



Master Thesis I  
Department of Economics  
Lund University

**LUND UNIVERSITY**  
School of Economics and Management

# Do the Swedish Trade Council and the Foreign Service Promote Exports?

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A study of the Relationship Between the Swedish Trade Council, the Foreign Service and Aggregate Swedish Merchandise Export

Author: Anna Welander  
Supervisor: Associate Professor Joakim Gullstrand  
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## **Abstract**

Export promotion policies are widely used in most countries. The aim is to increase exports to foreign markets and in this, Sweden is no exception. In this study, my objective is to investigate whether Swedish export-promoting activities abroad, realized through the Swedish Trade Council (STC) and the Foreign Service (i.e. embassies and consulates), are associated with higher aggregate Swedish merchandise exports. I estimate a panel data specification of the gravity model, widely used in analyzing international trade, for the period 1995-2009. The empirical results suggest that there is a positive systematic relationship between the STC, the Foreign Service and total Swedish exports and that Swedish representation abroad have an increasing effect on trade in more marginal export markets.

*Keywords: Export Promotion, Swedish Exports, the Swedish Trade Council, the Foreign Service, Panel Gravity Model*

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## List of abbreviations

CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CES	Constant Elasticity of Substitution
EU	European Union
RTA	Regional Trade Agreement
SACU	Southern African Customs Union
STC	Swedish Trade Council
WTO	World Trade Organization

# 1. Introduction

The growth of exports is associated with a growing economy and income levels. Therefore, export promotion policies are considered good economic policies by governments around the world. Different countries apply different methods to assist domestic businesses in expanding sales to foreign markets. Sweden is no exception. Both public and private actors are active in promoting foreign exports, through activities in Sweden as well as abroad. Export promotion have long been prevalent in Swedish economic policy and the government focuses a lot of attention on increasing Swedish business engagements in international markets. In addition, the Swedish Government Official Report *Swedish Exports and Internationalization* published in 2008 (SOU 2008:90) emphasizes the need for export promotion. It concludes that export promotion is important for Swedish businesses interested in engaging in foreign exports, as well as the Swedish economy as a whole. Naturally, if export promotion policies are beneficial, the outcome is expected to be an increase in total exports from Sweden. Seeing that the government, along with private companies, find it essential to sponsor export-promoting activities, it is relevant to consider if there are visible links between such activities and exports.

My objective is to investigate the relationship between Swedish export-promoting activities and aggregate Swedish exports over the 1995-2009 period. There are a number of different Swedish actors engaging in export promotion. I focus on the international operations of the Swedish Trade Council (STC) and the Swedish Foreign Service because these are the two central actors in the national export promotion policy. My aim is to analyze whether the international offices of the STC, embassies and consulates are associated with higher total Swedish merchandise exports.

I address this matter by estimating a fixed effects panel data specification of the gravity model of international trade over Swedish exports between 1995 and 2009. Apart from export promotion variables, I include standard variables that normally enter the gravity model of trade and a set of interaction effects investigating whether export-promoting activities affect trade differently depending on import country characteristics and the joint presence of an STC office and an embassy. These

interaction variables turn out to have a central role in the analysis, and similar variables have, as far as I know, not been used in previous studies. In addition, I deal with specification issues and potential problems with reverse causality.

This paper fits within the literature examining the effects of export promotion on bilateral merchandise trade. Previous studies on export promotion and exports focus on various aspects of export-promoting activities in a cross section or panel data setting. Nevertheless, to my knowledge nobody has examined this relationship for Swedish exports specifically, nor included the aforementioned interaction effects.

This paper is structured as follows. Chapter 2 gives a brief overview of the previous research on the topic of export promotion and the potential links to aggregate merchandise exports. The export-promoting activities of the STC and the Foreign Service are explored in chapter 3. In chapter 4, the theoretical foundation of the gravity model is presented, followed by a discussion on trade costs and export promotion. The empirical specification is introduced in chapter 5. Chapter 6 presents the data used in the empirical analysis and the chapter opens with a short description of Swedish exports patterns between 1995 and 2009. The estimation results along with the analysis are found in chapter 7, which also includes a discussion on robustness and causality. My conclusions are presented in chapter 8.

## 2. Previous research

The gravity model of international trade has been frequently applied in analyzing international trade flows. In addition, export-promoting activities have been widely investigated from various perspectives. However, as far as I know, there are only a few studies analyzing the relationship between export-promoting activities and aggregate trade by applying the gravity model. These studies have found a series of interesting results on how export-promoting activities are associated with trade patterns. The studies have focused on various aspects of export promotion, e.g. the Foreign Service, state visits, trade missions, and export promotion agencies. In addition, studies have focused on the institutional characteristics of export promotion agencies, as well as on whether or not the Foreign Service affects the creation of new trade links or help established links to expand trade further.

The proposition that the Foreign Service is important for a country's export patterns is evaluated by Rose (2007) and also discussed by Gil et al. (2007). Both incorporate regional foreign trade agencies in their analysis of export promotion and its effect on trade. Rose (2007) estimates a gravity model of trade based on a cross-section sample of 22 large exporters<sup>1</sup> and 200 importers and finds a significantly positive effect of embassies and consulates on aggregate trade. Rose (2007) drew the conclusions that establishing a first permanent foreign mission (embassy) is associated with a very large effect on trade levels, whereas additional consulates have lower effects on total trade. The positive relationship could also be caused by reverse causality. However, after introducing an instrumental variables specification, the author argues that the systematic relationship is robust. He includes e.g. the number of various popular tourist guides and proven oil reserves as instruments for the number of foreign missions. Gil et al. (2007) aim to analyze the effects of Spanish regional foreign trade agencies on regional exports, also applying the gravity model. In accordance with Rose (2007), the authors find that regional trade agencies are associated with higher trade. This is still true after controlling for reverse causality using the same set of instruments as Rose (2007). Furthermore, Gil et al. (2007) includes controls for the

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<sup>1</sup> Mainly OECD countries (including Sweden). For more details, see Appendix A1 in Rose (2007, p. 35).

<sup>2</sup> Swedish businesses taking part in multilaterally funded projects, e.g. procurements financed by international



number of Spanish embassies and consulates in each export destination, and they find that the Foreign Service have a significant effect on exports.

The gravity model has also been used to analyze the effects of more occasional export-promoting activities such as state visits and trade missions (including high-level government officials and sometimes the Prime Minister). Nitsch (2007) explores the effects of official state visits on total exports (and imports). To test the initial positive results, the author estimates what he calls a long-run difference-in-difference specification, as well as an IV-specification. From these causality analyses, he concludes that the positive effects of state visits are fairly robust against the existence of reverse causality. Moreover, Head and Ries (2010) analyze whether trade missions increase trade by using Canadian data on trade missions where a large number of business people as well as high-level government officials and sometimes also the Prime Minister participated. Contrary to earlier work investigating export-promoting activities, the authors conclude that no effects from trade missions were observable.

Export promotion has also been examined from slightly different perspectives. Segura-Cayuela and Vilarrubia (2008) investigated whether the effects of the Foreign Service on exports are observable at the extensive or intensive margins of trade at the country level, i.e. whether export-promoting activities help to create new trade links, or they help to increase trade between existing trading partners. Their analysis suggest that the Foreign Service is important for creating new links of trade (i.e. the extensive margin at the country level), whereas there seem to be no visible effect at the intensive margin. They also conclude that the Foreign Service has larger effects on sectors producing differentiated goods in relation to sectors with less differentiated products.

When examining export-promoting activities and especially export promotion agencies, it is relevant to discuss the institutional structures and the efficiency of such agencies. Lederman et al. (2010) suggest that on average, export promotion agencies have a positive effect on domestic exports. Agencies are the most effective where exporters face heavy trade barriers and when exports contain more differentiated products. Their results also indicate that export promotion agencies should be largely financed by public funds, but the executive board should have strong ties to the

private sector. However, no evidence suggests that the allocation of expenditures on various kinds of promoting activities affect the overall success of the agency.

**Table 2.1 Summary of empirical findings of export promotion**

<i>Authors</i>	<i>Export-promoting activity</i>	<i>Sample/estimation procedure</i>	<i>Results</i>
Rose (2007)	The Foreign Service, i.e. embassies and consulates	Cross-sectional gravity estimation of 22 exporters and 200 importers 2002/2003	Positive effects of the Foreign Service on aggregate exports
Gil et al. (2007)	Regional export promotion agencies and the Foreign Service	Panel data gravity estimation on exports from 17 Spanish regions to 188 importing countries 1995-2003	Positive effects of regional export promotion agencies and the Foreign Service on regional exports
Nitsch (2007)	State visits from France, Germany and the U.S.	Panel data estimation of the gravity model on national exports 1948-2003	Positive effects of state visits on aggregate exports
Segura-Cayuela and Vilarrubia (2008)	The Foreign Service	Cross-sectional two-stage estimation of 21 exporters and 163 importers 2002/2003	The Foreign Service has a trade creating effect at the extensive margin at the country level.
Head and Ries (2010)	Trade missions	Panel data gravity estimation of Canadian exports 1993-2003	No effects of trade missions on exports
Lederman et al. (2010)	National export promotion agencies	Cross-sectional estimation of 88 national agencies on exports/capita, average from 2000-2004	Positive effects on exports. Higher effects in markets with heavier trade barriers and when exports are heterogeneous. Private interests should be represented and public funding is important.

In table 2.1 above, I summarize the main results from the previous studies investigating the links between export-promoting activities and total exports.

### **3. Swedish export promotion abroad**

Export-promoting activities have long been an important tool in Swedish economic policy. The public efforts to promote Swedish exports are realized through the Swedish Foreign Service (i.e. the Ministry of Foreign Affairs, embassies and consulates), project exports<sup>2</sup> and the Swedish Trade Council (STC) (sweden.gov.se). The STC is the central national body for export promotion and its activities take place both in Sweden and overseas (SOU 2008:90). Also, the STC has a close working relationship with the Foreign Service. According to the Swedish government, this relationship is the key to a successful export promotion policy. Other public actors with the goal to foster exports from Sweden are e.g. the Swedish Export Credits Guarantee Board and the Swedish Export Credit Corporation<sup>3</sup> (sweden.gov.se). These actors actively cooperate with the STC and the Foreign Service, but have no international offices. Hence, they are not discussed in more detail in this paper.

