Ministry of Foreign Affairs

IOB Study

Good things come to those who make them happen

Return on aid for Dutch exports

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Preface

The recent financial and economic crisis has provoked a debate in the Netherlands about how the Dutch economy might be able to benefit more from international aid provided to low- and middle-income countries. In 2012, this contributed to the combination of trade promotion and development cooperation in one ministerial portfolio for Foreign Trade and Development Cooperation. Moreover, the establishment of the Dutch Good Growth Fund was an expression of the desire to link development cooperation and Dutch business interests more closely. Two years earlier, in 2010, the Scientific Council for Government Policy (WRR) already concluded that the Netherlands should focus more on comparative advantages, thereby implicitly referring to Dutch business interests. Recently, the Advisory Council on International Affairs (AIV) concluded that it is not impossible to give Dutch business a role in aid, provided that the objectives of development cooperation remain the point of departure. The Minister for Foreign Trade and Development Cooperation accepted this conclusion.

It is striking to note that the question of how the Netherlands already benefits from development cooperation is largely absent from this debate. The effects in terms of exports and associated employment play no role in budget discussions. The potential impact on the Dutch economy has been ignored, and thus far there seems to be little interest in the growing body of international literature on these economic effects.

For several years now, researchers at the University of Göttingen in Germany have been estimating the impact of *bilateral* aid on exports, for donors as well as for recipient countries. The research team, consisting of Inmaculada Martínez-Zarzoso, Felicitas Nowak-Lehmann and Stephan Klasen, has developed refined econometric models for analysing these effects and has applied these methods to estimate the effects. They appear to be rather strong. According to the researchers, each euro of German aid produces a EUR 0.83 return in increased exports. Bilateral German aid triggered about EUR 4-5 billion of additional exports. The effect of these figures on employment translates into at least 64,000 jobs.

The Policy and Operations Evaluation Department of the Netherlands Ministry of Foreign Affairs (IOB) has invited these researchers from the University of Göttingen to make the same kind of analysis for the Netherlands. Effects are not necessarily the same for every country. The structure of development cooperation, aid channels, modalities and sector policies may play a role, as well as the structure of the (donor) economy, the existence of comparative advantages, the national value added of exports and the labour intensity of export markets.

This study presents and contextualises the main findings. Results for the Netherlands are substantial. Each euro of Dutch bilateral aid produces a EUR 0.70-0.90 return in terms of increased exports, leading to a value added for the Dutch economy of about EUR 0.40-0.55 for each euro spent. This corresponds to total exports of about EUR 1.5 billion, a value added of EUR 900 million and 15,000 jobs.

The study is based on a collaboration between the Göttingen team and IOB. Several authors have contributed to the final product. First of all, the main contribution comes from Inmaculada Martínez-Zarzoso, Felicitas Nowak-Lehmann and Stephan Klasen from the University of Göttingen. The study draws heavily on their underlying more technical research report. This report is available for the interested reader. IOB evaluator Antonie de Kemp contextualised and edited the study. Caspar Lobbrecht (IOB) provided valuable research assistance. IOB received valuable comments on the draft report from Paul Gosselink en Wilma van Esch from the Office for International Cooperation (BIS) of the Ministry.

A special word of thanks goes to Paul Veenendaal from the Netherlands Bureau for Economic Policy Analysis (CPB), and Selwyn Moons from the Directorate-General for Foreign Economic Relations for their comments on the Göttingen report and the draft of the IOB study for providing value added tables of exports by sector. A word of thanks also goes out to Bart Los and Marjolein Jaarsma. Bart Los (University of Groningen) assisted with the calculation of input-output tables for the calculation of employment effects. Marjolein Jaarsma of Statistics Netherlands (CBS) provided information about exports to developing countries by sector.

IOB assumes final responsibility for this study.

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List of abbreviations

AIV	Advisory Council on International Affairs *(Adviesraad Internationale Vraagstukken)*
CBS	Statistics Netherlands *(Centraal Bureau voor de Statistiek)*
CPB	Netherlands Bureau for Economic Policy Analysis *(Centraal Planbureau)*
DAC	Development Assistance Committee
DGGF	Dutch Good Growth Fund
EDF	European Development Fund
EU	European Union
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GMM	Generalised Method of Moments
IMF	International Monetary Fund
IOB	Policy and Operations Evaluation Department *(Inspectie Ontwikkelingssamenwerking en Beleidsevaluatie)*
IOV	Operations Review Unit *(Inspectie Ontwikkelingssamenwerking te Velde)*
ISIC	International Standard Industrial Classification
LDC	Least Developed Countries
MDG	Millennium Development Goals
NGO	Non-governmental organisation
ODA	Official Development Assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
PDFGLS	Panel Dynamic Feasible Generalised Least Squares
PDOLS	Panel Dynamic Ordinary Least Squares
SITC	Standard International Trade Classification
SWAp	Sector Wide Approach
WRR	Scientific Council for Government Policy *(Wetenschappelijke Raad voor het Regeringsbeleid)*

Summary and conclusions

Evaluations and analyses of aid generally assess the impact on recipient countries. The primary objectives of aid include poverty reduction, economic growth, stability, improved health and life expectancy, and better education, to name but a few. However, an almost exclusive focus on the impact of aid in recipient countries has led donors to neglect the potential benefits in their own countries. Of course, effective aid promotes the long-term interests of donors by promoting peace, equity, stability and prosperity in recipient countries. But in the short term aid also contributes to recipient countries' capacity to import and therefore may increase exports in donor countries. In this respect, aid may also have positive returns for providers in the short to medium term.

So far, the potential positive effects of aid on the Dutch economy have largely been neglected. The government and employers' organisations have tried to involve Dutch business in development cooperation by tying aid and making it mandatory to spend at least part of the aid budget on goods and services in the Netherlands. In general, however, the potential indirect impact on the Dutch economy has been ignored.

There are good reasons to pay attention to returns on aid for the domestic economy when decisions are made about development cooperation. First of all, research shows that aid has positive returns in the form of increased exports and employment.[1] Second, many developing and emerging countries have high economic growth rates. Increasingly, they are contributing to the growth of the world economy and world trade. Exports and imports in these countries are experiencing high growth rates, in spite of the world economic and financial crisis. The Netherlands is benefitting as well. Since 2000, the share of low-income and middle-income countries in Dutch exports has increased rapidly, from less than 5% in 2000 to almost 11% in 2012. Third, politicians are increasingly raising the question of how the Netherlands is benefitting from development cooperation. Expanding the new portfolio of the Minister for Foreign Trade and Development Cooperation at the Ministry of Foreign Affairs to include the promotion of trade as well as development cooperation is an expression of this interest.

Aid has positive income effects and enhances a country's capacity to import. When developing and emerging countries have high growth rates and import more, many other countries profit from the situation as well. First of all, neighbouring countries will benefit from the opportunity to export more to their growing neighbours. Secondly, more distant countries, including donor countries, would benefit from increased trade opportunities as well.

Donors can also benefit much more directly. The literature cites three arguments that explain why donors would gain economically by giving aid:

[1] When calculating employments effects, the underlying assumption is an abundance of labour. It should be noted that this assumption holds for every calculation of employment effects. In case of full employment and a perfectly flexible labor market, extra demand (in whatever form) only shifts employment.

1. *Tied aid*: aid may trigger exports from the donor county if a considerable share of donor aid has been tied to imports from the same country.
2. *Habit formation effects*: donor-funded exports for aid-related projects may increase the proclivity of recipient countries to buy goods from the donor.
3. *Goodwill*: the aid relationship promotes a trade relationship in the sense that it creates 'goodwill' towards donor exporters.

Research shows that these effects are substantial. Donors benefit substantially from giving aid by increasing exports to recipient countries. Researchers from the Overseas Development Institute (ODI) concluded that European investments in development aid will be completely recouped by EU taxpayers and will lead to GDP gains within the EU. Estimates for specific countries confirm these results. According to researchers from the University of Göttingen, each euro of German bilateral aid produces a EUR 0.83 return in increased exports. Bilateral German aid triggered about USD 5-6 billion in additional exports in 2009 and about USD 6-8 billion additional exports in 2010. Estimates of the employment effects range from the creation of 64,000 jobs to 200,000 jobs. A report on Italy suggests that the effect on income gained from the provision bilateral aid is EUR 0.93 for each euro of aid.

IOB has asked the researchers of the German report to apply their methods to analyse the impact of *bilateral* aid on exports in the Netherlands. Applying state of the art econometric techniques, the researchers have been able to compute the impact of bilateral aid on (Dutch) exports. The analyses take into account – for instance – the economic development in the Netherlands as well as in recipient countries and deal with the endogeneity of aid.

The results are in line with findings from other studies. Using alternative techniques, they estimated that each euro of bilateral aid has a return in terms of increased exports of EUR 0.90-1.05. Taking into account a number of uncertainties, a conservative estimate suggests that the effect lies between EUR 0.70 and EUR 0.90 for each euro of aid.

The effects are greater in recipient countries with relatively high income levels. An explanation is these countries' higher import capacity. The growth of exports to upper middle-income countries in Asia and Latin America also suggests that the dynamic effects of aid (due to habit formation and goodwill) are more important than the static effects (due to tied aid). Low- and lower middle-income countries are catching up, however. Rather than lagging behind, they are increasingly contributing to world economic growth. Given the high economic growth of low-income countries and increased exports to them, one would expect the effect of habit formation and goodwill to increase in these countries.

The value added for the Dutch economy is lower than the value of the exports. Companies import raw materials and semi-manufactures from other countries. On average, every euro spent on exports to low- and middle-income countries has an estimated value added for the Dutch economy of EUR 0.60. Therefore, on average the payback effect (return on aid) for the Dutch economy is about EUR 0.40-0.55 for each euro of bilateral aid. This corresponds to total exports of about EUR 1.5 billion, a value added of EUR 900 million and 15,000 jobs (for

2008-2009). In total, (all) exports to these countries generate about 350,000-400,000 jobs in the Netherlands.[2]

The analyses also show that aid-export relations are not necessarily stable over time. They depend on development cooperation policies as well as economic development in recipient countries. The study shows relatively significant effects for the years 1973-1981. During these years, both aid and Dutch exports to aid recipients maintained high growth rates. The budget for development cooperation increased rapidly, focusing more on projects that aimed to reduce poverty and less on development cooperation as an instrument to promote Dutch exports. Nevertheless, bilateral aid remained mainly tied. Development cooperation concentrated on 18 main countries, (currently) middle-income countries in Latin America and South Asia, as well as several low-income countries in sub-Saharan Africa.

The crisis of the 1980s, which affected many countries, a high debt-service ratio and demands made by the IMF and World Bank's structural adjustment programmes, had a negative impact on imports in developing countries. Dutch exports to these countries and their share in total exports decreased. In the Netherlands, the high fiscal deficit led to budget cuts for development cooperation (as a percentage of GDP), even while absolute budgets remained fairly stable in constant prices. The government wanted to strengthen the role of Dutch business in development cooperation, but the impact of aid on exports diminished.

During the third period (1990-1998), Dutch budgets for development cooperation started to increase again, although the budgets for bilateral aid remained fairly stable. The Dutch Minister for Development Cooperation provided bilateral aid to many recipient countries, though with a stronger focus on low- and lower middle-income countries. Exports to these countries stagnated. Accordingly, the analysis does not show a (short-term) relation between aid and exports for this period.

This changed in the first decade of the new millennium. The aid coefficient becomes significant again and the short-term effect is comparable to the period 1973-1981. During these years, the Netherlands concentrated bilateral aid on about 35 countries, with an emphasis on programme support and the Millennium Development Goals (MDGs). The Netherlands also abolished tied aid for the least developed countries (LDCs), in line with the rules of the Organisation for Economic Co-operation and Development (OECD). A number of emerging countries, predominantly in Africa, began to show high growth rates, and this development also translated into an acceleration of exports to these countries. Low-income and middle-income countries became increasingly important for Dutch exports.

What does this all mean for the future? As a result of the new world economic and financial crisis, the Netherlands decided in 2010 to cut aid budgets – the most severe cuts since

[2] Exports due to bilateral aid account for about 3%-4% of total exports to low-income and middle-income countries.

development cooperation started to take off in the 1950s. Since 2010, budgets for development cooperation and exports to developing countries have been moving in opposite directions. As a result of the Dutch budgets cuts, the Dutch share in total (bilateral) official development assistance (ODA) is rapidly decreasing, even in the country's 15 partner countries. In the short run, the Netherlands may continue to benefit from habit formation and goodwill effects, and exports to (former) partner countries may well continue to grow. In the longer run, however, budget cuts may exert a negative effect, leading to a loss of these effects as the Netherlands becomes a minor player in the field of bilateral development cooperation. In the end, this may have a negative impact on Dutch economic interests.

1

Introduction

Partly as a result of the economic and financial crisis, politicians are increasingly raising the question of how the Dutch economy may benefit from development cooperation. The creation in 2012 of one Minister for Foreign Trade and Development Cooperation is an expression of this interest. The closer connection between foreign trade and development cooperation is also reflected in the establishment of a revolving fund of EUR 700 million, funded by the development cooperation budget. This Dutch *Good Growth Fund* (DGGF) aims to strengthen the role of (Dutch) business in development cooperation.

In a recent assessment, the Dutch Advisory Council on International Affairs (AIV, 2013) concluded that it is not impossible to give Dutch business a role in aid, provided that the objectives of development cooperation remain the point of departure. This can be done by taking into account the potential role of Dutch business when selecting countries and programmes for development cooperation and by defining policy frameworks that incorporate a sufficient number of proposals from Dutch enterprises. In response to questions in Dutch Parliament on the policy note '*A World to Gain: A New Agenda for Aid, Trade and Investment*' (TK 2012-2013, 33 625, no. 1), the Minister for Foreign Trade and Development Cooperation accepted this conclusion (TK 2012-2013, 33 625, no. 5, p. 72).[3] Several observers are more sceptical about the possibility to combine the two objectives.[4]

Combining aid and trade is not new. In the past, a large part of aid was tied to goods and services to be imported from donor countries. During the economic recession in the early 1980s, politicians and employers' organisations feared that the untying aid would lead to loss of export and investment opportunities and therefore to loss of employment (Jepma, 1991). There is no evidence, however, that the untying of aid led to a loss of exports and employment in donor countries.

Even when aid is not tied, it can lead to an increase in exports from the donor to the recipient country and therefore have a positive impact on the donor's economy. Aid enables recipient countries to increase their imports. Moreover, if aid has a positive impact on economic development, countries receiving support will attain higher income levels and import more goods and services from other countries.

This return on aid is neglected in the debate. There are nevertheless good reasons to pay more attention to the economic return of aid for the Netherlands. Low-income and middle-income countries are increasingly contributing to the growth of the world economy and world trade. Exports and imports in these countries show high growth rates, and the Netherlands is benefitting as well. Since 2000, the share of these countries in total Dutch exports has increased. There are risks as well. Budget cuts in development cooperation may have important consequences for the Dutch economy as they may have a substantial impact on Dutch exports and therefore on economic growth.

3 Note: TK stands for Dutch House of Representatives.

4 See for instance Paul Collier and Paul Hoebink in *Vice Versa*, 20 February, 2013.

IOB asked a team of researchers to analyse the relation between *bilateral* aid and exports for the Netherlands. The team consisted of Inmaculada Martínez-Zarzoso, Felicitas Nowak-Lehmann and Stephan Klasen from the University of Göttingen. Applying advanced state of the art econometric techniques, the researchers have been able to compute the impact of bilateral aid on (Dutch) exports. The analyses take into account – for instance – the economic development in the Netherlands as well as in recipient countries and deal with the endogeneity of aid. This report presents the main findings. It draws heavily on their more technical research report which also explains in detail the applied methodology and techniques.

The study uses *net bilateral aid* data as registered in the OECD database on aid from DAC Members, unless reported otherwise. Individual donor countries provide data for this database. Therefore, for this study, bilateral aid is defined as all aid from the donor country (the Netherlands) as identified by the donor as bilateral aid in the database provided to the OECD/DAC.

The report is structured as follows: Chapter 2 discusses the relation between aid and (donor) exports and presents the findings of other studies. Chapter 3 sketches the historical trends in Dutch development cooperation and trade relations with low-income and middle-income countries. Chapter 4 presents the results of the (econometric) analyses. In presenting the findings, IOB has tried to keep the technical details to a minimum. The underlying technical report is available for the interested reader.

2

The relation between aid and exports

2.1 Introduction

Aid improves recipient countries' capacity to import by relieving bottlenecks such as the savings and foreign exchange gap (Chenery and Strout, 1966). This is evident if we look at the (simplified) external balance of a country:

Exports + Official transfers + Private transfers - Imports - Interest payments = - Loans - Other net capital inflows - Change in reserves.

This equation is an identity: if one variable changes, one of the other variables has to change as well. By definition, imports are paid by exports, foreign aid, private transfers, loans, capital inflows or a reduction in reserves. Therefore, if everything else remains equal, foreign aid will lead to higher imports. Moreover, if aid is spent well, it will also boost economic growth and lead to a higher import capacity in the long term.

