The Trade Effect of Aid for Trade in Sub Saharan Africa

Are Donors Self-Interested?

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Abstract *Sub Saharan African (SSA) countries are facing severe economic challenges such as high trade costs, poor trade performance and low growth levels. As a result development assistance is needed to overcome these difficulties. SSA countries receive the highest share of Aid for Trade (AfT) and therefore it is important to assess the effects of AfT. This study investigates the trade effect of AfT on trade and whether it generates more exports of donors or exports of recipients. In addition, different institutional settings of recipient countries are taken into account. The main finding suggests that AfT works better in an environment where the recipient country's government operates effectively. Moreover, the results of this study cannot provide evidence for the pessimistic view of self-interested donors.*

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1 Introduction

The question of the usefulness of development aid is a controversial topic not only in practice but also in the academic literature. Generally, aid is a form of assistance provided by richer countries and given to poorer ones. The ultimate goal of aid is to improve the economic situation as well as welfare of people in poorer countries (Bourdet et al., 2007). There are many possibilities of how this goal can be achieved. One way is to benefit from the link between trade and economic development. Considering historical developments one can see that international trade can lead to economic improvements, increasing living standards and many more benefits. These gains are particularly important for developing countries nowadays as they are lacking behind economically (OECD&WTO, 2011b). The focus of this essay is on Sub Saharan African (SSA) countries, which face severe economic difficulties such as high trade costs, low levels of trade and a lack of export diversification. As a result, the demand for assistance is high. Specifically, development aid provided for infrastructure improvements and trade facilitation is important in these countries in order to enhance trade performance, reduce the costs of trading and improve export-led growth. However, this is not only the case for SSA, other developing countries are facing the same challenges (Karingi, & Leyaro, 2010). This matter of fact was a driving force for the World Trade Organisation (WTO) to establish the Aid for Trade (AfT) program in 2005 after the WTO Ministerial Conference in Hong Kong (OECD & WTO, 2015). According to the OECD and WTO (2011b) the AfT initiative aims at helping recipient countries "to overcome supply-side and trade-related infrastructure constraints" (p.1). The aid categories involved in the AfT program had not been new when the program was launched. But aid commitments to the sectors covered in the initiative increased substantially. The Aid for Trade program has become an interesting topic for empirical research ever since. Researchers are analysing the allocation as well as the effectiveness of AfT flows. There are plenty of studies investigating the role of AfT in specific case studies on the country level but some other papers conduct research on the multi-country level as well (OECD & WTO, 2011b). Nevertheless, the results obtained in the previous research differ from each other. The majority of researchers conclude that Aid for Trade is beneficial for trade flows, especially exports (Hühne et al. 2014; Heble et al. 2012; Berrittella & Zhang 2014; Cali & te Velde, 2011). However, Cirera and Winters (2015) cannot find any effects of AfT on trade in their investigations. Some studies specifically focus on African countries and note that AfT can improve export levels, reduce trade costs and enhance diversification of export products (Cali & Razzaque, 2015; Karingi & Leyaro, 2010). Furthermore, there are studies

pointing out the selfishness of donors and state that donations are mainly given with a hidden agenda of benefiting from future trade with these countries (Bertlehemy, 2006; Hoeffler & Outram, 2011; Pettersson & Johansson, 2013). On the other hand, Hühne et al. (2014) could not confirm the pessimistic view in their analysis. As a result, the discrepancy among the academic society emphasizes the need for further research in this area.

The aim of this paper is to assess the trade effect of AfT and whether the effect is asymmetric. More precisely, does AfT create more exports from donors than from receivers? In addition, the investigation focuses on whether the effect of AfT on trade differs between countries with different institutional settings. As mentioned above the study is limited to SSA countries and the time span covered ranges from 1995 to 2012. The theoretical framework is based on the gravity equation. In addition to overall AfT, several subcategories of AfT are analysed. The main results reveal that AfT works better in an environment where the government in the recipient country is operating effectively. Whether or not the country is classified as free does not seem to play an important role for the performance of AfT. Moreover, the findings in this study cannot confirm the pessimistic view of self-interested donors.

This paper is organized as follows. The next section presents an overview of the Aid for Trade program as well as a literature review. Then, section 3 discusses the theoretical framework applied in this study. Section 4 explains the data and the method used in the regressions. Subsequently, section 5 presents and discusses the results. Concluding remarks are offered in Section 6.