#### **3.1 The Swedish Trade Council**

The STC was formed in 1972 with the objective to coordinate the numerous export-promoting activities run by the government and private businesses in Sweden. It is a joint private and public entity owned in equal shares by the Swedish state and the Swedish Foreign Trade Association (SOU 2000:102). A central part of the organization's mission is to facilitate international expansion of small- and medium-sized enterprises. This is done through promotion of Swedish exports and the STC has the responsibility to plan, organize and carry out measures to foster exports from Sweden. Similar export promotion agencies are present in countries around the world. A comprehensive list of international export-promoting agencies can be found in Lederman et al. (2010, Appendix A, p. 265).

The most principal part of the STC's organization is located at the international offices. A majority of the international offices are Trade Commission Offices, but some are representative delegations as well as affiliations directly associated with the

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<sup>2</sup> Swedish businesses taking part in multilaterally funded projects, e.g. procurements financed by international organizations such as the EU or the UN.

<sup>3</sup> For more information see <http://www.ekn.se/en/> and <http://sek.se/en/>.

main organization of the STC (SOU 2011:21). However, in this study I treat all international offices as equal due to problems with measuring the different structures and the number of employees at the international locations over the whole time period. Appendix A gives a full list of countries where the STC has had representation during the 1995-2009 period. Apart from the main activities at international offices, the head quarter is located in Stockholm and a number of regional offices are engaged in promoting international expansion of Swedish businesses.

Since the early 1990s, the STC has gone through significant operational changes. Nevertheless, the main goals and structure have prevailed. In particular, this holds for the undertakings of foremost concern in this study, those taking place at the foreign offices. The activities of the STC are broadly divided into four categories<sup>4</sup>: *basic export services*, *consultancy services*, *skills development for companies*, and *targeted measures for international business promotion* (SOU 2008:90). The *consultancy services* are commercialized business advisory services for companies interested in engaging in foreign exports. They are run in line with market conditions and in competition with other actors in the market in question. *Basic export services* are basic export information for all Swedish businesses attracted to expand sales to foreign markets, free of charge and funded mainly through publically financed assignments. The two remaining categories; *skills development for companies* and *targeted measures for international business promotion*, incorporate measures to widen Swedish firms' knowledge and willingness to engage in foreign exports, in addition to various types of special projects to foster Swedish participation in international business affairs. These two categories are financed both through public assignments and by businesses participating in the various activities.

At the international offices, operations are primarily focused on *consultancy services* and *targeted measures for business promotion*. *Consultancy services* take place exclusively at the STC's international locations, whereas *targeted measures for business promotion* are available both abroad and in Sweden. Both *basic export services* and *skills development for companies* mainly take place in Sweden, but

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<sup>4</sup> Before 2007 there were three categories: *export information*, *export development* and *export consulting* (SOU 2000:102). *Export development* were more or less divided into two, *skills development for companies* and *targeted measures for international business promotion*.

projects are widely coordinated with offices abroad to fulfill the objectives of Swedish export promotion policy. *Basic export services*, previously known as *export information*, used to be available at the international offices before the Internet-based services advanced in the late 1990s. This study therefore incorporates *Consultancy services*, *targeted measures for business promotion* as well as *basic export services*, as these categories all have taken place at the international locations during the study period, 1995-2009.

### **3.2 Embassies and consulates**

One task of the Swedish Foreign Service is to contribute to the growth of the Swedish economy through supporting foreign trade and promoting Sweden abroad (SOU 2008:90). Therefore, Swedish embassies and consulates are active players in promoting Swedish economic interests in international markets. The Foreign Service provides information for exporters, which can be considered closely related to the *basic export services* and other informational services of the international STC offices. In addition, embassies and consulates are also available for further advisory and informational services for which a fee is charged. Besides these undertakings, public grants designated for special promotion projects are occasionally allocated to the foreign missions. Embassies and consulates are assigned to actively cooperate with representatives from the STC in order to successfully promote Swedish exports. The STC is also allowed to organize promotion schemes at embassies and consulates around the world. In places where the STC has no official representation, embassies and consulates hold the main responsibility to promote Swedish exports (SOU 2008:90). A complete list of Swedish embassies and consulates over the 1995-2009 period can be found in Appendix B.

## **4. Theoretical foundation**

In this chapter, I give a brief overview of the theoretical foundation of the gravity model of international trade. Thereafter, I present a framework for how export-promoting activities can have an effect on trade costs and, consequently, trade within the setting of the gravity model.

### **4.1 The gravity model of trade**

The gravity model of international trade has been widely used in analyzing international trade flows, and it is one of the most successful empirical models used in economics. The model is based on the idea of Isaac Newton's law of universal gravitation, where bilateral trade flows are positively affected by economic size, but negatively affected by the various bilateral costs of trade, i.e. economic distance. The model can therefore predict the "natural" trade flows between two economies and has been commonly applied in empirical work investigating determinants of trade.

Tinbergen (1962) and Pöyhönen (1963) introduced the gravity concept intuitively but without deeper theoretical underpinnings. Anderson (1979) began establishing a theoretical foundation of the gravity equation used in analyzing international trade. He presented a setting where manufactured products are differentiated by place of origin, and each region (or country) specializes in the production of one good. In addition, preferences were assumed to be identical across regions, homothetic, and described by a constant elasticity of substitution (CES) function. In this framework, costs of trade are put in relation to distance and therefore explain transportation costs of international trade. Others have introduced new theoretical expansions to the structure of the gravity model and Bergstrand (1985, 1989) discussed the setting by adding monopolistic competition. Furthermore, Helpman and Krugman (1985) explained some groundwork of the model (without trade costs) by applying a setting of monopolistic competition with increasing returns to scale and differentiated products.

Anderson and van Wincoop (2003) built on previous research and derived a more tractable version of the gravity model, based on the structure presented by Anderson

(1979). They modified the CES utility function to derive a more comprehensible gravity equation, and their foundations are in correspondence with the developments of the new trade theory. A CES utility function is maximized subject to a budget constraint stating that the income in one country equals the value of consumption of imported goods from all other countries. The inclusion of transaction costs of trade,  $t_{ij}$ , (e.g. transport costs, tariff and regulatory costs, and informational costs between county  $i$  and county  $j$ ) functions as trade resistance because these costs cause prices of imported goods to rise in relation to domestic goods. Exporting costs are transferred from the exporter to the importer. Solving the utility maximization problem and imposing market clearance, the gravity equation becomes<sup>5</sup>,

$$X_{ij} = \frac{Y_i Y_j}{Y^w} \left( \frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (1)$$

where  $X_{ij}$  denotes exports from country  $j$  to country  $i$ ,  $Y_i$  and  $Y_j$  are GDP in  $i$  and  $j$ , respectively,  $Y^w$  represents world GDP,  $t_{ij}$  is bilateral trade costs between  $i$  and  $j$ ,  $\sigma$  is the constant elasticity of substitution between the different goods, and  $P_i$  and  $P_j$  are price indices described as multilateral resistance variables in  $i$  and  $j$ . These multilateral resistance terms describe the average trade barriers to the rest of the world of the trading partners  $i$  and  $j$ , irrespectively. Thus, they depend on all bilateral resistance to trade (bilateral trade costs) for the importer and exporter, and not solely those referring to countries  $i$  and  $j$ .

The implications of the gravity equation are that trade between two countries is decided by relative trade barriers ( $t_{ij}/P_i P_j$ ) where trade costs between the exporter and importer are put in relation to the multilateral resistance terms of the exporter and importer, respectively. Higher multilateral resistance of the importing or exporting country will lead to more trade between the two trading partners since  $t_{ij}$  falls in relation to  $P_i P_j$ . The multilateral resistance of small countries is more affected by trade barriers since international trade is of greater importance to small countries, compared to large countries. Therefore, relative trade resistance is smaller in small countries in relation to the resistance of larger countries. Bilateral trade of small

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<sup>5</sup> For a more detailed derivation see Anderson and van Wincoop (2003).

countries will consequently fall less when trade barriers increase, again comparing with larger countries (Anderson and van Wincoop, 2003).

The observable and unobservable bilateral trade costs,  $t_{ij}$ , are essential to the equation and play a large role in determining exports from country  $j$  to country  $i$ . A number of methods have been used to approximate trade costs within the framework of the gravity equation. Earlier work mainly included bilateral distance as a simple proxy for economic distance, while further research have lead to the introduction of information regarding trading partners' colonial linkages, legal structures, common languages, adjacency, common currencies, etc. to explain what may determine bilateral economic distance in the gravity model (see e.g. Rose, 2007). This has led the way for investigating how export-promoting activities may affect unobservable bilateral trade costs, and subsequently, aggregate trade volumes.

#### **4.2 Trade costs and export promotion**

Export-promoting activities are expected to have an effect on trade costs, which in terms of the gravity model are the bilateral barriers to trade,  $t_{ij}$ . Imperfect information on exports is often described as important for carrying out export-promotion activities. Below, I discuss some aspects of this, opening with a commonly discussed rationale for publicly funded export-promoting activities

Publicly financed export-promoting activities are typically justified with arguments relating to imperfect information. Domestic firms may be unable to fully accommodate the potential expansion of sales to foreign markets due to incomplete information and high costs of information. Thus, governments find it desirable to provide free information regarding exports. Furthermore, positive external effects of export information are also important for the discussion of state funded export-promoting activities. Export information is costly, but many different firms could potentially utilize available information and benefit from general knowledge on exporting activities. Therefore, private firms may hesitate to invest in costly export related research if the private benefits are not believed to exceed the costs. On the other hand, the social costs of information are moderate when considering the social benefits of the aggregate export activities of firms (Eliasson et al., 2010). Firms do not



appreciate competing businesses benefitting from their privately financed information, and export-engagements are therefore lower than the socially preferable level (taking account of the social costs). Export promotion agencies that provide free (or relatively inexpensive) export information to domestic firms can therefore have an effect on total exports as the private costs of exporting are reduced (Lederman et al., 2010).

International trade in goods is associated with formal trade costs such as tariffs and transport costs. Nevertheless, unobservable informational costs of trade are also essential. Rauch (1999) argues that differentiated products can be separated from goods that are traded on organized exchanges or charged at a reference price. Contrary to the latter two product categories, differentiated goods are associated with considerable costs of matching buyers and sellers in international markets. This is caused by costs of information concerning e.g. market competition, consumer behavior, legal systems, etc. incurred on firms interested in exporting to foreign markets (Rauch, 1996). Thus, despite modern technology and the reduction of formal barriers to trade (i.e. tariffs, quotas, etc.), informational barriers to trade nonetheless hinder frictionless international trading processes (Head & Ries, 2010). Networks and ties have been found to be important for international trade (Rauch, 1999). Therefore, promotion measures focused on eliminating or at least reducing trade barriers with export information and local networks should theoretically give rise to an increased level of aggregate trade between two trading partners.

