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The contribution of trade policy to the openness of the Dutch economy

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Abstract in English

The last four decades, Dutch exports and imports grew annually about 7.5%, while re-exports rocketed in the last two decades. Using a gravity approach this paper finds that the increase in trade is largely caused by income developments. Trade policy, consisting of reductions in import tariffs and other trade barriers and the creation of the EU internal market, also has a significant impact on trade growth, although much smaller. Without any liberalisation of trade policy since 1970 the ratio of trade (excluding re-exports) to GDP would have been about 8%-points lower. By estimating the trade enhancing-effect of trade policy on GDP we conclude that trade policy has contributed 6% to 8% to the growth of national income in Netherlands since the 1970s. Foreign Direct Investments (FDI) experienced a massive but erratic growth, mostly in the last two decades. Income developments could explain half of that growth; deregulations of national capital markets explain only a small part of FDI growth.

Key words: trade policy, openness and income, gravity equation, FDI

JEL code: F15, F4

Abstract in Dutch

De afgelopen veertig jaar groeiden de Nederlandse export en import met gemiddeld 7,5% per jaar, terwijl de wederexport omhoog schoot in de laatste twee decennia. Gebruikmakend van een graviteitsvergelijking laat data-analyse zien dat de toename van de handel vooral door de toename van het bbp wordt veroorzaakt. Handelsbeleid, bestaande uit lage importtarieven, minder handelsbarrières en de totstandkoming van de interne markt, heeft ook een substantiële impact op handel, maar wel veel kleiner. Als het handelsbeleid sinds 1970 niet geliberaliseerd was, dan zou de handel (exclusief wederexport) als percentage van het bbp 8%-punten lager zijn geweest. We concluderen dat handelsbeleid sinds 1970 voor 6 tot 8% aan het Nederlandse bbp heeft bijgedragen door het handelsverhogende effect van beleid op het bbp te schatten. Directe Buitenlandse Investeringen hebben de laatste twintig jaar een substantiële maar volatiele groei laten zien. BBP-veranderingen kunnen de helft van deze stijging verklaren, de deregulering van kapitaalmarkten slechts een klein gedeelte.

Steekwoorden: handelsbeleid, openheid en inkomen, graviteitsvergelijking, DBI

Een uitgebreide Nederlandse samenvatting is beschikbaar via www.cpb.nl.

Contents

Preface

The Netherlands is the prime example of a small open economy. It belongs to the top ten traders and foreign investors in the world for a long time now in spite of its relative small population size. The last decades the internationalisation of the economy is accelerated. Exports have increased by about 7% per year since the 1970s and the growth in FDI stocks is even more spectacular, on average 18% per year since 1983. This paper discusses some of the causes of the increase in globalisation and in particular the role of trade policy. It also presents some of the effects of globalisation for the Netherlands. It shows that trade policy has contributed 6% to 8% to Dutch annual income growth.

This project fits into the renewed interest in the effects of globalisation for the Netherlands by policy makers and others. Recently CPB has started a new research programme on globalisation to meet this interest. This document is written by Harold Creusen and Arjan Lejour. They benefited from the substantial work of Gert-Jan Linders and Bas Straathof in collecting data and developing a research methodology to study the effects of the internal market on income growth in the EU and the Netherlands (CPB document 168). Harry Garretsen, Henri de Groot, Albert van der Horst and Bas ter Weel and particularly Roger Smeets and Bas Straathof provided useful comments. The authors also thank the participants of the meetings at the Dutch Ministry of Economic affairs for constructive discussions.

Coen Teulings,
director CPB

Summary

In the last four decades, Dutch exports and imports grew annually about 7.5%, while re-exports rocketed in the last two decades. This paper asks for the causes of increased openness and focuses in particular on the role of trade policy. Using a gravity equation approach we show that export and import growth can largely be explained by income developments. Trade policy, consisting of reductions in tariffs and other trade barriers and the creation of the EU internal market, also has a significant impact on trade, albeit much smaller. Without changes in trade policy since 1970, the ratio of trade (excluding re-exports) to GDP would be 8%-points lower. Secondly, we examine the impact of trade policy on income. Estimating the relation between openness and economic growth, we conclude that trade policy has contributed 6% to 8% to the growth of national income in Netherlands since the 1970s. This implies an income gain of 1200 to 1600 euro per capita measured by GDP per capita in 2008. Similar patterns are observed for bilateral trade across other OECD-countries, albeit that trade policy had a more modest impact on trade and income.

Foreign Direct Investments (FDI) experienced a massive but erratic growth, mostly in the last two decades. Income developments could explain half of that growth according to our gravity estimations; deregulations of national capital markets explain only a small part of the growth of inward FDI.

Developments in Dutch trade and FDI

One of the most eye-catching developments in our society is the strong impetus of globalization. The internationalisation of markets is intensified, reflected by large increases in trade and FDI. Goods have become more tradable, partly represented by the steep increase in re-exports. Indeed, over the years the Dutch mainports of Rotterdam and Schiphol have experienced an impressive growth in transits. The exports of Dutch firms and the imports to the Dutch market have increased as well, but at lower pace than re-exports. In fact, Dutch exports increased by 6.5% per year, Dutch imports by 6% (both excluding re-exports). The increases in exports are mainly due to increasing trade with existing trading partners, but in imports China and other BRIC-countries popped up and China became one of the most important suppliers in 2007.

Inward and outward Foreign Direct Investments (FDI) increased as well, first slowly but accelerated after 1985. Between 1983 and 2005 the average growth rate of inward FDI mounted up to 17.5%, and the rate of outward FDI even to 19%.

Research questions and method

Inspecting these trends two questions come to the fore:

- What is the impact of trade policy on trade in goods and FDI?
- What are the effects on income?

Several policy actions on the international level are undertaken to enhance globalization in recent decades. Countries have reduced tariffs and recently other non-tariff barriers via successive GATT-rounds. European countries took a step further and abolished all internal barriers on the international movement of goods and services, financial sources and people. Accession of new countries to the EU enhanced the expansion of the internal market.

The two research questions induce two steps in our analysis. First, we determine the effects of changes in trade policy on bilateral trade in goods and bilateral FDI. Following Baier and Bergstrand (2001), we estimate a gravity equation of bilateral trade using the joint income, trade policy and EU membership as determinants. We also calculate the actual contributions of trade policy to trade growth. Using a similar procedure, we investigate the impact of several determinants on FDI, particularly the impact of freedom on capital movements and entry on foreign markets.

In the second step, we determine the income effects of trade policy by calculating the contributions of increased trade openness that accrue from changes in trade policy on income growth. In this respect, we first estimate the income elasticity of openness, thereby controlling for differences in investment, education, population growth and other well-known growth factors. Then, we determine the contributions by combining these income elasticities with the counterfactuals of openness due to the changes in trade policy.

Determinants of trade

The growth of trade can be largely explained by the contributions of the determinants that are included in the gravity equations. Income explains more than 85% of the growth in trade. Trade policy and EU-membership contributed for about 10% to the growth of goods trade. This is still a substantial effect: without liberalised trade policy the increase in trade openness would be been much smaller. For the Netherlands trade openness (excluding re-exports) increased by 8%-points due to less restrictive trade policies since the 1970s. For the EU-15 we see a similar increase in trade openness. For the OECD the increase is on average lower, because some countries such as Japan and the US are less open to trade. Including re-exports, the increase in Dutch trade openness would be about twice as large.

Income effects of trade policy

Liberalised trade policies have contributed to income growth in the EU, particularly for the Netherlands. For the Netherlands, these realized income effects range from 6% to 8% of annual income growth. This has added 1200 to 1600 euro to the average Dutch income per capita in 2008. This effect is smaller than the CPB estimates of the income effects of internal market (1500 to 2200 euro) but these latter estimates also include the trade and income gains from 1960 to 1970. In that period half of the trade gains of the internal market are realized. This also implies a much smaller income benefit of about 750 to 1100 of the internal market since 1970.

In the long run, the income effects are bigger: 7% is a minimum estimate and the maximum estimate is more than three times the minimum estimate. The large difference between the minimum and the maximum follows from the parameter uncertainty of the long-term elasticity of openness on income. For the EU-15 countries, the realized income effects of trade policy add up to 3 to 4%, the long term effects would end up between 4% and 16% GDP per capita growth. The policy effects are less eminent for all OECD countries, as up to now they contributed only 1% to 2% to the average income growth, and on the long term between 2% and 8%.

Determinants of FDI growth

Finally, our empirical results also reveal that the substantial growth of Dutch FDI-stocks only partly emerged by the increase in income, as income growth contributed somewhat less than 50% to FDI-growth. The abolishment of restrictions on national capital markets had a modest but significant impact. Indeed, deregulation of capital markets in the host countries contributed almost 7% to the growth of outward FDI. The role of EU membership is more limited, as it contributed at most 3% to FDI growth (both inward and outward FDI). A large part of the growth in FDI-stocks can not be explained and could be related to country-specific effects.

Conclusions

Trade policy had a significant effect on trade and income growth in the Netherlands. In particular, the internal market has been important in this respect. It is not the most important policy to raise income and trade. Still, liberalized trade policy have contributed to a better allocation of production factors, diffusion of knowledge and specialisation, which all eventually result in more production and a higher level of income. Further policy initiatives to liberalise trade could add to production and income. These initiatives should concentrate on reducing non-tariff barriers in goods and services trade, because import tariffs are nearly eliminated in particular between OECD countries.

1 Introduction

Dutch trade has increased by about 7.5 % a year on average between 1971 and 2005. Exports grew slightly faster than imports. FDI grew even much faster since 1983: on average by about 18% a year. Trade and FDI grew thus much faster than GDP and the question is why? Dutch firms are becoming more and more internationalized. These are characteristics of the process of globalisation that have provoked strong feelings. For some it is a source of welfare gains, for others it is the root of many evils creating uncertainty and job losses. Economists tend to emphasize that globalisation in itself is welfare improving, raising productivity and income at the least. These benefits especially accrue to a small open economy like the Netherlands. These advantages and disadvantages for the Netherlands are recently presented in a report of the Dutch Social Economic Council on globalisation (SER (2008)).

This paper contributes to this debate by presenting more empirical estimates on the effects of globalisation on the Dutch economy. This is not completely new. Other researchers have concluded that globalisation has attributed to about 8% to 20% of GDP in the European Union (EU), and similar analyses for the US conclude that 13% of its GDP can be ascribed to globalisation, but numbers for the Netherlands are lacking.[1]

We investigate the factors which have contributed to the rise in Dutch trade and FDI and focus on the role of trade and investment policy. Further, we gauge the impact of these developments on Dutch national income. We concentrate on trade and FDI because these are the eye catching developments of the world wide integration of national economies. Based on the work of Baier and Bergstrand (2001) we use a gravity equation to explain the growth of bilateral trade using changes in income, imports tariffs and other trade restrictions and EU membership as explanatory variables. Time-varying country dummies for the exporting countries are included in the regressions to identify trade resistance and country specific effects. Our estimations differ in various aspects from Baier and Bergstrand (2001). First, we start from the recent theoretical framework Anderson and Van Wincoop (2003) which derives country and time dummies for the empirical specification. Second, we do not include an income convergence measure, but do include an EU dummy separate from the import tariffs. Third, we use an alternative indicator for tariffs to include other trade policy measures: the KOF index on trade restrictions. Fourth, we use a panel data estimations in levels. Fifth, we use another dataset: in our extended sample we cover more countries and a longer time period (1970 to 2005).

We conclude that most of Dutch trade growth can be ascribed to the rise in income in the Netherlands and its trading partners. A much smaller part of trade growth is caused by trade policy and EU membership. Without changes in these policies since 1970 trade (excluding re-exports) as a ratio of GDP would have been 8%-points lower. Also in the OECD country

[1] Badinger (2005), Denis *et al.* (2006) and Bradford *et al.* (2005) respectively.

sample, trade policy has had a significant impact on the growth of trade, but explains only a few percent of the growth in trade, much smaller than for the Netherlands. Income seems to be the main determinant for trade growth as also the results of Baier and Bergstrand (2001) and others point out.

Similar conclusions are drawn from analyzing the causes of the rise in FDI since the 1980s in a gravity equation. Income growth is the main determinant for the rise in FDI, but also regulation of capital markets had a significant impact. It explains about 7% of the FDI growth.

Increased trade openness has significantly contributed to economic growth. To test the hypothesis we estimate standard economic growth equations (Mankiw *et al.* (1992)) with an indicator for trade openness measured as exports plus imports divided by GDP. The panel is a set of middle and high income countries over five-year periods. The panel is estimated with a fixed effect estimation and the GMM method. These various methods provide a bandwidth for the results. We use the regression results to translate the effect of trade policy on income via the effects on openness. Trade policies including internal market policy have contributed 6% to 8% to the annual GDP growth in the Netherlands since the 1970s. The long-term income effect could be even higher because it takes decades before extra openness and international competition translate into higher GDP. For the EU and the OECD the effects are smaller, because these countries are less open to trade on average.

These GDP effects represent the effect of trade policy on Dutch income. Trade policy explains only a modest share of the rise in trade and FDI. Trade and FDI are mainly stimulated by the rise in income of our trading partners. The impact of trade policy is significant, but modest compared to other factors. It also suggests that trade policy can affect the speed of increasing openness to some extent, but cannot stop or reverse it, ignoring policies to forbid international trade completely.

The income effect focuses only on trade policy and does not cover all aspects of globalisation. The main reason is that it is hard to define a workable concept of globalisation because it is a multifaceted development. Scholte (2008) conceptualises globalisation as the supra territorial connections between people. People become more able - physically, legally, linguistically, culturally and psychologically - to engage with each other wherever they might be. This concept of globalisation is much more far stretching than internationalisation as it is used often in the economic literature, and also includes developments like access to the world-wide web and global communities. It seems impossible to apply this concept in practice. Only very closed economies like North Korea and Cuba are not seriously affected by globalisation according to this concept. If we use such types of countries as benchmarks for no globalisation, globalisation would be nearly everything. This is hardly meaningful for a study to analyse the causes and consequences of globalisation for the Netherlands.

Second, the focus on trade and FDI implies that we do not consider other aspects of globalisation like the effects of migration, offshoring, R&D and the effect on the income

distribution. We have various reasons not to consider these issues in this paper. We ignore migration here, because the impact of migration on national income in the Netherlands is quantitatively limited compared to trade and FDI. Moreover, Roodenburg *et al.* (2003) and other studies already deal with the impact of migration on the Dutch economy. We ignore outsourcing and offshoring in this document. Implicitly, trade and FDI related to offshoring are a part of total trade and FDI which we consider here. Gorter *et al.* (2005) have shown that the effects of offshoring on employment in the Netherlands are limited seen from a macro-economic perspective. The dynamism of offshoring takes place in specific economic sectors and for particular jobs. This requires another research methodology with a micro-economic perspective. This perspective will be the leading starting point in future CPB projects on globalisation. This also holds for the internationalisation of R&D and will be taken on board in these future projects. Some of these projects will also focus on the effects of globalisation on income. Recently, CPB (2008) and Groot and De Groot (2009) have studied developments in the Dutch income distribution using a macroeconomic and sectoral approach, respectively.

