

Tackling Barriers to Firm Trade

*In Thy wind—in Thy light—
How insignificant is everything else, how small are
we—and how happy in that which alone is great.*

—D. Hammarskjöld (1964)

To Maria, Axel, and Elias

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MAGNUS LODEFALK

Tackling Barriers to Firm Trade
Liberalisation, Migration, and Servicification

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Abstract

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This thesis analyses how to tackle barriers to firm trade and the consequences thereof. In Essay 1, we carefully model trade liberalisation scenarios that include the key elements of the WTO Doha round, scenarios that are implemented in a computable general equilibrium model. The simulation results indicate particularly strong gains for developing countries from liberalisation. A conservative estimate is that global income increases by approximately 0.2-0.7 per cent of initial GDP, depending on the degree of liberalisation, with trade facilitation contributing the most to these results. Overall, simulations indicate the importance of countries' own liberalisation for national income gains and of a broad-based round of trade negotiations. In Essay 2, we analyse the mechanisms through which immigrant employees help firms overcome informal barriers to trade, based on a heterogeneous-firm trade model. By exploiting a rich employer-employee panel for Sweden, we show that immigrants' skills and length-of-stay strongly influence their impact on firm trade. The link is also stronger for smaller firms and for differentiated goods, but similar across product margins of trade. Our findings are consistent with the hypothesis that immigrant employees facilitate firm trade by lowering information frictions and infusing trust into business relationships through knowledge of foreign markets and access to networks. Essay 3 is concerned with structural changes in the Swedish economy with respect to services in manufacturing. Despite suggestive evidence, large gaps remain in our knowledge about the process of servicification, a process whereby manufacturing focuses increasingly on services. We therefore analyse these changes in manufacturing in depth. The results show that manufacturing has been servicifying substantially. In Essay 4, the role of services for manufacturing firm exports is analysed. The microeconomic results suggest that service inputs affect a firm's export capabilities. Overall, Essay 4 provides new firm-level evidence for the role of services as inputs in manufacturing.

Keywords: trade, liberalisation, WTO, CGE, trade facilitation, services, migration, employer-employee, networks, servicification, manufacturing, firm, enterprise group, deindustrialisation

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I complete this thesis with joy, gratefulness and expectations. It is a joy to engage in economics research, which concerns how best to provide for all when resources are scarce, and even more so in the sub-discipline of foreign trade, which pools resources internationally. I am grateful to my family, friends, supervisors, and colleagues for encouragement and support. Having realised how little I know, I look forward to future research.

Having grown up wishing to become a musician, I could never have imagined studying economics. My road has been the less travelled one. However, looking back, I realise that my interest in political economy relates to my father's devotion to social work. When my musical studies had to be involuntarily abandoned, a colleague at the parish of Sundbyberg, Ingegerd Molin, encouraged me to think about university studies, which led me to enrol as a student in political science at Stockholm University. I later took a course in Economics 101, at Linneaus University, with Jan Ekberg and Lars Andersson as lecturers, and this was an eye opener. Eventually, I took a huge leap of faith and committed myself to economics.

During my graduate exchange studies at the University of Western Ontario, Canada, I had the great pleasure of being introduced to the political economy of the multilateral trading system by John Whalley, for whom I then briefly worked as a research assistant. I was later hired by Gunnar Fors of the Swedish National Board of Trade. The Board was the right place to be for someone interested in analysis of trade and trade policy. Gunnar encouraged me to dare to think about PhD studies, and he and his successor Agnès Courades Allebeck were both very supportive. Much of what I know about trade and trade policy, I have learnt from John Whalley and colleagues at the Board, especially Håkan Nordström. It has been an enjoyable experience.

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Örebro, May 2013
Magnus Lodefalk

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List of Abbreviations

AVE	Ad valorem equivalent
CGE	Computable general equilibrium
CN	Combined nomenclature
CPA	Classification of product by activity
EBA	Everything but arms initiative
EV	Equivalent variation
FDI	Foreign direct investment
GATS	General agreement on trade in services
GATT	General agreement on tariffs and trade
GDP	Gross domestic product
GMM	Generalised method of moments
GTAP	Global trade analysis project
ICT	Information and communication technologies
I-O	Input-output
ISCO	International standard classification of occupations
ISIC	International standard industrial classification of all economic activities
LDC	Least developed country
MFN	Most favoured nation
MNE	Multinational enterprise
NACE	Statistical classification of economic activities in the European community
NAMA	Non-agricultural market access
NTM	Non-tariff measure
OECD	Organisation for economic co-operation and development
OLS	Ordinary least squares
PS	Swedish population statistics
RAMS	Labour statistics based on administrative sources
R&D	Research and development
SBS	Structural business statistics
SNI	Swedish standard industrial classification
SPIN	Swedish standard classification of products by activity
WTO	World Trade Organization

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1. Firm Trade

Most firms do not trade internationally, but those that do dominate the economy and their industry. Even in the small open economy of Sweden, which is the focus of much of this thesis and has an openness ratio of 0.91,¹ only a small percentage of firms engage in merchandise trade.² Manufacturing firms are more involved in trade than non-manufacturing firms; even so, 65 per cent of manufacturing firms do not export (SOU, 2008). However, among larger Swedish manufacturing firms, most trade, as shown in Table 1. Additionally, trading firms account for more than 80 per cent of manufacturing industry, in terms of employment and value-added.

Table 1: Shares in the Swedish economy of trading and non-trading firms with at least 10 employees

	Traders	Non-traders
Number of firms	0.77	0.23
Value-added	0.89	0.11
Number of employees	0.84	0.16

Notes: Trade in merchandise in year 2007. Own computations for Swedish manufacturing firms with at least 10 employees, based on micro-data from Statistics Sweden. All monetary values are in 1,000 SEK.

Traders differ from non-traders in many respects, even within the same five-digit industries, as seen in Table 2. Trading firms are 22 per cent more efficient, on average, than non-trading firms, in terms of labour productivity.³ Trading firms are also much larger, in terms of employment and capital intensity, and are almost five times as likely as non-trading firms to belong to a multinational enterprise.

¹ The openness ratio – trade / Gross-Domestic-Product (GDP) – includes only cross-border trade in goods and services and is computed from data from Statistics Sweden (2013) for the year 2012.

² See Table 3 in Essay 3 of this thesis. One caveat is that official trade statistics in the EU exclude firm trade below certain thresholds.

³ The export productivity premium persists even when differences in capital intensities and size are controlled for (Eliasson et al., 2012, Table 3).

Table 2: Average differences between Swedish trading and non-trading firms within industries

	Traders	Non-traders	Difference (%)
Labour productivity	671	550	22
Number of employees	107	21	408
Physical capital intensity	319	208	53
Human capital intensity	0.18	0.13	42
Multinational affiliation (0,1)	0.39	0.08	392

Notes: Trade in merchandise in year 2007. Own computations for Swedish manufacturing firms with at least 10 employees, based on micro-data from Statistics Sweden. All monetary values are in 1,000 SEK. Means of within-five-digit industry averages across firms, according to trade status.

In response to empirical findings such as these, new general equilibrium trade models have been developed, for example, by Melitz (2003).⁴ In the influential Melitz-model, the representative firm of an industry is replaced by heterogeneous firms. Firms invest in order to start production but later discover their individual productivity levels and then decide to exit or continue production. Within their industry, firms act as monopolistic competitors. More productive firms have lower marginal costs, set lower prices, capture a larger share of market demand, and earn larger profits. Firms consider not only whether to exit or remain in the domestic market but also whether to enter foreign markets. Exporting is advantageous for the firm, as it means producing for a larger market and thus potentially gaining larger profits. However, exporting entails variable costs and additional fixed costs for each market entered. Many domestic firms therefore find that their productivity is too low to profitably sell abroad,⁵ whereas those that are able to export do so and thereby capture market share. Their expansion draws resources from less productive firms, which contract or exit, and productivity rises within the industry.