From the 1970s to the 1990s, many developing countries faced serious balance of payments problems that inhibited much-needed imports. Donors, including the Netherlands, therefore provided import support, usually tied to goods from the donor. In the late 1980s, tied aid was the most important type of Dutch programme aid, with an average total amount of EUR 390 million a year (about 25% of bilateral aid) for the period 1985-1988. A large part of this aid went to a limited number of countries, such as Bangladesh, India, Tanzania, Mozambique and Kenya (IOB, 2012a).

While global exports benefit from rising incomes and increased import capacities in aid-recipient countries, the economic literature cites three arguments why donors would benefit particularly strongly and directly from this higher import capacity:

1. *Tied aid*: aid may trigger exports from the donor country if a considerable share of donor aid has been tied to imports from the same donor.[5] The development-related export transactions of the Netherlands, for example, supported the export of Dutch goods for infrastructure. Dutch aid was mainly tied during the first decades of development cooperation.[6] During the 1980s and later, the Netherlands and other donors started to untie part of their aid. In 2001, OECD/DAC countries accepted the recommendation to untie their aid to the least developed countries (LDCs). Later on, the Paris Declaration (2005) and the Accra Agenda for Action (2008) contributed to a further reduction of tied aid.
2. *Habit formation effects*: these effects may start with 'informally tied aid', if the donor finances projects that require the import of goods and services in which the donor has comparative advantages (Wagner, 2003). In this way, these projects may increase the proclivity (habit) of recipient countries to buy goods from the donor. Familiarity with

[5] According to the OECD/DAC definition, tied aid comprises loans or grants that are formally or informally tied (OECD, 1987). The recipient country must use this liquidity to buy goods or services from the donor country.

[6] IOV (1990), *Hulp of Handel? Een evaluatie-onderzoek van het programma Ontwikkelingsrelevante exporttransacties*. The Hague: Ministry of Foreign Affairs.

products from the specific donor and the existence of contacts may facilitate exports from the donor to the recipient country, leading to future exports (Osei *et al.*, 2004; Silva and Nelson, 2012).

3. *Goodwill*: the aid relationship promotes a trade relationship in the sense that it creates 'goodwill' towards donor exporters. The recipient may feel inclined to buy goods and services from the donor country in order to secure the continuity of the aid flow (Wagner, 2003). Moreover, the aid relationship could 'open the door' for donor exporters if donor countries were to decide to combine aid missions and aid negotiations with trade missions. This extensive aid relationship may be an advantage because the more familiar the donor becomes with specific problems in the recipient country, the more likely it can provide suitable solutions. The donor may also be more familiar with local procurement procedures.

2.2 Empirical evidence

A number of studies confirm the assumed positive relationship between aid and exports. Nilsson (1997) analysed the link between aid and exports for European Union (EU) donors to 108 recipient countries over the period 1975-1992. He found an elasticity of exports with respect to aid of 0.23. For the average donor this translates into an increase of exports of EUR 2.60 for each euro of aid given (see chapter 4 for the calculation). The estimated effect for the Netherlands is EUR 1.09 for each euro of aid given. Applying a comparable approach, Wagner (2003) finds slightly lower effects for the period 1970-1990. The author calculates average returns on donors' aid of around EUR 2.29. However, a more robust approach, controlling for unobserved heterogeneity, reduces the effect to EUR 0.73 of exports per euro of aid. Arvin, Cater and Choudhry (2000) focused on the relation between untied assistance and exports using German data for the period 1973-1995. Their analysis supports the hypothesis that aid generates goodwill for the donor, which translates into higher exports. Similarly, Silva and Nelson (2012) show that donors benefit more from the higher imports of aid recipients than other developed countries.

Martínez-Zarzoso *et al.* (2013a) calculate the average positive effect of bilateral aid by OECD donors on exports for the period 1988-2007. According to their analysis, every euro of aid leads to an increase in exports of around EUR 2.50 in the long run. There are two caveat however. First, the positive effect seems to have vanished for most countries after 2000. According to the authors, this may be an effect of the recommendations given by the OECD-DAC concerning the tying of aid and aid allocation.

Second, the effect is only significant for 13 of the 21 donors and especially high for Austria, Australia, Italy, Japan, Sweden, the United States, Germany, Canada and Spain. The authors did not find a significant return of aid on exports for several donors, including the Netherlands.

Using a modelling approach, Holland and Te Velde (2012) conclude that the EU's EUR 51 billion investment in development aid (for the next EU budget's seven-year period) probably will be completely recouped by EU taxpayers and will lead to a 0.1% GDP gain in the EU.

Several studies analysed the return on aid in terms of higher exports for individual countries. Schumacher (1984) estimates that EUR 1.00 of German aid produces a return of EUR 0.80 in increased exports. Schönherr and Vogler-Ludwig (2002) find much higher indirect effects for the period 1976-1995, leading to a total return of more than EUR 4.00 for each euro spent on aid. According to the authors, this result did not depend on the tying of aid. A more recent study by Martínez-Zarzoso *et al.* (2013b), which uses more advanced techniques and recent data up to 2012, arrives at more modest conclusions. According to the authors, each euro of German aid generates EUR 0.83 of exports. The authors also show that the effect of aid varies for each economic sector, with machinery, electrical and transport equipment having higher than average aid-export elasticities. Quartapelle (2012) finds a return of EUR 0.93 for each euro of Italian aid. This effect is in line with other studies, as well as the findings of Martínez-Zarzoso *et al.* (2013a).

Several studies also conclude that the aid relationship encourages mutual trade: donors also import more from partner countries. This is an important finding, as most of the theoretical work on aid emphasises the possibly negative impact of aid on recipient country exports, due to potential Dutch disease effects (IOB, 2012a). Most studies disregard the potential positive effects of aid to overcome supply bottlenecks and promote bilateral trade relations (Nowak-Lehmann *et al.*, 2013). The Dutch Centre for the Promotion of Imports from Developing Countries (CBI), for example, aims to improve access to European markets for exporters in developing countries.

Pettersson and Johansson (2013) find that aid increases bilateral trade flows in both directions. The authors analyse the effects of various foreign development assistance variables on recipient and donor country exports and find a particularly strong relation between aid in the form of technical assistance and trade in both directions, supporting their interpretation that market knowledge through interpersonal relations is an important driver for exports. The researchers did not control for unobserved heterogeneity related to each bilateral relationship, and this may bias the estimates. They could not say whether aid causes exports, exports cause aid or whether both variables are influenced by a third unobserved variable. Nowak-Lehmann *et al.* (2013), however, find that the net effect of aid on recipient countries' exports to donor countries is insignificant. They conclude that exporters in recipient countries are not benefiting from trade relations with donors in terms of higher exports to the donor country. This does not mean that aid cannot increase recipient countries' general capacity to export; it only means that aid does not increase exports to particular donors.

The differences between the various studies may be explained by the sample of donor and recipient countries considered, as well as the chosen time period. Effects are not necessarily the same for all (donor and recipient) countries as time periods. In addition, differences in results may be explained by the use of alternative econometric techniques to estimate the effects. In general, a bi-directional relationship exists between donor exports and bilateral

aid, which implies that both series have to be considered as endogenous variables (Martínez-Zarzoso *et al.*, 2013b). A failure to do so may well lead to biased estimates of the effect of aid.

The export effects in recipient countries depend on the actual use of aid. If it is used for non-tradables – for instance to invest in public services – Dutch disease effects may dominate. On the other hand, aid may have a positive impact on exports when used to strengthen export sectors (IOB, 2012a). According to a study by the Overseas Development Institute (ODI), aid for trade helps to improve the investment climate and increase exports in recipient countries (Basnett *et al.*, 2012). Hühne *et al.* (2013) find that aid for trade increases recipient exports to donors as well as recipient imports from donors. According to these authors, the first effect dominates the latter. A doubling of total aid for trade would lead to an export increase of about 5% in recipient countries. Imports of recipient countries would increase by about 3%.

2.3 Tied aid

In general, the debate has mainly focused on the advantages and disadvantages of tying aid. Specific interest groups tend to favour the tying of aid in order to ensure that enterprises and workers in donor countries will benefit as well. Many (development) economists, on the other hand, are more critical about tying aid.

There are two broad theoretical arguments against tying foreign aid (Clay *et al.*, 2009). From a developmental perspective, tying aid may reduce its efficiency and effectiveness. First of all, it has an impact on the allocation of resources. The recipient buys specific goods from the donor because he can get them for a relatively good price through aid. However, if the recipient would have been able to spend the total amount of aid freely, he might have made other choices. In addition, tied aid may have distorting market implications, both at the domestic and international level. It may lead to higher prices, as competition has been reduced. Available evidence suggests that in the case of tied aid, prices are 15%-40% higher compared to the alternative unrestricted transfers (Jepma, 1991; Aryeetey *et al.*, 2003; OECD, 2006; IOB, 2013). Other increased indirect costs for tied aid, such as recurrent costs, shipping costs and the loan element, have been demonstrated to reduce the net value of tied aid (Clay *et al.*, 2009).

Furthermore, the obligation to import goods and services from donor countries may undermine local business development and entrepreneurship, just as linking aid to imports from donor countries can undermine the recipient's regional cooperation and economic integration. Finally, the global effects of tying aid are comparable to protecting and subsidising exports, leading to sub-optimal allocation at a global scale. Therefore, compared to unrestricted aid transfers, tying practices are likely to result in welfare losses for the recipient economies and a reduction in global welfare.

Jepma (1991) concludes that tying aid does not provide donors with additional benefits. First of all, tied aid represents only a small percentage of the donor countries' total exports.

Therefore, it is unlikely to provide substantial benefits to any donor's domestic employment or balance of payments aggregates. Second, about 70% of (European) bilateral aid has led directly to procurement in the donor country. This figure was 20 percentage points higher than procurement based on tied aid alone, suggesting that other mechanisms play a role as well. Other studies support this conclusion. According to Arvin and Baum (1997) and Arvin and Choudry (1997), untied aid has roughly the same export effects as tied aid, due to the effects of the recipient countries' goodwill and/or parallel trade agreements. The authors conclude that tying aid does not provide additional benefits in terms of higher export levels for donor countries. Tajoli (1999) and Osei *et al.* (2004) do not find conclusive evidence for the claim that tied aid increases donor's exports towards recipients either. Based on a comprehensive literature review, Clay *et al.* (2009) conclude that tying aid is not successful in generating a major positive impact on exports of donor countries. Commercial advantages remain restricted to specific interest groups. In the Netherlands, a large part of Dutch tied aid went to a small number of companies (IOB, 2013).

Martínez-Zarzoso *et al.* (2013a) nevertheless conclude that there is a positive correlation between the tying of aid and donors' exports: countries with higher levels of tied aid had significant positive returns of aid, but the authors did not find significant effects for several countries with lower levels of tied aid. In addition, the export effects of aid were higher in the 1990s than the first decade of the new millennium, when donors abolished tied aid to LDCs. However, even without tying aid, the same authors do find positive benefits of development cooperation for (German) exports. While tied aid has diminished substantially in the last decade, the positive relationship between aid and trade remains clearly evident (Johansson and Pettersson, 2008; Martínez-Zarzoso *et al.*, 2009). This can be interpreted as an indication that tying aid is not necessary to obtain positive export effects of foreign aid. It is plausible that tied aid funds may partially finance donor exports that would have been undertaken anyway.

2.4 Summary

Foreign aid increases the income of recipient countries and hence improves their capacity to import. There are three arguments why donors may benefit from rising incomes and increased import capacities in aid-recipient countries: tied aid, habit formation and goodwill.

The empirical literature provides evidence about the relation between aid and exports. While the research shows diverging results, on average, one euro of aid increases donor exports by about the same amount.

Some studies conclude that there is a positive impact of tied aid on exports. However, most studies do not find a difference with untied aid. In general it appears that tying aid is not necessary to obtain positive export effects of foreign aid.

3

Aid and exports in the Netherlands

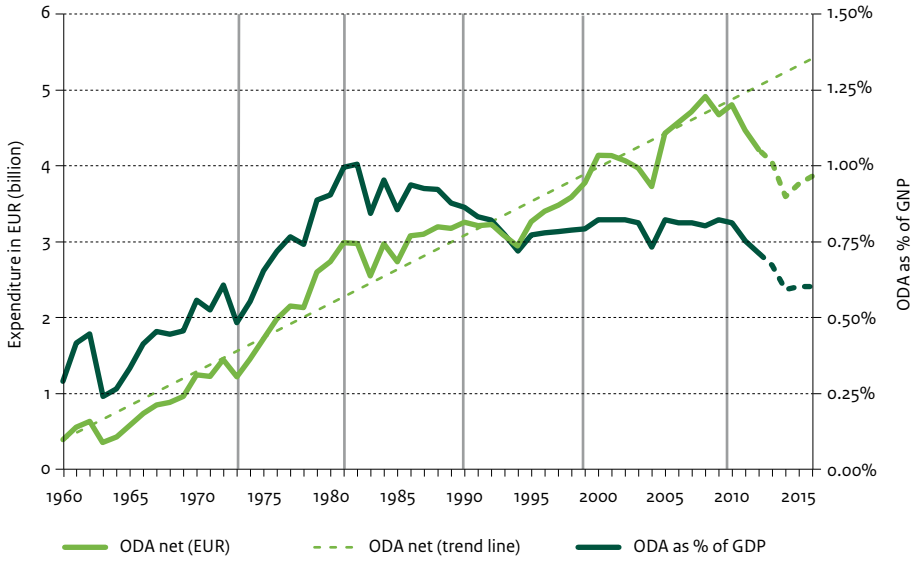
3.1 Introduction

In order to understand how aid may have an impact on exports, we will distinguish between several time periods to describe trends in Dutch development cooperation. The relation between aid and exports is not necessarily the same for every period and depends on prevailing aid modalities and the selection of partner countries. It is possible, for instance, that the impact of aid was higher when a larger amount of support was provided in the form of tied aid.

We distinguish between the following six time periods in this report:

1. 1962-1972: as development cooperation takes off, there is an increasing focus on Dutch interests;
2. 1973-1981: strong growth of development cooperation and more focus on poverty;
3. 1982-1989: the main years of structural adjustment programmes and balance of payments support;
4. 1990-1998: aid as a catalyst for development;
5. 1999-2009: the main years of the sector-wide approach (SWAp) and budget support, with a strong focus on the MDGs; and
6. 2010-2012: budget cuts and a greater role for Dutch business.

Figure 3.1 *Development of the Netherlands' official development assistance (EUR billion; constant prices 2010)*

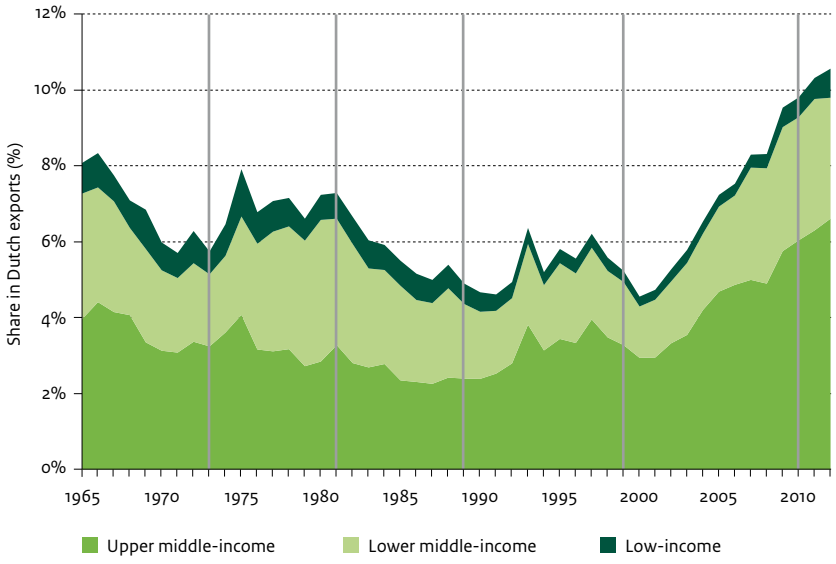


Note: In 2004, India repaid its debt, leading to a low net ODA figure of 0.73%. This low percentage was compensated for in the following years.
Source: Netherlands Ministry of Foreign Affairs.

From 1963 until the beginning of the 1980s, there was a strong increase in the level of aid, in absolute terms as well as in relation to Dutch GDP. Then, owing to the perceived need to reduce government deficits and expenditure, the budget for development cooperation was reduced as a percentage of GDP, stabilizing at a level of about 0.8% from 1996 onwards. Economic growth caused the (real) budget to keep rising to almost EUR 5 billion in 2008, at which point the absolute level began to fall. Initially, this was the result of the financial and economic crisis, and the linking of aid to the GDP, and later on it was the result of budget cuts. Figure 3.1 shows the break with the past from 2010 onwards.

