entire period and strongly positive (between 1.62 and 2.31 meaning that trade is between 3.7 and 10.1 times the expected trade level). This could possibly be explained by a “semi-border” effect between Sweden and the Baltic countries. Also, it is reasonable to assume that the strong cultural ties between the nations play a significant role. However, even when assigning these countries the border dummy the Baltic coefficient still remains positive and significant. This leads us to believe that other factors, such as export/import structure etcetera, might influence the results.

For the Central and Eastern European countries, CEECs, a slight upward trend can be detected. The coefficient becomes both higher and more significant with time and in 2004 trade is about 2.1 times the expected level. We can conclude that the significant positive coefficient is an indication that these countries’ relatively successful transition to market economy has had a clear effect on their trade with Sweden. Also, as the coefficient is positive rather than neutral one might suppose that export/import structure etcetera has an effect in this case as well. An interesting feature is that the coefficient does not change in any dramatic way if we eliminate Poland from the regression, which might come as somewhat of a surprise considering the relatively strong ties between Sweden and Poland.

Trade between Sweden and the former Soviet states shows a significant change over time. The first three years of the sample period the coefficient is strongly negative and significant at the 1 per cent level. In 1995 for example, Swedish trade with the former Soviet states was only one fourth of the expected trade level. The coefficient then loses significance and magnitude over time and is actually positive for 2004, although highly insignificant. The fact that the coefficients are significantly negative in the beginning of the sample period could likely be related to the problematic transition period for these countries.

Swedish trade with the Balkan countries also starts out in 1995 with a negative coefficient of -1.16 that is significant on the 1 per cent level. Overall, the trend seems to be much like the one for the former Soviet states, from significantly

Table 4. Results from the extended regressions. One asterisk denotes a significance level of 10 percent, two a level of 5 percent, and three a level of one percent.

	Trade		Exports		Imports	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.21	0.41	0.83	1.50	-9.59	-8.73***
lnGDP	0.86	58.48***	0.85	53.24***	1.14	36.02***
lnGDPCap	0.10	5.27***	0.11	5.44***	0.04	0.91
lnDist	-0.38	-8.48***	-0.46	-9.54***	-0.23	-2.38**
Border	1.24	8.75***	1.08	7.09***	1.77	5.85***
EU	0.72	7.64***	0.32	3.17***	1.52	7.56***
EFTA	0.89	6.27***	0.71	4.65***	1.62	5.33***
Baltic95	1.62	4.35***	1.11	2.78***	3.42	4.31***
Baltic96	1.68	4.53***	1.15	2.87***	3.44	4.32***
Baltic97	1.78	4.79***	1.34	3.34***	3.52	4.43***
Baltic98	1.88	5.07***	1.50	3.74***	3.45	4.35***
Baltic99	1.91	5.15***	1.31	3.28***	3.77	4.76***
Baltic00	1.97	5.32***	1.30	3.26***	3.87	4.87***
Baltic01	1.97	5.31***	1.34	3.34***	3.89	4.90***
Baltic02	2.05	5.53***	1.50	3.76***	3.90	4.91***
Baltic03	2.31	6.13***	1.64	4.04***	4.47	5.54***
Baltic04	2.10	5.57***	1.40	3.45***	4.16	5.16***
CEEC95	0.18	0.73	-0.04	-0.14	1.36	2.51**
CEEC96	0.20	0.77	-0.02	-0.06	1.27	2.35**
CEEC97	0.29	1.15	0.09	0.33	1.44	2.66***
CEEC98	0.51	2.03**	0.31	1.14	1.54	2.85***
CEEC99	0.59	2.35**	0.44	1.60	1.61	2.97***
CEEC00	0.54	2.13**	0.31	1.14	1.67	3.09***
CEEC01	0.54	2.13**	0.23	0.86	1.82	3.37***
CEEC02	0.61	2.42**	0.28	1.02	1.95	3.61***
CEEC03	0.72	2.83***	0.39	1.41	2.10	3.88***
CEEC04	0.74	2.92***	0.36	1.31	2.05	3.78***
Soviet95	-1.36	-4.73***	-1.21	-3.90***	-1.82	-2.94***
Soviet96	-0.79	-2.74***	-0.73	-2.33**	-2.24	-3.63***
Soviet97	-0.80	-2.79***	-0.69	-2.22**	-1.58	-2.57***
Soviet98	-0.43	-1.50	-0.33	-1.07	-1.12	-1.82*
Soviet99	-0.48	-1.68*	-0.44	-1.42	-1.36	-2.21**
Soviet00	-0.43	-1.50	-0.43	-1.38	-0.68	-1.11
Soviet01	-0.21	-0.75	-0.28	-0.89	0.15	0.25
Soviet02	-0.20	-0.69	-0.16	-0.52	-0.41	-0.66
Soviet03	0.07	0.25	0.08	0.24	-0.42	-0.69
Soviet04	0.27	0.95	0.24	0.78	-0.58	-0.95
Balkan95	-1.16	-3.63***	-1.02	-2.94***	-0.83	-1.21
Balkan96	0.16	0.50	0.31	0.88	-0.07	-0.10
Balkan97	-0.14	-0.43	-0.01	-0.04	0.17	0.25
Balkan98	0.23	0.70	0.32	0.92	0.69	1.01
Balkan99	0.09	0.27	0.16	0.45	0.70	1.02
Balkan00	0.14	0.42	0.18	0.51	0.70	1.02
Balkan01	0.10	0.32	0.16	0.45	0.78	1.13
Balkan02	0.13	0.40	0.18	0.53	0.83	1.21
Balkan03	0.13	0.41	0.14	0.42	1.17	1.70*
Balkan04	0.27	0.84	0.23	0.66	1.21	1.76*