Section 2 discusses recent trade and FDI developments in the Netherlands followed by a short overview of policy developments with respect to trade liberalization. Thereafter we discuss the literature explaining the growth of trade. Section 2.4 describes the economic mechanisms between openness and income and presents income effects from globalisation from other studies. Section 3 presents our empirical framework to estimate the causes of trade growth for a sample of OECD countries and the Netherlands. The results indicate that the largest part of trade can be attributed to income growth, but that trade policy is also significant. Section 4 disentangles the causes of the growth in FDI. Less restrictive capital market regulation has helped to stimulate FDI. The effects of more openness on income are discussed in Section 5. Section 6 summarizes and concludes.

2 Developments in Dutch trade and FDI

This section presents the *further* integration of the Netherlands in the world economy since the 1970s. The Netherlands was and still is one of the top ten trading countries in the world for centuries and the interwovenness with the world economy has continued to increase since the 1970s. According to several measures the degree of integration has more than doubled. One main aim of this section is to present these developments for trade and FDI. Moreover, we summarize the major changes in trade policy. Finally we discuss the role of trade policy in explaining increased openness and the impact of openness on income as presented in the literature.

2.1 The internationalization of the Dutch economy

2.1.1 Developments in trade

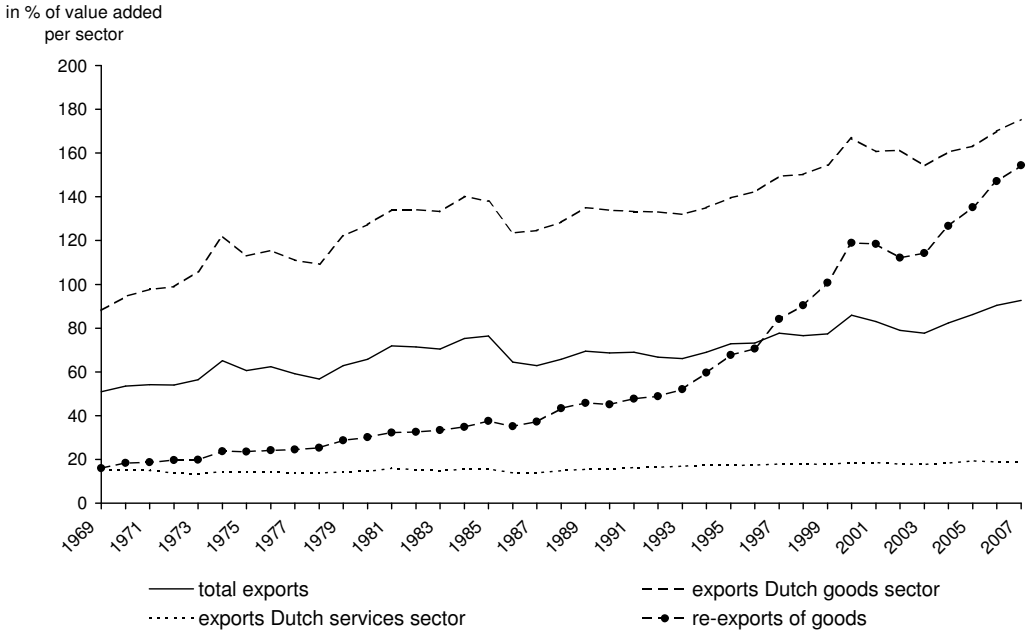
Figure 2.1 presents the developments of the Dutch exports per sector as a share of their value added.[2] The goods exports of the Dutch firms doubled as share of valued added in the goods sector from 88% in 1969 to 175% in 2007.[3] The re-exports of goods even rose more sharply, i.e. from 16% of the value added of the goods sector in 1969 to 154% in 2007. Services exports remained stable as a share in value added. This observation does not alter the fact that services exports has increased over time as did the value added of services. Services became much more important in the economy over that period. The composition of GDP changes in favour of services. Because services sectors are less open to trade than manufacturing sectors (cf. Kox *et al.* (2004)) total exports increased significantly less than good exports alone: exports for goods and services and re-exports increased gradually from 51% of the value added of all Dutch firms in 1969 to 93% in 2007.[4]

[2] These figures on export and imports do not include statistical adjustments such as CIF/FOB corrections, reclassifications regarding exports of contracted services or imported goods by the services sectors, consumption of non-inhabitants and exports of second-hand goods. Including these corrections will hardly influence the main trends.

[3] The goods sector contains the industries agriculture, mining, manufacturing industries and public utilities. The services sector contains the construction industry, trade, transport and communication industry, financial services, business services and health care.

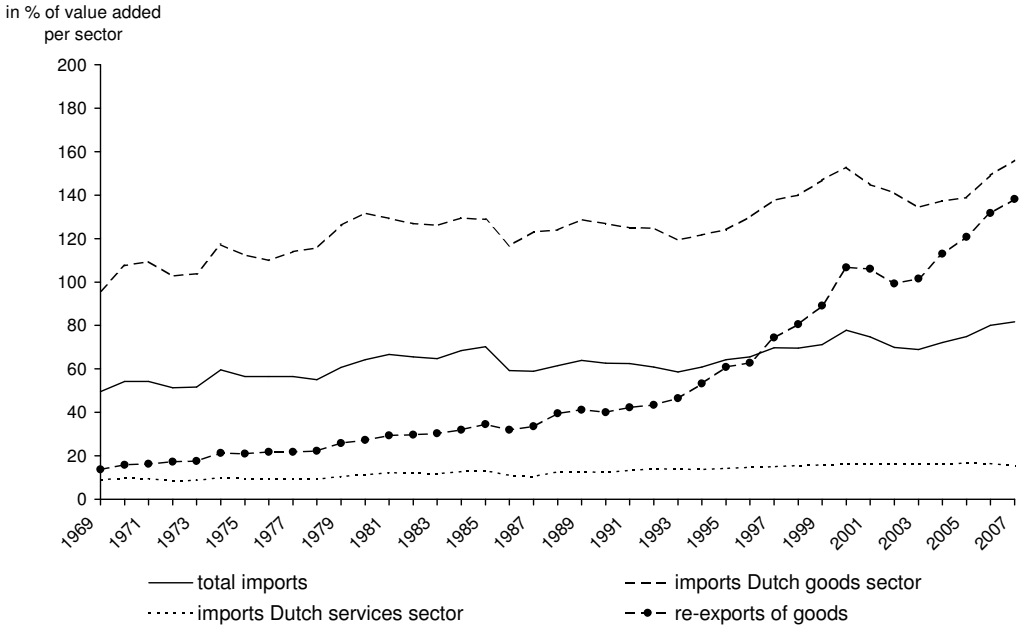
[4] Note that the lines in figure 2.1 do not add up, because of the different denominators.

Figure 2.1 Dutch exports by sector and re-exports[a]



[a] Data derived from sectoral data of the National Accounts, Statistics Netherlands. Exports of Dutch goods sectors and services sectors exclude re-exports, total exports include re-exports. Re-exports of goods are in % of the value added of the goods sector; re-exports of services are omitted because these are negligible (below 2% of value added of services sector).

Figure 2.2 Dutch imports by sector[a]



[a] Data derived from import data by type of expenditure of the National Accounts, Statistics Netherlands. Imports of Dutch sectors are all excluding re-exports and expenditures of Dutch consumers in other countries. The (imported value of) re-exports of goods are in % of the value added of the goods sector; re-exports of services are omitted as they are quite negligible (below 2% of value added of services sector).

Figure 2.2 presents the developments in Dutch imports of goods and services between 1969 and 2007. More precisely, it presents the values of the imports of goods and services as a share of the value added of the respective sectors.[5] The trends in imports are quite similar to the trends in exports. For instance, goods imports increased substantially from 96% in 1969 to 156% in 2007 as share of value added in manufacturing, but at a lower pace than goods exports. Obviously, the imported value of re-exports grew similarly as the exported value. The imports of services remained rather stable as share of value added. All imports of goods and services and the imported value of re-exports grew from 50% of total value added in 1969 to 82% in 2007, about by 10%-points less than total exports.

The increase in trade is mainly caused by increased trade with existing trading partners. This is illustrated in Table 2.1. The top-half of Table 2.1 contains the most popular country destinations of Dutch exports of goods, ranked by their share in the value of all Dutch goods exports (this also includes Dutch re-exports). The first two columns apply to 1962; the last two columns apply to 2007. The share of exports destined for Germany, Belgium, France and the UK was 50% in 1962 and is even 53% in 2007. 30% of Dutch exports go to other European countries.

Table 2.1 Top 5 Dutch export destinations and countries of origin import

Top 5 destination countries export

1962		**2007**	
Destination	export share	Destination	export share
Germany	20%	Germany	24%
Belgium	13%	Belgium	12%
United Kingdom	11%	United Kingdom	9%
France	6%	France	8%
Sweden	5%	United States	4%

Top 5 countries of origin import

1962		**2007**	
Origin	import share	Origin	import share
Germany	22%	Germany	20%
Belgium	19%	Belgium	11%
United States	11%	China	9%
United Kingdom	7%	United States	8%
France	4%	United Kingdom	6%

Source: Statistics Netherlands,

[5] Statistics Netherlands classifies imports only as type of goods and services products, not as sectors. Some of the goods imports are destined to services sectors and vice versa. We could not correct for this. We relate the value of the goods imports with the value added of the goods sector, and services imports with the value added of the services sector.

Of course, the number of export destinations has also increased, but the trade relations with these new destinations are less intense than with the existing trading partners. In spite of the rise of Asia and in particular China an India, these regions have not become major export destinations for Dutch products. Suyker *et al.* (2007) describe that Dutch exports to China have only increased from 0.1% in 1990 to 1.1% in 2006 and exports to India has remained stable at 0.3% of total Dutch exports. This is also the case for exports to Japan, Korea and the ASEAN countries. These comprise about 2% of total exports.

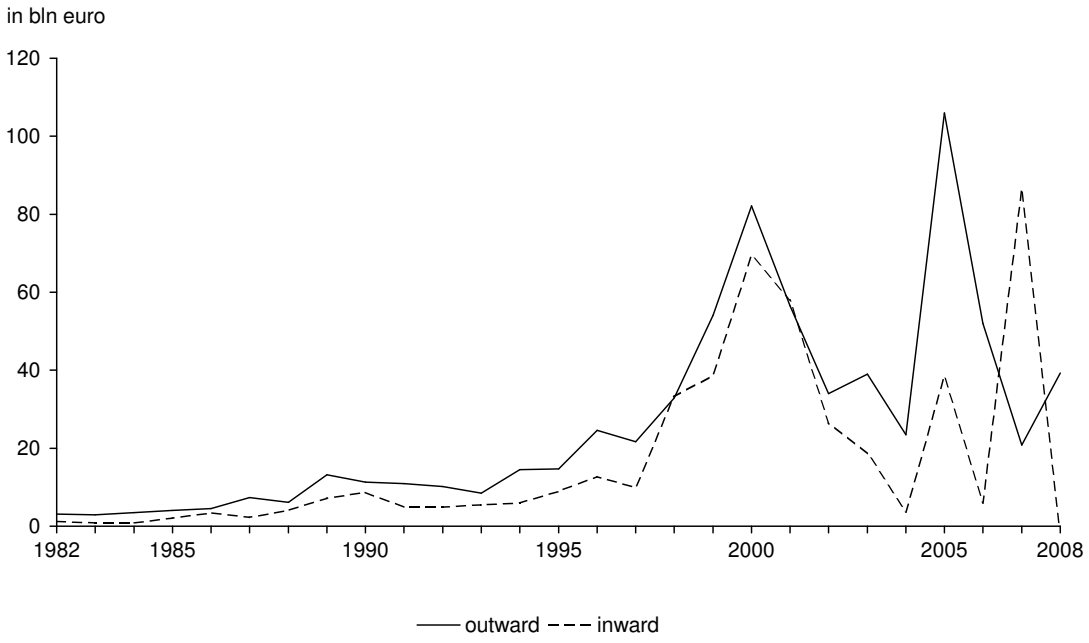
The country pattern for imports is different as is described in the bottom-half of the table. In 1962 48% of our imports came from Germany, Belgium and the UK. This share has declined to 37% in 2007. Most remarkable is the rise of China, more extensively discussed in Suyker and De Groot (2006)). In 1990 its share in imports was only 0.6%, steadily rose to 2% in 2000 and jumped to 9% in 2007. This acceleration suggests that the rise of China has not been truncated. Within a few years China will probably the second largest importer of the Netherlands. A large share of these imports is destined for other countries and leaves the Netherlands as re-exports. Imports from Japan, Korea, ASEAN and India together have increased from 5.8% in 1990 to 7.9% of total imports in 2006.

2.1.2 FDI

Foreign Direct Investments (FDI) are investments with the objective of obtaining a lasting interest by a resident entity in one economy in another economy (OECD (1996)). FDI has grown particularly fast, at a much higher rate than trade transactions since the 1980s. FDI flows have increased by about 25% per year on average and trade flows by about 10% (Markusen (2002), UNCTAD (2004)).

Before 1980, foreign direct investment was hardly known. International capital control restrictions and strict national capital market regulation prevented the international integration of capital markets. After the abolishment of these controls FDI started to rise, first slowly but after 1985 it has accelerated with several peaks. The peaks in Dutch inward and outward flows in 2001 can be explained to a large extent by investments of banks and holding companies. The peaks in 2005 and 2007 illustrate restructuring and acquisitions of Dutch major companies (such as Shell and ABN AMRO).

Figure 2.3 Development of Dutch FDI flows (inward and outward)



(Source: DNB)

Outward FDI of the Netherlands is larger than inward FDI (except 2007) which is not surprising for a country of savers. Most of the FDI are mergers and acquisitions, only a small part are new investments, so called greenfield FDI. Most of the FDI flows is destined for services sectors (see Kox *et al.* (2004)). The share of services in FDI becomes comparable to the services share in GDP.

In conclusion, from the 1970s increased openness in Dutch trade particularly enhanced goods trade and re-exports. International trade in services remained modest. Europe remains the Dutch major export destination stimulated by formation of the internal market. 80% of the Dutch exports are regional. For imports it is a little bit different. Europe provides most of the Dutch imports but its share is diminishing in recent years due to the rise of China. Outward and inward FDI started to rise from 1985 and reached unprecedented peaks in 2001, 2005 and 2007. A next step is to examine the patterns of some of the possible underlying causes of the expansion of trade: trade costs.

2.2 Development in trade costs

2.2.1 Global trade policy

Tariffs have been progressively reduced since the existence of the GATT. WTO (2007) claims that the average tariff rate was between 20% and 30% in 1947, and reduced to less than 4% in 2005 for the developed countries. The WTO also considers various tariff level country groups. The Netherlands, Belgium, Luxembourg and some Scandinavian countries belonged to the low tariffs groups with tariff rates of about 10% in 1947. Three factors have helped to lower the import tariffs. First, the formations of the EU and the NAFTA have been important for lowering and even eliminating tariffs. Second, preferential tariff treatment for the least-developing countries has lowered import tariffs in developed countries. Third, the successive GATT rounds exerted a downward pressure on the tariffs. In 1947 23 countries negotiated trade liberalization in Geneva on an item-by-item offer and request approach. This led to a cut in tariff rates of 26% (weighted average). In the Kennedy round in 1963 48 countries participated and a formula approach was used for linear cuts in tariffs leading to a 35% reduction in tariff rates. The succeeding Tokyo round between 1973 and 1979 was also successful in lowering tariff rates with about a third. The tariff rates reached a level of about 6% for manufacturing imports in the OECD countries. It was the first round in which the developing countries participated extensively. 99 countries gathered around the negotiation table and also agreed on voluntary codes of conduct on all non-tariff issues such as quantitative restrictions, subsidies, anti-dumping and countervailing measures, customs valuations and standard and technical regulations (except safeguards).