2 Aid for Trade

2.1 Aid for Trade Initiative and Sub Saharan Africa

The openness of a country towards trade can lead to economic improvements and to gains in living standards. Many developing countries already benefited by expanding their markets and integrating into the world market. However, to achieve substantial gains further assistance especially for the least developed countries is needed. These nations particularly need help in building institutions and infrastructure, and implementing trade related policies and procedures. These perceptions lead the World Trade Organisation (WTO) to develop the Aid for Trade (AfT) initiative. The program was launched following the WTO Ministerial Conference in Hong Kong 2005. The main goal of the program is to connect aid and trade policies more closely. As a result the member countries of the WTO agreed to expand their aid flows in order to help the recipient countries to improve their exports and thus successfully integrate into the world market and benefit from free trade. It has to be mentioned that Aid for Trade is not a new category of financial aid. It existed before but increased substantially since the introduction of the program (OECD & WTO, 2011b). The rise in aid flows can also be seen in *Figure 1*. According to the OECD and WTO (2011b) the AfT initiative should help the recipient countries "overcome supply-side and trade-related infrastructure constraints" (p.1). They further emphasise the fact that specific policies and reforms can help to increase foreign direct investment and as a result enhance economic growth and reduce poverty (OECD & WTO, 2011b).

These measurements and policies can be particularly interesting for Sub Saharan Africa (SSA), which faces economic challenges. Karingi and Leyaro (2010) state that trade performance, interregional trade and export-led growth are at very low levels. The authors refer to problems such as weak infrastructure, institutions and supply response in SSA countries. According to Karingi and Leyaro (2010) these problems increase trade costs, which in turn harm trade and growth. As a result, investment in these areas can help the countries overcome several cutbacks. Karingi and Leyaro (2010) point out the importance of investments in infrastructure such as transportation and in trade facilitation, specifically investments in customs and administrative systems. According to Cali and Razzaque (2015) SSA countries do not only suffer from poor trade performance but also GDP per capita and social and human development levels are very low in SSA. As a result the countries are constantly at risk of being trapped in severe poverty. Cali and Razzaque (2015) also point

out the lack of diversification and hence the restricted productive capacities in African countries. The largest part of the export sector is still primary commodities. Consequently, aid provided for the manufacturing and service sector is highly important in these regions (Cali & Razzaque, 2015).

In general, Aid for Trade is a part of regular official development assistance (ODA) and it makes up about a third of it. Most of the donations stem from developed countries but the share of donations from emerging economies is constantly increasing (Basnett et al., 2012). Aid for Trade can be divided into several subcategories, namely Trade Policy and Regulation, Economic Infrastructure, Building Productive Capacity and Trade-Related Adjustment (OECD & WTO, 2009). In this essay the focus is on the first three categories due to data availability. According to the OECD there has been a 60% increase in Aid for Trade commitments since the program was launched (OECD & WTO, 2011b). Having a closer look at the figures of Sub Saharan Africa in *Figure 1* one can see that aid commitments are increasing in all three subcategories. Moreover, it can be observed that the subcategories Economic Infrastructure (*AfT_inf*) and Building Productive Capacity (*AfT_prod*) account for the biggest shares of Aid for Trade flows. On the other hand, Trade Policy and Regulation (*AfT_pol*) represents the smallest share. According to the OECD and WTO (2011b) Africa receives the largest part of total Aid for Trade. Cali and Razzaque (2015) emphasise that effective AfT can help to overcome governance failures, gain access to foreign markets, improve the infrastructure in a given country and so forth.
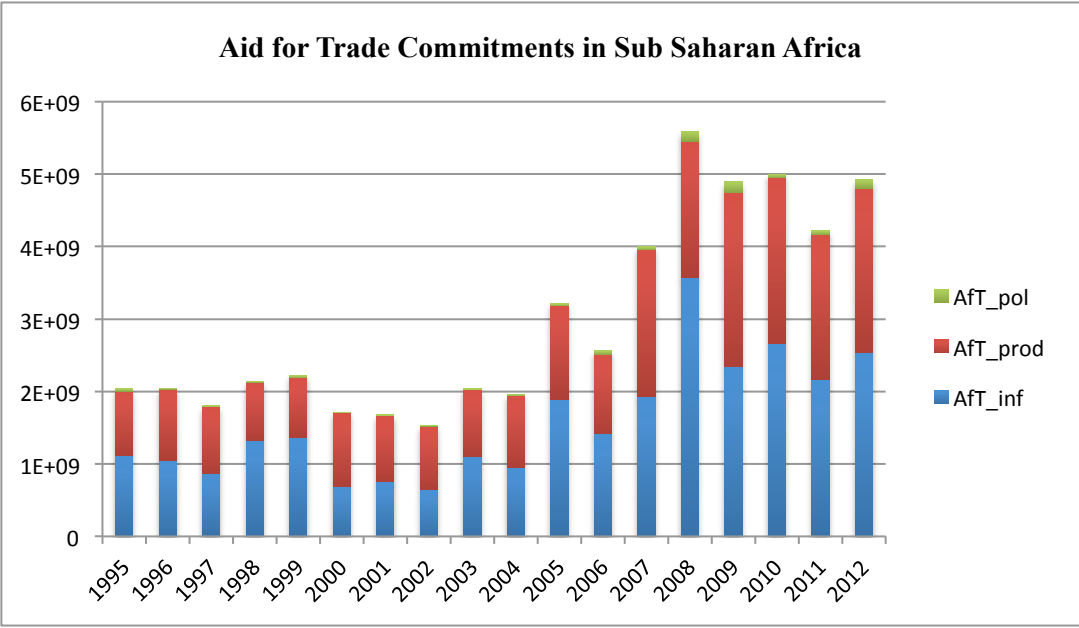
Figure 1: Commitments of AfT categories in Sub-Saharan Africa