Figure 3.2 sketches the development of the share of low-income and middle-income countries in Dutch exports. Between 1965 and the beginning of the 1990s, their share tended to decrease with the exception of the period 1973-1981, when the government intensified development cooperation. During the 1990s, these countries' share in Dutch exports increased again, although there was a sharp decline between 1997 and 2001. Since 2001, low-income and middle-income countries have steadily become more and more important for Dutch exports, even though it was precisely during these years that aid became increasingly untied.

Figure 3.2 *Share of low-income and middle-income countries in Dutch exports (1965-2012)*



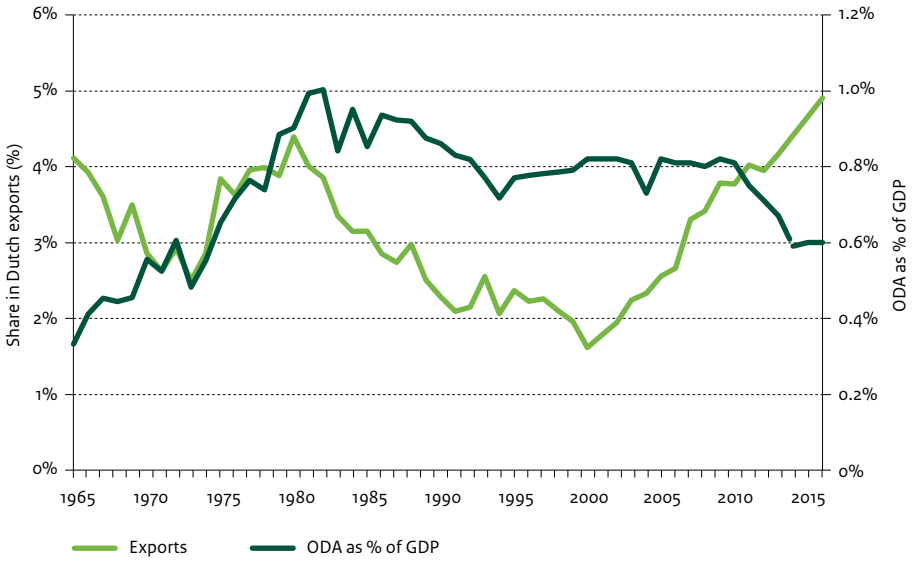
Source: CBS; elaborated on by IOB.

Initially, a large part of Dutch support went to (current) upper middle-income countries like Brazil, Venezuela, Mexico, Argentina and Suriname. Over the years, the Netherlands focused more on low-income and lower middle-income countries, especially in Africa. Figure 3.3 therefore shows both exports to low-income and lower middle-income countries and total ODA as a percentage of GDP. The trends in the two graphs differ. Until 1973, aid and exports

moved in opposite directions. Between 1973 and 1981, there was a strong correlation, and between 1982 and 1995 the two variables showed the same (downward) trend. Between 1995 and 2010, ODA was fairly stable as a percentage of GDP, but the export share initially continued to decrease, with a strong recovery from 2000 onwards. During these years, ODA remained stable as a percentage of GDP, but economic growth caused total ODA to increase until 2008 (see figure 3.1). For the coming years, expenditures on development assistance are scheduled to decrease. If the current trend regarding exports to low- and middle-income countries does not change, developments between ODA expenditures and export values will move in different directions.

One of the questions this report raises, however, is whether a reduction of bilateral aid will have an impact on exports to the recipient countries. In order to be able to answer this question, the next sections provide a more detailed description of the development of Dutch (bilateral) aid, alongside exports to low-income and middle-income countries.

Figure 3.3 *Share of low-income and middle-income countries in Dutch exports and aid as a percentage of GDP (1965-2015)*



Source: CBS; elaborated on by IOB.

3.2 The 1950s-1972: Take-off and Dutch interests

Dutch development cooperation started in 1949 in response to an appeal by the US President, Harry Truman. In line with the prevailing international 'modernisation' paradigm – which argued that with money and technical assistance, developing countries would be able to catch up – the Netherlands posted specialists to developing countries, usually through the United Nations. Until 1965, budgets were modest and consisted mainly of contributions to multilateral organisations. In the late 1950s, the Netherlands started to provide aid through the European Development Fund. In addition, the country provided bilateral aid to (former) colonies.

Dutch society and business gradually began to show more interest in development cooperation during the 1950s. Economic and political motives became more important, and employers' organisations lobbied for the inclusion of Dutch business interests in aid policies. In 1965, the government appointed its first Minister for Development Cooperation, Theo Bot. The policy focus shifted from multilateral to bilateral support and in 1968, under the second Minister for Development Cooperation, Berend Jan Udink, bilateral aid overtook multilateral aid as the main channel of aid delivery. Udink had also decided to limit the number of countries receiving aid. Eleven 'concentration countries', as well as Suriname and the former Netherlands Antilles, by then colonies of the Netherlands, would receive aid on a more structural basis. This support was closely interwoven with Dutch economic and political overseas interests.

Table 3.1 Dutch bilateral aid and exports to and imports from low- and middle-income countries 1962-1972 (EUR billion; constant prices 2010)

Income status	Type	South-East Asia	Europe / Eur-Asia	Latin America / Caribbean	Middle East	South Asia	Sub-Saharan Africa	Total
LI	ODA	0.0		0.0		0.0	0.2	0.2
LMI	ODA	1.6		0.0	0.0	0.6	0.2	2.5
UMI	ODA	0.0	0.1	1.2	0.0		0.0	1.4
LI	Export	0.3		0.1		0.1	7.2	7.7
LMI	Export	6.1		2.1	5.0	5.2	9.1	27.5
UMI	Export	5.7	1.8	17.7	7.4	0.0	6.8	39.4
LI	Import	0.2		0.0		0.0	7.9	8.2
LMI	Import	7.0		1.2	8.1	2.5	12.2	31.0
UMI	Import	4.8	1.1	25.3	18.7		2.7	52.6

Note: LI=Lower income; LMI=Lower middle income; UMI=Upper middle income.
Due to rounding figures, the subtotal figures do not necessarily add up precisely to total figures; all figures below 50 million are rounded as 0. Empty cells indicate missing data.
Source: OECD/DAC and UN Comtrade.

By then, the main part of Dutch financial development cooperation was managed by the Ministry of Economic Affairs. The financial support had to be spent on Dutch goods and services. In total, budgets for development cooperation increased from 0.25% of GDP to more than 0.50% in the early 1970s. Bilateral aid was mainly directed at Suriname, the former colony Indonesia and India. Trade with these countries was relatively well developed. Another important trade partner, Nigeria, also became one of the main beneficiaries of Dutch bilateral aid.

During the 1960s, the Ministry also started to co-finance Dutch NGOs. In line with this development, programme aid was increasingly replaced by project aid. Project aid was given through Dutch NGOs and business and concentrated on sectors such as agriculture and cattle breeding, health care and education.

3.3 1973-1981: Focus on poverty

The year 1973 marked a shift in Dutch development cooperation. While bilateral aid remained central, its objectives changed radically. The role of development cooperation as an instrument to promote Dutch exports diminished. The Minister for Development Cooperation at the time, Jan Pronk, focused more on the primary objective of poverty reduction. When he became minister in 1973, he also received the budgets for financial support that until then had been the responsibility of the Ministry of Economic Affairs. An evaluation had criticised the direct relation between (financial) aid and the obligation to buy specific goods and machinery in the Netherlands. Nevertheless, Pronk was not able to discontinue tied aid, and this created challenges for policy implementation. During Pronk's tenure, the Netherlands increased its total amount of aid six-fold to 0.75% of the GDP. Pronk focused on sectors such as infrastructure, water (irrigation and water and sanitation), agriculture and cattle breeding, and health. The tying of aid, however, implied that a large part of the rapidly expanding budget had to be spent on Dutch goods and machinery, while only a small part of Dutch commercial export was earmarked for developing countries (this included food supplies, factories for sugar, palm oil and milk products (VMF-Stork), aeroplanes (Fokker), medical supplies (Philips), trucks (DAF), dredgers, fertilizers and technical services).

Table 3.2 Dutch bilateral aid and exports to and imports from low- and middle-income countries 1973-1981 (EUR billion; constant prices 2010)								
Income status	Type	South-East Asia	Europe / Eur-Asia	Latin America / Caribbean	Middle East	South Asia	Sub-Saharan Africa	Total
LI	ODA	0.0		0.0		0.7	2.3	3.0
LMI	ODA	1.6		0.2	0.3	2.3	0.9	5.3
UMI	ODA	0.1	0.1	2.4	0.2	0.0	0.0	2.7
LI	Export	0.1		0.1		0.6	6.4	7.3
LMI	Export	4.9		1.1	7.7	3.3	12.0	29.0
UMI	Export	3.3	2.6	12.7	9.3	0.0	4.1	32.0
LI	Import	71		0.0		0.3	8.6	9.0
LMI	Import	5.9		2.2	6.3	3.0	32.6	44.0
UMI	Import	12.0	1.5	26.4	34.1	0.0	3.5	77.4

Note: LI=Lower income; LMI=Lower middle income; UMI=Upper middle income.
Due to rounding figures, the subtotal figures do not necessarily add up precisely to total figures; all figures below 50 million are rounded as 0. Empty cells indicate missing data.
Source: OECD/DAC and UN Comtrade.

Pronk expanded the number of concentration countries to 18, including more socialist-oriented countries in Latin America and Africa (such as Cuba and Zambia). These countries were selected on the basis of poverty levels, the need for aid and a receptive socio-political structure. While aid was mainly tied, new policies focused less on existing trade relations. India, Indonesia and Suriname remained the main beneficiaries, but the list of countries receiving a substantial amount of aid became much longer, the major recipients being Tanzania, Bangladesh, Pakistan, Kenya, Sudan, Sri Lanka and Peru. Sub-Saharan Africa became more important, both in Dutch development cooperation and in trade relations.

Jan de Koning, Minister for Development Cooperation from 1977 to 1981, continued his predecessor's policy but reduced the number of concentration countries, increased aid to Indonesia and focused more on bilateral aid. De Koning also partially untied Dutch aid. Budgets continued to rise until the beginning of the 1980s. The co-financing programme that was introduced in 1980 provided the framework for a more structural relation with four Dutch NGOs.

3.4 1982-1989: Structural adjustment and balance of payments support

During the 1980s, change in government policies as well as the world economic crisis had an important impact on Dutch development cooperation. The Dutch economy and employment were expected to benefit more from development cooperation, even though

aid was partially untied. The coalition agreement of 1982 stated that 'Dutch development cooperation must respond to the opportunities and capacities of Dutch economy and society' (see Hoebink, 2007, p. 27). Minister Eegje Schoo (1982-1986) from the Liberal Party (VVD) focused bilateral aid on rural and industrial (urban) development, gender and environmental sustainability, working in ten programme countries located in three regions (Southern Africa, Sahel and Central America), with Mozambique, Burkina Faso and Zambia becoming more important recipients. Low-income countries received a larger share of Dutch aid. Schoo, and her successor Piet Bukman (1986-1989), also strengthened the role of Dutch NGOs and the private sector.

Table 3.3 Dutch bilateral aid and exports to and imports from low- and middle-income countries 1982-1989 (EUR billion; constant prices 2010)

Income status	Type	South-East Asia	Europe / Eur-Asia	Latin America / Caribbean	Middle East	South Asia	Sub-Saharan Africa	Total
LI	ODA	0.0		0.0		0.9	3.7	4.6
LMI	ODA	1.8		0.7	0.6	1.8	1.6	6.5
UMI	ODA	0.2	0.0	1.3	0.1	0.0	0.1	1.7
LI	Export	0.0		0.2		0.7	6.5	7.4
LMI	Export	4.0		0.8	10.3	4.7	8.6	28.4
UMI	Export	4.5	3.2	9.0	9.0	0.0	3.8	29.5
LI	Import	0.0		0.0		0.4	8.4	8.8
LMI	Import	6.3		1.3	6.5	3.8	15.0	33.0
UMI	Import	15.9	2.7	33.6	25.4	0.0	3.5	81.2

Note: LI=Lower income; LMI=Lower middle income; UMI=Upper middle income.
Due to rounding figures, the subtotal figures do not necessarily add up precisely to total figures; all figures below 50 million are rounded as 0. Empty cells indicate missing data.
Source: OECD/DAC and UN Comtrade.

Trade with low- and middle-income countries stagnated, partly because of the continuing economic crisis and partly because of the demands of the IMF and World Bank's structural adjustment programmes. Both organisations provided loans conditional on macro-economic reform. Dutch development cooperation supported these programmes, especially through co-funding of World Bank programmes. In addition, the Netherlands provided import support and balance of payments support, mainly tied to imports from the Netherlands (see also Hoebink, 1988 and IOV, 1990).

3.5 1990-1998: Aid as a catalyst for development

Dutch development cooperation witnessed a new paradigm shift in the late 1980s when Pronk was reappointed Minister for Development Cooperation. Pronk believed that aid should catalyse change in development (Pronk, 2001). Ownership and bottom-up approaches became key elements of Dutch development policy. Dutch aid became more comprehensive: it established broad relationships and used many instruments in a number of sectors through different channels and in many countries (more than 60 partner countries). Development policy aimed to intervene simultaneously at several levels, encouraging macro-economic policy as well as social and political development. It introduced new imperatives, including good governance, gender, institutional development and the environment. For Pronk, aid was a political instrument, not one to serve Dutch interests but one to encourage change in developing countries. He used bilateral aid to 'buy a seat at the table'. In 1996, Pronk abolished the country lists. This was also reflected in the increase in the number of countries receiving substantial amounts of bilateral aid, as well as a much stronger focus on low-income and lower middle-income countries, especially in sub-Saharan Africa and Latin America (see table 3.4).

Table 3.4 Dutch bilateral aid and exports to and imports from low- and middle-income countries 1990-1998 (EUR billion; constant prices 2010)

Income status	Type	South-East Asia	Europe / Eur-Asia	Latin America / Caribbean	Middle East	South Asia	Sub-Saharan Africa	Total
LI	ODA	0.1	0.1	0.0		0.9	4.3	5.4
LMI	ODA	0.5	0.1	1.1	0.8	1.2	1.4	5.1
UMI	ODA	0.2	0.5	1.8	0.1	0.0	0.3	2.9
LI	Export	0.2	0.0	0.1		0.5	5.4	6.3
LMI	Export	6.6	1.6	1.1	7.2	5.3	7.6	29.3
UMI	Export	11.7	10.5	16.1	8.4	0.0	5.2	51.9
LI	Import	0.1	0.0	0.0		1.3	5.4	6.9
LMI	Import	15.2	0.7	2.1	4.5	8.2	11.1	41.8
UMI	Import	40.6	7.5	36.1	12.1	0.0	4.9	101.2

Note: LI=Lower income; LMI=Lower middle income; UMI=Upper middle income.
Due to rounding figures, the subtotal figures do not necessarily add up precisely to total figures; all figures below 50 million are rounded as 0. Empty cells indicate missing data.
Source: OECD/DAC and UN Comtrade.

From the mid-1990s onwards, the abandonment of (overvalued) fixed nominal exchange rate regimes in developing countries diminished the importance of balance of payments support. The importance of macro-support decreased from EUR 86 million in 1995 to EUR 46 million in 1997.

Minister Pronk and Hans van Mierlo, the Minister of Foreign Affairs, broke down the traditional barriers between foreign policy and development cooperation, encouraging integration of both activities. Exports to upper middle-income countries in Asia (China) and Latin America (Argentina, Brazil, Mexico, Chile and Colombia) rose significantly during these years, but export growth to low-income countries, mainly in sub-Saharan Africa, remained low. These countries still had low growth rates and the majority faced high debt services.

3.6 1999-2009: MDGs, sector-wide approach (SWAp) and budget support

Policy changed again with the arrival of Minister Eveline Herfkens in 1998 (1998-2002). The minister limited the number of partner countries with whom the Netherlands maintained structural bilateral development relations.[7] Much more than her predecessors, she wanted to choose these countries – in line with dominant notions about aid effectiveness at the time – based on their degree of poverty, the quality of governance and the quality of the socio-economic policy. While the sector-wide approach became the cornerstone of the new bilateral policy, Herfkens also introduced general budget support. In collaboration with other ministers for development cooperation in like-minded countries, Minister Herfkens abolished tied aid to LDCs and curtailed technical assistance, which she considered paternalistic. Herfkens was also committed to improving trade relations, and she was very critical of existing practices that condoned trade barriers in Northern countries while forcing Southern countries to open their markets.

Minister Agnes van Ardenne (2002-2007) also wanted policy to focus on a limited number of themes and countries, and she chose to concentrate on Africa (at least 50% of the bilateral budget). A list of 36 partner countries was compiled for the bilateral policy that aimed to promote good governance, respect for human rights and capacity enhancement. In addition, she focused more on the MDGs. Van Ardenne also provided more general budget support. During her tenure, the Dutch government introduced the '3D approach', which stressed the relationship between defence, diplomacy and development and generated renewed interest in a forgotten group of fragile states.