The Uruguay round between 1986 and 1993 marked a new period. For the first time agricultural trade was substantially covered in the negotiations. Further, the agreement on textiles and clothing aimed to the elimination of export constraints, and the General Agreement on Trade in Services (GATS) and trade-related intellectual property rights (TRIPS) were established. Import tariffs in manufacturing are reduced to 3.8% in the OECD countries. Moreover, the countries agreed to form a new international organisation: the WTO.

These developments show that over time more and more countries have agreed to lower trade barriers and that the coverage over trade-related measures has increased substantially. It has started with import tariffs for manufacturing goods in 1947. Because of substantial cuts in these tariffs these rates are nearly irrelevant in many importing OECD countries now, but lots of other trade-related issues moved to the heart of the negotiation tables on trade-liberalisation.

2.2.2 IM history in a nutshell

In 1957, six countries signed the Treaty of Rome, which established the European Economic Community (EEC). Improving prosperity and closer cooperation between member states are its main aims, and a common market and harmonisation of policies of the Member States its main instruments. In 1968, a customs union was put in place, eliminating bilateral import duties. In addition, a common import tariff applies for imports from third countries. After establishing the customs union, a lack of policy harmonisation proved to be an impediment to further integration. For some time, the main progress came from the European Court of Justice, enforcing mutual recognition of product standards in a number of landmark cases.

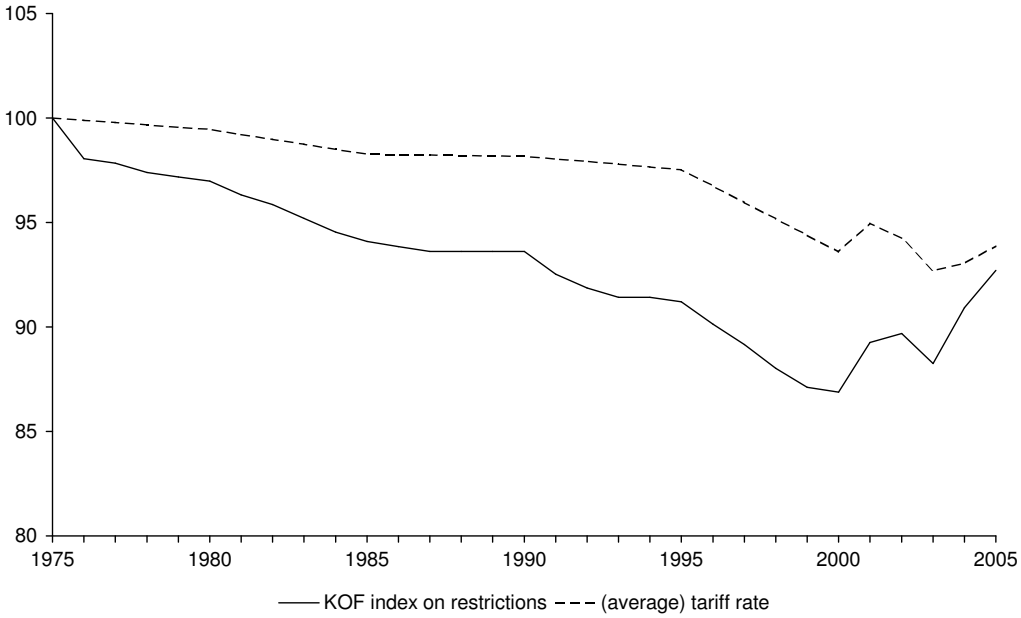
European integration was revitalised by the Single European Act of 1986. It aimed to remove all barriers to trade in goods between the member states by 1992. At that time the EU already consists of twelve Member States. Denmark, Ireland and the UK joined in 1973, Greece in 1981 and Spain and Portugal in 1986. Six years later, the Treaty of Maastricht (1992) provided the foundation for the euro by creating the Economic and Monetary Union. The simplification of payment transactions in the euro zone was a major stimulus to all four freedoms in the first years of this century.

In 2004 and 2007, the internal market expanded from 15 to 27 countries by the accession of the countries in Central and East Europe (CEE), Cyprus and Malta. Currently, the internal market comprises of about 500 million people. Straathof *et al.* (2008) conclude that the internal market has contributed on average 12% of total trade of the EU15 between 1961 in 2005. However the effect is dying out: in 2005 IM only contributed 8% to the trade flows of the EU15.

2.2.3 The implications for Dutch trade policy

Figure 2.4 presents the developments of Dutch import tariffs and the Dutch KOF index on trade restrictions between 1975 and 2005. Both variables are measured by indices with a value of 100 in the starting year and follow a downward pattern. The decrease in import tariffs is fairly limited since 1975. This is not surprising: we have discussed before that the tariffs with the main Dutch importers were already eliminated because of the internal market, or fairly low because of global trade policies. Also the new EU members faced already low import tariffs. After 1995, the average tariff decreased slightly, probably due to the implementation of the agreements of the Uruguay round. The recent rise could be caused by increasing imports from Asia, in particular China, because the imports levies on Chinese goods are higher than on goods from OECD countries.

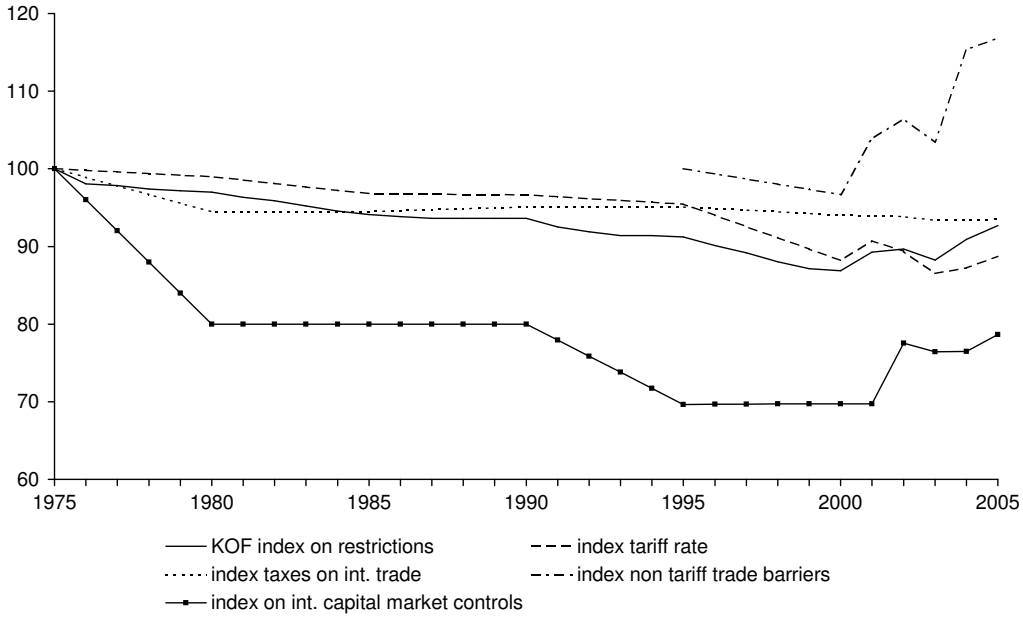
Figure 2.4 Developments in Dutch trade policy



The decline in the KOF index on trade restrictions measures a decrease in overall trade barriers (see Dreher (2006)). Since the year 2000 the decline in the KOF index reversed, due to the steep increase in non-tariff trade barriers and capital market controls. Figure 2.5 presents more details of the KOF index on international trade restrictions.[6] The index combines several sub-indices on direct trade costs and other restrictions: tariffs and taxes on international trade, other regulatory trade barriers, and international capital market controls. Figure 2.5 shows that the international capital controls have severely reduced between 1975 and 1980. However, it took some time before FDI flows accelerated, as Figure 2.3 already showed. Between 1990 and 1995, a part of the remaining restrictions is abolished. After the year 2000, some capital controls were put in place.

[6] The indices are transformed so that a lower index corresponds to more freedom of trade (see footnote 20).

Figure 2.5 Average trends of KOF indices on trade restrictions for the Netherlands



The index of the capital market does not determine the overall effect, although it has the most remarkable development. The index on trade taxes does not vary much over time as is the case for tariffs. Only recently the average import tariff rate has increased. As explained above the shift towards imports from China could be the primary cause of this change. Since 1995 the overall index has a sub index on regulatory barriers. Due to data limitations, this index could not be constructed before. From 2000 and 2003, some new barriers are put in place, including compliance costs of importing and exporting (such as security measures). This shift is not uncommon. In particular for the United States, Gwartney and Lawson (2008) observe a shift to more regulatory barriers to trade, but this shift does also occur for Belgium and the United Kingdom. The index suggests a movement towards less freedom to trade since the year 2000.

2.3 Explaining the growth in goods trade

The world-wide volume of traded goods is fifteen times bigger in 2003 than in 1950 and its share in GDP has tripled (Denis *et al.* (2006)). Krugman (1995) asks for the causes of this unprecedented increase in trade. Baier and Bergstrand (2001) take up the challenge and explain this empirically using a gravity approach for 16 OECD countries between 1960 and 1988. They use GDP, transport costs and import tariffs as explanatory variables in the gravity equation. They conclude that income growth (of the exporting and importing countries) explain 67% of trade growth, tariff rate reductions about 25% and transport costs declines about 8%. Income growth is a broad category. It represents the size of production which determines also the possibilities for trade. Underlying factors are technological improvements and changes in preferences.

Recently, Jacks *et al.* (2008) investigate the impact of transport costs on trade over a much longer time period: from 1870 to 2000. In terms of countries the dataset is much more limited. They also use a gravity approach and develop a trade cost measure which consists of distance, customs revenues, nominal exchange rate volatility, exchange rate regimes and membership of the British Empire. Trade costs include thus transport costs and tariffs. For the period 1950 to 2000 trade costs explain 33% of the growth in trade. The other 67% is due to income growth. These results are similar to Baier and Bergstrand (2001), but for the period 1870 to 1913, Jacks *et al.* (2008) report that trade costs are responsible for about 55% of the trade increase.

Whalley and Xin (2007) use a CGE model to explain growth in world trade. Using 1975 and 2004 data they show that changes in the home bias (that is to say less preference for home produced goods) explain 13% of the growth in trade. Income growth is responsible for 76% of the growth in trade, declining differences in income with trading partners 4% and the remaining 7% is due to falling trade costs.

Recently, Chen and Novy (2008) have challenged the view that income growth is dominant in explaining trade growth. They use a sector approach instead of a macro-economic approach. Their analysis is based on 166 industries for 11 EU countries. They conclude that manufacturing output growth is responsible for 42% of the trade increase between 1999 and 2003 in Europe. The other 58% include changes in transport costs, policy variables and other costs. It suggests that policy factors are relatively more important for these EU countries in that period than in the studies mentioned above, but results are difficult to compare due to different time period and other definitions of variables (like GDP growth and manufacturing output growth).

2.4 The income effects of globalisation

2.4.1 The relation between openness and income[7]

The relation between openness and productivity is a widely researched topic. Many of these cross country studies conclude that there is a positive correlation between (trade) openness and income or productivity. Lewer and Van den Berg (2003) found that a percentage point increase in the rate of growth of international trade increase the growth rate of the economy by about 0.22%. It is hard to believe this is a permanent increase, but even if the income *growth* effect dies out after 10 years, income is about 2.5% larger. Other recent studies focussing on the income *level* found similar effects: one percentage point increase in the share of trade in GDP raises the level of income in the range of 0.9 to 3 percent.[8]

[7] This section relies heavily on Lejour *et al.* (2009).

[8] Examples are Badinger (2005), Frankel and Romer (1999), Frankel and Rose (2002), Wacziarg and Horn Welch (2003) and the overview of Nordas *et al.* (2006).

The causality between openness and income is not undisputed. Most likely it runs from openness to income. Frankel and Romer (1999) tried to pin down the causal relation using instrumented variables and their results also point to that direction. Although the positive relation between openness and income is well established, the relation between trade policy and income is less clear. The reason is that openness is affected by many factors like geography, technological progress, transport and communications. Trade policy is only one of these factors.[9] This does not imply that trade liberalization policies affect income and productivity negatively. Most likely the correlation is positive because trade liberalization increases openness. This conviction is also based on the channels of increased openness to productivity. These channels are described below.[10]

First, increased openness leads to a better allocation of resources. Due to a larger market countries can specialise in products in which they have a comparative advantage. Therefore they are able to use their inputs for production, like labour, and capital, more efficiently. This increases income and productivity. Moreover, competition will also increase as markets are opened up internationally. The least efficient firms can not compete and resources are reallocated to the more efficient firms. This also increases productivity and income. These mechanisms increase productivity in the economy as a whole and within sectors. The productivity of individuals firms can also increase because more competition induces firms to innovate and enhance their competitive advantage vis-à-vis other (competing) firms.

Second, openness increases the effective market size for exporting firms. They have more opportunities to specialise and to exploit economies of scale. For importing firms, a bigger variety of imports is available. Often these imported inputs have lower prices and/or better quality. According to the endogenous growth theory this increase in variety of inputs stimulates productivity.

Third, opening up markets does not only increase productivity directly but also indirectly via investment. Levine and Renelt (1992) have established a robust link between the investment share and ratio of trade to GDP. First, resource allocation of capital to more better performing sectors increases the productivity of capital and stimulates further investment. This is not only the case at the industry level but also at the firm level. Second, increased opportunities for foreign investment (opening up capital markets) also increase the allocation of capital over countries and consequently the return to capital.

Fourth, trade in goods and services and foreign direct investment facilitates the diffusion of knowledge, technology and new ideas. This is one of the contributions of the endogenous growth literature to the trade productivity debate. An open economy (via trade and FDI) has

[9] See Wacziarg and Horn Welch (2003), Lopez (2005), Nordas *et al.* (2006) among others. Rodriguez and Rodrik (2001) and Irwin and Tervio (2002) argue that trade is not a significant determinant of productivity when geography and institutional quality are included.

[10] Some literature resources are Feenstra (2004), Lopez (2005), Nordas *et al.* (2006), and an extensive survey including empirical material of WTO (2008).

more access to technology and knowledge. Technology and knowledge are embodied in traded goods, services and FDI.