What emerges from this model conforms with empirical facts about firm trade: only more productive firms trade, and traders are larger than other firms in their industry. Also in line with empirical findings, the model pre-

⁴ Bernard et al. (1995) and Bernard and Jensen (1999) have made seminal empirical contributions, and Bernard et al. (2003) have developed a theoretical heterogeneous firm trade model with imperfect competition.

⁵ An anomaly, which merits further investigation, is the existence of firms in the lower end of the productivity distribution that have substantial trade and firms in the higher end of the productivity distribution that do not trade (e.g., Wagner, 2013).

dicts that reductions in trade costs enable more domestic firms to export and existing exporters to export more (Melitz and Trefler, 2012). The growth of exporters raises the productivity level required to survive, which causes some firms to exit, and, as a result of restructuring within the industry, productivity rises. In addition, higher aggregate productivity and the availability of more varieties of goods (through imports) increase welfare. Basically, trade gains that stem from resource reallocation within industries are added to the love-of-variety gains, as depicted in the model of Krugman (1979).⁶

Two limitations of the model are that it assumes that initial firm productivity is exogenous and that it does not include within-firm productivity growth. Within-firm productivity growth may arise because firms may learn through and in preparation to export. In foreign markets, exporting firms can receive information from customers, learn about competitors, encounter new technology, and confront more intense competition (Andersson and Lööf, 2009). As a consequence, the efficiency of exporting firms can rise, and this may be one reason exporting firms are more productive than non-exporting firms (Silva et al., 2012). Another source of differences in productivity between traders and non-traders within an industry may be that trading encourages investment in research and development (R&D), which, in turn, improves productivity (Melitz and Trefler, 2012). Finally, through imports, firms face more competition and may learn from foreign competition and technology.⁷

⁶ Bernard et al. (2007) also present a model that features gains from reallocation of resources between sectors and countries as a result of trade and where trade may also be driven by cross-country differences in factor endowments (Ohlin, 1933).

⁷ Transfers of technology through trade may explain part of the income gap between countries (Keller, 2004).

2. Barriers to Firm Trade

That most firms still do not engage in trade is somewhat puzzling. Reductions in barriers to trade increase the share of traders within an industry, according to the above model. Furthermore, in the last 60 years, various technological advances, such as containerisation and the internet, have facilitated trade as have numerous waves of trade liberalisation. The cost of moving a ton of bulk commodity across the world has decreased by two-thirds, in real terms, since the middle of the last century (Hummels, 2009). The average applied most-favoured-nation (MFN) tariff rate for manufactures in countries of the Organisation for Economic Co-operation and Development (OECD) is now less than one-sixth of the tariff rate that existed in the middle of the 20th century.⁸

However, first, in OECD countries, trade in intermediates now dominates trade in goods and services, and intermediates trade may be substantially more negatively affected by trade costs than trade in final goods and services (Mirodout et al, 2009; Hummels and Schaur, 2012). Second, the effects of trade barriers, such as tariffs, are magnified by internationally integrated production, as products cross several national borders during production (Yi, 2010).⁹ Third, timely delivery appears to have become more important in international transport (Hummels et al., 2007),¹⁰ possibly a response to an increase in demand for time-sensitive products, speedy delivery, and global value chains (Nordås et al., 2006; Hummels et al., 2007). With the development of global value chains, which are now fundamental features of world trade, and the adoption of just-in-time production management, delays in the delivery of a single component may call a

⁸ A lower bound of 25% for the original tariff rate has been computed based on estimated tariff cuts since 1947 under the General Agreement on Tariffs and Trade (GATT), as specified in Table 5 of WTO (2007), using the current tariff rate of 4% as the target. An upper bound of the original rate is likely to be 40%, as reported by Irwin (1995).

⁹ To illuminate the magnification effect – which stems from the fact that trade barriers apply to whole products, not to value added at each step – assume: an international value chain where each link adds a value of $v_i \geq 0$, with $i = 1, 2, \dots$, and where $i = 1$ is the first country in which production occurs; many countries c^j , with $j = 1, 2, \dots$, where the last importing country imports a product worth $m^j > 0$; an ad valorem tariff rate t^j ; and an actual tariff rate $t^{j*} = m^j / \sum v_i$, where $\sum v_i > 0$. It can then be shown that $t^{j*} > t^j$. E.g., if $i = 2, j = 3, t^j = 0.04$, and $v_i = 100$, then $t^{j*} \cong 0.06 > t^j = 0.04$, where $t^{j*}/t^j \cong 1.5$.

¹⁰ Hornok (2011) also examines the value of time in trade, within an EU context, while DeVoe and Pfeffer (2011) provide a psychological perspective on the link between income, wealth, and the economic value of time.

costly halt to a whole production process (Nordås et al., 2006; Hummels and Schaur, 2012). Fourth, and finally, as tariffs have been reduced, non-tariff barriers to trade have become relatively more important. Such barriers would seem to favour firms with international experience, which often belong to multinational enterprises, over other firms, which are more numerous.¹¹

The increasingly prominent role of services makes non-tariff barriers relatively more important. The service sectors in developed economies have expanded relative to manufacturing (Montresor and Vittucci Marzetti, 2011), and services are increasingly used in manufacturing itself (Nordås, 2008; Lind, 2010). Services also act as enablers of global value chains (National Board of Trade, 2013). Non-tariff barriers especially restrict trade in services, as services, due to their inherent characteristics, are more difficult to tax than goods. Typically, services are intangible products that are more heterogeneous than goods and, in the absence of digitisation, are non-storable and require involvement of the consumer in their production.¹² Formal barriers to trade in services consist primarily of bans, quotas, and regulations. To these can be added informal trade barriers, which are likely to be more severe for trade in services than for trade in goods because of the characteristics of services. Services trade accounts for approximately one-fifth of world trade.¹³

Table 3 presents the formal barriers to trade in high income OECD countries. Generally, the ad valorem tariff rate for manufactures is just 4 per cent, on average, although tariff peaks of several hundreds of per cent have occurred. The estimated ad valorem tariff equivalents (AVEs) of non-tariff-measures (NTMs), such as technical rules and regulations, are higher

¹¹ In informal discussion, some Swedish multinationals have indicated that non-tariff barriers are manageable for them but not for competitors, providing the Swedish multinationals with a relative advantage.

¹² Classifications may also be used to define services, e.g., codes 40-93, excl. 75, of the International Standard Industrial Classification (ISIC) of activities and the sectoral classification list of the WTO (1991).

¹³ In value added trade statistics, world services trade may be larger. For Sweden, services account for a quarter and more than a third of total trade, according to conventional and value added statistics, respectively (National Board of Trade, 2010). In addition, if foreign direct investment (FDI) in services and sales by foreign affiliates are added, services trade is substantially larger.

than the tariff rate for manufactures.¹⁴ The time it takes to export and import a good, excluding sea transport time, as well as the number of documents required, are related indicators of formal barriers to trade.¹⁵ Even among high income OECD countries, there is a large spread in these indicators, which suggests that there are gains to be made from facilitating firm trade. Nevertheless, the barriers listed in Table 2 are low in comparison with those that firms face in trade with the rest of the world. To conclude, firms bear substantial costs in foreign trade due to formal barriers to trade.