negative coefficients to highly insignificant coefficients close to zero. This means that there is no significant difference between Swedish trade with the Balkan countries compared to Sweden's general trade pattern. These results could indicate that the region has recovered from the years of civil unrest, at least from a Swedish trade perspective.

7.2.1 Export and Import

Moving on to Swedish export as the dependent variable, the R^2 becomes 0.88 and the standard error of the estimate 0.66. Similar to all the previous regressions the standard gravity coefficients have the expected signs and magnitudes and are significant at the 1 per cent level. All figures are depicted in table 4.

The coefficient for the Baltic countries is once again both positive (between 1.11-1.64) and significant at the 1 percent level over the entire sample period. The CEEC coefficient on the other hand, although positive for the later years, has a low significance. In 1999 the CEEC dummy reaches as high as 0.44, but although this is accompanied by an increasing t-value, the significance is still too low to draw any real conclusions about trade levels being above expected.

Turning to the coefficient for the former Soviet states, it is strongly negative and significant from the start of the sample period (in 1995 export is only one third of the normal level). Much like the case for total trade, the coefficients ends up slightly positive but insignificant.

The coefficient for the Balkan countries only has one significant year, this being 1995 when it is strongly negative at -1.29 and significant at the 1 per cent level. The rest of the sample period the coefficient stays close to zero (although mostly positive) and is not significant at any acceptable level for any year. This means that the Swedish export to these countries appear to be at the expected level.

Using Swedish import as the dependent variable, the R^2 is 0.79 with a standard error of the estimate reaching 1.31. The standard gravity coefficients have the expected signs but distance is only significant at the 2 percent level and GDP per capita is not significant at all.

For the four ETE dummies the import coefficients vary drastically between the different subgroups. For the Baltic countries we observe an extremely positive and highly significant coefficient over the entire estimation period. It is also increasing with time. In 2003 the imports from these countries were actually at 87 times the expected level. For further analysis on this result, we refer to the discussion chapter. The coefficient for the CEEC countries is also strongly positive during the entire period and increasing with time. Although it does not reach the heights of the Baltic coefficient, the peak observation of 2.10 in 2003 is still very high.

For the former Soviet states the import coefficient is strongly negative between 1995 and 1999 and highly significant. Although the magnitude and significance decrease later on (the coefficient actually turns positive in 2001, though

insignificant) it ends up being -0.58 and insignificant in 2004. This means that trade was only about half of what could have been expected.