The classification of these channels has no clear demarcation and the channels cannot be empirically discriminated, except for the knowledge spillovers of trade and FDI. For example, increased export opportunities and import competition can both affect each mechanism separately. For FDI a similar reasoning applies. Inward FDI increases competition (at the home market) and induces a better allocation of factor inputs and productivity and innovation effects. Outward FDI could increase the market for a firm enabling it to exploit better the economies of scale.11

2.4.2 Income effects of economic integration

Badinger (2005) has developed an economic integration index between 1950 and 2000. It is based on the reduction of import tariffs agreed upon in the negotiations rounds of the GATT, and on the European integration, in particular the elimination of bilateral tariffs and the common external tariff. He estimates a growth regression in which changes in the index is an explanatory variable. Badinger (2005) concludes that about 20% of GDP per capita of the EU15 Member States in 2000 can be ascribed to (European and global) economic integration in which globalisation is confined to goods trade integration. His results for the individual Member States are nearly similar because the changes in the integration index over time are the same for the EU15 members. This is surprising because one would expect that the country differences in the degree of openness have a varying effect on GDP growth.

Denis *et al.* (2006) estimate that the gains from globalisation (where globalisation is also limited to trade openness) have been modest for the period 1990 to 2003 but could accrue up to 8% of GDP for the EU in 2050 (2000 euro per citizen in 2004 prices). The reason for this belated impact on income is that the dynamic effects of globalisation are much more important than the (immediate) static effects. They use a dynamic open-economy model (Quest) to simulate the effects. If they compare their globalisation scenario with an anti-globalisation one, incomes are about 20% lower in the latter scenario.

Bradford *et al.* (2005) estimate the gains from economic integration for the US. They use an OECD estimate of 0.2 between trade exposure (measured by the (lagged) trade openness[12] adjusted for population size[13]) and income growth to determine the long term determinants on countries' growth of per capita income. This elasticity is multiplied with changes in exports exposure per decennium to calculate the income gains. In this period US exports are increased from 8.8% to 23.7%. Eventually Bradford *et al.* (2005) calculates a $5000 payoff, representing 13.2% of the total GDP gains per capita between 1950 and 2003. Bradford *et al.* (2005) also

[11] FDI and trade are also not independent from each other, see Markusen (2002) for the interplay between thee two decisions.

[12] I.e. (import+export) / GDP.

[13] I.e. in order to correct for differences across countries (for instance US and Japan have a lower trade openness than the smaller Singapore). This variable is calculated as the residual of an auxiliary regression of trade openness on the population size and a constant.

measure other aspects of globalisation (such as the benefits of variety, and of competition), but the gains have the same order of magnitude (about 10% of GDP in 2003). Future gains of globalization induced by eliminating non-tariff barriers in goods and in particular services could increase GDP in the US by another 5%.

These sources make clear that the authors use various methods to come to grips with the income effects of globalisation. First of all, it is hard to measure globalisation itself. It is a multi-faced development. Developments like the internationalisation of R&D, offshoring and migration are described, but the income effects of these developments are not estimated at all. In most cases only the income effects of increases in goods trade are estimated. This makes sense because goods markets are one of the most globally integrated markets at all and nice data series exist to quantify effects. For services trade the lack of data is a serious problem. Second, most of these studies do not address the impact of policy on globalisation or to be more specific on goods trade. This is one of the main aims of our study.

3 Factors of trade growth

The analysis in this chapter is based on Baier and Bergstrand (2001) who consider changes in income, transport costs and trade policy as the main explanatory variables for trade growth. Their methodology is updated using the recent insights of Anderson and Van Wincoop (2003) (A-vW) on the role of multilateral resistance factor to trade. Section 3.1 presents the model, data sources and construction of indices and section 3.2 the results for our sample of mainly OECD countries. Section 3.3 presents the results for the Netherlands and section 3.4 discusses some caveats.

3.1 Model, data sources and indices

Let c_{ij} be the consumption of goods from country *i* in country *j*. A-vW assume that consumers in country *j* maximize their utility *u*, which is defined by a CES utility function

$$u_j = \left(\sum_i \left(c_{ij} / \beta_{ij} \right)^{(\sigma-1)/\sigma} \right)^{\sigma/(\sigma-1)} \tag{3.1}$$

subject to the budget constraint

$$\sum_i p_{ij} c_{ij} \leq y_j \,. \tag{3.2}$$

The parameter β_{ij} allows for differences in preferences and the quality of goods across countries, σ is the elasticity of substitution between goods, y_j is a country's nominal income, and p_{ij} is the price of goods produced in country *i* for consumers in *j*. The price of a good is different for consumers in different countries because of trade costs. If p_i is the domestic price of goods produced in *i*, then p_{ij} is the domestic price multiplied by a trade cost factor τ_{ij}, with $\tau_{ij} \geq 1$.

$$p_{ij} = p_i \tau_{ij} \tag{3.3}$$

Assuming $\tau_{ij} = \tau_{ji}$, A-vW show that this framework leads to a 'gravity equation' explaining bilateral trade from the size of the trading economies relative to the size of the world economy (y_W), the trade cost factor specific to the pair of countries, and two multilateral resistance terms (P_i and P_j):

$$x_{ij} = \frac{y_i y_j}{y_W} \left(\frac{\tau_{ij}}{P_i P_j} \right)^{1-\sigma} \tag{3.4}$$

The larger the multilateral resistance terms are, the less attractive it is for countries *i* and *j* to trade with third countries. High multilateral resistance terms relative to the costs of trade between *i* and *j* therefore imply more trade between these two countries.

Each multilateral resistance term is a non-linear function of the multilateral resistance terms of the other countries, their share of the world economy and the trade cost factors:

$$P_j^{1-\sigma} = \sum_i P_i^{\sigma-1} \frac{y_i}{y_W} \tau_{ij}^{1-\sigma} \tag{3.5}$$

The trade costs are composed of various factors such as transport costs and trade policy costs. The latter could be split in import tariffs and membership of a free trade agreement or internal market in case of the EU. We assume that trade costs between country *i* and *j* are a function of these factors in the following way:

$$\tau_{ijt} = (1+t_{ijt})^{\gamma} \; b^{1-EU_{ijt}} \delta_{ij} \tag{3.6}$$

Here, t_{ijt} are the bilateral tariffs between country *i* and country *j* at time *t*,[14] EU_{ijt} is a dummy variable that equals one if both country *i* and country *j* are members of the EU at time *t* and zero otherwise. $b-1$ (with $b>1$) is the trade cost equivalent for trade flows that (partly) fall outside of the EU (excluding tariffs). δ_{ij} captures the effects of all time invariant factors influencing the trade cost for the pair *ij*. We have explicitly modelled bilateral tariffs, and EU membership as determinants of trade costs because these variables explain a part of the growth in trade (see Baier and Bergstrand (2001) and Straathof et al. (2008)).[15]

The empirical equivalent of the gravity equation using the dummy method is given by

$$\ln x_{ijt} = a_0 + a_1 \left(\ln y_{it} + \ln y_{jt} \right) + a_2 \left(1 - EU_{ijt} \right) + a_3 (1+t_{ijt}) + d_{it} D_{it} + d_{jt} D_{jt} + \eta_{ij} + \varphi_{ijt} \tag{3.7}$$

In the expression above $a_2 = (1-\sigma)\ln b$ captures the effect of EU membership, $a_3 = (1-\sigma)\gamma$ the effect of bilateral tariffs. The *D*'s are dummies for each country-year combination and with parameters d_{it}. D_{it} is one if country *i* is the exporting or importing country in the bilateral trade relation at time *t*, and zero otherwise. These dummies ensure that the estimated parameters are not biased because of multilateral resistance. In addition, the dummies absorb variation caused by y_W that is not absorbed by the constant a_0. The unobserved time-invariant characteristics of trade between *i* and *j* is captured by the pair wise fixed effects η_{ij}, which is a transformation of δ_{ij}.[16, 17] This later variable includes all bilateral non-time varying factors, like distance, adjacency, and differences in languages, culture and institutions.

[14] In our alternative specification *t* represents the transformed KOF index of Economic Globalization (data on restrictions). If we could measure bilateral tariffs perfectly as share of the imported value, γ is equal to 1

[15] We neglect bilateral transport costs because there are no reliable data (Hummels (2007)).

[16] The derivation of the relation between δ_{ij} and η_{ij} can be found in Linders and Straathof (2009).

Equation (3.7) is our basic specification. We will use this specification to estimate the impact of income, tariff policy and EU membership on bilateral trade in an OECD country sample. We apply a FE panel estimation with fixed effects for the bilateral dummies and a Hausman and Taylor (1981) estimation. Interestingly, Baier and Bergstrand (2001) use a specification of the gravity equation in differences for various reasons. They have several reasons to use this specification. First, they argue they are interested in changes in tariffs and transport costs as indicators for globalization and assess the role of these indicators for explaining the growth of trade between 1960 and 1988. Second, this estimation strategy solves some possible econometric problems. Following A-vW we confine our specification to (log)levels.

Data sources

To estimate equation 3.7, we combine data of several international databases. The data on bilateral trade are derived from the International Trade in Commodity Statistics (ITCS), maintained by the OECD and the UN. The time period is 1970 to 2005. Additional bilateral data on Dutch re-exports were based on approximations made in Mellens *et al.* (2007). GDP data are from the World Development Indicators (WDI) of the World Bank and completed with additional data from International Financial Statistics of IMF. These data are prepared by Straathof *et al.* (2008). The 33 countries that are included in the OECD country sample are mainly OECD-countries and (former) Central and Eastern European countries. Appendix A provides a list of these countries.

Indices on trade policy

Trade costs are hard to measure: direct measures are scarce. Anderson and Van Wincoop (2004) estimate that transport costs are equivalent to 21% of the production value. Border costs are equivalent to 44% of the production value consisting of policy related costs such as tariffs (8% of production value), language barriers (7%), currency barriers (14%), information cost barriers (6%), and security barriers for rich countries (3%). These are unilateral trade costs measures.[18]

In this study, we use two indicators for trade policy in the analysis: the average import tariff and the KOF index on the restrictions to international trade. The first is a very strict indicator measuring only a part of trade policy costs. The latter is a much wider indicator covering various dimensions of trade policy. The correlation between these two variables is 0.79, which is not surprising as the tariffs rates are incorporated in the overall KOF index.

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[17] Note that the theoretical model of Baier and Bergstrand assumes that firms may treat exports to different countries as imperfect substitutes due to differences in marketing and trade costs. This yields an additional term of the change in income of the exporting country. With this assumption the multilateral resistance terms are related to the firms' aggregate price index that picks up the extent of substitutability of export markets. But for many countries such price indices are hardly observable, so that additional simplifying assumptions are necessary to remove the dependence on firms' price index. In our model, we abstain from the assumption on imperfect substitutability between exporting countries.

[18] Cipollina and Salvatici (2008) discuss extensively all problems in deriving quantitative import protection measures for individual countries.

The import tariffs are the (unweighted) average of import tariffs on various product or product groups, which Gwartney and Lawson (2008) gathered from the databases of the WTO, ITC and UNCTAD, the World Bank and of the OECD. The data on import tariffs are averages across the exporting countries, because there is no sufficient data on the bilateral import tariffs for this time period.[19]

The KOF Index of globalisation provides several indicators on economic globalisation besides other subindices on social and political globalisation (Dreher (2006)). We select the sub-index "data on (trade) restrictions ". This index consists of hidden import barriers, mean tariff rates, taxes on international trade and international capital market restrictions. The data for all these restrictions are taken from Gwartney and Lawson (2008), except taxes on international trade for which World Bank data are used.

We transformed the overall KOF index such that a lower index entails less freedom of international trade.[20] The indicator is available from 1970 onwards, but not all sub indicators are available from the start. Import tariffs are included since 1975, although trade taxes are included from the start. Other regulatory trade barriers are introduced in 1995. This trade policy indicator does not cover all commercial trade policies including export promotion policies and economic diplomacy. For example, Rose (2007) argues that foreign embassies have a significant impact on trade. As long as these bilateral policies are stable over time these are captured by our bilateral dummy and unilateral policies are picked up by the country specific dummies.

3.2 Estimation results

3.2.1 Full country sample

We estimate equation (3.7) with various estimation techniques and for two indices for trade policy. Table 3.1 presents the results if trade policy is represented by import tariffs rates and Table 3.2 the results if the KOF index on trade restrictions is used as trade policy indicator. The first two columns in table 3.1 and 3.2 present fixed effects panel estimations. The bilateral relation is specified as a fixed effect. The third column in both tables present the regression estimated with the Hausman Taylor method.

In table 3.1, the results in the first column show that joint income has a significant positive effect on trade. The coefficient is about 0.5 comparable to Straathof *et al.* (2008). The level of import tariff rates has a significant negative effect on bilateral trade. EU membership has also a

[19] The GTAP dataset does provide import tariffs at the bilateral level, but only for 2001 and 2004.

[20] The reason for this transformation is that this aggregate index is positively formulated, so a higher index entails more freedom of international trade. Following the methodology of the Fraser institute, it is an unweighted average of sub-indices on the underlying determinants, with each sub-index of each determinant defined as $\left(V_{\max} - V_j\right)/V_{\max} * 10$, with V_j the respective variable (for example an average tariff), $V_{\max}$ some prefixed maximum value (see Dreher (2006) and Gwartney and Lawson (2008)). In order to interpret the aggregate index as an indicator for the cost of trade policy, we transformed the aggregate KOF index M^K from the database of the Fraser institute into $\left(1+t_{ij}\right)=\left(1+\left(1-M_j^K/10\right)\right)=\left(2-M_j^K/10\right)$. Then the dimension of a transformed KOF index corresponds to the dimension of (1+ ad valorem tariff rate). Moreover, it is easy to verify that the cost of trade policy $t_{ij}=\left(1-M_j^K/10\right)$ is equal to the average of the relative determinants $V_j/V_{\max}$.

positive significant effect on bilateral trade. The specification in the second column includes year dummies for the exporting countries, to identify the multilateral resistance (MR) terms of the exporting countries. In that case the coefficient for the import tariffs and the EU dummy are smaller, but still significant. It seems that the year- dummies for the exporting countries pick up annual developments which were captured by the EU dummy and tariffs in the first specification.

Table 3.1 Bilateral trade with import tariffs[a]

Determinant (expected sign)	(1)		(2)		(3)	
Joint income (+)	0.517		0.498		0.543	
	(0.013)	***	(0.028)	***	(0.01)	***
Tariff rate (–)	– 4.644		– 2.965		– 2.785	
	(0.462)	***	(0.524)	***	(0.158)	***
Dummy EU (+)	0.149		0.078		0.084	
	(0.034)	***	(0.032)	**	(0.019)	***
Number of observations	24687		24687		24687	
Number of groups	1024		1024		1024	
Degrees of freedom (model)	2		442		474	
R-squared	0.60		0.70		0.69	
F-statistic	1424		100		120	
Rho (serial correlation)	0.88		0.92		0.92	
Method	FE		FE		HT	
Country dummies importing countries	no		no		yes	
Country-year dummies exporting countries	no		yes		yes	

[a] Dependent variable is bilateral trade between any pair of two countries per year. Between brackets standard errors; ***, ** or * indicates significant at respectively 1%-level, 5%-level or 10%-level.

Equation (3.7) also suggests to include year dummies as a proxy of the MR terms for importing countries. But adopting these year-country dummies yields ambiguous estimates for the coefficients on tariff rates and the EU dummy. The reason is that the year dummies for importing countries highly correlate with their import tariffs and the EU dummy, and thus remove the trends of both trade policy variables.