The OECD and the WTO developed two ways to monitor and determine the success of the program. Quantitative monitoring is one way. The other way is to request donors and recipients of AfT to perform qualitative monitoring, which means to conduct self-assessment surveys. Moreover the OECD and the WTO encouraged participating countries to submit case stories. In 2011 when this project was launched 269 case stories had been published (OECC & WTO, 2011a)[1]. These case studies show that the initiative led to improvements particularly when it comes to exports, integration, employment and impacts on poverty. An example is a project undertaken in East Africa, which reduced transit times at the border from three days to three hours. Another program in Uganda trained woman entrepreneurs in business management. Most of these women could achieve an increase in sales of 50% within two years (OECD & WTO, 2011b).

In the following some of the existing literature is discussed. The main focus is on studies evaluating the effectiveness of AfT and its subcategories. Moreover, some examples from SSA are presented. Additionally the concern of self-serving donors is addressed.

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[1] A detailed list of case stories and their focus can be found in OECD&WTO (2011a): Aid for Trade at a Glance 2011: Showing Results

2.2   Literature Review

Basically, AfT programs are among others undertaken to assist countries to establish trade agreements. In addition, the programs aim at helping the receivers of aid to strengthen their human and physical capacities and build proper institutions, such that they can benefit from trade (Cirera & Winters, 2015). As mentioned above, there is a major increase in AfT commitments after 2005 when the AfT initiative was launched. To see if improvements had occurred as a result of the program it is important to investigate the effectiveness of these aid flows. Several studies have already been undertaken and the majority finds a positive impact of AfT on exports of recipient countries. However, the findings regarding the main subcategories differ between the investigations performed.

Heble et al. (2012), Berrittella and Zhang (2014), Hühne et al. (2014) and Cali and te Velde (2011) find a positive impact of Aid for Trade flows on export performance. Moreover, Wagner (2003) investigates the general link between exports and overall foreign aid flows and finds a strong positive impact of foreign aid on export performance of recipient countries. The author further distinguishes between different donors and finds differential behaviours among them. Furthermore, he concludes that the positive effects are limited to the year of the donation (Wagner, 2003). Pettersson and Johansson (2010) also investigate the general link between aid and trade and find a strong positive relationship. When they focus on Aid for Trade the positive impact is smaller and stems entirely from aid to infrastructure adjustments.

The majority of papers find a positive relationship between AfT and trade but they differ according to the scope of AfT and the methodology used. In addition to overall AfT, the subcategories Aid for Economic Infrastructure, Aid for Building Productive Capacity and Aid for Trade Policy and Regulation are frequently investigated in the literature. The results of these subcategories are not as clear as for overall AfT. Among the papers discussed below only Hühne et al. (2014) find a positive relationship between all subcategories and exports. Imports are analysed as well and the same conclusions are drawn. However, the effect on exports is higher in almost all estimations.

When the focus is put on Aid for Economic Infrastructure, several surveys confirm the positive view. Cali and te Velde (2011), Heble et al. (2012), Pettersson and Johansson (2010), Martínez-Zarzoso et al. (2016) and Vijil (2014) find a positive connection between

AfT_inf and trade flows. Cali and te Velde (2011) specifically point out the importance of aid flows to infrastructure in SSA countries in order to overcome constraints they are facing. Martínez-Zarzoso et al. (2016) study the AfT-trade link with the help of a panel quantile regression approach. They note that aid devoted to infrastructure only exhibits positive and significant results at the lowest quantile of the conditional export distribution. However, this means that AfT benefits disadvantaged economies, meaning that support is provided where it is needed the most.

When it comes to Aid for Building Productive Capacity the picture changes slightly. Martínez-Zarzoso et al. (2016) and Hühne et al. (2014) confirm the positive picture, whereas Cali and te Velde (2008, 2011) find mixed results for the category *AfT_prod*. Their findings depend on the setup used for the analysis. But there are also studies concluding that there is no effect of Aid for Building Productive Capacity on trade such as Cali and Razzaque (2015) and Cirera and Winters (2015). Specifically, Cirera and Winters (2015) do not find any significant effects of AfT on exports of recipients. The findings of Cali and Razzaque (2015) and Cirera and Winters (2015) are particularly interesting since they are investigating SSA countries.