Table 3: Formal barriers to trade in high income OECD countries

Trade barrier	Mean	Min.	Max.
MFN tariff (% , manufactures)	4	0	375
NTM tariff equivalent (% , manufactures) ^a	22	6	73
NTM tariff equivalent (% , services) ^a	9	2	32
Documents to export (number)	4	2	6
Time to export (days)	11	5	20
Documents to import (number)	5	2	8
Time to import (days)	11	5	20

Notes: Displayed are simple averages of trade barriers in high income OECD countries. Data for MFN AVEs in 2010 are from WTO (2013), AVE-estimates of NTMs are from Ecorys (2009), and other barriers in 2012 are from World Bank (2013). ^a Simple average for EU and the US.

Informal barriers have received increasing attention in the trade literature and are featured in Melitz (2003).¹⁶ Although difficult to quantify, there are indications that informal trade barriers are substantially higher than formal barriers (Anderson and van Wincoop, 2004). Informal barriers impose transaction costs on trade in products and job tasks, and to these

¹⁴ NTM tariff equivalents appear to be inversely related to the tariff rate and income of countries (Kee et al., 2009). It should be added that estimation of NTM AVE tariff rates is inherently difficult, and thus resulting figures should be interpreted cautiously. On NTMs more generally, see, e.g., WTO (2012) and OECD (2011).

¹⁵ A caveat is that trading time not only includes time for official procedures but also for handling and transport between the warehouse and the port of exit/entry.

¹⁶ This is, e.g., displayed in the growing literature on migration and trade, surveyed by Genc et al. (2011).

costs distribution costs are often added.¹⁷ Firms that wish to engage in trade incur these costs as they search for foreign partners or customers, learn about competition, market their products, adapt them to different markets, and set up distribution channels. Participation in foreign markets can also be difficult because of dissimilarities in institutions, business practices, culture, and language, which make foreign trade costly. In addition, there are ongoing costs of international transport, of time lost in transit, and of monitoring and managing the foreign market.¹⁸

Informal trade barriers are also highlighted in the in the so-called Uppsala model of firm internationalisation, a model that has been influential in the international business literature (Johanson and Vahlne, 1977 and 2009).¹⁹ According to the revised version of the model, a lack of market specific knowledge and, more importantly, a lack of foreign relations hinder firm internationalisation. Networks are therefore critical. However, establishing foreign relations is costly, and even more so the greater the “psychic distance” between the firm and the foreign market.²⁰ How psychic distance can be overcome is not specified in the model, but suggested possibilities include middlemen or business partners with foreign connections.²¹ When networks are established, they can foster trust, which promotes experiential learning and commitment to relationships. As a result, uncertainty is reduced, and business and internationalisation opportunities can be found and exploited for mutual gain.

Uncertainty, which may result from both formal and informal trade barriers, discourages firms from taking actions, such as investments associated

¹⁷ Arguably, trade in job tasks may be considered the ultimate division of labour, and joint and simultaneous performance of a task across borders might be viewed as an extension when the division of labour through trade in goods is exhausted. Joint performance could be considered, as firms pool resources internationally to raise efficiency in a given activity through attainment of critical mass, which might not be possible in an individual country. An example might be medical doctors with very specific areas of competence who examine new or very rare and difficult patient cases together and simultaneously through video-link.

¹⁸ Some anecdotal evidence on informal trade barriers is provided, e.g., in the Swedish interview study by Gunnarsson et al. (2012), while Kneller and Pisu (2011) provide more comprehensive evidence for UK firms.

¹⁹ An introduction and review is provided, e.g., by Lommelen (2004).

²⁰ Psychic distance is constituted by “factors that make it difficult to understand foreign environments” (Johanson and Vahlne, 1977).

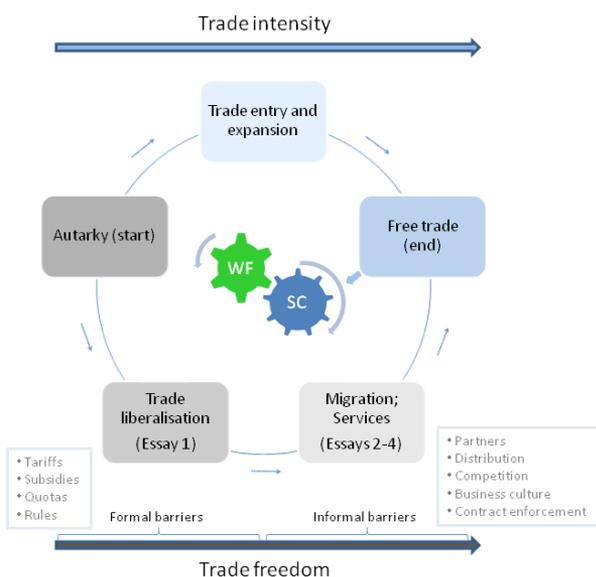
²¹ The role of individuals’ previous foreign relations in facilitating or driving internationalisation is illustrated and analysed in some detail in Axelsson and Agndal (2000).

with entering a foreign market, when there are sunk costs. The negative impact of uncertainty on trade is illustrated in the theoretical and empirical contribution of Handley (2012). He shows that simply binding applied tariff rates in the WTO, and thereby reducing policy uncertainty for trading firms, increases trade on the extensive margin. Empirically, he verifies this, using trade data for Australia from 2004 and 2006. The impact is almost as large as that of unilaterally removing applied tariffs altogether. More generally, international institutional frameworks can reduce uncertainty in firm trade. In theoretical work, Keck and Schropp (2007) highlight the role of dispute settlement mechanisms in sustaining legally binding trade agreements.

3. Tackling Barriers to Firm Trade

Against this background, the aim of this thesis is to examine what measures might be taken to tackle barriers to firm trade, especially informal ones, and the consequences of such efforts. The links between freedom from trade barriers, trade, structural change (SC), and welfare (WF) are schematically illustrated in Figure 1. Formal barriers to trade and their removal are found in the lower left quadrant, whereas informal barriers to trade and their removal are found in the lower right quadrant. As the freedom to trade increases, trade intensifies, as depicted in the Melitz-model and illustrated in the upper half of the figure. Trade opening, in turn, induces reallocation of resources, causing aggregate productivity to rise, and improves overall welfare, again in line with the Melitz-model. Ensuing structural changes and welfare consequences of trade liberalisation are represented in the middle of the figure.

Figure 1: Tackling barriers to firm trade



Countries can reduce formal barriers unilaterally or in tandem with one another, for example, within the World Trade Organisation (WTO) or through negotiations to form preferential trade agreements. Nowadays, such liberalisation efforts are aimed not only at tariffs on manufactures but also agricultural tariffs and subsidies, restrictions on trade in services, and a range of other issues, such as cumbersome border procedures. In Essay 1

of this thesis, trade liberalisation and its consequences are studied with respect to the latest round of multilateral trade negotiations, the so-called Doha Round.

The potential role of migrants in helping firms overcome informal trade barriers that are related to imperfect and asymmetric information is analysed in Essay 2, with a focus on the mechanisms involved. The role of migrants and networks in foreign trade has been highlighted by Gould (1994) and Rauch (1999), and there is now a burgeoning empirical literature on the issue. It is commonly found that the stock of immigrants in a country is positively related to trade between the host and the source country. However, although the role of proximity in the exchange of human and social capital is well known and has been discussed in the migration-trade literature, until recently, no studies had adopted a firm level perspective on the issue.