A second best solution is to include time-invariant country dummies as a proxy of the MR terms of importing countries, but this is not possible with our FE estimation on bilateral effects. Fortunately, the Hausman Taylor method[21] leaves the time-invariant country dummies unabridged while adjusting the other variables for the bilateral fixed effects. Still, the country dummies may not only pick up the MR terms, but also the country specific effects of the policy variables.

[21] This method, proposed by Hausman and Taylor (1981), is based on instrumental variables (see also (Verbeek (2004)). It is used in panel-data random-effect models in which some time-variant *and* time invariant covariates are correlated with the unobserved individual-level random effects. These individual effects are filtered out by taking appropriate instruments and thus leave all time-invariant variables in tact, in contrast to FE.

The third column in table 3.1 presents a specification that includes country dummies for the importing countries and is estimated with Hausman-Taylor. Moreover, we also add year-country dummies for the exporting countries as in the second specification. The results are comparable to these on the second column, but the standard errors are substantially smaller.

As indicated above the tariff rates of importing countries are only a narrow indicator ignoring non-tariff barriers among others. Table 3.2 repeats the three regressions for a boarder trade policy indicators: the KOF index on trade restrictions. In all regressions trade restrictions has a significant negative impact on bilateral trade. The coefficient in the first regression has the largest absolute size, for the same reasons as the coefficient for import tariffs. The EU dummy is only significant in the first regression, the coefficient collapses in the second and third regression. It could be the case that the KOF index also captures a part of internal market policy on non-tariff barriers and capital market integration which is not the case with the import tariffs.

Table 3.2 Bilateral trade with the KOF index

	(1)		(2)		(3)	
Joint income (+)	0.556		0.485		0.517	
	(0.011)	***	(0.024)	***	(0.008)	***
KOF index on restrictions (–)	– 1.770		– 1.298		– 1.178	
	(0.213)	***	(0.224)	***	(0.085)	***
Dummy EU (+)	0.134		0.020		0.034	
	(0.038)	***	(0.040)		(0.020)	
Number of observations	32549		32549		32549	
Number of groups	1056		1056		1056	
Degrees of freedom (model)	2		494		527	
R-squared	0.67		0.73		0.71	
F-statistic	2085		121		163	
Rho (serial correlation)	0.83		0.88		0.86	
Method	FE		FE		HT	
Country dummies importing countries	no		no		yes	
Country-year dummies exporting countries	no		yes		yes	

[a] Dependent variable is bilateral trade between any pair of two countries per year.. Between brackets standard errors; ***, ** or * indicates significant at respectively 1%-level, 5%-level or 10%-level.

3.2.2 Results for the Netherlands

In a second step, we focus on the Netherlands. We estimate the gravity equation (3.7) with interactions terms to discriminate between Dutch trade and Dutch trade policy on the one hand and non-Dutch trade and non-Dutch trade policy on the other hand. Trade policy is represented by import tariffs and the KOF index on restrictions. Moreover, we consider two cases for Dutch trade: including and excluding re-exports.[22] The latter case is an estimated correction for re-exports for bilateral trade flows related to Dutch exports and Dutch imports. Table 3.3 presents thus the results of four regressions, all estimated with Hausman-Taylor and year-country dummies for the exporting countries.

Table 3.3 Bilateral trade with interactions on (non-) Dutch trade[a]

	(1)		(2)		(3)		(4)	
Including or excluding re-exports	including		excluding		including		excluding	
Joint income (+)	0.532		0.477		0.511		0.510	
	(0.01)	***	(0.01)	***	(0.008)	***	(0.008)	***
Tariff rate: Dutch trade (–)	– 2.542		– 2.432					
	(0.169)	***	(0.209)	***				
Tariff rate: non-Dutch trade (–)	– 2.792		– 2.923					
	(0.158)	***	(0.157)	***				
KOF index: Dutch trade (–)					– 1.459		– 0.509	
					(0.240)	***	(0.241)	*
KOF Index: non-Dutch trade (–)					– 1.172		– 1.244	
					(0.086)	***	(0.086)	***
Dummy EU: Dutch trade (+)	0.166		0.000		0.171		0.093	
	(0.052)	***	(0.052)		(0.060)	***	(0.060)	
Dummy EU: non-Dutch trade (+)	0.074		0.069		0.009		0.014	
	(0.02)	***	(0.02)	***	(0.021)		(0.021)	
Number of observations	24687		24687		32549		32549	
Number of groups	1024		1024		1056		1056	
Degrees of freedom (model)	476		476		529		529	
R-squared	0.70		0.66		0.70		0.71	
F-statistic	120		117		163		161	
Rho (serial correlation)	0.92		0.98		0.86		0.86	
Method	HT		HT		HT		HT	
Country dummies importing countries	yes		yes		yes		yes	
Country-year dummies exporting countries	yes		yes		yes		yes	

[a] Dependent variable is bilateral trade between any pair of two countries per year. Between brackets standard errors; ***, ** or * indicates significant at respectively 1%-level, 5%-level or 10%-level.

[22] Indeed, section 2.1 revealed that the re-exports comprehend the major part in the growth of Dutch total trade. However, re-exports have only a minor impact on the Dutch GDP, because re-exports only generate additional value added of trading and transporting firms.

The coefficients of the import tariffs, KOF index and EU dummy for non-Dutch trade are similar to the ones in Table 3.1 and 3.2. This is not surprising, because only a minor part of the observations deals with Dutch trade. For only Dutch trade, the coefficients for the tariff rates are somewhat smaller, but that is not the case for the coefficients of the EU dummy. It is much larger with Dutch trade including re-exports, but it disappears if the data are corrected for re-exports.

In the third and forth regression with the KOF index on trade restrictions, the differences with and without Dutch re-exports become even bigger. For trade without re-exports, the coefficient for the KOF index becomes much smaller. The coefficient for the EU dummy becomes smaller and even insignificant. Further, the increase in re-exports (see Figure 2.1) is also probably related to the deepening of the internal market and could therefore explain the larger coefficient for Dutch trade including re-exports. The differences in coefficients for trade policy are much harder to explain. Additional regressions reveal that the differences in the coefficients for the EU dummy related to re-exports do not appear if year-country dummies for the exporting and importing countries are included (without trade policy). Because the corrections for re-exports are based on estimates and not on observations for re-exports we rely more on the Dutch trade data with re-exports than without. Therefore, we consider the results of regressions (1) and (3) in Table 3.3 as our benchmark estimates.

3.3 Contribution of trade policy

Based on the regression coefficients, we calculate the contributions of each determinant to the (average) growth of trade, which are presented in regressions (3) of Table 3.1 and Table 3.2 and regressions (1) and (3) in Table 3.3. These contributions give a more accurate view in the relevance of the determinants, because they also consider the actual size and direction of the changes in the determinants. Technically, the contributions are defined as average growth of each determinant multiplied by its elasticity on trade (i.e. respective estimated parameter). Note that the growth figures of trade and the contributions of the underlying determinants are only based on the data used the regressions. Table 3.4 presents the results for the OECD countries in the sample, the EU-15 and the Netherlands. In all cases the growth in income explains more than 80% of the growth in trade. Tariff rates explain 8% to 9% of trade growth and EU membership nearly nothing. If trade policy is represented by the KOF index the contribution of trade policy to trade growth is slightly lower and for Dutch trade without re-exports substantially lower.

Baier and Bergstrand (2001) confirm the major impact of income increases on trade growth, but also point to a (relatively) higher impact of tariff reductions and transportation costs. They find that income growth explained 67 % of the total trade growth, tariff reductions about 26% and reductions in transportation costs about 8%.

Table 3.4 Contributions of determinants on trade growth

	OECD countries	EU-15 countries	Netherlands (incl. re-exports)	Netherlands (excl. re-exports)
Annual trade growth (1976-2005)	9.20	9.09	8.64	7.44
Contributions of joint income	8.17	7.95	7.36	6.60
	(88.81)	(87.43)	(85.19)	(88.69)
tariff rates	0.84	0.78	0.65	0.62
	(9.15)	(8.53)	(7.47)	(8.3)
joint EU-membership	0.08	0.11	0.19	0.00
	(0.87)	(1.18)	(2.25)	(-0.01)
Unexplained	0.11	0.26	0.44	0.22
	(1.17)	(2.87)	(5.10)	(3.02)
Annual trade growth (1971-2005)	10.64	10.52	10.31	9.21
Contributions of joint income	9.01	8.88	8.62	8.60
	(84.69)	(84.41)	(83.62)	(93.3)
trade policy (KOF index)	0.67	0.63	0.73	0.26
	(6.34)	(5.98)	(7.11)	(2.77)
joint EU-membership	0.03	0.04	0.23	0.12
	(0.31)	(0.41)	(2.19)	(1.34)
Unexplained	0.92	0.97	0.73	0.24
	(8.67)	(9.2)	(7.08)	(2.59)

[a] Average annual trade growth in percentages, contributions of determinants to trade growth in percentage-points (between brackets contribution as percentage of annual trade growth).

Surprisingly EU membership hardly contributes to the growth in trade. This seems at odds with the importance of the internal market as emphasized in the empirical analysis of Straathof *et al.* (2008), but it is not. First, Table 3.1 measures the average effect for all bilateral trade flows in the sample including many non-EU countries such as the US and Japan. For the EU countries the contribution of the dummy will probably be two or three times as large. Second, our analysis starts in 1970 (or even 1975 for the tariffs) because of the data availability of the indicators of the KOF index, while the internal market study of Straathof *et al.* (2008) starts in 1960. Between 1960 and 1970 the six original members made a lot of progress in eliminating their internal barriers.[23] 6% of total EU-trade can be attributed to the improvement of IM in the period 1961 and 1970. This is about half of the average EU-trade effect of 12% in the period 1961 to 2005. Third, the indicators for tariff rates and KOF index on restrictions also capture some internal market effects.

Concluding the EU dummy in the current analysis is not a good indicator for measuring the EU effect on trade. For that analysis we refer to Straathof *et al.* (2008). The modest impact in

[23] We re-estimate some regressions in Straathof *et al.* (2008) for the period 1970 to 2005. Then the coefficient of the EU dummy is substantially smaller indicating a smaller effect of the internal market on bilateral trade.

this study can be explained by the starting year of the sample, the country coverage and the other trade policy indicators which already capture a part of the EU effect.

The percentages in Table 3.4 give some indication of the importance of various determinants of trade growth. It is however a crude measure because the values of the regression coefficients are interpreted as average effects while these do present marginal effects. For a more accurate analysis of the importance of trade policy including EU membership on trade growth we conduct a treatment analysis. We use the framework of Anderson and Van Wincoop (2003) to calculate the counterfactual trade flows if trade policy would not have been changed since 1970 (KOF index) or 1975 (import tariffs). We use the systems of all gravity equation (3.7) with the estimated coefficients to calculate the trade flows with the initial trade policy constant over time. The advantage of this method is that we also assess the impact of these policies on trade with and between other countries. We aggregate all counterfactual trade flows for the OECD countries, the EU-15 and the Netherlands with and without re-exports. Figure 3.1 to Figure 3.4 present the results, i.e. with each figure on the left including the counterfactual of tariff reductions and each figure on the right including the counterfactual of trade policy.

Each figure depicts the openness of countries as ratio of exports and import divided by GDP on the left-hand vertical axis. Because the numerical differences between the actual and counterfactual openness without policy are hard to read, the right-hand vertical axes present the differences. Without changes in trade policy, trade openness in the OECD countries would be 4%-points to 5%-points lower the actual openness (see Figure 3.1). Trade openness would hardly have been increased without less restrictive trade policies. The difference in results between trade policy and tariffs is due to the increase in non-tariff barriers since the year 2000. For the EU-15 we see a similar pattern in Figure 3.2. Initial openness is already higher and liberalised trade policy has helped to increase openness by 7%-points to 9%-points. Compared to the CPB study to the benefits of the internal, the increase in openness is about twice as large. Putting it differently, about half of the trade gains are due to the internal market in goods. For the Netherlands trade openness increase with nearly 16%-points (see Figure 3.3). The relative contribution of liberalising trade policies since the 1970s is comparable to the OECD and EU-15 because initial openness in the Netherlands is much higher, 60% in 1975. Combining these results with those in Table 3.4 we conclude that liberalising trade policies has helped to increase trade openness. Without changes in these policies the increase in trade openness would have been substantially lower. This does not change the fact that income is the main determinant of trade growth. Income growth have helped to stabilise the level of trade openness and even increased it slightly.

Figure 3.1 Contribution of trade policy to OECD trade

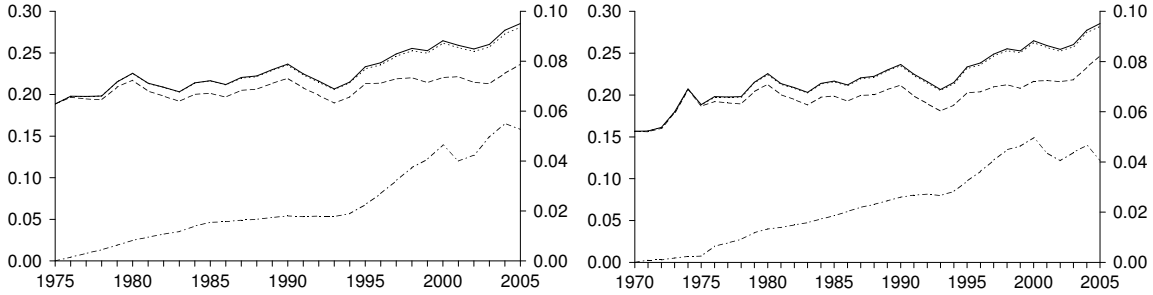


Figure 3.2 Contribution of trade policy to EU-15 trade

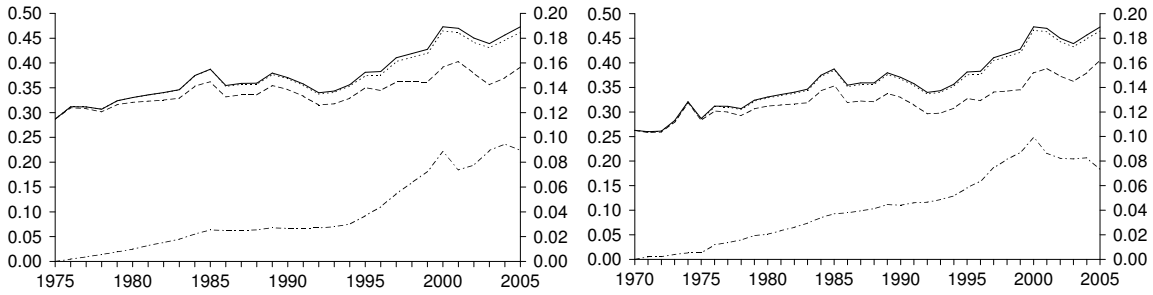


Figure 3.3 Contribution of trade policy to Dutch trade

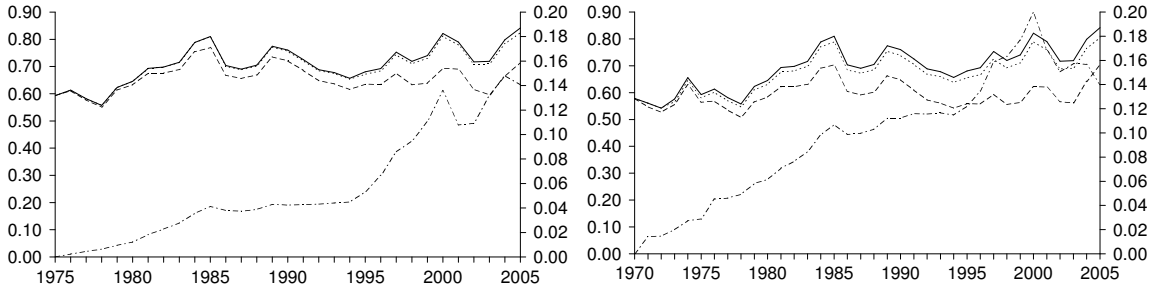
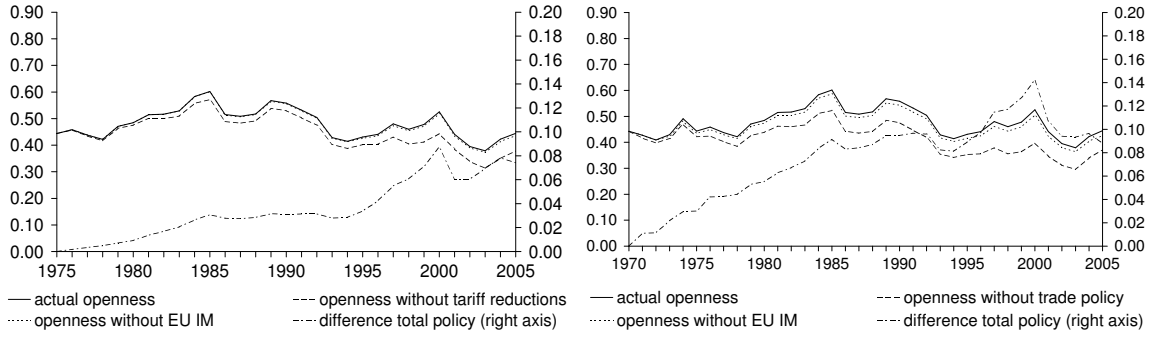