Another category frequently analysed is Aid for Trade-Policy and Regulation where the findings are again mixed. Cali and te Velde (2008), Hühne et al. (2014) and Heble et al. (2012) find a positive effect whereas Martínez-Zarzoso et al. (2016) state that there is no effect of this aid category on trade flows. Cali and te Velde (2011) conclude that the effectiveness of Aid for Trade-Policy and Regulation depends on the setup and method used and hence their findings are mixed.

Another focus in the empirical literature is the analysis of the main beneficiaries of development assistance. The findings are mixed. Some researchers claim that donor countries act out of self-interest and only according to their advantage (Bertlehemy, 2006; Hoeffler & Outram, 2011; Pettersson & Johansson, 2013). Others conclude that self-interest is not the main driving force (Hühne et al. 2014). However, some studies find a difference in the behaviour between donors (Hoeffler & Outram, 2011; Bertlehemy, 2006). To shed some light on the question of who benefits more from AfT; donors or recipients, Hühne et al. (2014) perform estimations analysing the impact of AfT on both exports and imports. In a second step they test the parameters of AfT from both regressions. The researchers note that the effect is stronger on exports of recipients than on their imports from donor

countries. Hence, the pessimistic view of self-interest cannot be confirmed. However, Hoeffler and Outram (2011) state that donors are self-interested but do also take the needs of the recipients into account. Moreover, donors tend to give more aid to countries that vote the same in the UN and who are already trade partners (Hoeffler & Outram, 2011).

Several studies focus specifically on the relationship between development aid and trade in Africa. Cali and Razzaque (2015) and Karingi and Leyaro (2010) find a positive relationship between AfT and trade in Africa. Karingi and Leyaro (2010) note that AfT has a positive impact on the cost of importing and exporting, and it improves export diversification and enhances trade competitiveness. Cirera and Winters (2015) focus on AfT and structural transformation. They point out the fact that the African economies are concentrating on primary commodities and natural resources and hence need to focus on structural improvements in order to increase economic development. As a result the authors investigate the effect of AfT on structural change as well as trade performance. However, they cannot find any significant effect of AfT on structural change nor on exports (Cirera & Winters, 2015). Another strand of literature is the relationship between FDI and foreign aid. Yasin (2005) is analysing this linkage for Sub Saharan African countries and finds that development aid has a positive impact on FDI. Furthermore, the author points out the importance of trade openness. Additionally, Yasin (2005) includes the Freedom House indexes for civil liberties and political rights but they do not exhibit a positive impact on FDI in SSA countries. Cali and Razzaque (2015) and Cali and te Velde (2011) also include the indexes for civil liberties and political rights in their analysis as instruments for AfT because they assume donors give more money to countries which have higher rankings regarding these measures. Both studies find significant coefficients for the civil liberties variable in almost all regressions confirming the adequacy of the instrument (Cali & te Velde, 2011; Cali & Razzeque, 2015). Moreover, this outcome shows that freedom in a country is an important factor when it comes to the effects of Aid for Trade.

With respect to the different theoretical backgrounds and econometrical methods used in the analysis, the opinions regarding the right approach differ. However, most of the studies apply a modified version of a standard gravity model (Hühne et al. 2014; Wagner, 2003; Heble et al., 2012; Pettersson & Johansson, 2015; Vijil, 2014; Cirera & Winters, 2015). In all these studies the gravity model is log-linearized and estimated using Ordinary Least Squares (OLS). Usually country and time fixed effects are included. Cali and te Velde (2011) use a CES (constant elasticity of substitution) utility function to derive their model. Subsequently,

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they estimate the log-linearized model using OLS. Generally, the studies differ substantially when it comes to the control variables. These parameters range form market potential measures to governance indicators. As robustness tests several studies apply methods such as GMM or Poisson Pseudo Maximum Likelihood (Hühne et al., 2014; Martínez-Zarzoso et al., 2016; Cali & Razzeque, 2015). Moreover, most of the studies include lagged values of the AfT variables in order to control for endogeneity. The problem of zero trade flows is also addressed using different methods ranging from truncation to the use of specific estimation methods. Generally, the chosen approach depends on the dataset and the main purpose of the study.

Next to the empirical studies presented above several researchers provide a review of the most recent existing literature. Cadot et al. (2014) focus on the literature investigating the link between aid and trade, the channels through which AfT exhibits an impact on trade flows and finally, the reduction of trade costs through AfT. The paper confirms that empirical results differ substantially as can be seen in the discussion above. A more comprehensive study of the status quo of the AfT literature is provided by Basnett et al. (2012). Their main focus is to find out what has worked, where the limits are and how to improve the impact of AfT. Basnett et al. (2012) also conclude that there is a significant positive effect of Aid for Economic Infrastructure on the export rates of recipient countries.

3 The Theoretical Framework

To evaluate the effectiveness and the main beneficiaries of Aid for Trade within different contexts the gravity model is used. In the following, the general gravity model is explained. Moreover, the connection to the setting applied in this essay is drawn and subsequently the model specifications estimated in this paper are explained.