Services may also be used by a firm in preparation for trade entry and expansion. They can be directly instrumental in overcoming informal trade barriers, for example, through trade intermediary services. Services can also benefit firm trade indirectly through increased productivity and quality improvements in the eyes of the customers, in line with the Melitz-model.²² The extent of services in the inputs and outputs in manufacturing is studied in Essay 3, while the effects of service inputs on manufacturing firm competitiveness abroad is analysed in Essay 4.

²² For example, Debaere et al. (2013) verify that services facilitate offshoring of Irish manufacturing firm activities, especially for stand-alone firms.

Essay 1 - What is at Stake in the Doha Round?

In Essay 1, we examine the reduction of formal barriers to trade using a computable general equilibrium (CGE) model of the world economy. Previous studies have shown large economic gains from liberalisation of world trade, especially in the areas of increased market access for services and measures to improve border procedures – so-called trade facilitation (e.g., Francois et al., 2005; Wilson et al., 2005; Matthews and Walsh, 2006). The latest round of multilateral negotiations to liberalise trade – the WTO Doha round – includes efforts in both these areas and is aimed particularly at further integrating developing countries into world trade.

We seek to contribute to the literature by carefully modelling formal trade liberalisation. The design of the Doha liberalisation scenarios is likely to affect both the overall results and underlying structural economic changes, not least those pertaining to new areas of services liberalisation and trade facilitation. In design, we benefit from theoretical and empirical advances with respect to NTMs and from detailed negotiation information. To make the scenarios more realistic, liberalisation is regarded as a convergence to best practices in a sector or country, as trade liberalisation may in some cases be unrealistic or even undesirable, for example, in the case of zero trade barriers in terms of border procedures. Overall, we expect the effects of trade liberalisation to be more modest, compared with previous studies.

All our scenarios encompass trade liberalisation in services, agriculture, and non-agricultural sectors, as well as trade facilitation. For liberalisation of trade in non-agricultural goods, a so-called Swiss harmonising formula is used to cut bound tariff rates. Agricultural tariffs are cut according to a tiered linear formula. Special attention has been given to the modelling of trade facilitation, which is expected to generate substantial welfare gains. Indirect as well as direct trade transaction costs are modelled. To simulate services liberalisation, we use quantitative estimates of indirect trade barriers. As a benchmark for the scenarios, we use the world economy after major expected trade policy changes have been made, which are carried out in a pre-simulation.

The simulations are performed using a comparative static CGE model of the world economy with monopolistic competition and scale economies – essentially a modified version of the so-called Global Trade Analysis Project (GTAP) model (Hertel, 1997). To improve our understanding, facilitate comparison with previous studies, and provide a robustness check, we also run the scenarios in the standard model with perfect competition and no scale economies and in a model with a dynamic link through capital accumulation. Finally, we decompose changes in welfare into its constitu-

ent parts, both as regards elements of liberalisation, countries' liberalisation, and the mechanisms involved.

The simulation results indicate that global trade increases by some seven per cent and that it increases particularly among developing countries. Some intra-EU trade is diverted to other regions and some EU imports are diverted from least developed countries (LDCs) to more developed countries. Trade diversion from the EU and LDCs is expected, as preferences internal to the EU and with respect to EU-imports from LDCs tend to erode through trade liberalisation. As for welfare, all regions in the aggregation gain in the simulated Doha scenarios, again with a particularly strong result for developing countries. A conservative estimate is that global welfare increases by 0.2-0.7 per cent of initial GDP, depending on the degree of liberalisation. The gains are somewhat lower than in previous studies and are mostly due to differences in the scenarios. Trade facilitation contributes most to the results. The next largest contributor is increased market access for non-agricultural goods. In contrast to previous studies, but in line with our expectations, services liberalisation has only minor effects on most countries, mainly because limited liberalisation is expected. Decomposition of the welfare results suggests that improved resource allocation contributes most to gains. For industrialised countries, better exploitation of economies of scale is important. Overall, simulations indicate the importance of countries' own liberalisation and that of broad-based world trade liberalisation for welfare gains.

Essay 2 – Investigating the Link between Immigrant Employees and Firm Trade

In Essay 2, we analyse the mechanisms through which immigrant employees help firms overcome informal barriers to trade. We contribute by reviewing the handful of previous firm level studies that exist on trade and migration, seeking to build on this literature to make further progress.

First, with a heterogeneous firm trade model as our point of departure, we analyse the within-firm-partner-country impact on a firm's exports and imports of hiring foreign-born workers and whether such effects differ according to skill-levels and time since immigration, which would be suggestive of key mechanisms in the migration-trade link. Second, to the best of our knowledge, our matched dataset is the largest employed so far in the firm level literature on migration and trade and is also more detailed than previous datasets in some respects. The dataset encompasses approximately 600,000 fulltime employees and 12,000 Swedish firms, as well as trade with 176 partner countries in the period 1998-2007.²³ The unbalanced panel dataset enables us to test hypotheses in the literature on migration and trade by examining their effects across important dimensions, such as firm size, homogeneous versus differentiated products, firm-country margins of trade, and eight-digit product margins of trade. Product margin analysis is improved by the construction of a detailed concordance, which is matched with trade data, to avoid inflating extensive product margins of trade – the number of products traded – caused by changes in nomenclature. Third, to isolate the local efficiency-promoting effects of local immigrants from the effects of immigrants' demand preferences, we include total stocks of immigrants in all specifications. Fourth, for estimation purposes, a panel selection model with fixed effects is employed that controls for selection bias, known confounding factors at the firm and country level, and unobserved differences across firms, trading partners, firm-trading partners, and years. What is estimated is therefore the within-firm-partner-country variation in trade associated with the hiring of immigrants born in those countries. Fifth, we discuss and empirically examine the potential endogeneity of the employment of foreign-born workers, for example, through instrumental variable analysis. Sixth, we perform extensive robustness analysis.

Our results suggest a positive and robust within-firm-partner-country impact of hiring immigrants on trade propensity and intensity with respect

²³ Over the whole period, 12,000 firms are included, while the number in any given year is about 7,000. There are two previous studies for Sweden, both at the country level (Brandell and Johansson Santos Silva, 2009; Hatziogeorgiou, 2010).

to immigrants' home countries. Hiring one additional immigrant is associated with a 0.9 and 0.7 percent increase in the employer's exports to and imports from the immigrant's home country, respectively. We find that the association is strongest for smaller firms' exports of differentiated goods, but rather similar across product margins of trade. Furthermore, skilled and recent immigrants are found to have the strongest within-firm-partner-country association with trade. These novel results are consistent with the hypotheses that migrants facilitate firms' trade through the information and trust channels by lowering information frictions and infusing trust into business relationships through knowledge of foreign markets and access to networks. The detailed dataset also helps to reconcile conflicting evidence in previous empirical literature regarding the effect of time since immigration and divergences between previous works and ours on product margins of trade. In sum, our findings provide new firm level evidence on the mechanisms through which migrants facilitate trade.