The Balkan countries start off on the negative side but end up strongly positive and significant at the 10 percent level. In 2004, Swedish imports from the Balkan countries were actually more than three times the expected level.

To conclude, according to the results Sweden seems to both import and export considerable more from the Baltic countries than what can be expected given their GDP values and distance to Sweden. For the CEECs Sweden appears to be exporting just about as much as would be expected, but importing more than expected. When it comes to the former Soviet states, trade in 1995 started off with a great potential for growth. In 2004, trade, both in terms of import and export, seems to have increased even though imports are still slightly lower than expected. The Western Balkan countries followed a similar pattern to the Soviet states in that trade showed potential for growth in the early years of the sample period. However, these countries appeared to have recovered rather quickly and imports are actually on their way to become higher than what could be expected.

7.3 Actual versus Predicted Trade Volumes

As a final test, we compare actual values for the individual countries for trade, export and import with the values predicted by the model had they not been ETEs. This means that the trade volumes are predicted as a function of GDP, GDP per capita and distance alone; the ETE dummy being disregarded. Table 5 depicts the actual versus the predicted values in 2004, as well as the quota actual/predicted.

The Baltic countries do indeed show higher actual values than the ones predicted by the model, with imports being particularly high. As an example Sweden imports over 31 times more than expected from Estonia. Poland shows the highest actual/predicted quote for trade and export among the CEECs while Hungary narrowly claims the top spot for import.

A perhaps more surprising discovery is that Sweden actually imports 2,5 times more than expected from Russia, showing that the other countries in the Soviet subgroup are responsible for the negative coefficient discussed above. Swedish imports from Azerbaijan were, for example, only 131000 SEK in 2004, producing an actual/predicted quote of just 0.003.

For the Balkan countries the actual/predicted quotas are higher on the import than the export side in all cases except for Serbia and Montenegro to which Sweden actually exports 32 percent more than expected while only importing 82 percent of the predicted value.

	Actual trade	Predicted trade	Actual/Predicted Quota	Actual Export	Predicted Export	Actual/Predicted Quota	Actual Import	Predicted Import	Actual/Predicted Quota
Poland	33,751,641	16,845,514	2,00	15,585,835	11,776,980	1,32	18,165,806	4,265,170	4,26
Russia	29,718,862	21,757,075	1,37	13,607,323	14,712,541	0,92	16,111,539	6,558,743	2,46
Estonia	11,508,572	1,673,187	6,88	4,998,029	1,238,184	4,04	6,510,543	206,110	31,59
Hungary	10,405,908	6,499,162	1,60	4,381,191	4,632,457	0,95	6,024,717	1,325,643	4,54
Czech Republic	9,135,578	8,066,622	1,13	4,797,861	5,771,168	0,83	4,337,717	1,686,793	2,57
Lithuania	6,617,827	2,575,687	2,57	2,679,890	1,870,493	1,43	3,937,937	369,173	10,67
Latvia	6,466,795	1,849,192	3,50	2,874,674	1,351,497	2,13	3,592,121	236,126	15,21
Romania	3,484,854	3,774,637	0,92	2,363,298	2,618,670	0,90	1,121,556	687,653	1,63
Slovakia	3,146,249	3,152,420	1,00	1,728,588	2,263,933	0,76	1,417,661	515,930	2,75
Ukraine	3,054,013	3,072,888	0,99	2,861,703	2,084,633	1,37	192,310	531,508	0,36
Croatia	2,297,237	2,342,996	0,98	1,346,189	1,682,451	0,80	951,048	364,187	2,61
Slovenia	2,170,345	2,558,789	0,85	1,086,453	1,877,063	0,58	1,083,892	400,527	2,71
Serbia-Montenegro	1,500,571	1,442,100	1,04	1,336,575	1,012,752	1,32	163,996	200,116	0,82
Kazakhstan	1,119,896	1,416,614	0,79	943,169	975,980	0,97	176,727	217,248	0,81
Bulgaria	1,082,847	1,350,189	0,80	733,986	948,301	0,77	348,861	186,867	1,87
Belarus	589,691	1,833,470	0,32	336,184	1,288,825	0,26	253,507	254,365	1,00
Azerbaijan	567,969	369,400	1,54	567,838	254,234	2,23	131	38,035	0,00
Bosnia-Herzegovina	269,377	591,484	0,46	213,308	418,541	0,51	56,069	63,441	0,88
Macedonia	178,650	373,155	0,48	137,300	266,645	0,51	41,350	35,793	1,16