While Herfkens had focused on macro-economic policy and macro-economic conditions for economic growth, Van Ardenne concentrated more on private sector development, including public-private partnerships (PPPs). In 2005, she decided to increase spending through the Dutch NGO channel. The co-financing programme for NGOs was broadened in 2003, allowing other development organisations to participate. From 2007 to 2010, more

[7] The minister selected 19 partner countries (later on 21), but also included 15 countries where the Netherlands focused on good governance, human rights and peacebuilding, as well as 8 countries where the Netherlands would actively promote a sustainable environment and 5 countries where the ministry contributed to private sector development.

than 50 NGOs received in total EUR 2.3 billion. The new Co-Financing System (MFS I, 2007-2010) provided the framework.

In line with what his predecessor had started, Labour Party (PvdA) Minister Bert Koenders (2007-2010) paid more attention to fragile states (such as Burundi and Afghanistan). The minister defined three groups of partner countries: 1) MDG countries: low-income countries where fragility did not dominate and government structures offered sufficient prospects for cooperation; 2) fragile states, where fragility or severe inequality impeded poverty reduction; and 3) a few emerging middle-income countries, specifically those with whom the Netherlands maintained 'broad relations' (Egypt, Georgia, Indonesia, Vietnam and Suriname). The minister also promoted the further development of public-private partnerships (PPPs).

Table 3.5 Dutch bilateral aid and exports to and imports from low- and middle-income countries 1999-2009 (EUR billion; constant prices 2010)

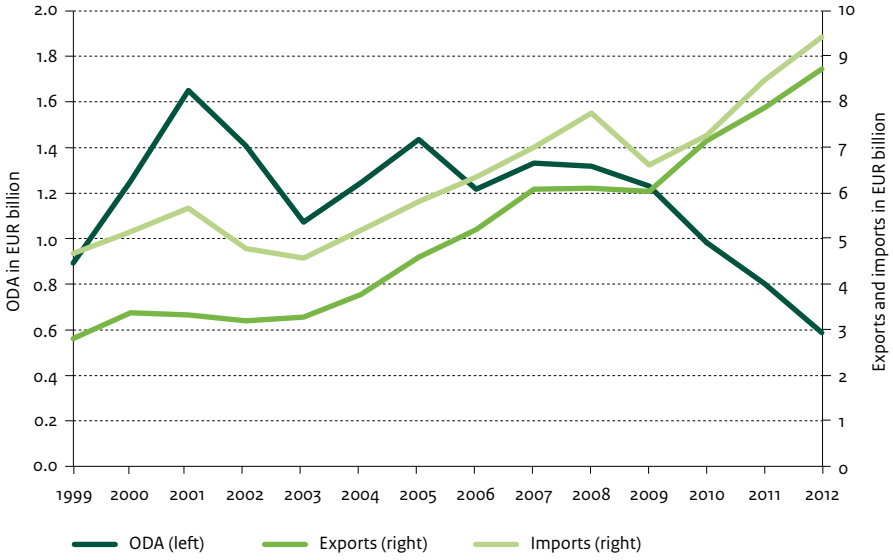
Income status	Type	South-East Asia	Europe / Eur-Asia	Latin America / Caribbean	Middle East	South Asia	Sub-Saharan Africa	Total
LI	ODA	0.1	0.0	0.0		1.5	6.4	8.0
LMI	ODA	1.7	0.2	1.2	1.0	0.5	3.3	7.8
UMI	ODA	0.3	0.8	1.0	0.1	0.0	0.5	2.6
LI	Export	0.3	0.2	0.2		0.1	9.1	10.8
LMI	Export	10.8	9.1	1.4	15.5	13.9	23.4	74.2
UMI	Export	41.1	37.4	37.7	13.4	0.1	14.2	143.8
LI	Import	0.4	0.1	0.0		3.4	9.4	13.3
LMI	Import	40.9	3.5	2.7	14.5	19.6	19.6	100.9
UMI	Import	252.5	22.6	91.0	13.6	0.0	14.5	394.2

Note: LI=Lower income; LMI=Lower middle income; UMI=Upper middle income.
Due to rounding figures, the subtotal figures do not necessarily add up precisely to total figures; all figures below 50 million are rounded as 0. Empty cells indicate missing data.
Source: OECD/DAC and UN Comtrade.

Compared to the 1990s, in the first decade of the new millennium aid concentrated more on a smaller number of partner countries. Another striking development was the strong growth of exports to developing countries, especially middle-income countries.

Figure 3.4 sketches the development of ODA, and exports to and imports from partner countries from 1999 onwards.[8] Total bilateral aid to these countries was more or less stable until 2010. The high figure for ODA in 2001 is the result of debt relief and incidental support to Ghana and Mozambique. The graph shows that exports to partner countries remained more or less constant until 2003, but accelerated from 2004 onwards, in line with the higher growth rates in many partner countries. Rather than lagging behind, emerging and developing economies are increasingly contributing to growth in world GDP per capita (see Radelet, 2010; IMF, 2012). Since 2002, emerging and developing economies have become the main contributors to growth (Holland and Te Velde, 2012). Between 1999 and 2009, the Netherlands' main export partners among the countries receiving aid were South Africa, Egypt, Indonesia, Pakistan, Colombia, Vietnam, Ghana, Suriname, Kenya and Senegal.

Figure 3.4 *Development of Official Development Assistance, exports and imports to partner countries (EUR billion; constant prices 2010)*



Source: OECD/DAC and UN Comtrade.

There are substantial differences between low-income countries and lower middle-income countries (see Annex III). At the beginning of the millennium, ODA and exports to low-income countries were comparable in size. Imports were much higher. During these years, the Netherlands' exports to partner countries were highest to Kenya, Guinea, Benin and Togo. In the case of Guinea, these mainly concerned re-exports (78% in 2010, especially

[8] Afghanistan, Albania, Armenia, Bangladesh, Benin, Bolivia, Bosnia and Herzegovina, Burkina Faso, Burundi, Cape Verde, Colombia, Egypt, Eritrea, Ethiopia, Georgia, Ghana, Guatemala, Indonesia, Kenya, Macedonia, Mali, Republic of Moldova, Mongolia, Mozambique, Nicaragua, Pakistan, Rwanda, Senegal, South Africa, Sri Lanka, Sudan, Suriname, Tanzania, Uganda, Vietnam, Yemen and Zambia.

fuels; see Kuypers *et al.*, 2012). Imports were highest from Bangladesh, Cameroon, Kenya and Zimbabwe. From 2004 onwards, trade with low-income countries increased substantially, while bilateral aid tended to decrease. ODA is becoming relatively less important, while these countries are becoming increasingly important as trade partners.

This trend is also discernible in lower middle-income countries. The main difference is the much smaller role that ODA plays in relation to trade. There is also a trade deficit, owing to large imports from the Philippines, India and Indonesia. Imports from the Philippines mainly consist of semiconductors and office and automation equipment.

3.7 2010-2012: Budget cuts and a greater role for Dutch business

In January 2010, the Dutch Scientific Council for Government Policy (WRR) published a report on Dutch development cooperation. While the report was fiercely debated in academic and professional circles, it was well received in the political arena. The authors sensed a change in the thinking about aid and advised the government to focus more on areas where the Netherlands was supposed to have a 'comparative advantage'.

Table 3.6 Dutch bilateral aid and exports to and imports from low- and middle-income countries 2010-2012 (EUR billion; constant prices 2010)

Income status	Type	South-East Asia	Europe / Eur-Asia	Latin America / Caribbean	Middle East	South Asia	Sub-Saharan Africa	Total
LI	ODA	0.0	0.0	0.0		0.4	1.4	1.9
LMI	ODA	0.1	0.0	0.2	0.1	0.1	0.4	0.9
UMI	ODA	0.0	0.0	0.1	0.0		0.1	0.3
LI	Export	0.0	0.1	0.1		0.7	6.8	7.7
LMI	Export	4.1	4.1	0.7	7.3	6.5	16.1	38.7
UMI	Export	24.2	16.8	22.0	4.8	0.0	6.2	73.9
LI	Import	0.3	0.0	0.0		1.6	3.6	5.5
LMI	Import	13.5	1.8	1.6	6.8	12.3	15.6	51.6
UMI	Import	116.3	9.9	42.0	5.2	0.0	4.2	177.6

Note: LI=Lower income; LMI=Lower middle income; UMI=Upper middle income.
Due to rounding figures, the subtotal figures do not necessarily add up precisely to total figures; all figures below 50 million are rounded as 0. Empty cells indicate missing data.
Source: OECD/DAC and UN Comtrade.

That same year, the new minority coalition government between the Liberal Party (VVD) and the Christian Democrats (CDA), tolerated by the right-wing Party for Freedom (PVV), reduced the budget for development cooperation from 0.8% to 0.7% of the GDP. Effectively, the reduction was higher, as in the future other expenditures (e.g. peacekeeping operations and the reception of immigrants) would also be financed through the budget for development cooperation. The total reduction was EUR 900 million, 18% of ODA expenditure in 2010.

In addition, the Netherlands discontinued general budget support and reduced the number of partner countries from 33 to 15. Later budget cuts also involved the closure of several embassies. More or less in line with the WRR report, Ben Knapen phased out support to the social sectors (mainly education and health), focusing more on economic sectors. The coalition wanted Dutch enterprises to benefit more from development cooperation, and therefore Dutch business would get a stronger stake in the implementation of development programmes and projects.

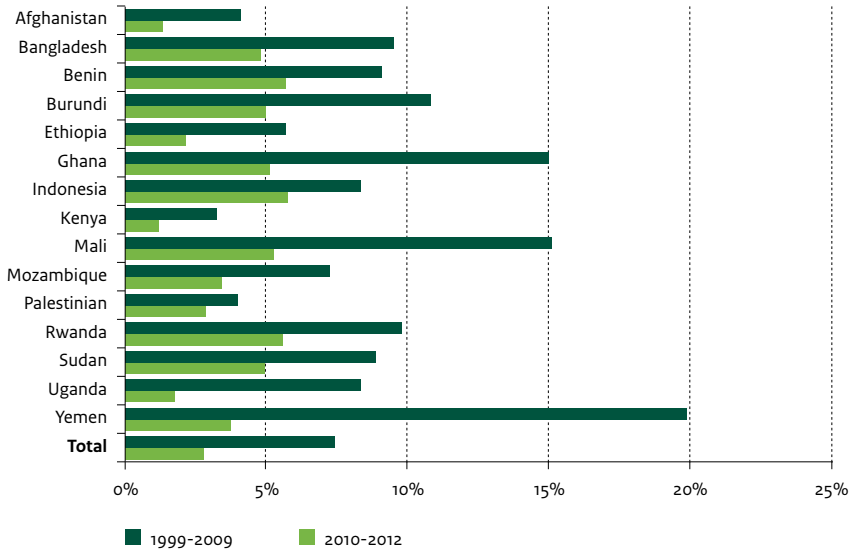
In 2012, the cabinet decided to introduce new budget cuts for development cooperation, with cutbacks increasing from EUR 520 million in 2014 to EUR 1.04 billion in 2017. The coalition partners also agreed to establish a new post called the Minister for Foreign Trade and Development Cooperation, confirming the importance of cohesion between these two policy areas. The new minister would be responsible for the promotion of international trade and development cooperation.

The budget cuts had a huge impact on the role of the Netherlands in international development cooperation. Between 1999 and 2009 the Netherlands has been an important bilateral donor in the 33-36 partner countries. As a result of the recent budget cuts, the Dutch contribution declined substantially, even in the 15 partner countries (see figure 3.5).

As a result of the budget cuts, ODA and exports to these countries are now moving in opposite directions, at least in the short run. In the longer run, the reduction of bilateral support may also have consequences for Dutch exports. Figure 3.6 tries to shed some light on this issue. The graph shows the growth of imports by former and present partner countries from 2004 onwards. This growth was highest in former partner countries, mainly lower middle-income countries.

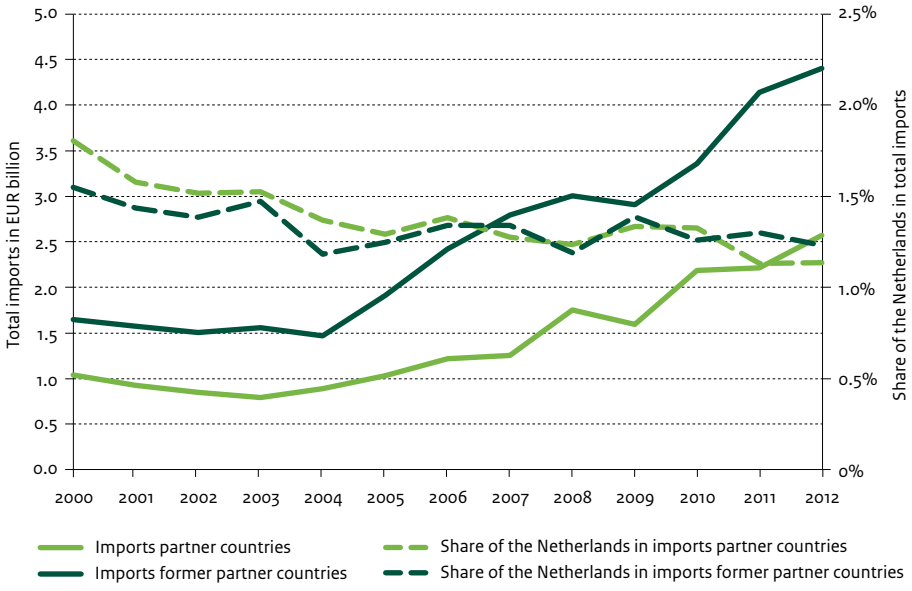
It appears that the Netherlands does not benefit proportionally, in spite of the high growth of exports to these countries. The higher imports from emerging countries such as China and India, as well as increasing regional integration, are important explanations. In the future, it will be important to monitor how the downward trend that began in 2009 continues to develop. The next chapter will discuss this in more detail.

Figure 3.5 *Share of Dutch aid in total net bilateral aid for the Netherlands' 15 partner countries (1999-2012)*



Source: OECD/DAC; elaborated on by IOB.

Figure 3.6 *Total imports of present and former partner countries (2000-2012)**



** Excluding Afghanistan, the Democratic Republic of the Congo, Sudan and the Palestinian Territories.*

Source: UN Comtrade; elaborated on by IOB.

3.8 Summary

In the late 1940s, the Netherlands gradually started to provide aid to developing countries. Initially, budgets for development cooperation were modest. As they gradually tended to grow, however, Dutch business became more interested and this pushed aid towards bilateral support. From 1973 onwards, budgets for development cooperation grew fast and began focusing more on the primary objective of poverty reduction and less on the promotion of Dutch exports. Between 1973 and 1981, both aid and Dutch exports to aid recipients had high growth rates.

This situation changed in the early 1980s. Trade with low- and middle-income countries stagnated, mainly as a result of the impact of the world economic crisis. In the Netherlands, budget cuts aimed at reducing the fiscal deficit had an impact on development cooperation budgets. The Dutch government showed a renewed interest in the involvement of the private sector in development cooperation.

Dutch policy changed again when Pronk was reappointed Minister for Development Cooperation in 1989. Pronk focused on bilateral aid, especially to low-income and lower middle-income countries in sub-Saharan Africa and Latin America. He was also able to reverse the reduction of ODA as a percentage of GDP.

In the late 1990s a number of emerging economies started to show high growth rates. Exports from the Netherlands to these countries also accelerated. This coincided with a new shift in Dutch development cooperation from the late 1990s onwards, when it began to concentrate on a smaller number of partner countries, attach more importance to programme aid and completely untie aid to the least developed countries.

In spite of the high growth rates in most developing countries as well as increasing evidence of the effectiveness of aid, development cooperation became more and more subject to debate in the Netherlands. In 2010 and 2012, the Netherlands decided to reduce the budgets for development cooperation as a result of the new world economic and financial crisis. Since 2010, budgets for development cooperation and exports to developing countries have been moving in opposite directions, at least in the short run. The Dutch share in total (bilateral) ODA decreased rapidly, even in the 15 partner countries. In the longer run, this may have an impact on Dutch exports to these countries.

4

Impact of aid on Dutch exports

4.1 Introduction

This chapter presents the results of the analysis of the impact of bilateral aid on exports for the Netherlands. Section 4.2 starts with a brief explanation of the conceptual framework, followed by a description of the data (section 4.3).

Section 4.4 presents the main findings, and section 4.5 zooms in on the results for trade and aid with low-income and lower middle-income countries. These sections concentrate on overall exports. However, the impact on exports is not the same as the value added for the Dutch economy. Section 4.6 discusses the difference and calculates the value added of aid for the Dutch economy. In the same way, section 4.7 analyses the corresponding employment. Section 4.8 concludes the chapter.