Essay 3 - Servicification of Manufacturing – Evidence from Sweden

Essay 3 is concerned with structural changes regarding the role of services in manufacturing. There are signs that manufacturing is increasingly focused on services, a process known as servicification. Despite suggestive evidence, large gaps in our knowledge about this process remain. In particular, trends in in-house service cost shares and their composition in relation to other inputs, including imported inputs, are poorly understood. Additionally, we have little knowledge about the importance and composition of sales and exports of services in the manufacturing industry. The latter shortcoming is related to the fact that official statistics are often collected at the level of the establishment or firm, whereas much of the diversification of services may be expected to arise at the enterprise group level. More specifically, service activities of a manufacturing enterprise group may be allocated to subsidiary firms. In official statistics, at both the firm and industry levels, the activities of those subsidiaries may be classified as belonging to the services industry. However, the subsidiaries' activities may in fact be intimately related to the manufacturing activities of the enterprise group. More generally, structural business changes may be more frequent within enterprise groups than between industries. Because enterprise groups are becoming increasingly prominent, lack of data at the enterprise group level is a significant limitation.

Our paper contributes to the literature by discussing the phenomenon of servicification, arriving at some conjectures and examining them empirically. We expect manufacturing firms in the EU to increasingly specialise in high value-added manufacturing and service activities, including expansion of in-house production of services. Less complex service activities with lower productivity potential may be candidates for outsourcing or offshoring, along with low-skill-content intermediate goods, produced more cost-efficiently offshore.²⁴ More complex activities may be kept in-house or bought-in externally, depending on outsourcing and offshoring costs and the agglomerative forces involved.

Empirically, we develop and analyse comprehensive datasets at *both* the firm and enterprise group levels for Sweden (1997-2006). The fine detail of the data allows us to capture changes in the size of industries and the use, sales and exports of different types of goods and services. We are also able to shed new light on the potential overestimation of the decline in manu-

²⁴ Offshoring here simply denotes a firm's sourcing of inputs from firms abroad, which may be its own affiliates.

facturing in industrialised countries, as discussed, for example, in McCarthy and Anagnostou (2004) and Vittucci Marzetti (2008).

The results confirm the continued decline of manufacturing in Sweden. However, when we account for service activities in manufacturing enterprise groups, the decline is smaller than previously thought. More importantly, the results present detailed evidence that manufacturing is substantially servicifying. On the input side, services and qualified services are increasingly characteristic of in-house activity. On the output side, service exports in manufacturing have risen significantly more than exports in the service industry itself; as expected, this trend is especially pronounced at the enterprise group level. Moreover, we show that diversification is much greater (almost 60 per cent higher) when all activities in the manufacturing industry's constituent enterprise groups are considered. The results imply that the practice of treating services and manufacturing separately – e.g., in trade policymaking – may be out-of-date. Finally, the findings illustrate the value of enterprise group-level data when studying structural economic changes.

Essay 4 - The Role of Services for Manufacturing Firm Exports

Manufacturing in industrialised countries is intensifying its use of services, and there are indications that the share of services in total turnover is rising. In Essay 4, we study the role of services in manufacturing firm competitiveness abroad. There are arguments that services can support manufacturing exports. In particular, services may help firms overcome costly informal barriers to international trade. Changes on the demand side in industrialised countries are also likely to favour manufacturing firms that increase the service content of their offerings (Schettkat and Yocarini, 2006). Finally, there may also be an indirect link between services and exports through productivity, as explained in this paper. Thus far, however, the relationship between service inputs and exports has only been partially explored, and the effects of the wide range of services that firms use on firms' export intensity has not been analysed.

We therefore add to the literature on export determinants by discussing the role of services for firms and empirically testing a set of related conjectures, using a rich panel of data on manufacturing firms in Sweden in the 2001-2007 period. The descriptive analysis shows that firms with a larger proportion of services in in-house production differ from other firms in significant ways. They also perform better in terms of exports. In subsequent econometric analysis, the share of exports in total sales is regressed on two services variables, while controlling for observed and unobserved firm heterogeneity. The partial truncation of the response variable is accommodated by using censored maximum likelihood estimation that also accounts for the variable's fractional nature. In essence, this results in a constrained, two-limit Tobit regression.

The microeconomic results suggest that, when controlling for the usual covariates and firm heterogeneity, in-house services are impactful. A 10 per cent increase in the ratio of services in in-house production is associated with an approximately 0.6 per cent higher export intensity on average in the next year, taking second order effects into account. The result is statistically significant and robust to different specifications and estimation methods. Increased usage of manager services, professional services and technical services are most strongly associated with increased export intensity. Buying-in more services appears to positively affect export intensity in some industries.

The increased use of services in manufacturing may be seen partly as a response to growing competition from emerging economies. Manufacturing in industrialised countries focuses on activities in the value-chain in which they have a comparative advantage. The advantages of relatively abundant, highly-skilled labour, research and development and previous

agglomeration patterns favour specialisation in high value-added manufacturing and service activities. One can only speculate, but another possible reason for the more intense use of services is changes on the demand side. Customers increasingly demand quality and services and are increasingly concerned about the environmental and social aspects of products and their production. Overall, these results underline the importance of services for manufacturing. By using more services, manufacturing firms in industrialised countries may become more competitive internationally.

4. Concluding Remarks and Policy Implications

After decades of efforts to reduce trade barriers, tariff rates on manufactures are at low levels, and most tariff rates on merchandise are prevented from increasing through WTO bindings. Firms benefit, on average, from reduced trade policy uncertainty, and their global value chains benefit from low tariff rates. Nevertheless, tariff peaks exist, and other formal and informal trade barriers abound. Non-tariff barriers have become relatively more important, not least because services now play a larger role in trade, which may explain why many firms do not trade. Tackling these barriers to firm trade is expected to promote new and more intense firm trade, contribute to furthering the international division of labour, and ultimately improve welfare.

The results from CGE simulations in Essay 1 indicate that there are substantial welfare gains from reduction of formal barriers to world trade, although the gains are found to be less and their composition somewhat different than has been found in previous studies. Welfare gains from trade liberalisation stem mainly from improved allocation of factors of production and economies of scale. With respect to specific elements of liberalisation, most of the gains come from improvements in border procedures and further reductions in tariffs on non-agricultural goods. Services liberalisation, on the other hand, yields only limited welfare gains in our simulations. The latter results arise mainly because of new inputs utilised in our modelling and the use of more realistic scenarios than those previously employed. However, even in the absence of further market access for the services trade, the manufacturing industry is using services more intensively, as discussed in Essay 3. Drawing on firm, enterprise, and input-output data for Sweden, we document that the services intensity in manufacturing has increased over time as measured by purchasing patterns, imports, in-house production, and exports – in short, manufacturing is being servicified. The increasing share of in-house services in total costs consists of a relative rise in payments to qualified services personnel. Servicification is especially clear when we consider the organisation of firms into enterprise groups. The results are in line with our expectations of changes in comparative advantages, where manufacturing firms in industrial countries specialise in high value-added segments and service activities, including innovation and headquarter services, and outsource or offshore less complex and low-skill-content activities. The results also seem in tune with the findings of OECD (2013); Barefoot and Koncz-Bruner (2012) for the US; and studies on the impact of offshoring and multinational affiliation on employees' education levels and job tasks in Sweden, although occupations

are not explicitly considered in these studies.²⁵ Part of the rising share of in-house services production in manufacturing may be accounted for by increasing service sales, as indicated in Falk and Peng (2012) for selected EU countries.²⁶

Essays 2 and 4 suggest that migrants and services can be instrumental in reducing informal barriers to firm trade, which are larger than formal barriers. Using rich panel datasets for Sweden and microeconomic techniques, both these studies analyse changes in trade of manufacturing firms and the sources of these changes. Essay 2 examines how migration impacts trade at the employee-employer level. The within-firm-partner-country results are suggestive of the hypotheses that migrants promote trade through their knowledge of their country of birth and their contacts in their home countries. In Essay 4, the overall role of services in firm export intensity is studied. Services may be used directly by firms to overcome informal trade barriers and indirectly to achieve greater efficiency and to provide an offering of products more in tune with demand. In line with expectations, we find a positive and statistically significant link between in-house service production and export intensity, whereas the link with purchased services is less robust. The link with in-house service production is also stronger for more qualified service occupations. Overall, the findings are consistent with previous studies on the role of service liberalisation in manufacturing performance (e.g., Arnold et al., 2010 and 2011; Duggan et al., 2013).