3.1 The General Gravity Model

The gravity framework represents one of the most important tools in the applied international trade literature. The model has first been established by Jan Tinbergen in 1962 and has been improved ever since. The name stems from the theory of gravitation formulated by Sir Isaac Newton. His theory refers to attraction of planets to each other, which is determined by their size and the distance between them. Similarly, the gravity equation in international trade tries to explain trade between countries with the help of the proportion of their GDP's and proximity. In the case of the gravity model empirical research predated theory. As a result, several attempts to create a theoretical basis for the model emerged over time. One of the most important contributions is the work of Anderson and Van Wincoop (2003) who state that relative trade costs play an important role in a gravity framework (WTO & UNCTAD, 2012). Among others Anderson and Van Wincoop (2003) incorporated the constant elasticity of substitution in their version of the gravity model. They assume that consumers can increase their utility by either consuming more of a given variety of a good or by consuming a wider range of different varieties, which is also known as "love of variety" preferences of consumers. Moreover, Anderson and Van Wincoop applied the monopolistic competition model of Krugman (1979) to derive the gravity equation (Shephard, 2012). The Krugman model assumes a large number of firms where each firm produces a unique number of varieties under increasing returns to scale. This model also presumes constant mark-up pricing and free entry (Feenstra, 2016). Taken these assumptions together Anderson and Van Wincoop derive the following gravity equation:

$$X_{ijt} = \frac{Y_{it}*Y_{jt}}{Y_t} * \left(\frac{t_{ijt}}{\Pi_{it}*P_{jt}}\right)^{1-\sigma} = \frac{Y_{it}*Y_{jt}}{Y_t} * \left(\frac{\Pi_{it}*P_{jt}}{t_{ijt}}\right)^{\sigma-1} \qquad (1)$$

In the equation above the term X_{ijt} refers to the monetary value of trade between country i and country j, where i refers to the recipient country and j denotes the partner. The term Y stands for world GDP and Y_{it} and Y_{jt} denote the GDP of country i and j respectively. The product of $\Pi_{it} * P_{jt}$ is also called multilateral trade resistance and refers to the ability of market access. It takes lower values if the country is remote from the world market. The bilateral trade costs are denoted by t_{ijt} and describe the costs of country j to import a good from country i and the last term σ stands for the elasticity of substitution (WTO & UNCTAD, 2012).

The multilateral resistance term is unobservable most of the time. As a result, several proxies are used in practice such as an iterative method using a non-linear approach, the usage of a remoteness variable or the inclusion of fixed effects for the importers and exporters in the regressions. The latter version is commonly used in the literature and yields unbiased results. Furthermore, the variable for trade costs t_{ijt} consists of a few variables, which can be determined. Typically, trade costs are a function of distance and several dummy variables, which can indicate if a country is landlocked or an island, or if the countries have common borders. It is assumed that trade costs are increasing with distance and that they are higher if the country is landlocked or an island. In a lot of cases information costs are also incorporated in the function of trade costs. These variables include measures for common language and other cultural aspects. As a result a typical function of trade costs looks as follows:

$$t_{ij} = d_{ij}^{\delta_1} * \exp\left(\delta_2 combord_{ij} + \delta_3 lang_{ij} + \delta_4 col_{ij} + \delta_5 landlock_{ij} + \delta_6 RTA_{ij}\right) \qquad (2)$$

where d_{ij} stands for bilateral distance and $combord_{ij}$, $lang_{ij}$, col_{ij}, $landlock_{ij}$ and RTA_{ij} refer to a common border, language, colonial history, if the country is landlocked and if the country is a member of a regional trade agreement, respectively. These measures have been found to have a significant impact on bilateral trade flows. However, in the academic literature one can find a lot of different functions determining trade costs (WTO & UNCTAD, 2012).

3.2   The Gravity Model and Aid for Trade

In this study the trade cost function comprises several other important variables to determine the trade effects as well as the main beneficiaries of Aid for Trade. Different

specifications of the trade cost function are considered. Generally, a measure of Aid for Trade represents the main variable of interest and it is incorporated in the trade cost function. Additionally, the trade effect of AfT is analysed for countries with different institutional settings. Firstly, the model is analysed in the context of an effective government in the recipient country. As an alternative a second model incorporates a measure stating if the recipient country is considered to be free according to surveys undertaken by the non-governmental organisation Freedom House. In the end, both measures are incorporated in one model.