This chapter tries to keep the technical details to as much of a minimum as possible. For the interested reader, Annex V goes into the techniques that have been used in more detail.[9]

4.2 Conceptual framework

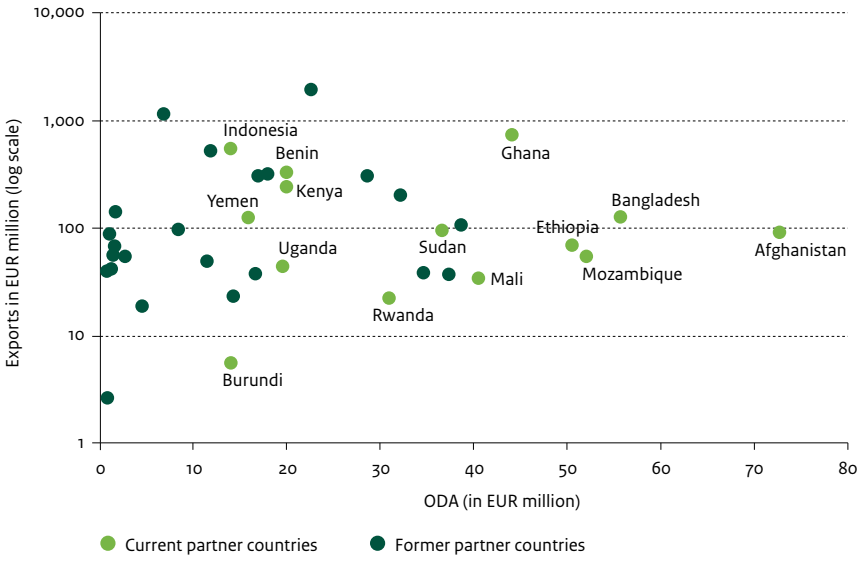
An assessment of the impact of Dutch aid on exports faces a number of challenges. Many other variables may have an impact on the imports of recipient countries and therefore also on the exports from the Netherlands to these countries. First of all, the Netherlands is not the only country to provide aid (see section 3.7). Bilateral aid from other donors may have an impact on Dutch exports in two ways (see Martínez-Zarzoso *et al.*, 2013c):

- to the extent that it improves recipient countries' capacity to import, one may expect it to have a positive impact on exports from the Netherlands to these countries; and
- it may also have a negative impact on Dutch exports if the aforementioned mechanisms of tied aid, habit formation and goodwill dominate and lead to higher exports from other donors (and fewer from the Netherlands).

Second, while aid may boost recipient countries' capacity to import, it is not the only factor that affects imports by recipient countries. Economic growth and higher exports are perhaps more important factors. In addition, trade relations may be influenced by the exchange rate or the existence of a (bilateral) trade agreement. Existing trade relations have an impact as well (Lejour, 2013). The intensity of these relations depends, among other factors, on geographical distance and historical and cultural ties. And last but not least, while aid may have an impact on Dutch exports, the causal relation may also go in the opposite direction: exports could have an impact on aid relations. Trade relations may be one of the criterions for selecting a partner country. Therefore, it is important to disentangle the causality of aid and trade relationships. The techniques used in this analysis allow for controlling for other factors (such as economic growth) and potential reverse causality (see section 4.4 and Annex V).

[9] For the interested reader, the more technical report of Martínez-Zarzoso *et al.* (2013c) is available online.

Figure 4.1 *Net bilateral aid and exports to partner countries (average 2010-2012)*



Source: OECD/DAC and UN Comtrade; elaborated on by IOB.

The (econometric) techniques used in this chapter intend to deal with these challenges.[10] Essentially, the report analyses the aid-export relationship within the framework of what is called a *gravity model*. Gravity models have been used to analyse trade flows, including the impact of economic diplomacy on trade.[11] This approach helps to discern the impact of Dutch (bilateral) aid from other factors, such as economic growth, geographical distance, the size of a country or aid from other countries. The *time series approach* used for this report also helps to control for potential reverse causality (e.g. the impact of exports on aid).

The report focuses on net *Official Development Assistance* (ODA) and within this category on two types of aid, namely:

- bilateral aid from the Netherlands; and
- aid from all other bilateral donors put together.[12]

In order to be able to give an unbiased estimate, the analyses include a number of *control variables*, such as the (nominal) bilateral exchange rates, the national income in the

[10] Annex V provides more information on the techniques used.

[11] See, for instance, IOB (2012b), *Effectiviteit van economische diplomatie: methoden en resultaten van onderzoek*. The Hague: Ministry of Foreign Affairs and IOB (2013), *Economic diplomacy in practice: An evaluation of Dutch economic diplomacy in latin America*. The Hague: Ministry of Foreign Affairs.

[12] These donors include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Netherlands and in recipient countries, and the existence of a free trade agreement (FTA). In addition, the model includes *time fixed effects* that control for omitted variables common to all trade flows but which vary over time (such as the development of world trade over time or the impact of the global economic crisis). Finally, the model includes *recipient-specific fixed effects* that proxy for time-invariant recipient country characteristics or a time-invariant relationship between the Netherlands and the recipient country. By including recipient-specific fixed effects, the model controls for unobserved heterogeneity, for instance historical ties (including colonial ties).

4.3 Data

The study focuses on *net bilateral aid*. Dutch ODA data are from the OECD database on Aid from DAC Members for the period 1962-2011.[13] Individual donor countries provide data for this database. Therefore, for this study, bilateral aid is defined as all aid from the donor country (the Netherlands) as identified by the donor as bilateral aid in the database provided to the OECD/DAC.[14]

Bilateral exports are obtained from the UN Comtrade database.[15] Data on income and population variables are drawn from the World Bank (World Development Indicators Database, 2012). Bilateral exchange rates are from IMF statistics, which have been corrected for the introduction of the euro and currency reforms in the recipient countries.[16] The recipient country currency is in the numerator, and the donor country currency (1 EUR) is in the denominator. The FTA variable is from De Sousa (2012).

The net bilateral ODA used in this study includes grants, capital subscriptions, net loans and other long-term capital provided by the Dutch government and other (bilateral) donors. The report uses actual disbursements, not commitments.

4.4 Results

This section presents the main results of the analyses of the impact of development assistance on exports (see table 4.1). The results are based on a time series approach (see Annex V for the methodological details).

[13] The original sample with data for the period 1962-2011 has been reduced. In the first decades, the level of Dutch aid was relatively low. Therefore, the analysis starts with 1973. The latest years (2010-2011) were characterized by a strong shift in the aid policy with significant cuts in the aid budget. It is too early to assess the impact of this shift on exports.

[14] The database is not without challenges. If the ministry or an executive agency does not specify part of the bilateral aid budget by country, this will lead to an underestimation of the bilateral aid.

[15] Online database: http://comtrade.un.org/db.

[16] The International Financial Statistics and World Development Indicator statistics are not adjusted for currency reforms and therefore problematic. The researchers have corrected the data accordingly.

All continuous variables are transformed into natural logs (ln), including the dependent variable (Dutch exports). This transformation reduces the influence of extreme observations (countries with a very high export value or relatively high degree of aid) and helps to understand the effect of the calculated (elasticity) coefficients. The beta coefficients denote the relation between a one unit change in ln X and a change in ln Y:

$$\beta = \partial \ln Y / \partial \ln X$$

Applying the log transformation to all left-hand-side and right-hand-side variables, the betas reflect elasticities (η), i.e. the percentage of change of Y (the dependent variable, not in logs) due to a 1% change in X (the explanatory variable, not in logs):

$$\eta = \frac{\partial Y}{\partial X} * \frac{X}{Y}$$

For small changes, β is approximately equal to η. Consequently, ∂Y/∂X gives the relation between aid and exports, or:

$$\frac{\partial Y}{\partial X} = \beta * \frac{Y}{X},$$

where ∂Y/∂X indicates by how much the dependent variable changes (in euros) if the explanatory variable changes by one euro.

The transformed variables are respectively Dutch bilateral aid, bilateral aid from other countries, Dutch national income, the national income of the recipient country and the exchange rate. In addition, the model includes the existence of a free trade agreement between the Netherlands and the recipient country. This variable has a value of 1 if an agreement is in place, and otherwise a value of 0.

The model deals with the endogeneity of explanatory variables through the inclusion of leads and lags and the use of first differences.[17] A lagged variable presents the value in t-1, one year earlier. A lead variable takes instead the value for the next year (t+1). In addition, the (first) difference is the change of a variable from one year to the next (Xt - Xt-1).

Two indicators provide information about the overall quality of the model. First, the adjusted R^2 indicates how well the whole model explains changes in the dependent variable. If the model is perfect, $R^2adj=1$; if there is no correlation between the explanatory variables and the dependent variable, $R^2adj=0$. In table 4.1, the R^2adj is very high, which is

[17] The Granger causality test, which is a test on weak exogeneity, rejects bilateral aid as exogenous and therefore supports the applied estimation strategy.

not unusual in time series. The Durbin-Watson statistic is a measure that detects serial correlation in the unexplained part of the model (the error term). This would invalidate the results. If serial correlation exists, the statistic has a value that differs substantially from 2. In table 4.1 this statistic is close to 2.

Table 4.1 The impact of Dutch bilateral aid on Dutch exports

	(1)		(2)		(3)	
Variables	**1973-2009**		**1973-1998**		**1999-2009**	
Ln bilateral aid NL	0.052 (0.027)		0.027 (0.040)		0.089 (0.021)	***
Ln bilateral aid other countries	0.075 (0.039)	*	0.093 (0.045)	**	-0.007 (0.032)	
Ln GDP NL	0.334 (0.092)	***	0.333 (0.117)	***	1.446 (0.243)	***
Ln GDP recipient	0.704 (0.062)	***	0.614 (0.069)	***	0.311 (0.121)	***
Ln exchange rate	-0.022 (0.011)	**	-0.022 (0.012)	*	-0.195 (0.032)	**
Free trade agreement	0.149 (0.050)	***	-0.110 (0.123)		0.130 (0.063)	**
Leads and lags of explanatory vars in first differences	Yes		Yes		Yes	
R^2 adj.	0.952		0.944		0.971	
Durbin-Watson stat.	2.145		2.056		2.019	
Observations	2,310		1,662		648	

*Note: standard errors are in parentheses. ***, ** and * stand for 1%, 5% and 10% error levels. Recipient fixed effects are added to all regressions. The model is estimated by means of panel dynamic feasible generalised least squares (PDFGLS). This method controls for endogeneity of the regressors and autocorrelation of the disturbances.*

The first model (1) presents the results of the analyses for the years 1973-2009. For these years, the aid-elasticity coefficient is positive (0.052), but not statistically significant. Statistical arguments suggest that the probability of no relation is too high (even higher than 10%) to determine with sufficient certainty that a relationship exists.

This finding does not exclude the possibility that over specific periods of time Dutch bilateral aid had a positive impact on Dutch exports. Therefore, two other models provide results for two different periods: 1973-1998 and 1999-2009.[18] Once again, the impact of net

[18] The Chow test (residual-based structural break test) indicates a structural break in 1999, and thus two separate regressions have to be run for the two sub-periods, 1973-1998 and 1999-2009.

bilateral aid on exports appears to be insignificant in the first period (1973-1998). By contrast, for the second period (1999-2009) Dutch bilateral aid had a significant positive impact on Dutch exports (model 3). Several factors may explain this result. First of all, at the end of the 1990s, the Netherlands moved towards a more focused aid strategy by concentrating more on a small number of partner countries (overall about 33-36). Second, during the period 1973-1998, many developing countries, especially in Africa, faced severe macro-economic difficulties and were subjected to the IMF and World Bank's structural adjustment programmes. Their capacity to import was limited during these years. In the late 1990s, many African countries started to produce much higher growth figures, while debt relief also helped to reduce import constraints.

In this second period, all coefficients have the expected signs. With average exports of USD 226 million and an average ODA figure of USD 22.3 million, the effect may be estimated at 0.089 * 226/22.3 = USD 0.90 for each dollar spent on aid, or, EUR 0.90 for each euro spent on aid.[19]

Column 3 in table 4.1 also shows that other donors' bilateral aid does not crowd out Dutch exports.[20] Its impact on Dutch exports is insignificant. As expected, recipient country GDP has a positive, significant impact on Dutch exports. Also, an increase in Dutch GDP leads to a positive, significant effect on Dutch exports. This may be explained by the capacity effect. The bilateral exchange rate has the expected negative sign: a depreciation of the recipient country's currency increases the price of imports in local currency and leads to a decrease of donors' exports to recipient countries.[21] The trade agreement variable contributes positively to exports, and its impact is significant in this later period.

An alternative technique (a static gravity model using panel econometric techniques with 2-way fixed effects) estimates the short-term (direct) impact of aid on exports.[22] Table 4.2 summarizes the main findings. For the interested reader, Annex VI provides the detailed results.

[19] Aid and exports data are in USD and effects have therefore been estimated in USD. Because of yearly fluctuations in aid and exports, the estimated impact in EUR is not necessarily precisely the same as the EUR effect. However, differences are very small. In the general formulation, there is no difference.

[20] If this variable is excluded, the coefficients for Dutch ODA are higher for the whole period and for 1973-1998, suggesting that the coefficient may be influenced by *multicollinearity*. On the other hand, dropping the bilateral aid of other donors may lead to biased estimates. The coefficients are exactly the same for the more recent years, 1999-2009.

[21] The (bilateral) exchange rate is defined as the value of a euro in local currency. Therefore, a depreciation leads to a higher value.

[22] This technique permits us to use all the observations (no leads and lags included) but does not control for the potential endogeneity of the aid coefficient.

Table 4.2 Static impact of Dutch bilateral aid on Dutch exports for different periods					
	1973-2009	1973-1981	1982-1989	1990-1998	1999-2009
Aid coefficient	0.034	0.0639	0.0417	0.0198	0.0349
Significance	***	***	*		***
Number of observations	3,173	672	679	936	971
Mean exports (USD million)	102.0	42.4	47.5	76.8	202.4
Mean aid (USD million)	12.1	6.2	9.1	12.3	18.2
Effect size	0.29	0.44	0.22	-	0.39

Note: Based on a static gravity model estimated with 2-way fixed effects.
****, ** and * stand for 1%, 5% and 10% error levels.*

The results in table 4.2 are in line with the tendencies described in chapter 3.[23] For the years 1973-1981, the Netherlands combined substantially higher development cooperation budgets with expanding exports to developing countries. By then, bilateral aid was mainly tied. The estimated short-term effect of aid on exports is higher for this period than for any other period considered, with an average return of EUR 0.44 for each euro spent on (bilateral) aid.

The years 1982-1989 witnessed the impact of the international economic crisis. In the Netherlands, the high fiscal deficit contributed to budget cuts for development cooperation (as a percentage of GDP), even while absolute budgets remained more or less stable in constant prices. Although the government wanted to strengthen the role of Dutch business in development cooperation, the impact of aid on exports diminished. Total exports to developing countries fell, and the share of these countries in Dutch exports decreased (from 7.3% in 1981 to 4.7% in 1990).

The third period, 1990-1998, saw a rise in resources available for development cooperation again, although the budgets for bilateral aid remained more or less stable. Moreover, the minister spread bilateral aid over many more countries, with more ODA going to lower middle-income countries. Exports to upper middle-income countries in Asia (China) and Latin America (Argentina, Brazil, Mexico, Chile and Colombia) doubled during these years, while exports to low-income countries, mainly in sub-Saharan Africa, stagnated. As a result, the static model does not show a relation between aid and exports. The fast growth of exports to upper middle-income countries in Asia and Latin America, however, suggests that the dynamic effects of aid (due to habit formation and goodwill) are more important than the static effects (due to tied aid).

[23] Unlike table 4.1, in table 4.2 this effect is significant for the whole period. Because of the endogeneity of aid, however, the technique used for table 4.1 is preferable.

Next, during the years 1999-2009, the aid coefficient (0.39) became significant again, and the short-term effect was comparable with the period 1973-1981 (0.44), though slightly less pronounced. During these years, the Netherlands delivered bilateral aid to about 35 countries, with an emphasis on programme support (SWAp and budget support) and the MDGs. Following a recommendation by the OECD/DAC secretariat, the Netherlands also abolished tied aid to LDCs. During these years, several emerging countries in Africa and elsewhere showed high growth rates, and this development expressed itself in higher exports to these countries.

Estimates with an alternative technique (see GMM estimates in Table II.4, Annex VI), for the years 1988-2009 point to a return on aid in the long run of EUR 1.05 for each euro spent on bilateral aid. This result is slightly higher than the estimate for the years 1999-2009 mentioned earlier (see table 4.1).

Several factors may influence the estimates:

- The calculated coefficient (β) depends on the sample that has been used. A different sample (of countries and years) may lead to a different coefficient. The standard errors, included in table 4.1 (in brackets) are an indication of the error margin. We can say with a certainty of 90% that the effect lies between 0.6 and 1.2.[24] For the alternative specification it would be between 0.75 and 1.35.
- The estimated return on aid also depends on the size of average exports and average aid. Outliers (such as China) may have a relatively large impact on the 'euro effect'. Results are slightly lower if we take this into account, leading to an effect of EUR 0.70-EUR 0.90 for each euro of aid.