From a policy perspective, the reluctance of countries to facilitate trade in services and movements of persons – unilaterally, bilaterally, or multilaterally – is unfortunate, given the findings of this thesis. Liberalisation in these areas could be instrumental in assisting firms in overcoming informal trade barriers and yield large welfare gains. Such liberalisation measures would appear to be the next step after trade facilitation (where some progress was made in the now dormant Doha round of the WTO), along with efforts to address unnecessarily restrictive NTMs for merchandise trade, in tackling barriers to trade. Indeed, the two areas of services and movements

²⁵ In brief, for Sweden, firms becoming multinational negatively affects demand for employees without a post-secondary degree but positively affects demand for job tasks that are non-routine and interactive (Hakkala et al., 2008 and 2010). With regards to offshoring, demand for labour across educational levels may vary, depending on whether offshoring is to a high-income or low-income country (Ekholm and Hakkala, 2005).

²⁶ Deindustrialisation is addressed in Montresor and Vittucci (2011), who, in line with Essay 3, find a decline in manufacturing, but a smaller decline when the rising importance of services is taken into account.

of persons partially intersect in the General Agreement on Trade in Services (GATS) of the WTO. One of its so-called modes of service delivery – mode 4 – concerns temporary movements of personnel to supply services. Although difficult to measure, mode 4 appears to account for a tiny share of trade in services. However, this is most likely due to the sensitivity of the issue, resulting in few market openings and restrictive domestic regulations on temporary immigration.²⁷ In addition, permanent movement of persons is not within the mandate of the WTO.²⁸ With regards to service liberalisation in general, levels of commitment among countries appears limited, as demonstrated in the Doha round and in most PTAs (Hoekman and Mattoo, 2012). New approaches may therefore be needed to promote liberalisation of trade in services.²⁹

A more integrated approach involving both manufacturing and services would be appropriate in trade negotiations, as the manufacturing and service industries are increasingly intertwined. Movements of persons is a related issue, as discussed above. A micro-perspective would facilitate for trade negotiators (and negotiators on migration) to connect to structural economic changes, such as servicification and global value chains, and to the barriers to trade that firms face today. Both firms and negotiators must become more aware of the interdependence between trade openness in manufactures and in services.³⁰ One important component in the promotion of trade in interdependent services and manufactures is likely to be facilitation of the movement of persons.³¹ The ability to export manufac-

²⁷ However, economic migration is also possible under, e.g., bilateral migration agreements, which are on the rise (Panizzon, 2010). For an overview of movements of persons under the GATS, see, e.g., Dawson (2013). A software industry perspective on mode 4 is provided, e.g., by Shah and Parikh (2002).

²⁸ It can be added that visa issues are only indirectly within the remit of the WTO, being exempted from MFN-treatment through note 13 of Annex 1B to the GATS. On the intersection between migration and trade policies, see, e.g., IOM (2004).

²⁹ An example is Hoekman and Mattoo (2011), who suggest that selected countries should focus on binding existing policies and pre-commitment to liberalise mode 3 (FDI) and mode 4, while negotiations among WTO members in general focus on MFN-treatment (rather than national treatment) and cooperation on domestic regulation.

³⁰ For in-depth discussion and illustration, see National Board of Trade (2012) and Nordås and Yunhee (2013).

³¹ Mode 4 services delivery is positively associated with merchandise trade in a gravity study of the US and UK by Jansen and Piermartini (2004) and with substantial welfare gains in CGE studies of Walmsley and Winters (2005) and Walmsley et al. (2011).

tured products but not associated services can make liberalisation in manufacturing increasingly void. Likewise, success in opening up foreign markets for manufactures is likely to be hampered by barriers to service imports in the home country.³² Service imports appear to be unnecessarily burdened by domestic regulations, given the wide variations in regulations across countries within the same service sectors, as indicated in Essay 1 and in OECD (2007).³³ Interdependence between exports and imports in global value chains, which today account for a substantial share of world trade, constitutes another fundamental reason for governments to embrace open markets, both abroad and at home (Lanz and Miroudot, 2011; OECD, 2013).³⁴

In addition to the liberalisation of trade and of the movements of persons, efforts to promote integration of immigrants into the labour market could be an additional means of tackling barriers to firm trade. Poor integration is an issue in several industrialised countries, including Sweden (OECD, 2012),³⁵ where unemployment is almost three times as high among foreign-born workers as among natives (Statistics Sweden, 2012). The matching between qualifications and jobs is worse for foreign-born workers, especially for women (Rooth and Ekberg, 2006; Olli-Segendorf and Teljosuo, 2011). Long-term unemployment is also more prevalent among the foreign-born (Statistics Sweden, 2011). Policies that would facilitate integration of immigrants into the labour market are therefore important in their own right, but are also expected to contribute to firms' internationalisation, as indicated in this thesis.

³² Nordås and Yunhee (2013) find that product differentiation and export prices in manufacturing are positively related to the quality of services and negatively related to services regulations, on average, using industry level panel data for a large sample of countries.

³³ OECD (2007) observes that regulations may be intended to address market failures, but often they appear to be unnecessarily restrictive.

³⁴ Lerner (1936) shows that an import tariff acts as an export tax. Tokarick (2006) verifies this empirically for developing countries.

³⁵ Although a complex concept, labour market integration is commonly measured by comparing, e.g., rates of employment and unemployment of natives and foreign born workers and matching between qualifications and jobs for natives and foreign born workers.

5. Limitations and Future Research

Several limitations of this thesis should be borne in mind, limitations that relate primarily to difficulties in modelling and to scarcity of data. The limitations also motivate further theoretical and empirical research. With respect to modelling, the role of uncertainty in trade is neither captured in standard CGE models of trade nor explicitly modelled in the prevalent heterogeneous firm trade models. Gains from tackling barriers to trade are therefore likely to be underestimated in the simulations of Essay 1. By comparing potential protectionist policies within the framework of the WTO, Bouët and Laborde (2010) find that gains would be much larger under protectionism, if the Doha round is concluded, compared with a continuation of the status quo – that is, without a conclusion of the round.³⁶ In the interests of conservatism, our simulations also ignore dynamic effects, and neither impacts on the extensive margin of trade, nor reallocations within industries are incorporated. In these areas, some modelling advances have been made only recently (Zhai, 2008). Another limitation is that multi-stage production is ignored, further dampening the impact of trade liberalisation (Yi, 2010). Caveats also relate to services and border procedures, whose modelling and estimation is difficult and for which data are scarce. For these reasons, our modelling of trade in services excludes FDI in services. Although we emphasise the modelling of border procedures and their facilitation, this is a relatively new area with divergent approaches to modelling.

Regarding the microeconomic work undertaken in this thesis, more data would have allowed for more in-depth analysis. For example, it would have been useful to explore how the trade impact of migrants varies across migration status, occupation, and professional background, as well as other employee-employer and geographical characteristics. Comparing trade linked to migrants employed in trade intermediaries with trade linked to migrants employed in trading firms is also worth exploring. Furthermore, to actually establish causality in the migration-trade nexus at the firm level, an experimental or refined quasi-experimental approach is needed. With regards to service usage and export intensity in manufacturing, a limitation of the thesis is that only manufacturing exports are considered, given the absence of comprehensive data for cross-border trade in services. This may underestimate the association between service usage and export intensity. To sum up, more micro-level work is needed to better understand how to tackle barriers to firm trade.