In this work the variable AfT_{ij} is the main variable of interest. In addition to the effect of an aggregated measure of AfT, the effect of different sub-categories is analysed. These subcategories consist of AfT_inf representing a measure for Aid to Economic Infrastructure, AfT_prod standing for Building Productive Capacity and AfT_pol denoting a measure for Trade Policies and Regulations. The literature on a theoretical basis of the impact of aid on trade provides a rather ambiguous picture. Generally, there are different links between aid and trade flows. According to Wagner (2003) there is a direct and an indirect link between them. A direct link between aid and trade occurs if development aid is explicitly tied, thus recipients have to use the money to purchase goods and services from the donor country. A direct link can also arise if aid is used for specific projects in recipient countries. On the other hand, an indirect link refers to untied aid. In order to secure aid flows from donor countries, recipients continue to purchase goods and services from them. As a result the exports from donors to recipients increase. This gives rise to the question of causation, which can act in both ways; aid increases exports but exports also increase aid flows (Wagner, 2003). According to Suwa-Eisenmann and Verdier (2007) aid can lead to trade flows because of several reasons. On the one hand, a general economic impact can occur in the recipient country, which works through macroeconomic channels. On the other hand, aid triggers trade because of tied aid flows. Furthermore, bilateral, economic and political relationships between donors and recipients can be triggered. There are hence many linkages between aid and trade. Having a closer look at the macroeconomic channel, aid is a form of additional savings in the recipient country. Increased savings in turn can lead to higher investments, which then accelerate growth rates. The rising growth rates also strengthen the general import capacity of the recipient. As a result, trade flows between the recipients and the rest of the world are increasing. This represents an indirect impact of aid on trade. On the other hand aid can be given in order to liberalize trade, which depicts a direct effect. However, if aid is provided for general structural reform, which in turn is supposed to

enhance growth, the same indirect effect as before occurs. Next to the linkage between aid and trade flows is the connection between aid flows/policies and trade policies in the donor and the recipient countries (Suwa-Eisenmann & Verdier, 2007). This essay focuses on actual aid and trade flows. Consequently, a precise investigation of the connection between aid/trade flows and aid/trade policies is not within the scope of this paper. Another aspect of the impact of aid on trade is the fact that foreign assistance can take the form of multilateral or bilateral aid and as a result work through different channels. The opinions regarding the superiority of either one of them differ substantially. Bilateral aid is supposed to be more effective because of increased responsibility and control of donors. As a result also domestic needs of the donor countries are considered and hence the decision of giving aid is partly a political one. Not surprisingly this fact raised criticism of bilateral aid. However, studies confirmed that there is a difference between donors. Nordic and other European countries tend to prioritize development needs over their own political ones when giving aid. On the other hand, supporters of multilateral aid claim the importance of recipients control over aid in order to distribute it according to their needs. Furthermore, the political influence of donors is minimized and development needs are in the foreground when aid is provided multilaterally. Nonetheless, there are discrepancies in the academic literature and one can find support for both forms of foreign assistance (Anderson, 2015). This paper focuses on the trade effects of bilateral aid. Thus, one can also have a closer look at the main beneficiaries of foreign assistance.

As mentioned above the trade effect of Aid for Trade is analysed in the context of the government's efficiency in the recipient country as well as in the context of civil liberties and political rights. The measure for government effectiveness (GE_i) reflects if the country in question exhibits a good management. Generally, this implies reliability of the government, which means among others higher quality of public and civil services as well as of policy formation and application (Worldbank, 2016). To investigate the connection between AfT_{ij} and GE_i an interaction term is included in the model. Thus one can see if countries behave differently when the recipient country's government acts more effectively. If countries have an effective and reliable government, a stronger and positive effect of Aid for Trade is expected (OECD & WTO, 2013). Alternatively, the analysis of the effectiveness of AfT is put into another context. Thereby civil liberties and political rights are incorporated into the investigation. More precisely these two measures are taken together and provide an indicator whether a given recipient country can be considered as free (Freedom House, 2016). This dummy variable enters the model as an interaction with AfT_{ij}

in order to see if countries behave differently within different backgrounds. A stronger and positive effect is expected in free countries. Besides the actual AfT flows and their interactions an AfT dummy variable is included. The dummy takes the value 1 after the first donation has been made and then continues having the value 1 to indicate a better trade relationship after aid has been given.

Taking the variables described above together the following trade cost functions are obtained and subsequently incorporated in the gravity model:

$$t_{ijt} = dist_{ij}^{\delta_1} * AfT_{ijt}^{\delta_2} * AfTxGE_{ijt}^{\delta_3} * \exp\bigl(\delta_4 GE_{it} + \delta_5 col_{ij} + \delta_6 llocked_i + \delta_7 isl_i + \delta_8 AfT\_du_{ijt}\bigr)$$
$$(3)$$

$$t_{ijt} = dist_{ij}^{\delta_1} * AfT_{ijt}^{\delta_2} * AfTxF_{ijt}^{\delta_3} * \exp\bigl(\delta_4 F_{it} + \delta_5 col_{ij} + \delta_6 llocked_i + \delta_7 isl_i + \delta_8 AfT\_du_{ijt}\bigr)$$
$$(4)$$