Networks and ties that have a positive effect on bilateral trade are likely to be influenced by proximity (Rauch, 1999). Thus, in more accessible export markets, both in terms of market size and geographical distance, information is likely to be less crucial in relation to marginal markets. Export promotion could therefore be of greater importance in distant, less accessible export markets.

Reduction of trade barriers from export promotion may help to establish new links of exporting, which can be described as the extensive margin of trade at the country level. However, since export information may be specific for every differentiated product (as described by Rauch, 1996, 1999), established trading partners can benefit from export-promoting activities in international markets in order to increase exports

(Segura-Cayuela & Vilarrubia, 2008). That is, the intensive margin of trade at the country level can also be affected by export promotion<sup>6</sup>. The intensive margin is central in the gravity model, i.e. equation 1, as it predicts bilateral trade to increase from lower trade barriers.

Research at the micro (firm) level of exporting has drawn attention to costs of exporting previously ignored by theory (see e.g. Helpman & Krugman, 1985) (Greenaway & Kneller, 2007). These costs are described as nonrefundable sunk costs for firms engaging in foreign exports, which incorporate unobservable search and information costs. A combination of sunk costs and firm productivity decides if firms participate in exporting activities (Melitz, 2003). If sunk costs can be reduced by export promotion, it could lead to more firms exporting<sup>7</sup> and consequently an increase of trade at the intensive margin at the country level. Thus, export-promoting activities affect trade costs,  $t_{ij}$ , and subsequently trade, in the gravity model.

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<sup>6</sup> The extensive margin of trade is described as establishing new links of trade, i.e. the start of exporting to a new trading partner. The intensive margin of trade, on the other hand, is described as changing the volume of trade of established trade links, i.e. trading more with already established partners (Felbermayr & Kohler, 2004).

<sup>7</sup> See e.g. Alvarez (2004) and Bernard and Jensen (2004) for empirical research on the relationship between export promotion and firms' decisions to export.

## 5. Empirical specification

I estimate a panel data specification of the gravity model to analyze the relationship between Swedish export-promoting activities and aggregate Swedish merchandise exports. This chapter contains a description of the variables included in the empirical analysis, and a presentation of the econometric specification of the gravity model.

### 5.1 Variables

Standard variables included in a typical gravity model specification are incorporated in the model, along with additional export promotion variables relevant for this analysis of Swedish international export-promoting activities that attempt to reduce trade costs.

#### 5.1.1 *Export*

Naturally, this gravity model specification includes a variable describing bilateral trade flows from Sweden to its trading partners. The export variable is defined as  $X_{xmt}$ , explaining bilateral exports from Sweden ( $x$ ) to import country  $m$  at time  $t$ .

#### 5.1.2 *Export promotion variables*

In order to investigate the potential relationship between total Swedish exports and international export-promoting activities, I include the necessary information on the various Swedish international export-promoting activities. A dummy variable representing the international offices of the STC is included to examine if this can account for a reduction of some unobservable trade costs and lead to a higher level of exports. If the STC has one or more offices in the importing country,  $m$ , at time  $t$ , the dummy variable,  $STC_{mt}$ , takes the value 1 and otherwise 0. Here, all international offices are treated as equal because of the difficulties of measuring the institutional characteristics of different offices abroad. The dummy variable does not incorporate information concerning the number of offices in each country. Naturally, these simplifications generalize the overall picture of the STC's international

representation, but are not likely to affect the results significantly. In addition, there are currently only four countries<sup>8</sup> with more than one STC office.

Furthermore, additional dummy variables for countries where Sweden has official permanent representation in the form of an embassy or consulate are included. These variables are constructed using the same method as for the international offices of the STC, and are defined as  $Embassy_{mt}$ <sup>9</sup> and  $Consulate_{mt}$ . That is,  $Embassy_{mt}$  ( $Consulate_{mt}$ ) takes the values 1 if Sweden has an embassy (consulate) in country  $m$  at time  $t$  and 0 otherwise. Results from previous studies, especially Rose (2007) and Gil et al. (2007), also provide realistic arguments for incorporating information on the presence of the Foreign Service in this analysis. I only include a dummy variable for consulates, contrary to Rose (2007) and Gil et al. (2007), who specify the total number of foreign missions. However, for the case of Sweden, I reason that this makes little difference for the empirical results seeing that Sweden has very few consulates in total and that only the U.S. has more than one Swedish consulate. Additionally, Swedish honorary consulates are not included in the analysis.

In some specifications, the variables above are merged into the dummy variable  $Swedish\ representation_{mt}$ , in order to describe if Sweden has any official representation in country  $m$  at time  $t$ . This variable is designed to investigate if the important aspect is that there are any official representation and not what form it takes.  $Swedish\ representation_{mt}$  is not included in the regressions where the other export promotion variables are present.

### 5.1.3 Gravity variables

An empirical specification of the gravity model (see equation 1 above) requires a measure of economic size of the trading partners. In the literature, economic size has been approximated by e.g. GDP, GDP per capita or population (see e.g. Carrère, 2006). In line with other previous studies, I include the product of the economic mass of the exporter and importer expressed as follows,

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<sup>8</sup> There are currently two offices in China and Russia, and three offices in India and the U.S.

<sup>9</sup> In this sample, Hong Kong, SAR of China is defined as an independent country, and the Swedish general consulate is therefore defined as an embassy.

$$Mass_{xmt} = GDP_{xt}GDP_{mt} \quad (2)$$

where  $GDP_{xt}$  is the gross domestic product of the exporter (Sweden) at time  $t$  and  $GDP_{mt}$  describes the gross domestic product of the importer at time  $t$ .

The variable,  $Distance_{xm}$ , represents bilateral geographical distance between the capital cities and is introduced to account for bilateral trade costs directly related to distance.

Earlier studies have accounted for the multilateral resistance terms (i.e. the price indices,  $P_i$  and  $P_j$  in equation 1) in several different ways. In a cross-sectional framework, Anderson and van Wincoop (2003) modeled the price indices ( $P_iP_j$ ) with a nonlinear estimation, whereas e.g. Rose and van Wincoop (2001) handled the multilateral resistances with the more common approach of country fixed effects. However, none of these techniques incorporate the time dimension of the data. I therefore include a remoteness variable<sup>10</sup> in the gravity equation, to properly account for the time variant multilateral resistance in the data sample. This variable is a proxy for the economic remoteness of the importer. Since the remoteness variable for Sweden is the same for all importing destinations, only the remoteness of the importer is specified here. The construction of the variable follows the demonstration by Carrère (2006, p 227-228),

$$Remoteness_{mt} = \left[ \sum_{k=1, k \neq m, t=1}^{N, T} GDP_{kt} (Distance_{mk})^{1-\sigma} \right]^{\frac{1}{1-\sigma}} \quad (3)$$

where  $Remoteness_{mt}$  denotes the remoteness of the importer,  $GDP_{kt}$  is the GDP of partner country  $k$  at time  $t$ ,  $Distance_{mk}$  is the bilateral distances between the capitals of the importer and partner country  $k$ , and  $\sigma$  denotes the constant elasticity of substitution. A value of 4 is used for  $\sigma$  in this study, as proposed by Carrère (2006)<sup>11</sup>.

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<sup>10</sup> Carrère (2006) describes the work of Baier and Bergstrand

<sup>11</sup> Based on suggestions in empirical literature, e.g. Obsfeld and Rogoff (2001)

Moreover, regional trade agreements (RTAs) have generally been found to have an influence on bilateral trade (see e.g. Greenaway & Milner, 2002 and Carrère, 2006). Therefore, an additional dummy variable,  $RTA_{xmt}$ , is introduced. It takes the value of 1 if Sweden,  $x$ , and the importer,  $m$ , are both signatories of a common free trade agreement on merchandise goods at time  $t$ , and 0 otherwise.

Additional dummy variables introduced as common determinants of trade are also included in the estimation. These describe whether or not Sweden and the importing country are adjacent (share a common border) or share legal system, and if the importing country is landlocked and/or a member of the World Trade Organization (WTO). However, some variables commonly used in gravity model estimations representing colonial linkages and currency unions are irrelevant for this study with Sweden as the sole exporter. Hence, these variables are not included. Information on common official languages is largely captured by the distance and adjacency variables seeing that Finland is the only trading partner sharing an official language with the exporter Sweden.

#### 5.1.4 Interaction variables

For a deeper understanding of the relations between export promotion activities and total exports, my empirical analysis will also include a set of interaction variables. More specifically, the  $STC_{mt}$  and  $Embassy_{mt}$  dummy variables are multiplied with the economic mass variable described in equation 2, and the distance variable. These variables measure whether or not the combined economic mass as well as the bilateral distance of the trading partners, influence the effect of STC offices and embassies. More specifically, they are predicted to show if an embassy or an STC office has a significantly smaller or larger effect on greater or more distant markets. I expect STC offices and embassies to have a larger effect on geographically more distant markets, as the economic distance is reduced from markets that are far reached for Swedish exporters. Furthermore, STC offices and embassies can be anticipated to have a smaller effect on larger markets, seeing that exporters could be assumed to find larger markets more readily available for exports, without assistance from export-promoting activities. In addition, the  $STC_{mt}$  and  $Embassy_{mt}$  variables are multiplied to create a dummy variable,  $STC_{mt} * Embassy_{mt}$ , indicating if Sweden has both an embassy and an

STC office in country  $m$  at time  $t$ . This variable is intended to identify whether or not the combination of embassies and STC offices have a significant effect on total Swedish exports. Furthermore, it is important for the analysis, seeing that the Swedish government regards this relationship to be vital for a successful export promotion policy.

Similar interaction variables are constructed for the combined export promotion variable *Swedish representation<sub>mt</sub>*. They are defined as *Swedish representation<sub>mt</sub> \* LnMass<sub>xmt</sub>* and *Swedish representation<sub>mt</sub> \* LnDistance<sub>xm</sub>*, and are only included when the *Swedish representation<sub>mt</sub>*-variable is used instead of the other, separated export promotion variables. To my knowledge, neither of the previous studies investigating the connection between aggregate levels exports and various export-promoting activities have included such interaction variables. Therefore, these empirical results are particularly noteworthy.