Figure 3.4 Contribution of trade policy to Dutch trade excluding re-exports



We are also interested in the increase in Dutch openness without re-exports. To calculate the counterfactual we use the coefficients of the regression including re-exports. Actual openness without re-exports is of course much lower and Figure 3.4 shows that it remains more or less constant over time. Without trade liberalisation it would have dropped substantially, i.e. about 8%-points. If we compare these results to Straathof *et al.* (2008) the increase in openness due to trade policy is slightly larger than the benefits from the internal market. The internal market would contribute to about 80% of the trade increase of liberalised Dutch trade policies. This is a remarkable difference compared with the impact of the internal market on EU-15 trade openness in goods. The main reason for this difference is that 80% of Dutch exports are directed to the internal market and 70% of the imports come from other EU countries. For the EU as a whole only half of total trade is intra-EU trade. Because the share of non-EU trade is much larger global trade policies excluding the internal market have a much larger impact on trade openness in the EU than in the Netherlands.

3.4 The robustness of the estimation results

3.4.1 Multilateral resistance terms

In recent years, many papers have discussed the appropriate methodology of estimating the multilateral resistance terms in the gravity equation (see also Straathof et al. (2008)). The Bonus-Vetus method of Baier and Bergstrand (2009) and the fixed effect estimations with year-country dummies in panel data are some examples. These methods are often applied to estimate free trade agreements, a bilateral variable. However, our main variable of interest is trade policy in the importing country, a unilateral variable. The Bonus-Vetus method does not work for unilateral variables and we can also not include year-country dummies for the importing country because these correlated with tariff policy. Only a fixed country dummy with the Hausman-Taylor approach is possible. For these reasons, our results could be biased because we can not capture these multilateral resistance terms in the importing country. Whether this bias has in practice a large effect on the coefficients remains to be seen. In the regressions above our preferred regression is the Hausman-Taylor estimation. With year-country dummies of the exporting countries the coefficients are also smaller.

3.4.2 Endogeneity issues

The literature suggests that trade policy is not exogenous. For various (econometric) reasons trade policy could be correlated with the error terms in the regressions due to omitted variables or a simultaneity bias.

First, we discuss the possibility of omitted variables. The political economy of trade policy is widely investigated, and also a possible endogeneity bias of trade policy in gravity equations has received some attention in recent years. Baier and Bergstrand (2004) conclude that economic size of both countries, distance and adjacency determine the likelihood of a free trade

agreement (FTA) between two countries. These are the same variables that determine the size of bilateral trade flows. Moreover, they argue that unmeasurable domestic regulations which hamper trade could be part of the unobserved heterogeneity in trade flows. These regulations and unobserved heterogeneity could also determine the possibility of an FTA. In the case of domestic regulations, this unobserved variable has a negative impact on trade and thus on the error term. If a high level of regulation increases the chances of an FTA, because the FTA could induce large welfare gains by lowering regulation, the intensity of regulation and the possibility of the FTA are positively correlated, suggesting that the FTA and the error term are negatively correlated. Then the impact of the FTA tends to be underestimated. Baier and Bergstrand (2004) believe that this could be an important source for endogeneity. In particular, they are convinced that the likelihood of an FTA is related to the level of trade.

Second, the openness and growth literature suggests a possible endogeneity bias due to the simultaneity between GDP and exports, see Frankel and Romer (1999), Irwin and Tervio (2002) among others. However, it is not likely that this endogeneity is a problem in gravity equations explaining bilateral trade. First of all, GDP is partly determined by net exports, the relation with gross exports is much weaker. Second bilateral trade is only a modest share of total trade, which weakens the relations with GDP further. Third, the literature on openness and income that has corrected for the endogeneity using instrumental variables concludes that this seems not to be a serious problem (see Frankel and Romer (1999) and Irwin and Tervio (2002)), although it is always difficult to find proper instruments for IV estimates.

Most of these econometric issues are solved in a panel estimation of the gravity equation. First, the country and bilateral unobserved heterogeneity can be identified with country and bilateral dummies as long as the heterogeneity is time invariant. Second, country-specific time variance is picked up by the year-country dummies for the exporting countries. Only for time-varying heterogeneity in the bilateral relation our estimations are not corrected. However, the empirical results of Baier and Bergstrand (2004) suggest the level of bilateral trade does not affect future FTAs. Moreover, our Hausman-Taylor estimations instrument unilateral trade policy and correct for endogeneity. We conclude the possible endogeneity of trade policy does not affect our results seriously.

3.4.3 Exchange rate effects

The literature also argues that the developments or the variability of the exchange rates could affect bilateral trade. Exchange rate developments are already captured by the time-varying country dummies. The volatility of exchange rates could have an impact on trade. The literature provides mixed evidence. Some papers do not find a significant effect of exchange rate volatility on trade, others find conflicting evidence (Dell'Ariccia (1998)). Dell'Ariccia (1998) concludes that exchange rate volatility has a negative impact on trade in a sample of western European countries between 1975 and 1994. However, the quantitative effect on trade

is small. A total absence of volatility could have increase bilateral trade by 3 to 4 percent. Because of these limited effects, we have not exploited this issue further.

Endogeneity issues and the absence of modelling exchange rates do probably not affect our estimation results significantly in our view. It is rather unfortunate that we can not correct for all multilateral resistance terms (of the importing countries) in our estimations. It is not clear whether multilateral in which way the multilateral resistance would affects the estimation results in particular the coefficients on trade policy, but it can not be excluded that the effects of liberalising trade policy between 1970 and 2005 would have a smaller impact on trade openness.

4 Which factors drive FDI ?

FDI has grown much faster than trade transactions since the 1980s. For many firms FDI and foreign sales are a more important mode for internationalization than trade. The rise of FDI is a global phenomenon. We are interested in the drivers of FDI growth, in particular those related to policy. We specify an empirical model, based on recent theories explaining foreign direct investment, which has much overlap with the gravity model.

4.1 Model and data sources

Model

The empirical model for bilateral trade can theoretically derived from the Anderson and Van Wincoop (2003) model. This is not the case for bilateral FDI. There are various theories for explaining FDI, lacking a coherent framework. Although the literature on FDI is not conclusive, it predicts that FDI is affected by three main factors: market size, trade costs and factor endowments. With some of these theories we can derive a gravity framework for explaining the size of FDI. Many empirical studies have successfully used the gravity model to estimate FDI flows.

Helpman (1984) and Markusen (1984) suggest that FDI decisions are motivated by trade barriers and by access to cheap labour (factor endowments). Brainard (1997) shows empirically that the share of total foreign sales that are exported depends negatively on these trade costs like transport costs and tariffs using US data. Markusen *et al.* (1996) develop a knowledge-capital model, which is more complex. The implications of this model are that FDI is influenced by the traditional gravity variables like market size and trade frictions, as well as by factor endowments. Carr *et al.* (2001) test empirically the hypotheses of this model for the US. In their empirical specification the amount of affiliate sales depends on the GDP of both countries, the trade costs, the FDI costs, and differences in factor endowments labelled as skill differences. They conclude that trade costs, factor endowments and market size matter.[24]

We will use a similar specification as Carr *et al.* (2001). Market size is measured by GDP in both countries and FDI costs by various indicators measuring the freedom of capital movements and firm entry on (foreign) markets. We include productivity differences as proxy for differences in skills. Except market size we control for differences in market size by introducing a GDP-gap between both countries in the equation. We exclude trade costs such as tariff rates because these are mainly relevant for trade. Indirectly trade costs could have an effect on FDI (Brainard (1997)), but we include this relation by introducing the bilateral trade flows as explanatory variable in the regression. The full equation then reads as:

[24] However, the evidence for vertical motivated FDI (factor endowments) was criticised because of the specification of the skill differences variable (Blonigen *et al.* (2003)).

$$\log FDI_{ijt} = b_0 + b_1 \log\left(y_{it}\, y_{jt}\right) + b_2 EU_{ijt} + b_3 \log M_{jt}^{ce} + b_4 \log(prod_{it} / prod_{jt}) + b_5 \log(y_{it} / y_{jt}) + b_6 \log(trade_{ijt}) + b_{7a} D_{it} + b_{7b} D_{jt} + \varepsilon_{ijt} \quad (4.1)$$

with

FDI_{ij}	FDI stock from country *i* to *j*
M_j^{ce}	indicator on the freedom of capital movements and firm entry
$prod$	labour productivity in country *i*

We expect that the parameters b_1, b_2 and b_3 are positive. The parameter related to trade (b_6) can be positive (pointing to FDI as a complement for trade) or negative (suggesting substitution between trade and FDI). A positive correlation between FDI and trade may refer to the increasing relevance of intra-concern trade and outsourcing. We also control for the differences in labour productivity. A relative low labour productivity in the host country indicates relatively low wages which makes vertical FDI more attractive. In that case we expect a positive sign (b_4). Sometimes, low productivity could also be interpreted as a lack of absorptive capacity, but this is not expected to be the case in this country sample with mainly OECD countries. Differences in GDP between the parent and the host country point to differences market size. We expect that (b_5) has a negative sign because a relatively small market hampers FDI.

Data sources and definition of indicators

To estimate the effects of globalisation on FDI we use data on bilateral FDI stocks, derived from the OECD. Preferably we would use sales from an affiliate at a foreign market to measure the impact of firms at foreign markets, but these data are hardly available except for the US. The alternative is FDI data, because the size to the foreign investment stock is closely related to production and sales abroad. The database contains bilateral FDI stocks between 30 reporting OECD countries.[25] In principle there are 870 observations for each year, but the data are not complete for all country-pairs. This is most often the case in the 1980s. We use the stock values reported by the host country, because these values are considered to be more reliable than those of the partner country. When a host country does not report a FDI stock we use the reported value by the partner country.

The developments in the freedom of capital movements and entry on foreign markets are captured by two indicators of the Fraser institute (see Gwartney and Lawson (2008)):

- Index on international capital market controls, assessing countries' restrictions on foreign ownership and their controls on international capital movements.
- Index on (general) capital market regulations, reflecting the extent of competition on the (domestic) capital market and conditions for credit granting.

[25] The non-OECD partner countries have been removed, because many data any missing.

The first index focuses on restraints on international capital movements, and is only relevant for foreign investors. This index is also a sub-indicator in the KOF index on trade restrictions. The last indicator refers to general impediments on firm entry and access to financial markets, and thus hold for both domestic and foreign investors. Both indices are positively formulated, so a higher index points to better conditions for FDI.

4.2 Results for all countries

Regression results

Table (4.1) present the regressions results of four specifications using the Hausman-Taylor estimation method.. The baseline variant, i.e. variant (1) in Table 4.1, only includes the joint income (representing market size), the impact of capital market regulation and a EU dummy. All variant also include countries dummies for the importing countries and country-year dummies for the exporting ones. The results suggest that joint income and less capital market regulation in the host country significantly enhances inward FDI. EU membership also has a positive effect on bilateral FDI as is also concluded by Straathof *et al.* (2008).

We have added other explanatory variables to the baseline specification in Table 4.1 to test the robustness of the results. These variables are bilateral trade, the productivity gap between the parent and host country and the difference in market size measured by the GDP gap. In all these variants the basic results still hold. Higher income stimulates FDI between both countries as does better capital market regulation and EU membership. All coefficients are significant and positive, and hardly change compared to the baseline specification.

The second variant in Table 4.1 suggests that more trade between countries might also induce higher FDI. The coefficient is positive and statistically significant. In that case firms in a parent country likely trades via intra-firm trade and sell their products by their subsidiaries or selling points in the host country. This suggests complementarity between goods trade and FDI, confirming the results in the literature (Fontagné (1999)).

Variant (3) adds the productivity gap between the parent and host country. The negative and strongly significant sign suggests that a relatively higher productivity in the parent country diminishes FDI. This makes sense because products can be more efficiently produced in the parent country. Moreover, low productivity in the host country could also indicate a lower level of human capital and less absorptive capacity for receiving FDI. The negative sign of the differences in GDP in variant (4) of Table 4.1 suggests that a relatively smaller market size in the host country could hamper FDI, but this effect is not statistically significant.

Table 4.1 Regression of FDI stocks: impact of capital market controls[a]

	(1)		(2)		(3)		(4)	
Joint income (+)	0.654		0.531		0.504		0.636	
	(0.057)	***	(0.061)	***	(0.069)	***	(0.072)	***
Index capital market regulation (+)	1.304		1.176		1.214		1.298	
	(0.069)	***	(0.074)	***	(0.073)	***	(0.07)	***
Trade flow (+/–)			0.205					
			(0.033)	***				
Productivity-gap parent vs host (+/–)					– 0.383			
					(0.096)	***		
GDP-gap parent vs host (+/–)							– 0.041	
							(0.095)	
EU dummy (+)	0.347		0.338		0.339		0.347	
	(0.053)	***	(0.053)	***	(0.053)	***	(0.053)	***
Number of observations	9397		9385		9397		9397	
Number of groups	641		641		641		641	
Degrees of freedom (model)	365		366		366		366	
R-squared	0.40		0.38		0.40		0.40	
F-statistic	38		38		38		38	
Rho (serial correlation)	0.92		0.91		0.94		0.92	

[a] Estimation method: Hausman-Taylor with countries dummies for the importing countries and country-year dummies for the exporting countries. Dependent variable is FDI-stocks for any country per year. Between brackets standard errors; ***, ** or * indicates significant at respectively 1%-level, 5%-level or 10%-level.