where $dist_{ij}$ denotes the distance between the trading partners and AfT_{ijt} stands for Aid for Trade. These measures are followed by interaction terms of AfT and the complementary variables GE and F. The variables GE_{it} and F_{it}, are dummy variables which indicate if the recipients have an effective government and if they are seen as free. The dummy variables col_{ij}, $llocked_i$ and isl_i denote colonial history, if the recipient country is landlocked or an island. The dummy variable AfT_du_{ij} indicates when the first donation is made. Incorporating the trade cost functions into the general gravity equation leads to the following models, which will be analysed in this essay:

$$Trade_{ijt} = mass_{it}^{\beta_1} * t_{ijt}^{\beta_2} + \eta_{ij} + \lambda_t \qquad\qquad (5)$$

where $Trade_{ijt}$ takes values of exports from recipient country i to the partner country j and on the other hand it takes values for imports of recipients from donors. The variables $mass_{it}$ refers to the interaction of the GDPs of both the recipient and the donor country. The model is further estimated using country pair fixed effects and time fixed effects represented by η_{ij} and λ_t. As a result the variables, which do not change over time are captured in the fixed effects and hence do not appear in the regressions.

In this paper an increase of exports and imports is expected when aid flows are increasing, meaning a positive sign for the parameters involving AfT_{ijt}. In order to see who are the main

beneficiaries of aid flows, both exports from recipients to donors and imports of recipients from donors are analysed. Testing the parameters involving AfT_{ij} from both regressions shows if the coefficients are statistically equal. If the null hypothesis of equality is rejected one can see whether exports or imports are increasing to a higher extent. If AfT has a positive and stronger effect on imports of recipients from donors one can see that donor countries are the main beneficiaries of development aid.

4   Data and Method

In the next section the data and variables used for the regressions are explained. Furthermore, the empirical model is presented and the methodology applied in the estimations is discussed.

4.1   Data and Variables

The empirical research undertaken in section five is based on a dataset covering the time span 1995 to 2012. Furthermore countries receiving Aid for Trade flows are restricted to 44 Sub Saharan African countries, which are listed in the Appendix (*Table A1*). Due to limitations regarding data availability several Sub Saharan African countries are not covered in the analysis. The donors consist of countries that are official members of the Development Assistance Committee (DAC) of the OECD[2]. The European Union as an Institution is also listed as a DAC member and provides development aid in addition to the members of the EU who donate themselves. However, as the focus in this essay is on bilateral trade, the EU is not among the donor countries in this analysis. The *Table A1* in the Appendix provides a list of the donor countries. Data of Aid for Trade as well as of the different subcategories of AfT is obtained from the International Development Statistics of the OECD[3]. Following the approach of Berthélemy (2006) and Vijil (2014) commitments instead of disbursements are used for the AfT variable, mainly because of data availability. The distinction between the different subcategories is in line with the categorisation of the OECD[4]. A more detailed description of the subcategories can be found in *Table A2* in the Appendix. Moving on to the data sources: Trade data is collected from the United Nations Comtrade database[5]. Figures for GDP are obtained from the World Development Indicators of the World Bank[6]. Furthermore, data on other control variables are obtained from the NGO Freedom House[7] and from the Worldwide Governance Indicators published by the World Bank[8]. A more detailed description of the variables used for the analysis can be

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[2] List of donor countries: http://www.oecd.org/dac/dacmembers.htm

[3] Data on development aid: http://stats.oecd.org/qwids/

[4] Aid for trade subcategories: http://www.oecd.org/dac/aft/Aid-for-trade-sector-codes.pdf

[5] Data on trade in goods at current US prices: http://comtrade.un.org/data/

[6] Data on GDP and population: http://data.worldbank.org/data-catalog/world-development-indicators

[7] Data on civil liberties and public rights: https://freedomhouse.org/report-types/freedom-world

[8] Data on government effectiveness: http://info.worldbank.org/governance/wgi/index.aspx#home

found in *Table A2* in the Appendix. *Table 1* below presents summary of the main variables used in the regressions. More precisely, the variables are dummy variables where the mean indicates the amount of SSA countries that received *AfT, AfT_inf, AfT_prod* and *AfT_pol* respectively. For instance, 31.39% of the SSA countries covered in the dataset received AfT, whereas only 4.34% received Aid for Trade Policy and Regulation. Moreover, the percentage of governments working effectively is 13.73%. In addition, 22.35% of the recipients are classified as free by the NGO Freedom House.

Table 1: Summary statistics of the main variables

	(1)	(2)	(3)
VARIABLES	Obs	Mean	Std. Dev.
AfT	43344	0.3139	0.4641
AfT_inf	43344	0.1485	0.3556
AfT_prod	43344	0.2835	0.4507
AfT_pol	43344	0.0434	0.2038
GE	43344	0.1373	0.3442
Free	43344	0.2235	0.4166

Note: All variables are dummy variables where the mean values refer to percentage amounts.