## 5.2 Econometric specification of the gravity model

The econometric specification is presented in equation 4 below. Exports from Sweden to all importing countries are explained by the variables described earlier. Because the gravity model described in equation 1 is log-linear, I take the natural logarithms of all continuous variables included in the model to obtain the relationship in equation 4.

$$\begin{aligned} \ln X_{xmt} = & \\ & \alpha + \alpha_t + \gamma_{xm} + \beta_1 \ln Mass_{xmt} + \beta_2 \ln Distance_{xm} + \beta_3 \ln Remoteness_{mt} + \quad (4) \\ & \beta_4 RTA_{xmt} + \sum_{i=5}^8 \beta_i W_{mit} + \sum_{i=9}^{13} \beta_i Z_{xmit} + \sum_{i=14}^{18} \beta_i Q_{xmit} + \varepsilon_{xmt} \end{aligned}$$

In this econometric specification,  $x$  denotes the exporter (i.e. Sweden),  $m$  the importing country, and  $t$  the year.  $W_{mit}$  represents the export promotion variables described earlier, i.e. *STC<sub>mt</sub>*, *Embassy<sub>mt</sub>*, *Consulate<sub>mt</sub>* and *Swedish representation<sub>mt</sub>*.  $Z_{xmit}$  contains the interaction variables presented in the previous section. Additionally,  $Q_{xmit}$  is the set of dummy variables describing the country specific characteristics, e.g. common legal system or adjacency. The constant,  $\alpha$ , is common to all country pairs and all time periods and  $\alpha_t$  represents the time dummy included to control for time effects common to all countries in the year  $t$ .  $\gamma_{xm}$  is a country pair effect which is the

same for all years and included in the fixed effects estimation described in more detail below.

All variables included in the model, besides  $Distance_{xm}$  and the landlocked dummy, are predicted to have a positive effect on bilateral trade between Sweden and the importing countries. Therefore, all coefficient estimates, except  $Distance_{xm}$  and the landlocked dummy, are expected to be positive.

A panel data setting is practical as it allows for cross-sectional heterogeneity in the data. Thus, country specific heterogeneity can be accounted for, and unobservable characteristics affecting bilateral trading patterns can be captured in the estimation of the gravity model (Verbeek, 2008). Fixed effects and random effects are two methods to handle country heterogeneity in the sample. However, in a random effects model all country specific characteristics are assumed to be uncorrelated with the explanatory variables and can thus be captured in the error term (Kennedy, 2008). This is not assumed in a fixed effects model, in which the unobservable characteristics are isolated from the error term. Because there is no guarantee that all explanatory variables are uncorrelated with the unobservable heterogeneities in the sample, I find the fixed effects estimator (also called the within estimator) a more suitable alternative in this estimation of the gravity model. A Hausman test comparing the two estimators also suggest the use of the within estimator. This fixed effects approach is in line with previous studies estimating the gravity equation (see e.g. Gil et al. 2007 and Head & Ries, 2010). Similar studies have normally include different combinations of fixed effects for importers, exporters and country pairs (Nitsch, 2007). Due to the characteristics of my sample (Sweden is the sole exporter), separated exporter and importer fixed effects and country pair fixed effects (or importer fixed effects) yield identical results. As the country heterogeneities are excluded from the estimation with fixed effects, the risks of endogeneity bias and omitted variable bias are reduced.

In the fixed effects model specification, the country specific effects that are unique for Sweden and its trading partners are identified and isolated. Therefore, time invariant country specific features included in  $Q_{xmit}$ , e.g. adjacency, common languages, and legal statuses etc., are isolated and dropped from the fixed effects regressions. As the



geographic distance variable,  $Distance_{xm}$ , is also time invariant, the fixed effects estimator captures this too. Moreover, the WTO dummy variable is dropped for the within estimation because the variation of this variable is mainly captured by the fixed effects. Any multilateral resistance of the importer that is time invariant is also found in the fixed effects.

### 5.3 Reverse causality

Researchers have discussed problems relating to the possibility that countries open export promotion agencies (such as the STC), embassies and consulates in places where trade is already high. This is a difficult problem to deal with and previous studies have applied various methods to control for this type of reverse causality. Contrary to Rose (2007) and Gil et al. (2007), I find no suitable instruments to employ in this study. This is due to the characteristics of my sample, with Sweden as the sole exporter, and the difficulties in finding relevant time variant instruments.

In order to attempt to investigate whether reverse causality could be a problem in my sample. I follow the example of Nitsch (2007) and include a comprehensive set of lagged and future values of the export promotion variables. They represent the export promotion variables for three past and future time periods. The  $Consulate_{mt}$  variable is not included here because the number of consulates is much smaller than embassies and STC offices, and the potential effect is thus expected to be much smaller. The leads of the export promotion variables are intended to capture if offices abroad are located where exports are already high and increasing, and the lags can potentially capture if the effects of the export promotion variables have a delayed effect on exports. Because of the very large number of variables in the regressions, I do not include lagged and future versions of the interaction variables. Therefore, the lags and leads of the export promotion variables do not give a complete picture of the causality between aggregate exports and promoting activities, but it ought to give a reasonable indication.

I also include a second empirical specification in agreement with Nitsch (2007). Here, I investigate the export growth in relation to the growth of the combined economic

size of Sweden and the importer and the export promotion variables. The empirical specification is designed as follows,

$$gX_{xmt} = \alpha + \alpha_t + gMass_{xmt} + \sum_{i=1}^4 \beta_i U_{im} + \sum_{i=5}^8 \beta_i V_{imt} + \varepsilon_{xmt} \quad (5)$$

where the growth of export from Sweden ( $x$ ) to the importing countries,  $m$ , at time  $t$  is explained by growth of the combined economic mass of Sweden and the importer,  $m$ , at time  $t$ ,  $U_{im}$ , which represents set of variables describing if the importing country,  $m$ , has ever had an STC office or an embassy, along with export promotion variables in  $V_{imt}$  designed to show when the STC office or embassy actually was present.  $\alpha$  is a constant, and  $\alpha_t$  is time dummy variable. Consulates are not included in this specification because in this sample, Swedish consulates are only present in countries where an embassy is already established.

The set of “ever export promotion”-variables in  $U_{im}$  is intended to capture whether countries that have ever had an STC office or an embassy have experienced higher export growth than countries where no Swedish official representation has been present. If these variables are statistically significantly different from zero, the specification suggests that export-promoting representation is focused on countries that already see higher exports, which could be an indication of reverse causality in the data sample. The set of export promotion variables in  $V_{imt}$  capture if the growth of exports indeed is higher in places when/after an export-promoting office of some sort is introduced. Thus, the additional set of variables,  $V_{imt}$ , is foreseen to capture whether exports grow when, and after, the foreign representation in question actually is established, which is predicted by the theory of the gravity model described in chapter 4 (equation 1).

The two methods to investigate potential reverse causality do not give a complete picture of the relationship between export promotion and aggregate exports. They do, however, give an indication of the possible linkages.

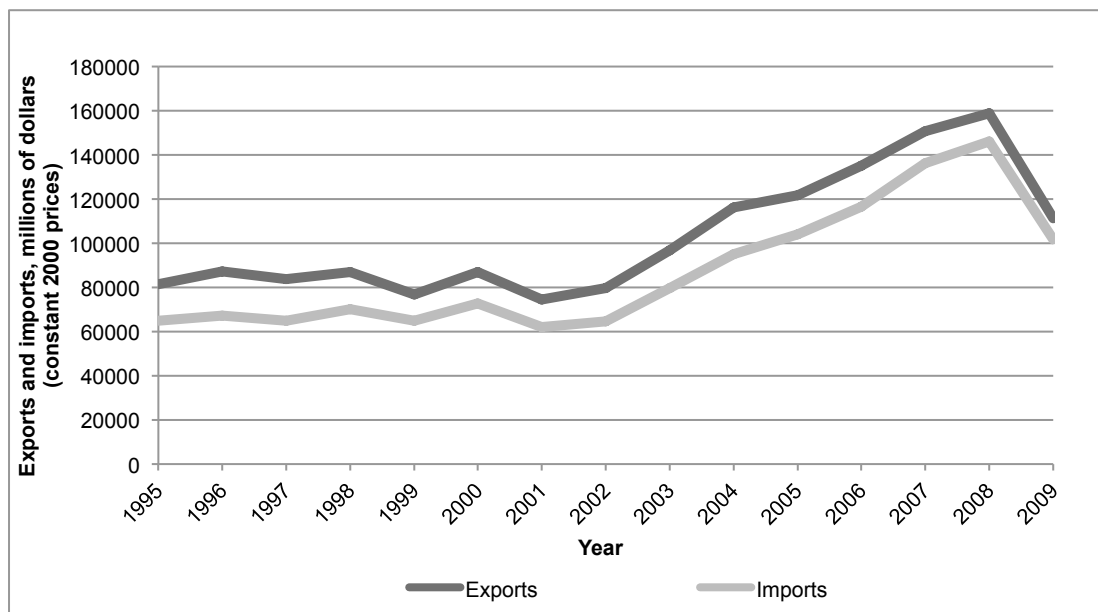
## 6. Data

This chapter is dedicated to the details regarding the data sample used in the empirical analysis. Since the study is focusing on aggregate Swedish merchandise exports, I start by providing selected descriptive information on Swedish exports covering the period of interest, 1995-2009.

### 6.1 Swedish export patterns

Figure 6.1 illustrates aggregate Swedish exports and imports for the 1995-2009 period. As can be seen in the figure, aggregate trade patterns develop in fairly similar ways for exports and imports, which indicate that there are no special circumstances pertaining either for exports or imports during the period studied in this paper. Both total Swedish exports and imports followed similar balanced paths up until 2001 and grew steadily after that, only to decline when the international economic crisis hit in 2008.