Table 5. Actual trade volumes in 2004 compared to predicted trade volumes (thousand SEK)

7.4 Robustness

In order to test whether the results from the model were robust or not, several different configurations were tried. One important aspect was to test whether the results would hold if the year dummies were transformed into one single trend dummy. The results obtained using this configuration did not show any important differences from our previous ones. The estimated ETE coefficient still followed the same pattern and all the other dummies had the expected signs and reasonable sizes.

Configurations with dummies such as EU, EFTA and Border excluded in different combinations were also tested and the results came out as expected. Removing all three of these dummies increased the magnitude and significance of the ETE coefficient, which should not come as a surprise as the EU, EFTA and Border dummies capture a big part of the strong trade relations that Sweden enjoys with Western Europe in general and with the Nordic countries in particular, thus making the Swedish trade with the ETEs seem relatively smaller.

Other types of changes were also tested. The Baltic countries were assigned the border dummy in order to see how much of the strong Baltic coefficient that would be explained by classifying these countries as neighbouring ones. The results from this test also came out as expected. To us, one rather surprising feature was that Poland did not turn out to be as accountable to the strong CEEC coefficient as we expected. Removing Poland from the regressions did not change the results in any dramatic way at all.

Also, removing Albania entirely from the regressions seemed to improve the results as the observations for this country contained several outliers. Since Albania also represents a very special case both economically and historically, it was decided that the removal of this country would not have a significant negative impact on the explanatory properties of the model.

As a final test we conducted a regression where Estonia, Lithuania, Latvia, Hungary, the Czech Republic, Slovakia, Slovenia, Cyprus and Malta were set as European Union member countries for year 2004. This did, however, not change the overall conclusions either.

All in all, the model seems to produce satisfactory robust results.

8 Discussion on Empirical Results

Even though it is outside the scope of the thesis, we cannot refrain from devoting some space to ponder on our results.

When it comes to Sweden's extraordinary trade levels with the Baltic countries, there are many possible explanations. First of all, there is of course the fact that they are neighbouring countries and could almost be considered bordering countries if we stretch the definition a tad. But this in itself does not explain the whole effect. As noted earlier, even when the Baltic countries were assigned border dummies they were still well above expected levels. This means that there must be other contributing factors.

One of those factors could be the large inflow of FDI that for example Estonia has been receiving from Finland in particular. Large companies such as Nokia conduct much of their business from Estonia and that fact alone might affect the statistics for a relatively small economy like Estonia. In addition, it is reasonable to assume that strong cultural ties between Sweden and these countries may play a role as well. The recent efforts with the BSSSC (Baltic Sea States Sub-regional Cooperation) further strengthen this assumption. Moreover, a quick look at indices such as the Finger-Kreinin Export Overlapping Index, as described in Crespo et al. (2004), reveals that Sweden and the Baltic countries experience very little overlapping in their export structures. Even though this does not prove anything per se, one might speculate that this indicate a rather good fit between Swedish imports and Baltic exports and possibly vice versa.

As mentioned in chapter 3, when entering the European Union, Sweden adopted the union's policy regarding country of origin in the import statistics. This new policy means that a good shipped to Sweden from a country outside the European Union, but entering the European Union in another member state, can be registered in the statistics as originating from that member state instead of the true originating country. In effect, this can artificially blow up Swedish imports from the European Union in general, in particular from member states with important ports etcetera. Naturally, the opposite effect occurs for Swedish imports from the countries outside the union, especially for those from which goods are generally not shipped directly to Sweden (this may be yet another clue as to why Swedish imports from the Baltic countries are so large since goods from these countries for obvious reasons normally are shipped directly to Sweden). This policy may pose somewhat of a problem for some of the statistics in chapter 3, but should not be a grave concern for the validity of the results of our regressions. The reason for this being that the EU dummy should capture this effect and hence, to a large extent, "shield" the results from being biased.