³⁶ The simulation is limited to merchandise liberalisation.

References

- Andersson, M. and H. Lööf (2009). Learning-by-Exporting Revisited: The Role of Intensity and Persistence. *Scandinavian Journal of Economics* 111(4), 893-916.
- Anderson, J. E. and E. van Wincoop (2004). Trade Costs. *Journal of Economic Literature* 42(3), 691-751.
- Arnold, J., Javorcik, B., Lipscoom, M. and A. Mattoo (2010). Services Reform and Manufacturing Performance: Evidence from India. CEPR Discussion Paper 8011.
- Arnold, J., Javorcik, B. and A. Mattoo (2011). Does Services Liberalization Benefit Manufacturing Firms? Evidence from the Czech Republic. *Journal of International Economics* 85(1), 136-146.
- Axelsson, B. and H. Agndal (2000). Internationalisation of the Firm – A Note on the Crucial Role of the Individual’s Contact Network. Paper presented at the 16th IMP Conference, Bath, UK.
- Barefoot, K. and J. Koncz-Bruner (2012). A Profile of U.S. Exporters and Importers of Services – Evidence From New Linked Data on International Trade in Services and Operations of Multinational Companies. *Survey of Current Business*, June 2012, 66-87.
- Bernard, A., Jensen, J. and R. Lawrence (1995). Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-1987. *Brookings Papers on Economic Activity, Microeconomics* 1995, 67-119.
- Bernard, A. and J. Jensen (1999). Exceptional Exporter Performance: Cause, Effect, or Both? *Journal of International Economics* 47(1), 1-25.
- Bernard, A., Eaton, J., Jensen, J. and S. Kortum (2003). Plants and Productivity in International Trade. *American Economic Review* 93(4), 1268-1290.
- Bernard, A., Redding, S. and P. Schott (2007). Comparative Advantage and Heterogeneous Firms. *Review of Economic Studies* 74(1), 31-66.
- Bouët, A. and D. Laborde (2010). Assessing the Potential Cost of a Failed Doha Round. *World Trade Review* 9(2), 319-351.
- Brandell, L. and C. Johansson Santos Silva (2009). Immigrant-Trade Links: Empirical Evidence from Sweden. Master’s Thesis in International Economics, Stockholm School of Economics.

- Dawson, L. R. (2013). Labour Mobility and the WTO: The Limits of GATS Mode 4. *International Migration* 51(1), 1-23.
- Debaere, P., Görg, H. and H. Raff (2013). Greasing the Wheels of International Commerce: How Services Facilitate Firms' International Sourcing. *Canadian Journal of Economics*, forthcoming.
- DeVoe, S.E. and J. Pfeffer (2011). Time is Tight: How Higher Economic Value of Time Increases Feelings of Time Pressure. *Journal of Applied Psychology*, 96(4), 665-676.
- Duggan, V., Rahardja, S. and G. Varela (2013). Service Sector Reform and Manufacturing Productivity: Evidence from *Indonesia*. *World Bank Policy Research Working Paper* 6349.
- Ecorys (2009). Non-Tariff Measures in EU-US Trade and Investment – An Economic Analysis. Report to the European Commission, DG Trade. ECORYS Nederland BV.
- Ekhholm, K. and K. Hakkala (2005). The Effect of Offshoring on Labour Demand: Evidence from Sweden. CEPR Discussion Paper 5648.
- Eliasson, K., Hansson, P. and M. Lindvert (2012). Do Firms Learn by Exporting or Learn to Export? Evidence from Small and Medium-Sized Enterprises. *Small Business Economics* 39(2), 453-472.
- Falk, M. and F. Peng (2012). The Increasing Service Intensity of European Manufacturing. *The Service Industries Journal*, 1-21.
- Francois, J., van Meijl H. and F. van Tongeren (2005). Trade Liberalization in the Doha Development Round. *Economic Policy* 42, 349-379.
- Genc, M., Gheasi, M., Nijkamp, P. and J. Poot (2011). The Impact of Immigration on International Trade: a Meta-Analysis. Norface Discussion Paper Series 20.
- Gould, D. M. (1994). Immigrant Links to the Home Country: Empirical Implications for U.S. Bilateral Trade Flows. *Review of Economics and Statistics* 76(2), 302-316.
- Gunnarsson, C., Frankelius, P., Hultman, C. and C. Johanson (2012). Exploring Export Barriers of Cleantech Business: An Interview Survey of Swedish Cleantech Companies. Research paper presented at the Greening of Industry Network conference, Linköping, October 22-24, 2012.
- Hakkala, K., Heyman, F. and F. Sjöholm (2008). Multinational Firms and Job Tasks. IFN WP 781.

- Hakkala, K., Heyman, F. and F. Sjöholm (2010). Multinationals, Skills, and Wage Elasticities. *Review of World Economics* 146(2), 263-280.
- Hammarskjöld, D. (1964). *Markings*. (translation: L. Sjöberg and W.H. Auden). Knopf, New York.
- Handley, K. (2012). Exporting Under Trade Policy Uncertainty: Theory and Evidence. Research Seminar in International Economics Discussion Paper 634, University of Michigan.
- Hatzigeorgiou, A. (2010). Does Immigration Stimulate Foreign Trade? Evidence from Sweden. *Journal of Economic Integration* 25(2), 376-402.
- Hertel, T. (ed.) (1997). *Global Trade Analysis: Modeling and Applications*. Cambridge University Press, Cambridge.
- Hoekman, B. and A. Mattoo (2011). Services Trade Liberalization and Regulatory Reform. World Bank Policy Research Paper 5517.
- Hoekman, B. and A. Mattoo (2012). Liberalizing Trade in Services – Lessons from Regional and WTO Negotiations. Mimeo.
- Hornok, C. (2011). Need for Speed: Is Faster Trade in the EU Trade-creating? CEPR Discussion Paper 8451.
- Hummels, D., Minor, P., Reisman, M. and E. Endean (2007). Calculating Tariff Equivalents for Time in Trade. Report for USAID, Nathan Associates Inc.
- Hummels, D. (2009). Globalization and Freight Transport Costs in Maritime Shipping and Aviation. International Transport Forum Paper 2009:3, OECD, Paris.
- Hummels, D. and G. Schaur (2012). Time as a Trade Barrier. NBER Working Paper 17758.
- IOM (2004). Essentials of Migration Management – Volume Two: Developing Migration Policy. *International Organization for Migration*, Geneva.
- Irwin, D. (1995). The GATT in Historical Perspective. *American Economic Review* 85(2), 323-328.
- Jansen, M. and R. Piermartini (2004). The Impact of Mode 4 on Trade in Goods and Services. WTO Staff Working Paper ERSD-2004-7.
- Johanson, J. and J.-E. Vahlne (1977). The Internationalization Process of the Firm - A Model of Knowledge Development and Increasing Foreign