**Figure 6.1 Swedish exports and imports 1995-2009**

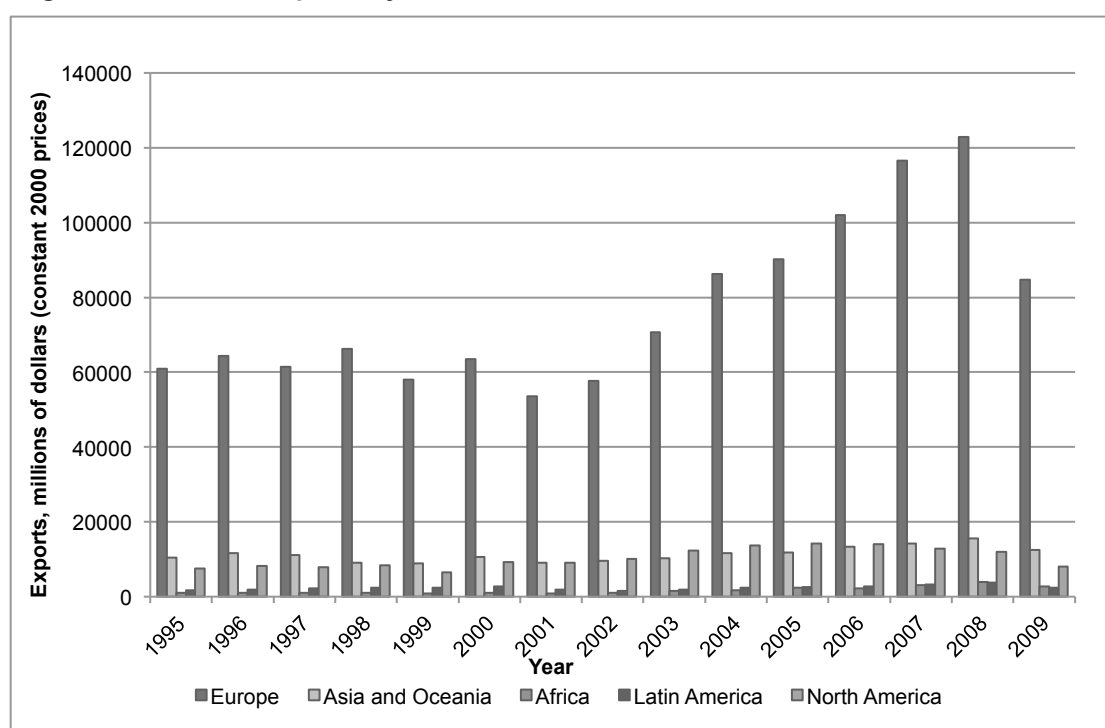


Source: Author's calculations on UN COMTRADE data.

Figure 6.2 illustrates total Swedish exports by continent for the same time period. European countries are by far the most important destinations for Swedish exports. Export patterns to Europe follow the total export patterns illustrated in figure 6.1

fairly well. North American export destinations and Asia and Oceania follow a rather similar pattern, but around 2006 North America fell behind Asia and Oceania. Interesting to note is that the U.S. receives approximately 90 percent of total exports to North America. As can be seen in figure 6.2, Latin American and African export destinations are the least important for total Swedish exports. The continents are far behind Europe, and do not seem to catch up on either North America or Asia and Oceania, despite the dip in exports to North America after the 2008 economic crisis. This dip is also tangible in European export destinations as shown in the figure below.

**Figure 6.2 Swedish exports by Continent 1995-2009**



Source: Author's calculations on UN COMTRADE data.

**Table 6.1 Number of STC offices, embassies and consulates (the Foreign Service) by Continent 2009**

Continent	STC offices	The Foreign Service	Continent	STC offices	The Foreign Service
Europe	28	37	Latin America	4	5
Asia and Oceania	21	22	North America	4	4
Africa	8	14			

Source: The Swedish Trade Council (2011) and the Ministry of Foreign Affairs (2011)

Furthermore, as shown in table 6.1 above, a majority of the STC's international offices, as well as embassies and consulates, are located in Europe, followed by Asia. Thus, the growing export numbers to Asian destinations, and the large number of STC offices in Asia, along with the dominance of European export destinations and the many European STC offices and number of missions abroad may indicate a relationship between the activities of the STC and total exports. The many offices in relation to the number of countries in North America also show that there could be a connection between the STC, the Foreign Service and aggregate exports. Geographically and economically more distant markets in Africa and Latin America have fewer offices and the levels of exports are lower than to the other continents.

## **6.2 Data sources**

### *6.2.1 Swedish exports*

Data on bilateral exports are collected from UN COMTRADE (in current US dollars). The sample consists of aggregate merchandise bilateral export data between Sweden and 183 importing countries. Data on Swedish exports are more comprehensive compared with import data collected from reported importing countries over the corresponding time period, which is why I find export data more suitable in this study.<sup>12</sup> Thus, problems with missing values are reduced. Export data have been deflated using the GDP deflator (base year 2000) for Sweden available via the World Bank's *World Development Indicators* database. A complete list of the trading partners included in the study can be found in Appendix C.

### *6.2.2 Export promotion variables*

Information on the STC's international offices are collected from the STC's online webpage, and offices with no listed year of opening have been asked directly via email or telephone. Regarding the permanent missions of the Foreign Service, the information is gathered from the yearly journal published by the Foreign Service<sup>13</sup>

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<sup>12</sup> Data reported from Sweden is assumed to be of high quality and hence missing importing data from reporting countries in COMTRADE may actually be wrong when export data from Sweden is available and are non-zero values.

<sup>13</sup> Utrikesdepartementets kalender, 1995-2009.

containing contact information and addresses to all official Swedish representation abroad.

### 6.2.3 Gravity variables

GDP data (in constant 2000 US dollars) are collected from the *World Development Indicators*. For Taiwan, data is collected from the National Statistics of the Republic of China. Data on bilateral geographical distances are gathered from the distance dataset published by Centre d'Etudes Prospectives et d'Informations International (CEPII), and are calculated using the great circle formula using longitudes and latitudes on countries' capitals (or most important cities in terms of population). This is a rather simple measure on bilateral distance, although it provides a suitable proxy for this estimation. Furthermore, information regarding countries' involvement in RTAs is gathered from the gravity dataset made available by CEPII and is complemented with information from the WTO's gateway on RTAs for the period 2007-2009, since these years are not covered by the CEPII gravity dataset. The gravity dataset is also consulted for the additional country specific dummy variables specified in section 5.1.3.

## 6.3 Data limitations

For a group of importing countries and time periods, country specific data on exports are unavailable from the UN COMTRADE database.<sup>14</sup> Therefore, data on bilateral exports and GDP are merged for these groups of countries over the whole time period, 1995-2009. The country groups merged are Belgium-Luxembourg, the Southern African Customs Union (SACU) (Botswana, Lesotho, Namibia, South Africa and Swaziland) and Serbia-Montenegro-Kosovo.

Following the merging of trade and GDP data of these country groups, the largest countries<sup>15</sup> in the groups are used for the bilateral distances. This also applies to embassies and RTA-membership. SACU members are merged with South Africa and Montenegro and Kosovo are joined with Serbia. The STC offices in Namibia and

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<sup>14</sup> Unavailable separated data on groups: Belgium-Luxembourg pre-1998, SACU pre-2000, and Serbia-Montenegro-Kosovo pre-2006.

<sup>15</sup> Belgium, Serbia and South Africa.

Botswana, opened in 2006 and 2008, respectively, are not included in the study seeing that the countries are merged with South Africa as members of SACU.

## 7. Results

This chapter opens with a brief discussion on the correlation between the variables of relevance in this study. I thereafter present the regression results from the different specifications of the gravity model described in chapter 5 and a comprehensive analysis of the empirical results. Also, robustness concerns are addressed along with attempts to shed some light on matters of reverse.

Briefly examining the correlation matrix (table D.1) presented in Appendix D indicates that there is a fairly high correlation between the dependent variable,  $LnX_{xmt}$ , and the export promotion variables. In addition, there seem to be relatively high linkages between the combined economic mass variable and the export variable. The export promotion variables, especially the embassy and STC variables are also correlated with  $LnMass_{xmt}$ , which is reasonable seeing that embassies to a large extent are situated in economically central locations. The matrix also indicates that multicollinearity does not appear to be an issue in this sample.

### 7.1 Results from the gravity model specifications

The results from the fixed effects regressions are of foremost importance for this analysis. The pooled regressions are nevertheless presented for comparative purposes, in line with most previous studies applying the gravity model to investigate the effects from export-promoting activities. Robust standard errors are used in all regression to avoid problems with autocorrelation and heteroskedasticity in the panel data sample. In all tables, p-values are found in the parentheses. Moreover, statistically significant coefficient estimates at the ten, five and one percent level are marked with \*, \*\*, and \*\*\*, respectively.

In table 7.1, the first three columns present the pooled OLS results. The results from the fixed effects model are shown in columns 4, 5 and 6. Columns 1 and 4 show the regression results when all the export promotion variables are excluded. Columns 2 and 3 show the estimation for the regressions with the export promotion variables  $STC_{mt}$ ,  $Embassy_{mt}$ , and  $Consulate_{mt}$  included separately, and columns 3 and 6 present the regression results with the merged *Swedish representation* $_{mt}$ -variable.



**Table 7.1 Estimation results of equation 4 - excluding interaction variables**

Dependent variable: $LnX_{xmt}$	Pooled OLS			Fixed effects		
	(1)	(2)	(3)	(4)	(5)	(6)
$STC_{mt}$		0.190*** (0.001)			-0.181** (0.011)	
$Embassy_{mt}$		0.475*** (0.000)			0.029 (0.682)	
$Consulate_{mt}$		-0.515*** (0.000)			0.035 (0.733)	
$Swedish\ representation_{mt}$			0.501*** (0.000)			0.008 (0.917)
$LnMass_{xmt}$	1.057*** (0.000)	0.994*** (0.000)	0.981*** (0.000)	0.941*** (0.000)	0.949*** (0.000)	0.941*** (0.000)
$LnDistance_{xm}$	-0.965*** (0.000)	-0.941*** (0.000)	-0.940*** (0.000)			
$LnRemoteness_{mt}$	0.096* (0.013)	0.096** (0.018)	0.083** (0.038)	0.216 (0.705)	0.173 (0.764)	0.219 (0.703)
$RTA_{xmt}$	-0.018 (0.787)	-0.160*** (0.009)	-0.148** (0.020)	-0.320*** (0.000)	-0.310*** (0.000)	-0.320*** (0.000)
$Adjacency_{xm}$	-0.583*** (0.000)	-0.315*** (0.003)	-0.461*** (0.000)			
$Common\ Legal\ System_{xm}$	1.281*** (0.000)	1.198*** (0.000)	1.194*** (0.000)			
$Landlocked_m$	-0.420*** (0.000)	-0.404*** (0.000)	-0.387*** (0.000)			
$WTO_{xmt}$	0.368*** (0.000)	0.340*** (0.000)	0.357*** (0.000)			
<i>Constant</i>	1.681*** (0.000)	2.527*** (0.000)	2.965*** (0.000)	-3.874 (0.408)	-3.920 (0.405)	-3.877 (0.408)
Number of observations	2682	2682	2682	2682	2682	2682
Significance, F-statistic	0.000	0.000	0.000	0.000	0.000	0.000
R <sup>2</sup>	0.876	0.880	0.880	0.775 <sup>#</sup>	0.776 <sup>#</sup>	0.775 <sup>#</sup>

Note: P-values in parentheses. Statistically significant coefficients at the 10, 5, and 1 percent level are marked with \*, \*\*, and \*\*\*, respectively. <sup>#</sup>Overall R<sup>2</sup>

First, taking a look at the pooled OLS results in table 7.1, I draw the conclusion that the coefficient estimates of the standard gravity variables generally seem to be statistically significant and have the expected signs. As predicted by theory, trade is proportional to the size of the economic mass variable as the coefficient of the latter takes a value close to one in all specifications. The results thus indicate that the model specification of the gravity equation is in line with economic theory. However, the  $RTA_{xmt}$ - and  $Adjacency_{xm}$ -variables behave somewhat out of line with theory. This could be because of country characteristics specific for Sweden as the sole exporter in

this analysis. In addition,  $RTA_{xmt}$  seems to be correlated with the export promotion variables<sup>16</sup>.