We have also estimated the variants in Table 4.1 with fixed effects. Table 4.2 presents the basic variant with fixed effects in the first column. All results holds and the estimated coefficients deviate hardly form the ones with fixed effects. Only the significance of the trade flow in variant 1 is smaller, but still significant at the 90% level.

Instead of capital market regulation we have also used international capital market controls from the Fraser institute as indicators on the freedom of capital movements. The last three columns in Table 4.2 present the results for the basic specification, with trade flow and the productivity gap. These regressions provide also significant results, and the estimated coefficients are more or less similar to the ones in Table 4.1. Only if we use the fixed effect method the index of international capital controls is not significant. Because the index on capital market regulation seems to be more robust for various estimation methods we decided to use this policy variable for calculating the policy impact on FDI stocks.

Finally, note that the index of capital market regulation in the host country may also pick up the effects of other policy variables of the host country like corporate tax rates or other national regulations which stimulate FDI.

Table 4.2 The impact of capital market regulation on FDI stocks[a] (dummies for only parents)

	(1)		(2)		(3)		(4)	
Joint income (+)	0.656		0.633		0.494		0.513	
	(0.078)	***	(0.057)	***	(0.062)	***	(0.068)	***
Index capital market regulation (+)	1.304							
	(0.176)	***						
EU dummy (+)	0.339		0.419		0.397		0.411	
	(0.085)	***	(0.053)	***	(0.053)	***	(0.053)	***
Index international capital market (+)			0.141		0.134		0.122	
			(0.049)	***	(0.049)	***	(0.049	***
Trade flow (+/-)					0.221			
					(0.04)	***		
Productivity-gap parent vs host (+/–)							– 0.312	
							(0.097)	***
Number of observations	9367		9150		9146		9150	
Number of groups	641		641		641		641	
Degrees of freedom (model)	304		365		367		366	
R-squared	0.60		0.33		0.38		0.33	
R-squared within	0.60							
F-statistic	266		35		41		35	
Rho (serial correlation)	0.9		0.93		0.92		0.94	

[a] Estimation method first column: (bilateral) fixed effects with year-country dummies for exporting countries. Estimation method second to fourth column: Hausman-Taylor with dummies for the importing countries and year-country dummies for the exporting countries. Dependent variable is the FDI stock of any country per year. Between brackets standard errors; ***, ** or * indicates significant at respectively 1%-level, 5%-level or 10%-level.

Contributions to FDI growth

The first column of Table 4.3 presents the contributions of joint income, capital market regulation and EU membership on FDI stock growth for all countries based on the regression of the base line variant (1) using the Hausman-Taylor estimation method in Table 4.1. It indicates that the average growth of FDI across all countries mounted up to 18% per year. Reduced capital market regulation has a significant impact on the substantial growth of FDI, as it contributes for nearly 9% to FDI growth. The role of EU membership is limited to 2%. Increases in joint income explain about 46% of the FDI-growth. A large part of the growth in FDI-stocks, about 43%, can not be explained by these variables. A part of this unexplained share consists of country-specific effects.

For the Netherlands, the growth of outward FDI (19.1% per year) was slightly higher than the growth in inward FDI (17.4% per year). Reductions of capital market constraints in the receiving countries contributed at most 7%-point to outward FDI. But the capital market regulations in the Netherlands hardly changed and even deteriorated slightly, and which seems to have no impact on Dutch inward FDI.

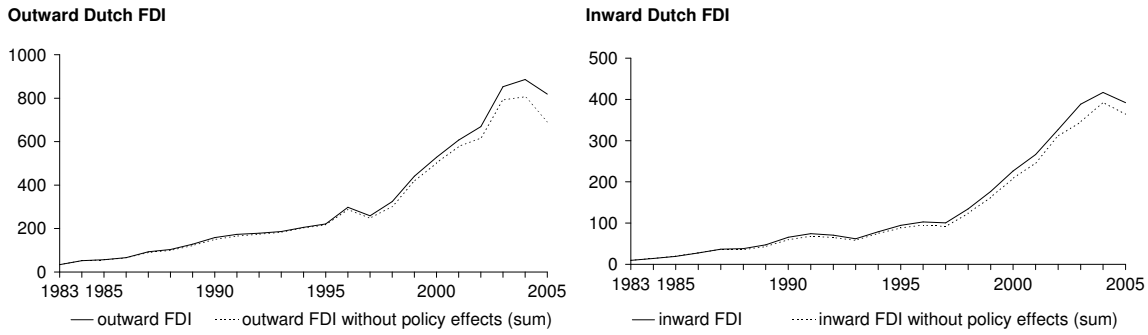
Table 4.3 Contributions to average growth of Dutch FDI's [a]

	Total FDI OECD		Outward Dutch FDI		Inward Dutch FDI	
Growth FDI-stock	18.6	(100)	19.1	(100)	17.4	(100)
Contributions of Joint income	8.5	(45.6)	8.3	(43.2)	8.3	(47.5)
Capital market regulation	1.7	(9.1)	1.4	(7.3)	– 0.1	(– 0.4)
EU dummy	0.4	(2.4)	0.5	(2.8)	0.5	(3.0)
Unexplained	8.0	(42.9)	8.9	(46.7)	8.7	(49.9)
Period	1983-2005		1983-2005		1983-2005	

[a] Average growth of total FDI stocks, outward FDI stocks and inward FDI stocks in percentages, contributions of determinants to the respective growth in percentage-points (in brackets as percentage of the respective growth).

The results in Table 4.3 only give a rough indication of the policy effect on the level of the FDI stocks. Theoretically the coefficients of the regression represent marginal effects while we interpreted these as average effects. Therefore we have calculated the Dutch inward and outward FDI stocks if capital market regulation and EU membership would not have been changes since 1983. We have used the regression results of the basic variant in Table 4.1 to calculate the counterfactual bilateral FDI stocks from and to the Netherlands without any policy changes over time. Aggregating the inward and outward stocks leads to the graphs in Figure 4.1. The lower lines in both graphs represent the FDI stocks without policy change between 1983 and 2005. The Dutch outward FDI stocks would have been 15.5% lower in 2005 and the Dutch inward stock 7.1%. It is not surprising that the effect on Dutch inward FDI is much smaller because capital market regulation in the Netherlands hardly changed.

Figure 4.1 Impact of capital market restrictions and EU internal market on Dutch FDI stocks (in billion US$)



Concluding, policies like capital market regulation and the internal market of the EU had a significant, but modest impact on the growth of FDI stocks between 1983 and 2005. The rise in GDP was the major impact on the internationalization of firms whether trade or FDI is the mode of delivery.

5 The impact of globalization on income

This section investigates the effects of increased openness resulting from changes in trade policy on GDP per capita in the Netherlands. We calculate the effects of trade policy on income in two steps. In the first step we regress income per capita of all countries on openness (measured by exports and imports divided by GDP), thereby controlling for differences in their investment rate and their growth of effective labour. In the second step, we calculate the contribution of liberalised trade policy between 1970 and 2005 on the Dutch GDP per capita growth. In fact, we combine the estimated income-elasticity from the regression in the first step with the counterfactuals of openness that accrue from the changes in trade policy (presented in Figures 3.3 to 3.4). We compare these effects with similar income effects for the EU and other OECD countries. We measure the effects of trade policy indirectly through the induced changes in trade.

We focus on the effects of increased trade and not on FDI because we lack a well established research framework to analyse the income effects of FDI. Moreover, the developments in trade and FDI show similar patterns since the 1980s. In particular for manufacturing it seems that FDI and trade are complementary developments (Fontagné (1999)).

5.1 The relation between openness and income per capita

Model

For the first step, we use regression results of Straathof *et al.* (2008). Starting from an augmented Solow model, the model first derives an expression for the steady state level of the income per "unit of effective labour". Following Frankel and Romer (1999) and Frankel and Rose (2002) among others, Straathof *et al.* (2008) extend this model by including a relation between openness and the TFP-level. More economic integration and less barriers to international trade may gradually raise (international) knowledge spillovers and enhance competition, and eventually raise the TFP-level of countries by efficiency-gains. It reads as:

$$\begin{aligned}\ln y_{it} = {} & \beta_0 + \beta_1 \ln y_{i,t-\tau} + \beta_2 \ln\left(I_{it}/Y_{it}\right) - \beta_3 \ln\left(n_{it} + 0.05\right) \\ & + \beta_4 \ln pe_{it} + \beta_5 \ln se_{it} + \beta_6 O_{it-\tau} + \beta_7 EU_{it} + \eta_i + \varepsilon_{it}\end{aligned} \tag{5.1}$$

with for each country *i* in year *t*

y_{it}	GDP per capita
I_{it}/Y_{it}	investment rate, i.e. total investments as percentage of GDP
$n_{it}+0.05$	growth of effective labour, approximated by the augmented population growth
pe_{it} , se_{it}	attainment of primary education and secondary education as an indicator for the level of human capital

$O_{it-\tau}$	Trade openness measured as exports plus imports divided by GDP
EU_{jt}	dummy for EU-membership
η_i	dummy for adjustments of country-specific effects

The rate of convergence in which the actual GDP per capita converges to its steady state can be determined as $\lambda = -\left(\ln\left(\beta_1\right)/\tau\right)$ in which τ represents the time period. To circumvent business cycle effects, we estimate the model for five-year spans in which the variables of interest are averaged over these five years.

Regression methods and data sources

Straathof *et al.* (2008) start with pooled OLS and Fixed Effects (FE) regressions. Despite their shortcomings, these methods may be helpful to interpret the regression results. More precisely, both the OLS and FE method may result in biased estimates for the coefficient of the initial income (see Bond *et al.* (2001)), but the combination of these regression results still provides a guiding band for the actual rate of convergence. On the one hand, regressions with OLS result in an upward bias of the estimated coefficient for lagged income because of omitted variables, and thus imply a downward bias of the rate of convergence. FE regressions correct for country-specific but unobserved effects and exploit only the time dimension of the data for estimating the parameters. It still suffers from an endogeneity biased in finite samples because initial income and the error term are negatively correlated. This entails a downward bias for that coefficient and thus in an upward bias of the rate of convergence (Roodman (2006)).

Straathof *et al.* (2008) estimate subsequently the model with system GMM to solve for the endogeneity problem. Bond *et al.* (2001) show that the system GMM estimates two equations: a first-differenced equation, using lagged levels as instruments, and a levels equation that uses suitably lagged first-differences as instruments. This estimator is able to provide consistent estimates even in finite samples, where the number of periods is small. The use of exogenous instruments in this method prevents an estimation bias due to omitted country-specific effects and potentially endogenous regressors are also instrumented.

The data for these regressions are based on the dataset used for earlier CPB research on the income effects of the internal EU-market (see Straathof *et al.* (2008)). This dataset contains data on income per capita, investment rates and population growth of the Penn World Tables, Mark 6.2 of 81 non oil-producing countries for the period 1960 - 2005. All variables are expressed in constant international prices (PPP adjusted). These data are extended with data on the attainment of education levels as an overall indicator of human capital, and are derived from Cohen and Soto (2007).

Regression results

Table 5.1 duplicates the regression results from Straathof *et al.* (2008). The regression with system GMM provides significant estimates for the impact of initial income and openness. Still, the estimated coefficient of initial income with GMM is slightly above the estimated coefficient with OLS. This suggests that in this model regressing income with OLS does not particularly yield overestimation of the coefficient of the lagged income, or underestimation of the rate of convergence to the steady state. It could also be the case that GMM overestimates the coefficient for initial income. The estimated coefficient for initial openness with OLS is much smaller than the estimated coefficient in the FE and GMM regression. The test-statistics point to relatively robust estimates of the GMM estimates. More precisely, the relatively high p-value of the AR-test suggests that the probability for autocorrelation in the GMM regression is modest, while the relatively high p-value of the Hansen test points to only a small probability of overidentification of instruments.

Table 5.1 Regression of GDP per capita [a]

	OLS		FE		GMM	
Initial income	0.943		0.800		0.947	
	(0.010)	***	(0.024)	***	(0.029)	***
Investment/savings rate	0.089		0.050		0.129	
	(0.019)	***	(0.020)	**	(0.029)	***
Augmented growth rate	– 0.223		– 0.083		– 0.154	
	(0.051)		(0.074)		(0.183)	
Attainment primary school	0.004	***	0.007		0.044	
	(0.006)		(0.017)		(0.019)	**
Attainment secondary school	0.017		0.012		-0.005	
	(0.010)		(0.024)		(0.030)	
Initial openness	0.051		0.087		0.091	
	(0.019)	**	(0.013)	***	(0.020)	***
EU dummy	0.002		0.032		0.002	
	(0.012)		(0.033)		(0.036)	
Constant	– 0.304		1.388		– 0.175	
	(0.150)	*	(0.278)	***	(0.523)	
Implied rate of convergence	0.012		0.045		0.011	
Number of observations	601		601		601	
Number of groups			81		81	
F-statistic	5162		196		1626	
R-squared within/adjusted	0.99		0.84			
AR(2) p-value					0.71	
Hansen p-value					0.82	

[a] Dependent variable is the income per capita for any country at the end of the five year period. Between brackets panel adjusted standard errors (adjustment for country specific effects) ; ***, ** or * indicates significant at respectively 1%-level, 5%-level or 10%-level.
Source: Straathof *et al.* (2008) .

We have used several specifications for systems GMM by instrumenting only a few explanatory variables and changing the lag structure. We conclude that it is important to instrument GDP per capita, the investment rate and initial openness. It has no added value to instrument the other variables of the regression because these are exogenous in this empirical specification. The regression results of both specifications are nearly identical.

The coefficient for openness varies between 0.05 and 0.09 and the coefficient on initial income varies between 0.80 and 0.95. The latter is important to determine the long-run impact of openness on income. The econometric literature suggests that the GMM method is superior to OLS and FE. Moreover it also instruments openness, so the IV regressions are not necessary. The FE regressions underestimate the coefficient for initial income and therefore the long-run impact of openness. On the other hand, the convergence rate is faster, so the realized effects of current openness will be closer to the long-term effects. The FE estimates serve as a lower benchmark to address the income effect of globalization policies.

5.2 Income effects

This section presents the impact of reduced trade barriers on income growth that go through the change in openness. We combine the estimated income-elasticities of openness from the regressions in Section 5.1 with the counterfactuals of openness that accrue from the changes in trade policy including the EU dummy.