- Market Commitments. *Journal of International Business Studies* 8(1), 23-32.
- Johanson, J. and J.-E. Vahlne (2009). The Uppsala Internationalization Process Model Revisited: From Liability of Foreignness to Liability of Outsidership. *Journal of International Business Studies* 40(9), 1411-1431.
- Keck, A. and S. Schropp (2007). Indisputably Essential: The Economics of Dispute Settlement Institutions in Trade Agreements. WTO Staff Working Paper ERSD 2007-02.
- Kee, H., Nicita, A. and M. Olarreaga (2009). Estimating Trade Restrictiveness Indices. *The Economic Journal* 119(534), 172-199.
- Keller, W. (2004). International Technology Diffusion. *Journal of Economic Literature* 42(3), 752-782.
- Kneller, R. and M. Pisu (2011). Barriers to Exporting: What Are They and Who Do They Matter To? *World Economy* 34(6), 893-930.
- Krugman, P. (1979). Increasing Returns, Monopolistic Competition, and International Trade. *Journal of International Economics* 9(4), 469-479.
- Lanz, R. and S. Miroudot (2011). Intra-Firm Trade: Patterns, Determinants and Policy Implications. OECD Trade Policy Papers 114.
- Lerner, A. (1936). The Symmetry between Import and Export Taxes. *Economica* 3(11), 306-313.
- Lind, D. (2010). Avindustrialiseringen av Sverige: myt och verklighet. *Ekonomisk Debatt* 38(7), 35-51.
- Lommelen, T. (2004). A Learning Perspective on Internationalization: Progression in the Internationalization of Logistic Services Providers. PhD Thesis in Business Administration, Hasselt University.
- Matthews, A. and K. Walsh (2006). The Economic Consequences of the Doha Round for Ireland. *Economic and Social Review* 37(1), 47-69.
- McCarthy, I. and A. Anagnostou (2004). The Impact of Outsourcing on the Transaction Costs and Boundaries of Manufacturing. *International Journal of Production Economics* 88(1), 61-71.
- Melitz, M. (2003). The Impact of Trade on Intra-industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71(6), 1695-1725.
- Melitz, M. And D. Trefler (2012). Gains from Trade When Firms Matter. *Journal of Economic Perspectives* 26(2), 91-118.

- Miroudot, S., Lanz, R. and A. Ragoussis (2009). Trade in Intermediate Goods and Services. OECD Trade Policy Papers 93.
- Montresor, S. and G. Vittucci Marzetti (2011). The Deindustrialisation/Tertiarisation Hypothesis Reconsidered: a Subsystem Application to the OECD7. *Cambridge Journal of Economics* 35(2), 401-421.
- National Board of Trade (2010). Made in Sweden – A New Perspective on the Relationship between Sweden’s Exports and Imports. National Board of Trade 2010:6.
- National Board of Trade (2012). Everybody is in Services – The Impact of Servicification in Manufacturing on Trade and Trade Policy. National Board of Trade 2012:6.
- National Board of Trade (2013). Global Value Chains and Services – An Introduction. National Board of Trade 2013:1.
- Nordås, H., Pinali, E. and M. Gelosso Grosso (2006). Logistics and Time as a Trade Barrier. OECD Trade Policy Papers 35.
- Nordås, H. (2008). The Impact of Services Trade Liberalisation on Trade in Non-Agricultural Products. OECD Trade Policy Papers 81.
- Nordås, H. and Y. Kim (2013). The Role of Services for Competitiveness in Manufacturing. OECD Trade Policy Papers 148.
- OECD (2007). Globalisation and Structural Adjustment – Summary Report of the Study on Globalisation and Innovation in the Business Services Sector. OECD STI Report.
- OECD (2011). The Impact of Trade Liberalisation on Jobs and Growth. OECD Trade Policy Papers 107.
- OECD (2012). Settling In: OECD Indicators of Immigrant Integration 2012. OECD Report, OECD Publishing.
- OECD (2013). Final Report on Global Value Chains. OECD-document DSTI/IND(2013)2, draft.
- Ohlin, B. (1933). Interregional and International trade. Harvard Economic Studies 39. Harvard University Press, Cambridge, MA.
- Olli-Segendorf, Å. and T. Teljosuo (2011). Sysselsättning för invandrare – en ESO-rapport om arbetsmarknadsintegration. ESO, Rapport nr 5.
- Panizzon, M. (2010). Standing Together Apart: Bilateral Migration Agreements and the Temporary Movement of Persons under “Mode 4”

- of GATS. Centre on Migration, Policy and Society WP 77, University of Oxford.
- Rauch, J. E. (1999). Networks versus Markets in International Trade. *Journal of International Economics* 48(1), 7-35.
- Rooth, D.-O. and J. Ekberg (2006). Occupational Mobility for Immigrants in Sweden. *International Migration* 44(2), 57-77.
- Schettkat, R. and L. Yocarini (2006). The Shift to Services Employment: a Review of the Literature. *Structural Change and Economic Dynamics* 17(2), 127-147.
- Shah, A. and V. Parikh (2002). Movement of Natural Persons Under the GATS in the Software Services Sector. Paper by Nishith Desai Associates presented at the Joint WTO-World Bank Symposium on Movement of Natural Persons (Mode 4) under the GATS, Geneva, 11-12 April 2002 (available at www.wto.org/english/tratop_e/serv_e/symp_mov_natur_perso_april02_e.htm).
- Silva, A., Afonso, O. And A.P. Africano (2012). Learning-by-Exporting: What We Know and What We Would Like to Know. *The International Trade Journal* 26(3), 255-288.
- SOU (2008). Svensk export och internationalisering – Utveckling, utmaningar, företagsklimat och främjande. Betänkande av exportutredningen, SOU 2008:90.
- Statistics Sweden (2011). Långtidsarbetslöshet bland personer i åldern 15-74 år. Statistiska meddelanden.
- Statistics Sweden (2012). Arbetskraftsundersökningarna (AKU) 2011. Statistiska meddelanden.
- Statistics Sweden (2013). Statistics Database, Accessed 6 March 2013.
- Tokarick, S. (2006). Does Import Protection Discourage Exports? IMF Working Paper 06/20.
- Vittucci Marzetti, G. (2008). Input-Output Data and Services Outsourcing: a reply to Dietrich, McCarthy and Anagnostou. Università' di Bologna, WP 621.
- Wagner, J. (2013). Are Low-Productive Exporters Marginal Exporters? Evidence from Germany. University of Lüneburg WP in Economics 263.

- Walmsley, T. and A. Winters (2005). Relaxing the Restrictions on the Temporary Movements of Natural Persons: A Simulation Analysis. *Journal of Economic Integration* 20(4), 688-726.
- Walmsley, T., Winters, A. and A. Ahmed (2011). The Impact of the Movement of Labour: Results from a Model of Bilateral Migration Flows. *Global Economy Journal* 11(4).
- Wilson, J., Mann C. and T. Otsuki (2005). Assessing the Benefits of Trade Facilitation: A Global Perspective. *World Economy* 28(6), 841-871.
- World Bank (2013). Doing Business Database, Accessed 7 March 2013.
- WTO (1991). Services Sectoral Classification List. WTO-document MTN.GNS/W/120.
- WTO (2007). World Trade Report 2007 – Six Decades of Multilateral Trade Cooperation: What Have We Learnt? Report, World Trade Organization.
- WTO (2012). World Trade Report 2012 – Trade and Public Policies: A Closer Look at Non-Tariff Measures in the 21st century. Report, World Trade Organization.
- WTO (2013). Integrated Data Base, Accessed 7 March 2013.
- Yi, K.-M. (2010). Can Multistage Production Explain the Home Bias in Trade. *American Economic Review* 100(1), 364-393.
- Zhai, F. (2008). Armington Meets Melitz: Introducing Firm Heterogeneity in a Global CGE Model of Trade. ADB Institute Discussion Paper 108.

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