The first three columns all exhibit high R-squared values and significant F-statistics, which suggest that the gravity model fits the data well. In the pooled regressions, the export promotion variables apart from  $Consulate_{mt}$  are positive and statistically significant, indicating a systematic relationship between export-promoting activities, fulfilled by the STC and the Foreign Service, and total Swedish exports. The *Swedish representation<sub>mt</sub>*-variable is statistically significant at the 1 percent level and the coefficient estimate of 0.501 suggest that a Swedish representation abroad tend to increase trade by 65 percent on average. The STC seem to have a lower effect on exports than embassies seeing that an STC office is associated with approximately 21 percent higher trade, and an embassy increase trade with about 61 percent.

The fixed effects model will capture various unspecified characteristics of the countries in the dataset that are important for the empirical analysis. I therefore examine the fixed effects regressions more thoroughly, starting with the variables normally included in gravity model estimations. The economic mass variable is statistically significant and has the expectant sign and size in all of the fixed effects estimations, presented in columns 4, 5 and 6. The remoteness variable is, although positive and larger in size than in the pooled regressions, insignificant, indicating that the fixed effects capture most of the time variant remoteness of the importer in this sample. Furthermore, the regional trade agreement variable is still negative and significant, which could be explained by Swedish export patterns not being positively affected by trade agreements signed as a member of the European Union (EU). In addition, agreements signed as an EU member are few and can potentially be found in the fixed effects. Also, since the data sample starts in 1995, the fixed effects model (or the pooled OLS regressions discussed earlier) cannot identify the potential effects from EU membership in relation to earlier trade agreements with European countries.

Column 5 present the coefficient estimates for the different export promotion variables. From these results, the picture is quite different from the pooled regression

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<sup>16</sup> Excluding the  $RTA_{xmt}$ -variable in the pooled OLS regressions does not affect the coefficients of the other variables. The results are robust towards change.

shown in column 2. Here, the STC seems to have a significantly negative effect on Swedish exports, whereas embassies and consulates are insignificant and cannot be connected with aggregate exports in this specification. Thus, the export promotion variables could be correlated with unobservable trade resistance captured by the fixed effects. Contrary to the results by Rose (2007) and Gil et al. (2007), fixed effects lead to insignificant effects on trade from the Foreign Service in this model. Rose (2007) though, notes that the Swedish Foreign Service is the smallest (by number of foreign missions) in his sample of 22 large exporters, which could suggest that Swedish foreign missions have a significantly smaller effect on national exports than other countries' permanent foreign missions. In addition, the small number of Swedish consulates could partly explain the insignificant consulate variable. The *Swedish representation<sub>mt</sub>*-variable is insignificant, in line with embassies and consulates.

These results reveal that the relationship between the export promotion variables and aggregate Swedish exports is complex and needs further investigation. I therefore introduce the interaction variables. The regression results are presented in table 7.2 below and the table follows the same outline as table 7.1. Columns 1 and 2 show the pooled OLS results, whereas the fixed effects estimations are demonstrated in columns 3 and 4. As can be seen, columns 1 and 3 present regressions with the separated export promotion variables, and columns 2 and 4 the combined *Swedish representation<sub>mt</sub>*-variable.

**Table 7.2 Estimation results of equation 4 - including interaction variables**

Dependent variable $LnX_{xmt}$	Pooled OLS		Fixed effects	
	(1)	(2)	(3)	(4)
$STC_{mt}$	5.779*** (0.000)		8.601*** (0.000)	
$Embassy_{mt}$	3.287*** (0.000)		-1.389 (0.301)	
$Consulate_{mt}$	-0.114** (0.019)		0.009 (0.921)	
$Swedish\ representation_{mt}$		5.010*** (0.000)		0.037 (0.980)
$Embassy_{mt} * LnMass_{xmt}$	-0.128*** (0.000)		-0.070 (0.252)	
$Embassy_{mt} * LnDistance_{xm}$	-0.010 (0.878)		0.349*** (0.000)	
$STC_{mt} * LnMass_{xmt}$	-0.265*** (0.000)		-0.457*** (0.000)	
$STC_{mt} * LnDistance_{xm}$	0.119** (0.014)		0.205*** (0.008)	
$STC_{mt} * Embassy_{mt}$	-0.003 (0.982)		0.407*** (0.004)	
$Swedish\ representation_{mt} * LnMass_{xmt}$		0.199*** (0.000)		-0.168*** (0.007)
$Swedish\ representation_{mt} * LnDistance_{xm}$		-0.009 (0.900)		0.431*** (0.001)
$LnMass_{xmt}$	1.088*** (0.000)	1.088*** (0.000)	0.913*** (0.000)	0.951*** (0.000)
$LnDistance_{xm}$	-0.879*** (0.000)	-0.901*** (0.000)		
$LnRemoteness_{mt}$	0.114*** (0.003)	0.124*** (0.002)	0.196 (0.734)	0.105 (0.856)
$RTA_{xmt}$	-0.064 (0.256)	-0.035 (0.561)	-0.273*** (0.000)	-0.274*** (0.000)
$Adjacency_{xm}$	-0.342*** (0.000)	-0.299*** (0.000)		
$Common\ Legal\ System_{xm}$	1.238*** (0.000)	1.110*** (0.000)		
$Landlocked_m$	-0.423*** (0.000)	-0.423*** (0.000)		
$WTO_{xmt}$	0.331*** (0.000)	0.319*** (0.000)		
<i>Constant</i>	0.135 (0.852)	0.343 (0.653)	-2.904 (0.539)	-3.663 (0.442)
Number of observations	2682	2682	2682	2682
Significance, F-statistic	0.000	0.000	0.000	0.000
R <sup>2</sup>	0.886	0.883	0.673 <sup>#</sup>	0.714 <sup>#</sup>

Note: P-values in parentheses. Statistically significant coefficients at the 10, 5, and 1 percent level are marked with \*, \*\*, and \*\*\*, respectively. <sup>#</sup>Overall R<sup>2</sup>

An initial glance at the results in table 7.2 suggest that the standard gravity model variables still behave as predicted by theory, both in the pooled OLS regressions and the fixed effects specifications. The exceptions are still  $RTA_{mt}$  and  $Adjacency_{xm}$  in the pooled OLS regressions where  $RTA_{mt}$  is insignificant and  $Adjacency_{xm}$  is negative and statistically significant. In the fixed effects regressions, the variables behave in a similar manner compared to the fixed effects regressions not including the interaction variables. Furthermore, the very low p-values for the F-statistics suggest a good model fit, along with the relatively high R-squared and overall R-squared values in the pooled OLS and fixed effects specifications, respectively.

Including the interaction variables affect the coefficient estimates of the standard export promotion variables. The coefficient estimate of the STC variable is positive and significant, whereas the embassy and consulate variables are insignificant. This shows that the international export-promoting activities of the STC are systematically linked to aggregate Swedish exports. The embassy variable does not seem to be connected with aggregate exports. Furthermore, the small number of Swedish consulates could be a potential explanation for the insignificant connection between exports and consulates abroad, as described earlier.

The interaction variables behave rather closely to what has been suggested in the earlier discussion. The results from the fixed effects estimations indicate that offices of the STC have an increasing effect on geographically more distant markets, whereas the effect of the STC's presence is smaller the larger the export market gets. For embassies, results are fairly similar. The  $Embassy_{mt} * LnMass_{xm}$ -variable is insignificant, whereas  $Embassy_{mt} * LnDistance_{xm}$  is positive and significant. Embassies therefore seem to have a larger effect on trade in more distant markets, which follows the effect of the STC's international offices. Taking a closer look at the size of the coefficient estimates of  $STC_{mt} * LnDistance_{xm}$  and  $Embassy_{mt} * LnDistance_{xm}$ , the results indicate that embassies have a slightly more increasing effect than the international offices of the STC on exports the more distant markets get. In the fixed effects estimation, the  $STC_{mt} * Embassy_{mt}$ -variable reveal that places where Sweden has both an STC office and an embassy are associated with higher trade. Thus, the positive working relationship between the STC and the Foreign Service, emphasized by the Swedish government and the STC, do seem to be apparent in this empirical analysis

of aggregate exports. This could imply that when the STC cooperates with the Foreign Service at the international locations where there is a greater effect on exports. Comparing the results from the fixed effects estimation with the pooled OLS regressions, they indicate fairly similar outcomes when the interaction variables are incorporated, which suggest that the results are robust.

The *Swedish representation<sub>mt</sub>*-variable is insignificant, whereas *Swedish representation<sub>mt</sub>\*LnMass<sub>xmt</sub>* and *Swedish representation<sub>mt</sub>\*LnDistance<sub>xm</sub>* are significant and take the expected signs. Swedish representation in any form seems to have a growing effect the more distant the market gets, while the effect is diminishing with the size of the export market. The results in this analysis give a clear indication that the interaction variables are essential for the empirical investigation of Swedish export-promoting activities and total exports. In addition, the results are in line with the theory and intuition that more marginal markets in terms of size and geographic distance are less known to exporters. Therefore, information brought about by export promotion is more important in these markets and hence affects exports to these places to a greater extent than to less marginalized markets. Seeing that similar interaction variables have not, to my knowledge, been included in comparable studies, the results are important for the overall analysis of export promotion and aggregate trade. The findings from including the interaction variables are in line with Lederman et al. (2010) who conclude that export promotion agencies are of greater help to exporters when trade barriers and informational costs of trade are high.