Regarding the future, we would like to limit our predictions to a minimum. A few observations might be prudent however.

First of all, the conclusion that Swedish trade with the ETEs seems to be equal to or even above the expected trade levels does not mean that there is no room for further growth. Given that the GDP of these countries continue to increase, so will trade (as implied by the model). Trade could also be boosted by new trade agreements, new shipping methods or even new payment methods for example. In effect, one might argue that these factors could “reduce” the distance between two trading partners. Attempting to predict these types of changes is well beyond the scope of this thesis, especially with respect to magnitudes.

On the other hand, changes in the opposite direction could naturally also occur. Civil unrest, political turmoil or even wars must still be considered a realistic possibility at least for some of the ETEs, and would most likely affect trade in a negative manner. Hopefully the risk of such phenomena occurring decreases day by day, but however unlikely — a word of caution might still be prudent.

9 Final Remarks

Since the mid-nineties, trade between Sweden and the Eastern transition economies has grown substantially. Compared to Sweden's general trade pattern, the growth rate has been considerably higher for the ETEs. Just by studying statistics, however, it is impossible to say whether there are still significant differences between Swedish trade with the ETEs and Sweden's general trade pattern. Previous studies conducted on other countries indicate that the trade potential already may be exhausted, meaning that the ETEs are as integrated in the international trade market as any other country on the average. In order to see whether this would hold for Sweden as well, we used a gravity model. Also, this framework allowed us to see whether there are any important differences between Swedish import and export and to what extent trade between Sweden and different ETE regions differ.

From our gravity analysis the overall conclusion is that Swedish trade with the ETEs, after lagging behind during the first years succeeding the collapse of the economic regimes, now is up to par with Sweden's general trade pattern. The results are quite strong as our ETE dummy both decreases in magnitude and significance over time. As is expected from a gravity estimation, our model performs well with a high coefficient of determination and low standard deviation. The gravity coefficients are also satisfactory with expected signs, sizes and high t-statistics.

Moreover, we conclude that Sweden's imports from the ETEs differ considerably from Sweden's exports to these countries. While exports, much like overall trade, show significant negative coefficients for the early years; the coefficient for imports goes from being insignificant to significantly positive later on.

When separating the ETE dummy into four different regional ones, we observe that there are large differences between the regions. Swedish trade with the Baltic countries is particularly high, with imports from Estonia being more than 31 times larger than predicted by the gravity model in 2004. At the other end we have the former Soviet states for which the coefficients remain on the negative side throughout most of the time period, although not always significant. As it turns out however, none of the coefficients for the different subgroups are significantly negative in 2004.

To summarise, all three of our original hypotheses seem to be valid. Swedish trade with the ETEs is in fact up to par with overall Swedish trade, imports from the ETEs are relatively larger than exports and there are indeed large differences between the various regions within our ETE group.

Suggestions for further research

Due to the descriptive character of our essay, some questions are left unanswered and a number of new questions are raised. First, it would be interesting to investigate the effects of the European Union accession on Swedish trade with concerned ETEs. Has the Union membership influenced trade volume according to the model's predictions? Are imports and export affected equally? Applying the model constructed in this essay to recent data could provide more insight into these topics.

Second, it would be worthwhile looking further into the causes of some of the interesting phenomena observed in this essay. For example: Why does Sweden trade so extensively with the Baltic countries? As noted earlier, this coefficient – perhaps surprisingly – is even stronger than the border effect. Although the essay makes some initial attempts at explaining the reasons behind this, further research is certainly warranted. Other intriguing results have also been produced, for instance the large differences between the former Soviet countries and the CEECs. Are import/export structures or cultural/political reasons the best way to explain this, or are there other reasons omitted in this essay? Strong robust results from a descriptive study, such as this one, seemingly leave an endless line of questions and therefore act as a good starting point for anyone interested in investigating trade patterns in general and Swedish ones in particular.

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