4.5 Results for low-income and lower middle-income countries

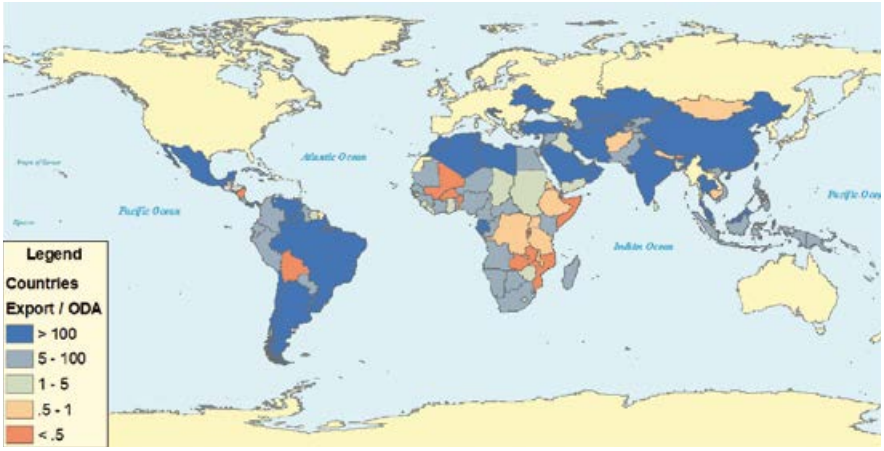
As mentioned before, results may vary for different groups of recipient countries. The impact of aid on Dutch exports may be higher for countries receiving substantial support than for countries receiving relatively small amounts. In addition, Dutch export markets may have closer ties with wealthier countries than low-income countries.

Figure 4.2 gives an impression of this heterogeneity (for the years 1999-2011). Countries in red show an export/aid ratio of less than one, e.g. more aid than trade), whereas countries in blue show an export/aid ratio of more than one. With the exception of Bolivia and Nicaragua, exports to Latin America were much higher than the provision of aid. Disregarding a few exceptions, this was also the case for countries in North Africa, the Middle East and Asia. In sub-Saharan Africa, on the other hand, the exports/ODA ratio was

[24] With a coefficient of 0.089 and a standard error of 0.021 there is a certainty of 90% that the actual effect lies between 0.089 - 1.65*0.021 and 0.089 + 1.65*0.021.

much lower, with the exception of Gabon and Equatorial Guinea. In a number of countries such as Zambia, Mozambique, the Democratic Republic of the Congo, Somalia, Mali and Burkina Faso, total ODA from the Netherlands was higher than exports between 1999 and 2011. Annex IV gives a more detailed picture for exports and aid to African countries. More recently, between 2010 and 2012, ODA was only higher than exports in Mali, Rwanda and Burundi, and about equal in Mozambique and Burkina Faso.

Figure 4.2: *Bilateral aid and exports to low-income and middle-income countries (1999-2011)*



Source: UN Comtrade and OECD/DAC; elaborated on by IOB.

Table 4.3 sketches the results of the analyses for the low- and lower middle-income countries. They point to slightly higher (and significant) elasticities (0.11) for the period 1999-2009. It should be noted, however, that in general the exports/ODA ratio is much lower in these countries and therefore the impact of aid on exports is not necessarily higher.

Table 4.3 The impact of Dutch bilateral aid to low-income and lower middle-income countries on Dutch exports						
	(1)		(2)		(3)	
Variables	**1973-2009**		**1973-1998**		**1999-2009**	
Ln bilateral aid NL	0.06 (0.04)		0.04 (0.05)		0.11 (0.04)	***
Ln bilateral aid other countries	0.13 (0.06)	**	0.15 (0.07)	**	0.01 (0.04)	
Ln GDP NL	0.30 (0.10)	***	0.28 (0.12)	***	1.70 (0.24)	***
Ln GDP recipient	0.65 (0.08)	***	0.60 (0.08)	***	0.18 (0.15)	***
Ln exchange rate	-0.05	***	-0.04	*	-0.30	**
Free trade agreement	(0.02)		(0.02)		(0.13)	
R^2	0.95		0.94		0.97	
Durbin-Watson stat.	2.13		2.05		2.03	
Observations	1,509		1,065		444	

*Note: standard errors are in parentheses. ***, ** and * stand for 1%, 5% and 10% error levels. Recipient fixed effects are added to all regressions. The model is estimated by means of panel dynamic feasible generalised least squares (PDFGLS). This method controls for endogeneity of the regressors and autocorrelation of the disturbances.*

During the years 1999-2009, the low- and middle-income countries in the sample received an average of USD 23.4 million per year in bilateral aid from the Netherlands, while Dutch exports to these countries amounted to an average of USD 121.6 million per year. If we apply the 0.11 coefficient (see table 4.3, column 3) to all low- and lower middle-income countries in the sample, we get an estimated effect of EUR 0.55-EUR 0.60 for each euro of aid (0.11 * 121.6/23.4).[25]

Comparing this figure with the overall results, it appears that Dutch exports benefit more from aid to countries with a relatively high income than from aid to the poorest countries. While the tying of aid may play a role, it seems more likely that it is the result of the higher import capacity of the (upper) middle-income countries. Imports in low-income and lower middle-income countries are rising very fast, however, and therefore it is likely that the effect of habit formation and goodwill will increase in these countries.

[25] See footnote 19.

4.6 Value added for the Netherlands' economy

The preceding section showed the robust positive and significant effect of bilateral Dutch aid on Dutch exports (total exports) for the period 1999-2009. However, the value added of these exports for the Dutch economy does not equal the increase in exports.[26] First of all, a large part of Dutch exports consists of re-exports. In the case of re-exports, an enterprise in the Netherlands has become the owner of an imported product, but this product is hardly processed in the Netherlands before it is exported again. Re-exporting companies are mainly engaged in distribution and transport activities. The value added of re-exports for the Dutch economy is low. However, these re-exports mainly go to other European countries, and especially neighbouring countries (Kuypers *et al.*, 2012). Second, Dutch companies also depend on raw materials and semi-manufactures from other countries. Therefore, part of the total export value is earned by companies abroad and the net income effect (or value added) for the Netherlands is lower than the total export value.

In 2009, almost 40% of total Dutch exports and 50% of the exports of goods consisted of re-exports. On average, the value added of these re-exports for the Netherlands was 7.4% of the total export value. The value added of goods produced in the Netherlands was 58.5%. Overall, and including the export of services (with a relatively high value added in the Netherlands), the value added of exports was 42% that year.[27]

The effects are probably not the same for all sectors. To estimate the added value of Dutch exports to low- and middle-income countries that have received Dutch support, the report has relied on estimates of the added value by sector provided by the Netherlands Bureau for Economic Policy Analysis (CPB). Table 4.4 shows how the value added of additional aid has been calculated. The first row gives the total exports of the countries that have received aid from the Netherlands. Aid elasticities have been used to calculate additional exports. Second, estimates of the value added share by sector have been used to calculate the value added of these exports. This approach estimates the value added at 57% of the (additional) exports to these countries.

[26] The value added is the difference between the value (market price) of goods and the cost of materials or supplies that are used in producing them.

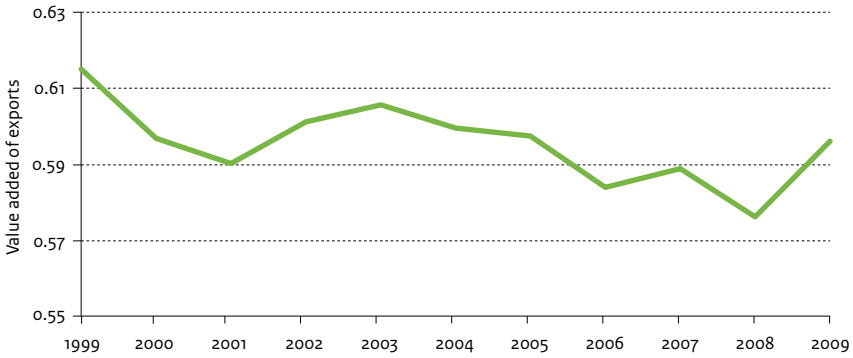
[27] Source: CBS/CPB.

Table 4.4 Value added of exports due to aid (2008)						
	Total exports (EUR billion)	Aid elasticities (beta coeffi-cients)	Sign.	Additional exports due to aid (EUR million)	Value added by sector	Additional VA exports due to aid (EUR million)
Agriculture	2.28	0.01		---	0.67	---
Mining	--	---		---	0.88	---
Food	3.04	-0.00		---	0.60	---
Textiles	0.70	0.08	*	56.0	0.58	32.6
Leather	0.17	0.19	***	31.5	0.69	21.8
Wood	0.08	0.15	**	11.9	0.67	7.9
Pulp	0.79	0.11	**	86.9	0.68	59.5
Coke	6.12	-0.06		---	0.24	---
Chemicals	4.79	0.08	*	383.3	0.49	187.9
Rubber	1.49	-0.03		0.0	0.55	0.0
Non-metallic metal	0.16	0.08	*	12.9	0.66	8.5
Basic & fabricated metal	3.11	0.03		---	0.54	---
Machinery	11.92	0.02		---	0.60	---
Elect. Eq.	3.47	0.08	***	277.9	0.55	152.4
Transport eq.	2.68	0.15	***	402.5	0.52	207.4
Manufact. & recycling	3.99	0.07	***	279.1	0.74	205.7
Totals (goods)	**44.79**			**1,541.8**	**0.57**	**883.7**

*Note: ***, ** and * stand for 1%, 5% and 10% error levels. Beta coefficients are estimated by means of the PDFGLS technique. Additional sectoral exports are computed as beta coefficient times sectoral exports.*
Source: UN Comtrade (export data). VA shares of exports were provided by the Netherlands Bureau for Economic Policy Analysis (CPB).

This figure is not necessarily the same for every year. The composition of exports and the value added for each sector change over time. Figure 4.3 presents the results of the calculations for the years 1999-2009. These results also show that the value added was higher for several other years. On average, every euro of exports to low-income and middle-income countries has a value added for the Dutch economy of EUR 0.60. Therefore, the average effect of aid on Dutch exports is about EUR 0.40 to EUR 0.55 for each euro of aid (0.6 * 0.7 to 0.9).

Figure 4.3 *Average value added of exports associated with aid (1999-2009)*



Source: UN Comtrade (export data) and VA shares of exports provided by the Netherlands Bureau for Economic Policy Analysis (CPB); elaborated on by IOB.

4.7 Employment associated with aid

In order to be able to calculate the jobs needed to produce the additional exports, the researchers used input-output analysis techniques. This analysis starts with the additional gross output, as an increase in final demand requires the production of intermediates whose production, in turn, also requires intermediates (and so forth). Job multipliers have been used to calculate the employment effects. These job multipliers show the relation between gross output and employment (in the Netherlands) in a particular sector. Table 4.5 shows the results for 2008.

Table 4.5 Employment corresponding to additional exports due to aid (2008)

	Total exports (EUR billion)	Aid elasticities (beta coeffi-cients)	Sign.	Additional exports due to aid (EUR million)	Job multipliers (jobs per million output)	Additional jobs
Agriculture	2.28	0.01		---	4.28	15
Mining	---	---		---	0.26	1
Food	3.04	-0.00		---	2.13	28
Textiles	0.70	0.08	*	56.0	4.57	258
Leather	0.17	0.19	***	31.5	5.45	172
Wood	0.08	0.15	**	11.9	5.60	81
Pulp	0.79	0.11	**	86.9	4.89	520
Coke	6.12	-0.06		---	0.16	2
Chemicals	4.79	0.08	*	383.3	1.20	466
Rubber	1.49	-0.03		0.0	4.59	4
Non-metallic metal	0.16	0.08	*	12.9	3.82	70
Basic & fabricated metal	3.11	0.03		---	3.88	113
Machinery	11.92	0.02		---	4.21	20
Elect. Eq.	3.47	0.08	***	277.9	3.95	1,136
Transport eq.	2.68	0.15	***	402.5	2.70	1,098
Manufact. & recycling	3.99	0.07	***	279.1	14.05	3,970
Total goods	**44.79**			**1,541.8**		**7,953**
Services						5,161
Total employment						**13,114**

*Source: Note: ***, ** and * stand for 99%, 95% and 90% confidence intervals, respectively. UN Comtrade (export data) and the World Input-Output Database (World Bank).*

According to the estimates, the export of goods due to bilateral aid generates about 13,000 jobs, of which 8,000 in manufacturing and 5,000 in the services sector.

There are several reasons why this is a low estimate and why the actual figure is probably higher:

- The calculations do not include estimates for sectors with insignificant elasticities. If these effects were included, the total effect would be 10%-15% higher.[28]
- Total employment effects depend on the total size of exports, production of these exports in the Netherlands and total employment in these sectors. As we saw before, in 2008 the value added of exports in the Netherlands was relatively low compared to other years.

In total, the effects are probably at least 15% higher. This would imply a total of about 15,000 jobs generated by the export of goods due to aid. Given the high increase in exports to low-income and middle-income countries, the total employment effects are probably higher for more recent years. Figure 4.4 gives a rough estimate of the development of these employment effects. The graph does not include employment generated by the export of services. In total, (all) exports to these countries generated about 350,000-400,000 jobs.[29] The estimated 15,000 jobs due to aid, therefore, play a substantial role in the overall creation of employment associated with exports to recipient countries.

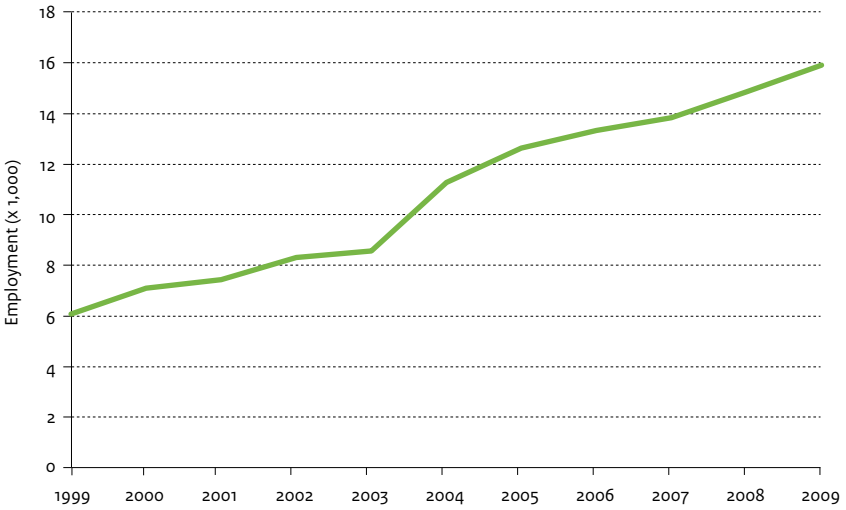
The employment effects of bilateral aid are estimated to be higher in Germany (about 64,000-200,000 jobs) than in the Netherlands. Several factors explain this difference:

- German bilateral aid is more substantial than Dutch aid, owing to Germany's larger economy;
- in addition, bilateral support is a larger share of total German aid than it is in the Netherlands (about two-thirds);
- the value added of German exports is higher;
- Dutch labour coefficients are lower than German labour coefficients. Production in the Netherlands is more capital intensive and uses more automated production techniques; and
- Germany has a higher share of manufactured goods in exports (and the Netherlands has a higher share of services).

[28] In general, statistical techniques are used for hypothesis testing. This means that if the probability is too high (for instance, higher than 10%), then economists and statisticians would conclude that there is no relation. This probability depends on the standard error. However, there is also another risk, namely of not rejecting the null hypothesis that there is no relation, when in fact there is a relation. The power of a statistical test denotes the probability of rejecting the null hypothesis when the alternative hypothesis (there is a relation) is true. The standard error only gives the error margin. If a coefficient has a value of 2 with a standard error of 1.5, there is a relatively high probability that there is no relation (i.e. the real value of the coefficient is 0). However, there is an equally high probability that the actual value is 4 or higher. Therefore, if we want to make the best estimate of corresponding employment, and if the total estimate is based on a number of separate functions (sectors), inclusion of insignificant results gives a more reliable and accurate estimate than continuously taking the risk of rejecting a hypothesis that is actually true.

[29] Exports due to bilateral aid account for about 3%-4% of total exports to low-income and middle-income countries. The conclusion is in line with the findings of Groot *et al*. (2011).

Figure 4.4 *Estimated employment associated with additional exports due to bilateral aid (1999-2009)*



Source: UN Comtrade (export data) and job multipliers; elaborated on by IOB.

4.8 Summary and conclusions

This chapter presented the findings of an analysis of the impact of aid on (Dutch) exports. Section 4.2 sketched the approach and section 4.3 provided information on the data that were used for the analysis.