Based on the empirical results presented above, there seem to be a positive systematic relationship between the STC, the Swedish Foreign Service and Swedish aggregate merchandise exports. In addition, there are also indications that it is not only the STC, as an export promotion agency, that affects exports, but that the links to the Foreign Service are important. The results further suggest that the intensive margin at the country level, which is central in the gravity model used in this study, could be affected by export promotion, and not solely the extensive margin as suggested by Segura-Cayuela and Vilarrubia (2008). However, this relationship is of course difficult to investigate further based on the gravity model as it is specified in this study.

## 7.2 Robustness and reverse causality

Initially, the robustness of the gravity model specification is tested. Then follows a discussion on the results from the two methods to detect potential reverse causality.

### 7.2.1 Robustness checks

As discussed earlier, the standard gravity model variables are very robust to the various specifications presented in the empirical analysis. To further test the robustness of the fixed effects results presented in tables 7.1 and 7.2, I reduce the regressions by excluding the regional trade agreement variable and the importer remoteness variable. Table E.1 in Appendix E gives a full table of the results from the reduced regressions. These suggest that the export promotion variables, i.e.  $STC_{mt}$ ,  $Embassy_{mt}$ ,  $Consulate_{mt}$ , and  $Swedish\ representation_{mt}$ , are robust to the alterations to the model specification. Moreover, table E.2 in Appendix E illustrates the results of the robustness checks including the interaction variables. I draw the conclusion that the export promotion variables as well as the interaction variables are robust toward modifications in the specification of the gravity model.

### 7.2.2 Reverse causality

In table F.1 in Appendix F the regression results from the gravity model including the extensive set of past and future values of the export promotion variables is presented. The regressions with the added lags and leads are both run with fixed effects. As can be seen, almost all of the included lags and leads of the export promotion variables are statistically insignificant. The exceptions are the first and third lagged values of the embassy variable, and this could imply that there is a slight delay in the effect of embassies' export promotion on exports. However, it is difficult to investigate this delay further, seeing that most of the added lags are insignificant in this regression. Because all the lead variables are insignificant, reverse causality do not appear to be a great concern in this sample.

The regression results from equation 5 can be found in table F.2 in Appendix F. The regressions are run with pooled OLS, as the unobservable characteristics are captured by the model specification including the growth of exports as the dependent variable. Taking a look at the results in table F.2, the “ever export promotion”-variables are all

statistically insignificant, which implies that the growth of exports have not been higher before the STC offices and embassies were opened. The results also hold for the estimations with the Swedish representation variable, which is a sign of robustness. However, it seems that the other, time variant, export promotion variables included in the regression,  $STC_{mt}$  and  $Embassy_{mt}$  as well as  $Swedish\ representation_{mt}$ , are not linked with the growth of exports, which makes it difficult to connect the growth in exports to the opening of the international offices of the STC as well as embassies. Only the growth of the combined economic mass is significantly linked to the growth of exports. The results nevertheless suggest that reverse causality is difficult to detect in this sample. Although these two methods for revealing reverse causality do not give a complete picture of the linkages between Swedish international export promotion and total merchandise exports, the results suggest that it is not a large problem in this sample.

Based on the robustness checks and the attempts to investigate potential reverse causality, the fixed effects estimations appear to give a reasonably fair illustration of the relationship between total exports and Swedish international export-promoting activities.



## 8. Conclusions

In this thesis, I analyze the relationship between Swedish export-promoting activities abroad and total merchandise exports. The pooled OLS regression results indicate that the STC and the Foreign Service have a significantly positive effect on total exports. However, when fixed effects are introduced to control for unobservable determinants of bilateral trade, the links are no longer visible in the empirical results. The fixed effects seem to capture unobservable trade costs possibly correlated with export promotion offices abroad.

The results show that the inclusion of interaction variables is vital for a correct specification of Swedish export promotion. With interaction variables I find that there is a positive systematic relationship between Swedish international export-promoting activities and aggregate merchandise exports. Furthermore, the effects of international export promotion are larger the more marginalized export markets get, both in terms of economic size and geographical distance, which follows the intuition that export information about such markets is more difficult to obtain by exporters. In addition, the empirical results also imply that the working relationship between embassies and offices of the STC abroad has a positive effect on Swedish foreign exports. I also draw the conclusion that the empirical results from the gravity model are robust toward alterations in the model specification. Moreover, the results from the fixed effects estimations seem to be robust against reverse causality.

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## Appendix A

Table A.1 gives a complete list of the international offices of the Swedish Trade Council over the 1995-2009 period.

**Table A.1 The Swedish Trade Council - list of countries 1995-2009**

<i>Country</i>	<i>STC office</i>	<i>Country</i>	<i>STC office</i>
Angola	Opened in 2007	Morocco	Opened in 2008
Argentina	Opened in 2006	Mexico	Opened in 2003
Australia	*	Namibia	Opened in 2006 <sup>#</sup>
Austria	*	Netherlands	*
Belgium	*	New Zealand	*
Botswana	Opened in 2008 <sup>#</sup>	Nigeria	Opened in 2007
Brazil	*	Norway	*
Bulgaria	Opened in 2007	Philippines	Opened in 2008
Canada	*	Poland	*
Chile	Opened in 2008	Portugal	*
China	* <sup>+</sup>	Romania	Opened in 2004
Czech Republic	*	Russia	* <sup>+</sup>
Denmark	*	Saudi Arabia	*
Egypt	Opened in 2007	Serbia	Opened in 2001
Estonia	*	Singapore	Opened in 2008
Finland	*	Slovakia	*
France	*	South Africa	*
Germany	*	South Korea	Opened in 1996
Greece	Opened in 2006	Spain	*
Hong Kong	*	Switzerland	*
Hungary	*	Taiwan	*
India	* <sup>++</sup>	Thailand	Opened in 2008
Italy	*	Turkey	*
Japan	*	Ukraine	*
Kazakhstan	Opened in 2008	United Arab Emirates	Opened in 2006
Kenya	Opened in 2007	United Kingdom	*
Latvia	Opened in 1996	United States of America	* <sup>++</sup>
Lithuania	Opened in 1999	Vietnam	Opened in 1996
Malaysia	Opened in 2005		

\* The whole period, 1995-2009

<sup>#</sup> Offices not included in the study, merged with South Africa

<sup>+</sup> Countries with two offices (information from Spring 2011)

<sup>++</sup> Countries with three offices (information from Spring 2011)

## Appendix B

Tables B.1 and B.2 present the Swedish embassies and consulates around the world over the 1995-2009 period, respectively.

**Table B.1 Swedish embassies - list of countries 1995-2009**

<i>Country</i>	<i>Embassy</i>	<i>Country</i>	<i>Embassy</i>	<i>Country</i>	<i>Embassy</i>
Afghanistan	Opened in 2008	Greece	*	Peru	Closed in 2000
Algeria	*	Guatemala	*	Philippines	Closed in 2008
Angola	*	Guinea-Bissau	Closed in 1999	Poland	*
Argentina	*	Hungary	*	Portugal	*
Australia	*	Iceland	*	Republic of Korea	*
Austria	*	India	*	Romania	*
Bangladesh	*	Indonesia	*	Russia	*
Belgium	*	Iran	*	Saudi Arabia	*
Bosnia-Herzegovina	*	Ireland	*	Senegal	*
Botswana	Closed in 2008 <sup>#</sup>	Israel	*	Serbia	*
Brazil	*	Italy	*	Singapore	*
Bulgaria	*	Japan	*	Slovakia	Opened in 2003
Canada	*	Jordan	*	Slovenia	Opened in 2000
Chile	*	Kenya	*	South Africa	*
China	*	Kuwait	Closed in 2000	Spain	*
Colombia	*	Latvia	*	Switzerland	*
Côte d'Ivoire	Closed in 2005	Libya	Closed in 1995	Syria	*
Croatia	*	Lithuania	*	Tanzania	*
Cuba	*	Luxembourg	* <sup>#</sup>	Thailand	*
Cyprus	Opened in 2004	Macedonia	Opened in 2005	Tunisia	Closed in 2000
Czech Republic	*	Malaysia	*	Turkey	*
Democratic People's Republic of Korea	*	Mexico	*	Uganda	Opened in 1999
Democratic Republic of the Congo	Opened in 1998	Morocco	*	Ukraine	*
		Mozambique	*	United Arab Emirates	Opened in 2002
		Namibia	Closed in 2008 <sup>#</sup>	United Kingdom	*
		Netherlands	*	United States of America	*
Denmark	*	New Zealand	Closed in 1995	Venezuela	Closed in 1999
Egypt	*	Nicaragua	Closed in 2008	Vietnam	*
Ethiopia	*	Nigeria	*	Zambia	*
Finland	*	Norway	*	Zimbabwe	*
France	*	Pakistan	*		
Germany	*				

\* Embassy the whole period, 1995-2009

<sup>#</sup> Embassy not included in the study, merged with other countries

**Table B.2 Consulates - list of countries 1995-2009**

<i>Country</i>	<i>Consulate</i>	<i>Country</i>	<i>Consulate</i>
Australia	Closed in 1995	Russia	*
China	Opened in 1996	Saudi Arabia	Closed in
Finland	*	Thailand	Opened in 2005
Hong Kong	*#		Closed in 2006
Italy	Closed in 1995	The United States	*
Poland	Opened in 1998	Turkey	*
	Closed in 2006		

# Included as an embassy in the empirical analysis

## Appendix C

The complete list of importing countries included in the study is found in table C.1.