The counterfactual effects are based on the regressions results for the Dutch trade excluding re-exports and for the bilateral trade between all countries as presented in Figure 3.1 to 3.4. We calculate two types of income effects, i.e. the realized effects up to 2005 and the effects on the long term. Further, we only present the income effects based on the FE panel estimation and the system GMM estimation. The reason is that income-elasticities of these two regressions entail a lowerbound and an upperbound for the income effects.[26]

Realized income effects

The realized impact *per period* can be derived from totally differentiating equation (5.1). The total derivative of per capita income levels in the end-year T with respect to changes in openness in all previous periods can be computed as:

$$d\ln(y_{i,T}) = \sum_{t=2}^{T} \frac{\partial \ln(y_{i,t})}{\partial O_{i,t-1}} \cdot d\,O_{i,t-1} = \sum_{t=2}^{T} \beta_1^{T-t} \cdot \beta_6 \cdot d\,O_{i,t-1} \tag{5.2}$$

[26] Indeed, the income effects based on the elasticities from OLS-regressions are exactly between the income effects based on the FE and the GMM elasticities.

Equation (5.2) reflects two effects of changes in trade openness on per capita income levels. First, a change in openness at the beginning of a period raises income levels 5 years later, at the end of the period. The parameter for openness (β_6)in the growth regression reflects this first effect. Second, an increase in income per capita transfers to future income levels over time. This effect (captured by the parameter on initial income, β_1) is less than proportional, though, reflecting decreasing returns to reproducible production factors (physical and human capital) and convergence to a new steady state.

Table 5.2 presents the realized income effects of reduced trade barriers that have been accumulated from the 1970's until 2005. More precisely, it presents the (average) annual growth of the (average) GDP per capita, and the contributions of reduced trade barriers as the percentage of the annual income growth. For the Netherlands, reductions in trade barriers lead to an increase in openness of about 8%-points (see Figure 3.4). Consequently, the estimations suggest that 5.6 to 7.5% of the annual income growth of 1.6% in the Netherlands can be attributed to trade policy in its broader sense. For the OECD and EU-15 countries the impact of trade policy on income is smaller. For the EU-15 it seems likely that about 2.6 to 3.6% of income growth between 1971 and 2005 can be attributed to trade policy and for the OECD countries overall it is only about 1.5%. These smaller numbers are not surprising. The results for the OECD are heavily affected by two large countries: the US and Japan. Both countries are less open to trade, so trade policy has consequently less impact on income growth. The EU-15 consists of countries with much higher trade to GDP ratios than the US and Japan, but in general not as high as in the Netherlands.

Table 5.2 Realized income effects for the Netherlands, the EU15 and the OECD[a, b]

	Income growth	Lower bound	Upper bound
Income growth ('71-'05) Netherlands	1.59		
Contributions of trade policy (KOF index)		4.7	6.3
joint EU membership		0.9	1.2
Total policy effect (sum)		5.6	7.5
Income growth ('71-'05) EU-15	2.25		
Contributions of trade policy (KOF index)		2.4	3.2
joint EU membership		0.2	0.3
Total policy effect (sum)		2.6	3.6
Income growth ('71-'05) OECD	2.51		
Contributions of trade policy (KOF index)		1.2	1.6
joint EU membership		0.1	0.1
Total policy effect (sum)		1.3	1.7

[a] I.e. impact of reduced trade barriers on income via the openness without re-exports.
[b] Income growth is calculated as the average annual growth of (average)GDP per capita in percentages, contributions of determinants as percentage of that income growth. The lowerbound effects are derived from the FE regression, the upper bound effects from the GMM method.

Table 5.2 presents the effects of general trade policy on GDP. Alternatively, we could consider the impact of tariffs as we did in section 3. These effects are presented in appendix B. The results reveal that for the Netherlands the income effects of tariff reductions between 1975 and 2005 are somewhat lower than the income effects of trade policy in general. Other determinants, like reductions of international capital market controls and money transfers particularly within the EU (see also Figure 2.5), have eased Dutch trade. For OECD-countries and the EU-15 the income effects of tariffs are more in line the income effects of total policy. Indeed, these countries trade more with countries outside the EU.

Long run effects

The realized effects in Table 5.2 are smaller than the steady state effects, i.e. when the impact of an increase in openness has completely died out over time. These dynamic effects can be summarized in the eventual (long term) income effects of reduced trade barriers. The long term effects of changes in openness on income are calculated by multiplying the long term income-elasticity of (initial) openness with the change in openness over the period $[t_0, T]$:

$$\Delta \ln y_{iT} \equiv \ln y_{iT} - \ln y_{it_0} = \frac{\beta_6}{1-\beta_1}\left(O_{i,T-1} - O_{i,t_0-1}\right) \tag{5.3}$$

Using the calculated effects of trade policy on trade openness in Figures 3.1 to 3.4, we have estimated the impact of policy on trade between the 1970s and 2005. Combining these results with the long-term elasticity of openness on income, Table 5.3 presents the likely long run effect of trade policy on income in the Netherlands, the EU-15 and the OECD.

According to the estimations, a significant part of Dutch GDP growth between 1971 and 2005 can probably be attributed to changes in trade policy: between the 7% and 27%. The bandwidth is considerable but we know from the estimation techniques that 7% is probably an underestimate. On the other hand, although the system GMM method is theoretically superior, it could overstate the impact of openness on income. Then the upper bound is too high. The upper bound is similar to the result of Badinger (2005), but seems to be high because GDP growth is affected by many policy and non-policy related factors: education, knowledge, innovation and regulation are only a few of them. If trade policy (even including internal market policy) alone would be responsible for 20% of GDP growth, then many of these other factors would be less important than trade policy.

International trade policy has contributed most to this result: consisting of trade taxes, non tariff barriers and fewer restrictions to international capital movements. The EU effect on income is also sizeable, but the importance of the internal market is probably not completely reflected by the dummy. Lower import tariffs, lower NTBs and international capital restrictions due to EU internal market are also included in the KOF index on trade restrictions. The internal market study of Straathof *et al.* (2008) revealed a long-term impact of the internal market on

the Netherlands for 4% to nearly 15% of the GDP level in 2005. Assuming that trade policy measured by the KOF index and the EU dummy together capture all Dutch trade policy, the results for the internal market suggests that IM policy contributes most to trade policy. This would be consistent with the large trade shares to other EU members. International trade policy (excluding IM policy) would have a somewhat smaller effect on income.

Table 5.3 Long term income effects for the Netherlands, the EU15 and the OECD[a, b]

	Income growth	Lower bound	Upper bound
Income growth ('71-'05) Netherlands	1.61		
Contributions of trade policy		5.6	21.2
joint EU membership		1.4	5.6
Total policy effect (sum)		7.0	26.8
Income growth ('71-'05) EU-15	2.25		
Contributions of trade policy		3.7	13.9
joint EU membership		0.4	1.7
Total policy effect (sum)		4.1	15.5
Income growth ('71-'05) OECD	2.51		
Contributions of trade policy		1.9	7.2
joint EU membership		0.2	0.6
Total policy effect (sum)		2.0	7.9

[a] I.e. impact of reduced trade barriers on income via the openness without re-exports.
[b] Income growth is calculated as the (average) annual growth of (average) GDP per capita in percentages, contributions of determinants as percentage of that income growth. The lowerbound effects are derived from the FE regression, the upper bound effects from the GMM method.

Trade policy effects on income in other OECD countries are much smaller as Table 5.3 shows. Our estimates suggest that 2% to 8% of average income growth between 1971 and 2005 can be attributed to trade policy. The average OECD country is of course less open to trade than the Netherlands. Again, the largest effects are caused by liberalised trade and less by the internal market. For the EU-15 the estimated long-term income effects are twice as large: between the 4% and 16% of income growth since the 1970s. For both the EU and the OECD the EU effect on income is much less important than the KOF index. Besides the fact that the KOF index also measures a part of IM policy, this outcome could also reflect the importance of non-EU countries for EU trade. The internal market is relatively more important for the Netherlands for two reasons. The first one is the higher trade to GDP ratio. The second is a bigger focus on trade with other EU countries.

For the FE estimations, the realized and long-term effects more or less similar. This is caused by the low coefficient for initial income in the estimates. For the GMM estimates the long-term income effect of trade policy is much larger than the realized effect because the estimated convergence speed is very low (related to its high coefficient for initial income). As this high

coefficient even exceeds the upward biased coefficient of the OLS estimate (see previous section), one would suggest that the long-term effect derived from GMM estimate is overestimated. It does not seem likely that most of the effects of the current degree of internationalization have not accumulated in higher income, although we know that it can take decades before the income effects of extra openness are fully realized.

6 Conclusions

Dutch exports increased from 51% of GDP in 1969 to 93% in 2007 and imports grew slightly less from 50% in 1969 to 82% in 2007. These big changes in trade are mainly driven by the rise of re-exports and the increased tradability of goods. The tradability of services remained rather stable in this period. The increases in exports are mainly due to increasing trade with existing trading partners.

What are the causes of the increases in trade, and in particular what is the role of trade policy? Using a gravity approach this paper distinguishes income growth and trade policy together with EU membership as possible causes. For a sample of mainly OECD countries we conclude that at least 85% of the trade increase between 1970 and 2005 can be explained by higher incomes, about 10% by liberalised trade policies including EU membership. These results correspond to the literature. So, even without further trade liberalisation the results predict that the economic rise of Asia, resulting in high GDP increases, will have a large impact on Dutch trade. The recent trend of the increasing importance of China as exporter to the Dutch market is an illustration of this prediction.

Without liberalised trade policies and the extension and deepening of the internal market, trade openness would have been lower. For the OECD countries trade liberalisation led to a 4%-points to 5%-points increase in openness. For the EU-15 it varies between the 7%-points and 9%-points depending on the index for trade policy. Dutch trade openness excluding re-exports developments also increased by about 8%-points. Including re-exports, nowadays about 50% of total trade, the effect is twice as large.

Does this increased trade openness over the last four decades contribute to economic growth in the Netherlands? The answer seems to be affirmative. In general, the literature concludes that openness has a positive impact on income. For the Netherlands, our estimates suggest that more freedom of trade and EU membership have contributed for about 6% to 8% to the increase in Dutch GDP since 1970. For the EU-15 and the OECD, these income effects are smaller because these countries rely less on trade for selling their products and services, and for obtaining consumption and intermediate goods and services. For the Netherlands, the income effect is mainly driven by the integration and expansion of the internal market (Straathof *et al.* (2008)), but international trade policy has added a substantial increase in openness and income.

These results indicate that liberalised trade policy adds substantially to GDP growth, at least for open economies such as the Netherlands, but it is not the main driver for GDP growth. Liberalised trade policy is not the solution for lifting economies out of a recession, but protectionist policies could worsen a recession. The recent rise in the KOF indicator suggests that open borders are not granted forever. Even if import tariffs do not increase, non-tariff

barriers and investment restrictions are on the rise since 2001 and could have a negative impact on GDP growth.

Further liberalisation policies have to concentrate on non-tariff barriers, the so called behind the border measures. In most OECD countries import tariffs are already very low or even eliminated. Baldwin (2001) concludes that differences in technical standards and regulation are the eye-catching trade barriers for industrial countries. The results of the Gallup survey (2007) stress the importance of the Single Market, a common currency and eliminating border controls for doing business within the EU (see Lejour *et al.* (2009)). These measures could act as an example for external trade policy. However, the survey results also suggest possible improvements within the internal market. Simplified and standardized regulation procedures could help to integrate markets further, as is also the intention of the services directive.

The internationalization of production did not manifest itself only by increased trade, but also by establishing foreign affiliates for producing intermediate and final goods. Since 1983 FDI stocks have grown nearly 20% each year on average in the OECD countries. This is much stronger than the growth in trade. Also the growth in FDI is induced by the increasing economic size of the countries, as reflected by increasing GDP. EU membership has also helped to stimulate FDI and capital market regulation. Together these policies explain about 10% points of the total growth in FDI stocks since 1983. We could not determine the income effects of FDI policy separately, but adds probably less to income than trade does. That does not imply that FDI is not important for economic growth. It is important for the allocation of productive capital, production and thus income.

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Appendix A: countries in dataset

Table A.1 provides a list of countries that are included in regressions of sections 3. It contains countries that are currently existing, but also former countries as additions of countries for reasons of continuity in the data set.

Table A.1 List of countries (trade in goods, incl. country code)[a]

Countries	Aggregates and former countries
Australia (36)	Belgium / Luxembourg (58) containing
Austria (40)	Belgium
Bulgaria (100)	Luxembourg
Canada (124)	
Cyprus (196)	Former Czechoslovakia (200), containing
Denmark (208)	Czech Republic
Finland (246)	Slovak Republic
France incl. Monaco/overseas (251)	
Germany (276)	Former USSR (810), containing
Greece (300)	Armenia
Hungary (348)	Azerbaijan, Rep. of
Iceland (352)	Belarus
Ireland (372)	Estonia
Italy incl. San Marino/Vatican (381)	Georgia
Japan (392)	Kazakhstan
Korea, Rep. of (410)	Kyrgyz Republic
Malta (470)	Latvia
Netherlands (528)	Lithuania
New Zealand (554)	Moldova
Norway incl. S./JM. excl. B. (579)	Russia
Poland (616)	Tajikistan
Portugal (620)	Turkmenistan
Romania (642)	Ukraine
Spain (724)	Uzbekistan
Sweden (752)	
Switzerland incl. Liechtenstein (757)	Former Yugoslavia (890), containing
Turkey (792)	Bosnia & Herzegovina
United Kingdom (826)	Croatia
USA incl. PR./Virgin Islands. (842)	Macedonia, FYR
	Montenegro
	Serbia
	Slovenia

[a] Coded countries are included in dataset for the regressions of bilateral trade.

Appendix B: income effects of lower tariff rates

Realized income effects for the Netherlands, the EU15 and the OECD[a, b]

	Income growth	Lowerbound	Upperbound
Income growth ('76-'05) Netherlands	1.59		
Contributions of tariff reductions		3.3	4.2
joint EU membership		0.4	0.4
Total policy effect (sum)		3.6	4.7
Income growth ('76-'05) EU-15	2.18		
Contributions of tariff reductions		2.5	3.2
joint EU membership		0.3	0.4
Total policy effect (sum)		2.8	3.6
Income growth ('76-'05) OECD	2.44		
Contributions of tariff reductions		1.4	1.8
joint EU membership		0.1	0.1
Total policy effect (sum)		1.5	1.9

[a] I.e. impact of reduced trade barriers on income via the openness without re-exports.
[b] Income growth is calculated as the (average) annual growth of (average) GDP per capita in percentages, contributions of determinants as percentage of that income growth. The lowerbound effects are derived from the FE regression, the upper bound effects from the GMM method..

Long-term income effects for the Netherlands, the EU15 and the OECD[a, b]

	Income growth	Lowerbound	Upperbound
Income growth ('76-'05) Netherlands	1.59		
Contributions of tariff reductions		6.0	22.7
joint EU membership		0.8	3.1
Total policy effect (sum)		6.8	25.9
Income growth ('76-'05) EU-15	2.18		
Contributions of tariff reductions		5.3	19.9
joint EU membership		0.7	2.9
Total policy effect (sum)		6.0	22.7
Income growth ('76-'05) OECD	2.44		
Contributions of tariff reductions		2.9	11.1
joint EU membership		0.3	1.1
Total policy effect (sum)		3.2	12.2

[a] I.e. impact of reduced trade barriers on income via the openness without re-exports.
[b] Income growth is calculated as the (average) annual growth of (average) GDP per capita in percentages, contributions of determinants as percentage of that income growth. The lowerbound effects are derived from the FE regression, the upper bound effects from the GMM method