The analysis was limited to the years 1973-2009. From 1973 onwards, the budget for development cooperation increased substantially. In 2010, there was a break in the continuity of Dutch development cooperation. The government started to reduce the budget for development cooperation and made the policy more trade-oriented, moving away from the social sectors and the provision of budget support.

An analysis of the decades between 1973 and 2009 did not show a significant impact of aid on Dutch exports. However, for the period 1999-2009, the econometric models revealed a significant effect, ranging from EUR 0.90 for each euro of aid to EUR 1.05, depending on the model used. Taking into account a number of uncertainties, the effect may be estimated to range between EUR 0.70 and EUR 0.90 for each euro of aid.

The analyses also show that the effects are higher for recipient countries with relatively high income levels. An explanation for this is these countries' higher import capacity. However, several low-income countries have high growth rates and their imports also rise rapidly. It is therefore likely that habit formation and goodwill will increase in these countries.

The value added for the Dutch economy is lower than the size of the exports. Companies working in the Dutch production sector import raw materials and semi-manufactures from other countries. On average, every euro spent on exports to low- and middle-income countries has a value added for the Dutch economy of EUR 0.60. Consequently, on average the return on aid for the Dutch economy is about EUR 0.40 to EUR 0.55 euro for each euro of aid.

The total employment associated with additional exports due to bilateral aid is estimated at 15,000 jobs (for 2008-2009). Developments over the past ten years suggest that the effects on employment are still going strong as a result of higher exports to low-income and middle-income countries. In total, exports to these countries generate about 350,000-400,000 jobs in the Netherlands.

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Annexes

Annex I List of partner countries over time

Udink (1967-1971)	Concentration countries: Indonesia, India, Pakistan, Sudan, Tanzania, Kenya, Uganda, Nigeria, Tunisia, Colombia, Peru, Suriname and the Netherlands Antilles.
Pronk (1973-1977)	Concentration countries: Upper Volta, Bangladesh, North Yemen, Tanzania, Sudan, Sri Lanka, India, Pakistan, Kenya, Egypt, Indonesia, Zambia, Colombia, Tunisia, Cuba, Peru, Jamaica and Suriname.
De Koning (1977-1981)	Concentration countries: Bangladesh, Colombia, Egypt, India, Indonesia, Kenya, Pakistan, Sri Lanka, Sudan, Tanzania, Upper Volta and Zambia.
Schoo (1982-1986)	Programme countries: Bangladesh, Egypt, India, Indonesia, Kenya, North Yemen, Pakistan, Sudan, Sri Lanka and Tanzania.
Pronk (1989-1998)	Egypt, Sudan, Ethiopia, Yemen, Kenya, Tanzania, Uganda, Rwanda, Angola, Botswana, Lesotho, Malawi, Swaziland, Mozambique, Zambia, Zimbabwe, Namibia, Burkina Faso, Mali, Gambia, Guinea Bissau, Cape Verde, Mauritania, Niger, Senegal, Chad, Benin, Ghana, Cameroon, India, Pakistan, Bangladesh, Thailand, Cambodia, Vietnam, Laos, Myanmar, Sri Lanka, Nepal, Philippines, China, Suriname, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Jamaica, Bolivia, Colombia, Ecuador, Peru and Chile.
Herfkens (1998-2002)	Bangladesh, Bolivia, Burkina Faso, Egypt, Eritrea, Ethiopia, Ghana, India, Indonesia, Macedonia, Mali, Mozambique, Nicaragua, the Palestinian Territories, South Africa, Sri Lanka, Tanzania, Uganda, Vietnam, Yemen and Zambia. Good Governance, Human Rights and Peace-Building: Albania, Armenia, Bosnia and Herzegovina, Cambodia, Colombia, El Salvador, Georgia, Guatemala, Guinea-Bissau, Honduras, Kenya, Moldova, Namibia, Nepal and Rwanda. Environmental countries: Brazil, China, Ecuador, Philippines, Cape Verde, Mongolia, Peru and Senegal. Business Sector: Cuba, Côte d'Ivoire, Jordan, Nigeria and Thailand.
Van Ardenne (2002-2007)	Afghanistan, Albania, Armenia, Bangladesh, Benin, Bolivia, Bosnia and Herzegovina, Burkina Faso, Colombia, Egypt, Eritrea, Ethiopia, Georgia, Ghana, Guatemala, Indonesia, Yemen, Cape Verde, Kenya, Macedonia, Mali, Moldova, Mongolia, Mozambique, Nicaragua, Pakistan, the Palestinian Territories, Rwanda, Senegal, Sri Lanka, Suriname, Tanzania, Uganda, Vietnam, Zambia and South Africa.

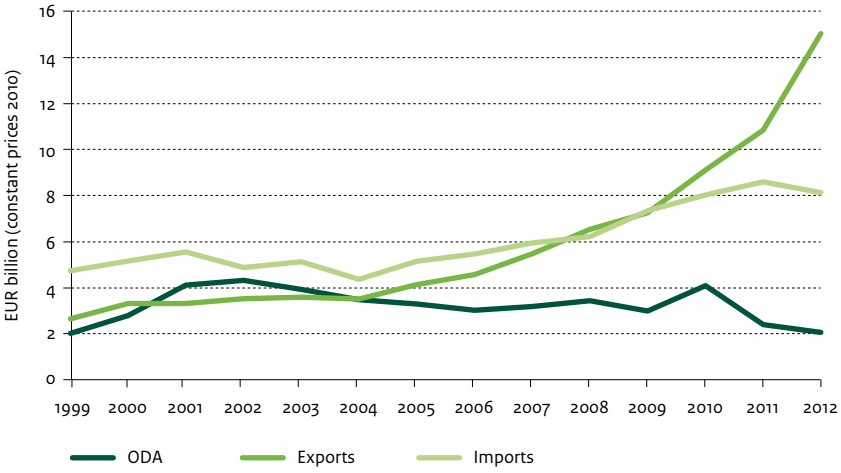
Koenders (2007-2010)	MDG countries: Benin, Ethiopia, Bangladesh, Bolivia, Burkina Faso, Ghana, Yemen, Kenya, Mali, Moldova, Mongolia, Mozambique, Nicaragua, Rwanda, Senegal, Tanzania, Uganda and Zambia. Fragile states: Afghanistan, Burundi, Colombia, Congo (DRC), Guatemala, Kosovo, Pakistan, the Palestinian Territories and Sudan. Emerging countries: Egypt, Georgia, Vietnam and Suriname.
Knapen (2010-2012)	MDG countries: Benin, Ethiopia, Mali, Mozambique, Uganda and Rwanda. Fragile states: Afghanistan, Burundi, Yemen, the Palestinian Territories and Sudan. Emerging countries: Bangladesh, Ghana, Indonesia and Kenya.
Ploumen (2012-)	Aid relation: Afghanistan, Burundi, Mali, Yemen, Rwanda, South Sudan, and Palestinian Territories. Transition countries: Bangladesh, Benin, Ethiopia, Ghana, Indonesia, Kenya, Mozambique and Uganda.

Annex II Countries included in the analyses

Afghanistan
Albania
Antigua and Barbuda
Argentina
Armenia
Azerbaijan
Bahamas, The
Bahrain
Bangladesh
Barbados
Belarus
Belize
Bhutan
Bolivia
Bosnia and Herzegovina
Brazil
Cambodia
Chad
Chile
China
Colombia
Congo, DRC
Costa Rica
Côte d'Ivoire
Croatia
Cuba
Cyprus
Djibouti
Dominica
Dominican Republic
Ecuador
Egypt
El Salvador
Equatorial Guinea
Eritrea
Ethiopia
Fiji
Gabon
Gambia, The
Georgia
Ghana
Grenada
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
Hong Kong
India
Indonesia
Iran
Iraq
Israel
Jamaica
Jordan
Kazakhstan
Kenya
Kiribati
Korea
Kuwait
Kyrgyzstan
Laos
Lebanon
Liberia
Libya
Macedonia
Madagascar
Malawi
Malaysia
Maldives
Mali
Malta
Mauritania
Mauritius
Mexico
Moldova
Mongolia
Morocco
Mozambique
Nepal
Nicaragua
Niger
Nigeria
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Rwanda
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Samoa
São Tomé and Príncipe
Saudi Arabia
Senegal
Seychelles
Sierra Leone
Singapore
Slovenia
Solomon Islands
Somalia
South Africa
Sri Lanka
Sudan
Suriname
Syria
Tajikistan
Tanzania
Thailand
Togo
Tonga
Trinidad and Tobago
Tunisia
Turkey
Turkmenistan
Uganda
Ukraine
United Arab Emirates
Uruguay
Uzbekistan
Vanuatu
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

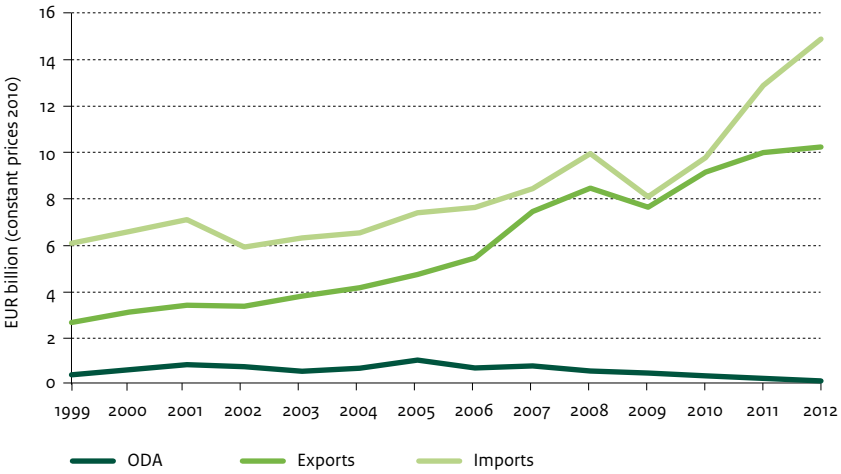
Annex III Development of ODA and trade for groups of countries

Figure III.1 *Development of Official Development Assistance, exports and imports to low-income countries (EUR billion; constant prices 2010)*



Note: excluding countries with ODA of less than EUR 1 million per year (on average).
Source: OECD/DAC and UN Comtrade.

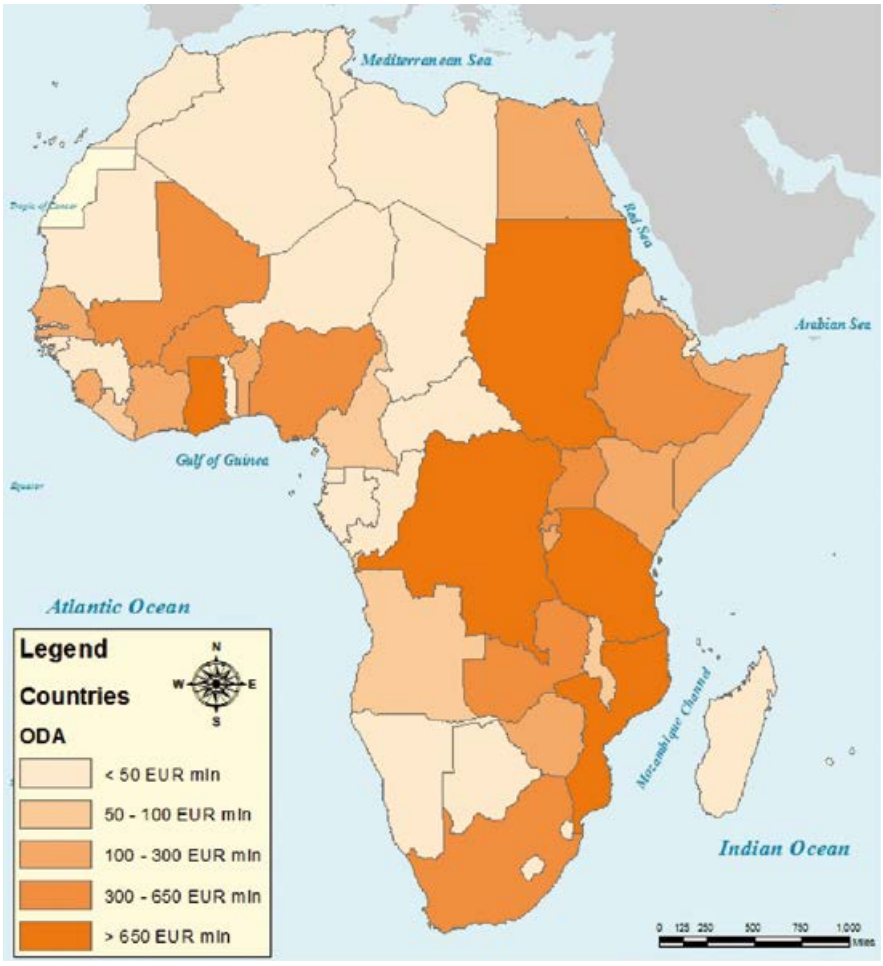
Figure III.2 *Development of Official Development Assistance, exports and imports to lower middle-income countries (EUR billion; constant prices 2010)*



Note: excluding countries with ODA of less than EUR 1 million per year (on average).
Source: OECD/DAC and UN Comtrade.

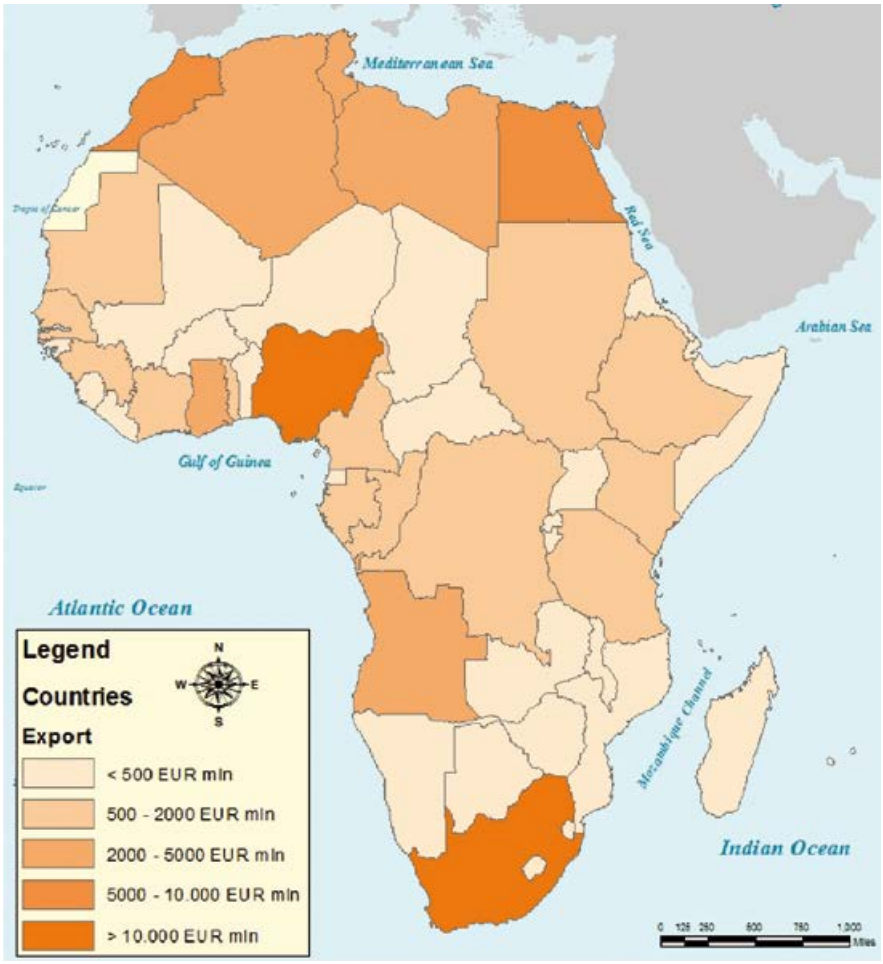
Annex IV ODA and exports to Africa

Figure IV.1 *Total ODA by the Netherlands to countries in Africa (1999-2011)*



Source: OECD/DAC, elaborated on by IOB.

Figure IV.2 *Total exports from the Netherlands to countries in Africa (1999-2011)*



Source: UN Comtrade, elaborated on by IOB.

Annex V Methodology

Conceptual framework

In order to study the impact of foreign aid on exports, the report focuses on net *Official Development Assistance* (ODA) and within this category on two types of aid, namely bilateral net ODA (aid) from the Netherlands (NL) to a recipient country *j (BAID)* and the sum of bilateral aid given by all donors (except the Netherlands) to country *j* (BAIDREST). The donor countries, which enter the analysis in BAIDREST, are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

To the extent that aid improves recipient countries' capacity to import (by relieving bottlenecks such as the savings and foreign exchange gap), one may expect both indicators of aid to speed up overall exports from the Netherlands. On the other hand, BAID is also intended to measure the extent to which aid promotes bilateral relations between the Netherlands and recipient countries. In this case, bilateral aid would promote not just overall exports but specifically exports from the Netherlands to the recipient. In addition, *BAIDREST* is added to investigate whether aid given by other donors influences an existing bilateral trade relationship between the Netherlands and the recipient (j). While aid from other donors may lead to additional income that can be spent on imports from all *j* donors (especially if aid is untied), it might also precisely promote imports from the other donors (see Martínez-Zarzoso *et al.*, 2013b).