**Table C.1 List of importing countries in the sample**

Albania	Côte d'Ivoire	Iran	Norway	Tanzania
Algeria	Croatia	Iraq	Oman	Thailand
Andorra	Cuba	Ireland	Pakistan	Timor-Leste
Angola	Cyprus	Israel	Palau	Togo
Antigua and Barbuda	Czech Republic	Italy	Panama	Tokelau
Argentina	Democratic Republic of the Congo	Jamaica	Papua New Guinea	Tonga
Armenia	Denmark	Japan	Paraguay	Trinidad and Tobago
Aruba	Djibouti	Jordan	Peru	Tunisia
Australia	Dominica	Kazakhstan	Philippines	Turkey
Austria	Dominican Republic	Kenya	Poland	Uganda
Azerbaijan	Ecuador	Kiribati	Portugal	Ukraine
Bahamas	Egypt	Kuwait	Qatar	United Arab Emirates
Bahrain	El Salvador	Kyrgyzstan	Republic of the Congo	United Kingdom
Bangladesh	Equatorial Guinea	Laos	Romania	United States of America
Barbados	Eritrea	Latvia	Russia	Uruguay
Belarus	Estonia	Lebanon	Rwanda	Uzbekistan
Belgium+	Ethiopia	Liberia	Saint Kitts and Nevis	Vanuatu
Luxembourg	Federal States of Micronesia	Libya	Saint Lucia	Venezuela
Belize	Fiji	Lithuania	Saint Vincent and the Grenadines	Vietnam
Benin	Finland	Macao	Samoa	Yemen
Bermuda	France	Macedonia	Saudi Arabia	Zambia
Bhutan	French Polynesia	Madagascar	Senegal	Zimbabwe
Bolivia	Gabon	Malawi	Serbia+Montenegro+	
Bosnia- Herzegovina	Gambia	Malaysia	Kosovo	
Brazil	Georgia	Maldives	Seychelles	
Brunei	Germany	Mali	Sierra Leone	
Bulgaria	Ghana	Malta	Singapore	
Burkina Faso	Greece	Marshall Islands	Slovakia	
Burundi	Greenland	Mauritania	Slovenia	
Cambodia	Grenada	Mauritius	Solomon Islands	
Cameroon	Guatemala	Mexico	South Korea	
Canada	Guinea	Moldova	SACU: Botswana, Lesotho, Namibia, South Africa, Swaziland	
Cape Verde	Guinea-Bissau	Mongolia		
Central African Republic	Guyana	Morocco	Spain	
Chad	Haiti	Mozambique	Sri Lanka	
Chile	Honduras	Nepal	Sudan	
China	Hong Kong	Netherlands	Surinam	
Columbia	Hungary	New Caledonia	Switzerland	
Comoros	Iceland	New Zealand	Syria	
Costa Rica	India	Nicaragua	Taiwan	
	Indonesia	Niger	Tajikistan	
		Nigeria		



## Appendix D

A correlation matrix of all included variables is found in table D.1 below. In table D.2, summary statistics of the variables in the gravity model are illustrated.

**Table D.1 Correlation matrix**

	$LnX_{xmt}$	$LnMass_{xmt}$	$LnDistance_{xm}$	$LnRemoteness_{mt}$	$RTA_{xmt}$	$Common\ legal\ system_{xm}$	$Adjacency_{xm}$	$WTO_{xmt}$	$STC_{mt}$	$Embassy_{mt}$	$Consulate_{mt}$	$Swedish\ representation_{mt}$
$LnX_{xmt}$	1.000											
$LnMass_{xmt}$	0.902	1.000										
$LnDistance_{xm}$	-0.497	-0.311	1.000									
$LnRemoteness_{mt}$	-0.427	-0.342	0.634	1.000								
$RTA_{xmt}$	0.497	0.399	-0.648	-0.511	1.000							
$Common\ legal\ system_{xm}$	0.237	0.116	-0.369	-0.124	0.297	1.000						
$Adjacency_{xm}$	0.196	0.112	-0.321	-0.105	0.209	0.703	1.000					
$WTO_{xmt}$	0.286	0.295	0.030	-0.144	0.182	0.092	0.064	1.000				
$STC_{mt}$	0.666	0.664	-0.424	-0.322	0.464	0.190	0.197	0.170	1.000			
$Embassy_{mt}$	0.698	0.684	-0.375	-0.321	0.460	0.173	0.121	0.233	0.542	1.000		
$Consulate_{mt}$	0.306	0.334	-0.225	-0.097	0.164	0.157	0.242	0.039	0.313	0.239	1.000	
$Swedish\ representation_{mt}$	0.717	0.709	-0.359	-0.318	0.458	0.167	0.118	0.235	0.597	0.970	0.232	1.000

Number of observations: 2682

**Table D.2 Summary statistics of the variables**

Variable	Min	Max	Mean	Std. Deviation	No of observations
$LnX_{xmt}$	4.551	23.527	16.854	3.143	2723
$LnMass_{xmt}$	16.168	28.898	21.826	2.400	2700
$LnDistance_{xm}$	5.935	9.783	8.515	0.825	2745
$LnRemoteness_{mt}$	-0.571	3.557	2.141	0.749	2745
$RTA_{mt}$	0	1	0.203	0.402	2745
$Common\ Legal\ System_{xm}$	0	1	0.022	0.146	2745
$Adjacency_{xm}$	0	1	0.011	0.104	2745
$WTO_{xmt}$	0	1	0.719	0.450	2745
$STC_{mt}$	0	1	0.221	0.415	2745
$Embassy_{mt}$	0	1	0.426	0.495	2745
$Consulate_{mt}$	0	1	0.042	0.200	2745
$Swedish\ representation_{mt}$	0	1	0.441	0.497	2745

## Appendix E

Table E.2 show the results from the reduced regressions testing the robustness of the gravity model specification in equation 4. The  $RTA_{xmt}$ - and  $LnRemoteness_{xmt}$ -variables are excluded in the regressions.

**Table E.1 Estimation results of equation 4 - robustness**

Dependent variable: $LnX_{xmt}$	FE			
	(1)	(2)	(3)	(4)
$STC_{mt}$	-0.221*** (0.002)		8.379*** (0.000)	
$Embassy_{mt}$	-0.007 (0.918)		-1.594 (0.240)	
$Consulate_{mt}$	0.026 (0.797)		0.000 (0.997)	
$Swedish\ representation_{mt}$		0.035 (0.640)		-0.433 (0.775)
$Embassy_{mt} * LnMass_{mt}$			-0.080 (0.193)	
$Embassy_{mt} * LnDistance_{xm}$			0.394*** 0.000	
$STC_{mt} * LnMass_{xmt}$			-0.462*** (0.000)	
$STC_{mt} * LnDistance_{xm}$			0.239*** (0.002)	
$STC_{mt} * Embassy_{mt}$			0.458*** (0.003)	
$Swedish\ representation_{mt} * LnMass_{mt}$				-0.180*** (0.004)
$Swedish\ representation_{mt} * LnDistance_{xm}$				0.514*** (0.000)
$LnMass_{mt}$	0.959*** (0.000)	0.948*** (0.000)	0.920*** (0.000)	0.958*** (0.000)
Constant	-3.854 (0.383)	-3.666 (0.403)	-2.706 (0.545)	-3.652 (0.415)
Number of observations	2682	2682	2682	2682
Significance, F-statistic	0.000	0.000	0.000	0.000
R <sup>2</sup>	0.809 <sup>#</sup>	0.814 <sup>#</sup>	0.713 <sup>#</sup>	0.735 <sup>#</sup>

Note: P-values in parentheses. Statistically significant coefficients at the 10, 5, and 1 percent level are marked with \*, \*\*, and \*\*\*, respectively. <sup>#</sup>Overall R<sup>2</sup>

## Appendix F

Table F.1 shows the regression results from the specifications including the extensive set of past and future versions of the export promotion variables and the results from the model specification in equation 5 are found in table F.2.

**Table F.1 Estimation results of equation 4 - including lags and leads**

Dependent variable: $LnX_{xmt}$	Fixed effects	
	(1)	(2)
$STC_{mt}$	-0.079 (0.541)	
$Embassy_{mt}$	-0.003 (0.986)	
$Consulate_{mt}$	-0.389*** (0.007)	
$Swedish\ representation_{mt}$		0.004 (0.981)
$STC_{mt-1}$	-0.012 (0.939)	
$STC_{mt-2}$	0.008 (0.949)	
$STC_{mt-3}$	-0.098 (0.251)	
$STC_{mt+1}$	-0.142 (0.153)	
$STC_{mt+2}$	-0.096 (0.458)	
$STC_{mt+3}$	-0.062 (0.600)	
$Embassy_{mt-1}$	-0.381* (0.071)	
$Embassy_{mt-2}$	0.272 (0.201)	
$Embassy_{mt-3}$	0.332** (0.032)	
$Embassy_{mt+1}$	0.1205 (0.513)	
$Embassy_{mt+2}$	0.020 (0.902)	
$Embassy_{mt+3}$	-0.087 (0.534)	
$Swedish\ representation_{mt-1}$		-0.422* (0.058)
$Swedish\ representation_{mt-2}$		0.287 (0.207)
$Swedish\ representation_{mt-3}$		0.351** (0.047)
$Swedish\ representation_{mt+1}$		0.129 (0.510)
$Swedish\ representation_{mt+2}$		-0.020 (0.908)
$Swedish\ representation_{mt+3}$		-0.037 (0.818)

**Table F.1 Estimation results of equation 4 - including lags and leads, continued**

<i>LnMass<sub>xmt</sub></i>	0.435 (0.175)	0.411 (0.193)
<i>LnRemoteness<sub>mt</sub></i>	0.571 (0.539)	0.653 (0.482)
<i>RTA<sub>xmt</sub></i>	-0.360*** (0.000)	-0.392*** (0.000)
<i>Constant</i>	5.967 (0.424)	6.186 (0.400)
Number of observations	1614	1614
Significance, F-statistic	0.000	0.000
R <sup>2</sup>	0.418 <sup>#</sup>	0.465 <sup>#</sup>

Note: P-values in parentheses. Statistically significant coefficients at the 10, 5, and 1 percent level are marked with \*, \*\*, and \*\*\*, respectively. <sup>#</sup>Overall R<sup>2</sup>

**Table F.2 Estimation results of equation 5**

Dependent variable: <i>gX<sub>xmt</sub></i>	Pooled OLS	
	(1)	(2)
<i>Ever STC</i>	-0.021 (0.574)	
<i>Ever Embassy</i>	-0.014 (0.822)	
<i>Ever Swedish representation</i>	0.010 (0.110)	-0.009 (0.901)
<i>STC<sub>mt</sub></i>	0.010 (0.749)	
<i>Embassy<sub>mt</sub></i>	-0.024 (0.663)	
<i>Swedish representation<sub>mt</sub></i>		-0.041 (0.516)
<i>gMass<sub>xmt</sub></i>	1.151** (0.029)	1.150** (0.028)
<i>Constant</i>	-0.186*** (0.003)	-0.183*** (0.003)
Number of observations	2491	2491
Significance, F-statistic	0.000	0.000
R <sup>2</sup>	0.035	0.035

Note: P-values in parentheses. Statistically significant coefficients at the 10, 5, and 1 percent level are marked with \*, \*\*, and \*\*\*, respectively. <sup>#</sup>Overall R<sup>2</sup>