The report analyses the aid-export relationship within the framework of the *gravity model*. This model has been broadly used to investigate the role played by specific policy or geographical variables in explaining bilateral trade flows. It makes it possible to evaluate and quantify the impact of aid on exports, controlling for a variety of factors related to trade friction, the business cycle and the level of development, to name but a few.

Consistent with this approach, and in order to investigate the effect of development aid on Dutch exports, this report adds bilateral aid from the Netherlands as a 'trade facilitator' factor. Aid from other DAC countries may have an income effect in the recipient country, as well as act as a 'trade deterrent' factor in the Netherlands. The model also includes bilateral exchange rates.[30] The empirical application used here focuses exclusively on exports from the Netherlands over time to all trading partners that have received development assistance. The researchers specify a one-side gravity model to explain bilateral exports, in which recipients are indexed by *j* and years by *t*.

[30] When the gravity model is estimated using panel data (with a time dimension and in multiple units of analysis), exchange rates are generally included as important determinants of bilateral trade flows over time.

The model reads as follows:

$$(1) \quad \ln X_{jt} = \beta_0 + \chi_t + \alpha_j + \beta_1 \ln (YR_{jt} * YNDL_t) + \beta_2 \ln BAID_{jt} + \beta_3 \ln BAIDREST_{jt} + \beta_4 \ln EXRN_{jt} + \beta_5 FTA_{jt} + \varepsilon_{jt}$$

where:

ln	denotes variables in natural logs;
X_{jt}	are the exports from the Netherlands to country *j* in period *t* in current USD ;
YR_{jt}	indicates the recipient country's GDP in period *t* at current USD ;
$YNDL_t$	stands for Dutch GDP in period *t* in current USD ;
$BAID_{jt}$	is bilateral official net development aid (disbursement) from the Netherlands to country *j* in current USD ;
$BAIDREST_{jt}$	is other DAC donors' official net development aid disbursed (except the Netherlands) to country *j* in current USD ;
$EXRN_{jt}$	is the nominal bilateral exchange rate in monetary units of the recipient currency per euro;
FTA_{jt}	takes the value of 1 when the Netherlands has a free trade agreement in force with the destination country, *j*, in period *t*.
χ_t	are time fixed effects that control for omitted variables common to all trade flows but which vary over time and are used as a proxy for the multilateral resistance factors modelled by Anderson and Van Wincoop (2003).
α_j	are recipient specific fixed effects that proxy for time-invariant recipient country characteristics or a time-invariant bonding between the Netherlands and the recipient country.

When recipient-specific fixed effects are included, the influence of the dummies that vary only with the '*j*' dimension, such as distance, automatically drop from the equation (as there is no variation over time) and therefore are not included in the regression.

Equation (1) is estimated using different econometric approaches:
by applying panel data techniques for different time periods and country groups; and using time series techniques for a smaller sample of countries for which enough observations over time are available.

The first technique controls for unobserved heterogeneity (country-specific and time-invariant country effects, as well as time effects that are common to all countries). The time series approach, by contrast, is more suitable when the data is non-stationary and the time horizon is the long run.

Table II.1 presents the main results for the static gravity model estimated with 2-way fixed effects (1). Table 4.2 summarizes the main results. In addition, table II.2 shows the results for the dynamic gravity model. This model includes the lagged dependent variable (lagged aid) as an additional regressor. By taking the first differences of the variables in the model to eliminate unobserved heterogeneity, the model reads as follows:

$$(2) \quad \Delta \ln X_{jt} = \eta_t + \lambda \Delta \ln X_{j,t-1} + \gamma_1 \Delta \ln (YR_{jt} * YNDL_t) + \gamma_2 \Delta \ln BAID_{jt} + \gamma_3 \Delta \ln BAIDREST_{jt} + \gamma_4 \Delta \ln EXRN_{jt} + \gamma_5 \Delta FTA_{jt} + \Delta \mu_{jt}$$

A time series approach

The main results presented in chapter 4 are estimated with time series techniques, based on the concept of *cointegration*. This concept is important for an understanding of the validity of techniques for analysing time series.

If two (independent) variables each follow a specific trend over time, it may seem that they are correlated, while in reality there is no relationship between the two. The apparent relationship is solely based on the fact that the variables are non-stationary. A stationary process is a stochastic process whose joint probability distribution does not change over time: the mean and variance do not follow trends. An example is economic growth (in the long run). On the other hand, economic development, as measured by the GDP, is non-stationary. Regressions run with non-stationary variables could produce spurious results, meaning that the found relation is not real and that there is no causal relation (see, for instance, Verbeek, 2004). Statistical techniques for stationary processes, therefore, may lead to erroneous results if applied to non-stationary variables. However, even though individual time series may be non-stationary, specific linear combinations of these series may be stationary. In such a case, the time series are *cointegrated*. An example is the relationship between income and consumption.

In the specific case of the analysis of the impact of aid on exports, it appeared that all variables in the regression are non-stationary, while the error term, which contains all (redundant) omitted variables, is stationary. This implies that the variables are cointegrated. This finding is important for two reasons. First, the existence of a stationary error term implies that the relationship is not spurious. Second, as the cointegration property is invariant to extensions of the information set, estimates will not be significantly affected by the presence of additional variables.

For estimating the cointegrating long-run relationship, the researchers used the leads and lags approach that is also known as the *Panel Dynamic Ordinary Least Squares procedure* (PDOLS).[31] This procedures makes it possible to deal with the endogeneity of all right-hand-side

[31] PDOLS has been proposed by Kao and Chiang (2000) and Mark and Sul (2003) as a means of estimating long-run relationships between cointegrating variables.

(explaining) variables (Wooldridge, 2009). The panel DOLS regression is given by (see, for example, Kao and Chiang, 2000; Mark and Sul, 2003):

$$(3) \quad \begin{aligned} Ln\,X_{jt} = (\chi_t) + \alpha_j + \beta_1 Ln\,YR_{jt} + \beta_2 Ln\,YNDL_t + \beta_3 Ln\,BAID_{jt} + \\ \beta_4 Ln\,BAIDREST_{jt} + \beta_5 Ln\,EXRN_{jt} + \beta_6 FTA_{jt} + \\ \sum_{p=-1}^{p=+1} \theta_{1p} \Delta\, Ln\,YR_{jt-p} + \ldots + \sum_{p=-1}^{p=+1} \theta_{lp} \Delta\, Ln\,EXRN_{jt-p} + \eta_{jkt} \end{aligned}$$

where $\theta_{1p} \ldots \theta_{lp}$ are the coefficients of the lead and lag differences that account for endogeneity. j is the recipient, p stands for the number of lags or leads and t is time. Δ stands for the first difference of the variables analysed. α_j stands for the autonomous rise or fall in exports from donor countries through time-invariant factors that characterise the recipient country involved. The time effects, χ_t, can only be included if autocorrelation is not controlled for. Therefore, they appear in brackets.

Because of autocorrelation of the disturbances, the researchers controlled for autocorrelation in the errors by integrating a FGLS procedure into the PDOLS procedure and they estimated the model using a panel dynamic feasible generalised least squares (PDFGLS) procedure.[32]

Computation of sectoral exports and associated employment

For the computation of sectoral exports, the team collected sectoral export data (at the 2-digit level) from the UN Comtrade database using the Standard International Trade Classification (SITC Rev. 2). The 99-SITC sectors were then merged into sixteen sectors according to the International Standard Industrial classification (ISIC)[33] used in the Dutch input-output tables. They contain export as well as employment data (see concordances in Annex VII). The ISIC-specific employment (labour) coefficients are computed based on 2008 figures, which reflect the pre-crisis era and should allow to yield undistorted estimates.

The computation of the employment effects required the application of input-output analysis (I-O-A) techniques.[34] Additional exports due to aid (Δexport) had to be transformed

[32] This procedure involves the following steps: after the model has been estimated via PDOLS (the first step), the residuals are saved and the autocorrelation coefficient ρ of the residuals is estimated using $\eta_{jt} = \rho\eta_{jt-1} + \nu_{jt}$. A new error term is generated $\eta^*_{jt} = \eta_{jt} - \rho\eta_{jt-1}$, which has all desirable properties. The estimated ρ is then used to transform all right- and left-hand-side variables into soft or quasi first differences (e.g. $\ln X^*_{jt} = \ln X_{jt} - \rho \ln X_{jt-1}$, etc.). In the second step, equation (3) is re-estimated by replacing the original variables with the soft differences.

[33] Since there are no exports in the mining and quarrying sector, only computations for 15 sectors are shown.

[34] The team would like to thank Bart Los (University of Groningen, Europe's leading institution in input-output-analysis) for his assistance.

into additional gross output (Δoutput) given that an increase in final demand requires production of intermediates whose production in turn also requires intermediates (and so forth). The required production of intermediates leads to the multiplier effect of production for final demand (i.e. to produce 1 unit of exports the economy in question has to produce more than 1 unit of gross output to accommodate the production of intermediates). The multiplier is of the form $(I\text{-}A)^{-1}$, I denotes the identity (unit) matrix and A contains the input coefficients that result from the input-output tables:

(4) $\Delta output = (I - A)^{-1} \Delta export$

After having computed the change in gross output that has been triggered by a change in exports, the employment effects of aid can be calculated according to,

(5) $\Delta jobs = job\_multi * \Delta output$

The input-output-analysis rests on several assumptions:

(i) each sector in the economy produces only one product.
(ii) there is no substitution between intermediate inputs;
(iii) the production function is linear; we have constant returns to scale; if we double intermediate inputs we double intermediate output;
(iv) final demand is exogenous;
(v) primary inputs are abundant; i.e. labor is abundant and available with the adequate mix of skills;
(vi) no stocks; if final demand rises, there are no stocks that could be depleted.

Annex VI Additional statistics

Table VI.1 Summary statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Total Dutch exports[a]	3,173	101.99	310.14	0.03	6,385.87
Dutch ODA[a]	3,173	12.13	23.56	0.01	344.03
ln Dutch exports	3,173	16.87	1.97	8.01	22.57
ln Dutch ODA	3,173	14.45	2.35	9.21	19.66
ln ODA rest of DAC	3,173	18.21	1.71	9.21	23.81
ln Dutch GDP	3,173	26.35	0.65	24.92	27.49
ln recipient GDP	3,173	22.52	1.96	17.21	29.23
ln exchange rate	3,173	2.03	4.47	-26.89	10.08
Regional trade agreement dummy	3,173	0.04	0.18	0	1

[a] *US dollars million, at current prices.*
Note: Sample of 130 countries.

Table VI.2 Static gravity model estimated with 2-way fixed effects (2WFE) for different periods

	(1)	(2)	(3)	(4)	(5)
Variables	**1973-2009**	**1973-1981**	**1982-1989**	**1989-1998**	**1999-2009**
Ln bilateral aid NL	0.0340*** (0.00918)	0.0639*** (0.0220)	0.0417* (0.0215)	0.0198 (0.0158)	0.0349*** (0.00880)
Ln bilateral aid other countries	0.0552*** (0.0161)	0.111*** (0.0126)	0.0293 (0.0221)	0.0409* (0.0213)	0.0459** (0.0184)
Ln (income recipient * income NL)	0.802*** (0.0384)	0.673*** (0.0814)	0.480*** (0.0461)	0.607*** (0.0748)	0.505*** (0.0544)
Ln exchange rate	-0.0134** (0.00552)	-0.0203 (0.0357)	0.0213 (0.0145)	0.0169 (0.0134)	-0.172*** (0.0566)
Free trade agreement	0.219*** (0.0517)	0.331*** (0.102)	-0.498*** (0.0849)	0.00 (0.00)	0.0557 (0.0439)
Constant	-23.02*** (1.779)	-18.21*** (3.602)	-7.733*** (2.464)	-13.83*** (3.541)	-8.238*** (2.827)
R^2	0.631	0.392	0.29	0.148	0.671
Observations	3,173	672	679	936	971
Number of recipients	130	93	99	120	119

Note: Year and country fixed effects are added to all the regressions. Standard errors are robust to heteroskedasticity, cross-sectional dependence and first-order autocorrelation.
****, ** and * stand for 1%, 5% and 10% error levels.*

Table VI.3 Static gravity model estimated with 2WFE for different group of countries for the period 1973-2009					
	(1)	(2)	(3)	(4)	(5)
Variables	**G15**	**G36**	**Africa**	**LAC**	**LDC**
Ln bilateral aid NL	0.129*** (0.0376)	0.0568** (0.0227)	0.0623*** (0.0206)	-0.0168 (0.0147)	0.0820*** (0.0262)
Ln bilateral aid other countries	0.232*** (0.0462)	0.183*** (0.0416)	0.0991** (0.0421)	0.0197 (0.0229)	0.164*** (0.0538)
Ln (income recipient * income NL)	0.606*** (0.0761)	0.560*** (0.0715)	0.686*** (0.0605)	0.683*** (0.0875)	0.635*** (0.117)
Ln exchange rate	-0.0467*** (0.0127)	-0.0491*** (0.00659)	-0.0282 (0.0193)	-0.0105*** (0.00339)	-0.0302 (0.0224)
Free trade agreement	0 (0)	0 (0)	0.276*** (0.0797)	0.471*** (0.125)	0 (0)
Constant	-18.81*** (3.612)	-14.61*** (2.879)	-18.48*** (2.766)	-16.35*** (4.139)	-18.20*** (5.096)
R^2	0.792	0.638	0.62	0.694	0.542
Observations	384	1,072	1,162	784	1,007
Number of recipients	12	32	37	25	37

Note: Year and country fixed effects are added to all the regressions. Standard errors are robust to heteroskedasticity, cross-sectional dependence and first-order autocorrelation. Stata command xtscc.
****, ** and * stand for 1%, 5% and 10% error levels.*

Table VI.4 Dynamic gravity model estimated for five-year averages with system GMM						
	(1)		(2)		(3)	
	1973-2009		1973-1997		1988-2009	
Ln bilateral aid NL	0.060 (0.028)	**	0.028 (0.027)		0.068 (0.031)	**
Ln bilateral aid other countries	-0.040 (0.024)	*	0.033 (0.035)		-0.06 (0.026)	**
Ln exports (t-1)	0.404 (0.099)	***	0.357 (0.142)	**	0.52 (0.214)	**
Ln (income recipient * income NL)	0.445 (0.073)	***	0.444 (0.091)	***	0.392 (0.147)	***
Ln exchange rate	0.011 (0.01)		0.009 (0.011)		0.013 (0.019)	
FTA	0.063 (0.098)		-0.01 (0.149)		-0.026 (0.116)	
Ln distance	-0.690 (0.154)	***	-0.661 (0.199)	***	-0.65 (0.22)	***
Common colony	0.835 (0.42)	**	1.102 (0.779)		0.735 (0.481)	
Landlocked dummy	-0.594 (0.157)	***	-0.675 (0.197)	***	-0.555 (0.259)	**
Observations	633		396		330	
N of recipients	125		123		101	
N of instruments	75		34		33	
Ar(1) prob.	0		0.01		0.02	
Ar(2) prob.	0.40		0.18		0.32	
Hansen stat.	66.47		23.12		21.74	
Hansen prob.	0.24		0.34		0.35	

*Note: Year fixed effects are added to all the regressions. Standard errors are robust to heteroskedasticity and first-order autocorrelation. ***, ** and * stand for 1%, 5% and 10% error levels.*
Factors that impede or promote trade, such as being a former colony or sharing a common language or common border, are taken from the CEPII database.

Annex VII Concordance between SITC and ISIC classification

Table VII.1 Concordance between SITC and ISIC classification

SITC Rev. 2 (2-digit)	Input-Output Table for 2009, ISIC Rev. 3.1		
00+03+04+05+08+22+29	AtB	Agriculture, Hunting, Forestry and Fishing	1
extraction is not exported	C	Mining and Quarrying	2
01+02+06+07+09+11+12+41+42+43	15t16	Food, Beverages and Tobacco	3
26+65+84	17t18	Textiles and Textile Products	4
21+61+85	19	Leather, Leather and Footwear	5
24+63	20	Wood and Products of Wood and Cork	6
25+64	21t22	Pulp, Paper, Paper , Printing and Publishing	7
32+33+34+35	23	Coke, Refined Petroleum and Nuclear Fuel	8
27+51+52+53+54+55+56+59	24	Chemicals and Chemical Products	9
23+57+58	25	Rubber and Plastics	10
66	26	Other Non-Metallic Mineral	11
28+67+68+69	27t28	Basic Metals and Fabricated Metal	12
71+72+73+74+75+76	29	Machinery, Nec	13
77+87+88	30t33	Electrical and Optical Equipment	14
78+79	34t35	Transport Equipment	15
81+82+89+93	36t37	Manufacturing, Nec; Recycling	16

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