4.2 Methodology

In the academic literature several estimation methods can be found. The most popular approach is to log linearize the gravity equation and estimate it using Ordinary Least Squares (OLS). As a result the parameters can be interpreted as elasticities. To control for multilateral resistance either a remoteness variable or fixed effects are added to the model. A common problem when estimating the gravity equation is zero trade flows and how to deal with them. This problem becomes relevant when the model is log linearized, as it has to be done for the OLS estimation. Zero trade flows will drop out of the estimation when the logarithm is taken (WTO & UNCTAD, 2012). Furthermore, using OLS when heteroskedasticity is present, which is highly likely in practice, can lead to inconsistent estimates. In the literature there are several approaches, which can be used to deal with zero trade flows. Common practices are the truncation of the dataset, which means to drop all zero trade flows and the censoring method where a small constant is added to the trade flow such that it does not drop out when the logarithm is taken. However, these methods can lead to inconsistent results. Moreover, there might be a loss of information due to omitting zero trade flows. Furthermore, adding a small constant can result in measurement

errors as well as in selection bias (Kareem et al., 2014). Choosing the best estimation approach also depends on the assumed origin of the zero trade flows. They can occur due to rounding errors, missing observations or the deliberate decision not to trade (WTO & UNCTAD, 2012).

One way to deal with zero trade flows is the Tobit model. However, the appropriateness of this model is questioned in the literature. Generally, the model is applied in situations where some trade flows are unobservable and thus treated as zero. Moreover, it works best if only a small amount of trade flows is zero or if trade is negative. Such a situation cannot be found in practice very often, thus other methods are superior. An obstacle following the elimination of zero trade flows can be a selection bias. A solution to this problem is the so-called Heckman model, which corrects for the selection bias. However, a crucial assumption for this model to work is the existence of variables indicating the firms' decision not to trade (WTO & UNCTAD, 2012). Another approach commonly used in the literature is the Poisson Pseudo Maximum Likelihood (PPML) estimator, which can be applied to non-linear models. Moreover, there is no need to log linearize the model, it can simply be used on level data. More advantages are the robustness of the results under heteroskedasticity and the fact that the model naturally deals with zero trade flows (Kareem et al., 2014). The usage of a two-stage procedure as a solution to the zero trade flow problem is a common approach as well. Following this method, a Probit model is estimated in the first stage to determine the likelihood of trade, which enters into the gravity equation estimated in a second step. The results of the Probit model, also called the inverse of the Mill's ratio, should correct the sample selection bias, which occurred due to throwing out the zeros in the trade variable. However, there are several drawbacks of this approach such as inconsistent results when using fixed effects in the Probit model (WTO & UNCTAD, 2012). As can be seen in the discussion above, the academic society has not agreed upon the best method and one can find support for several options.

In this essay the standard Poisson Pseudo Maximum Likelihood (PPML) estimator is used to estimate the gravity equation specified in section 3. There are several reasons for the decision of this estimator. Firstly, as already mentioned, it is able to deal with the problem of zero trade flows, which make up a substantial amount in the dataset as it is restricted to Sub Saharan African countries. Secondly, the estimator yields consistent results when fixed effects are added. Lastly, the coefficients of the independent variables entering the regression as logarithms can be interpreted as elasticities just like in OLS estimations. The

ones on a level basis can be interpreted as semi-elasticities (Shephard, 2012). The empirical set up applied in this essay uses the trade variables in levels and takes the logarithm of the control variables. It has to be noted that the problem of zero aid flows occurs for the AfT variables as well. The censoring method, where a small fraction is added when taking the log is used to deal with the zeros. As a result, the empirical models estimated in section 5 are constructed as follows:

On the one hand the trade effects of AfT are analysed in the context of government effectiveness:

$$M_{ijt}/X_{ijt} = \beta_1 * lnmass_{ijt} + \beta_2 * lnAfT_{ijt} + \beta_3 * lnAfTxGE_{ijt} + \beta_4 AfT\_du_{ijt} + \beta_5 * GE_{it} + \eta_{ij} + \lambda_t$$

$$(6)$$

Alternatively the trade effect of AfT is investigated in the context freedom in the recipient country:

$$M_{ijt}/X_{ijt} = \beta_1 * lnmass_{ijt} + \beta_2 * lnAfT_{ijt} + \beta_3 * lnAfTxF_{ijt} + \beta_4 AfT\_du_{ijt} + \beta_5 * F_{it} + \eta_{ij} + \lambda_t$$

$$(7)$$

A third approach combines the two complementary views and investigates:

$$M_{ijt}/X_{ijt} = \beta_1 * lnmass_{ijt} + \beta_2 * lnAfT_{ijt} + \beta_3 * lnAfTxGE_{ijt} + \beta_4 * lnAfTxF_{ijt} + \beta_5 AfT\_du_{ijt} + \beta_6 GE_{it} + \beta_7 * F_{it} + \eta_{ij} + \lambda_t$$

$$(8)$$

In the equations above M_{ijt} is a value for the imports of recipients from donors and X_{ijt} denotes the export variable.

The Poisson estimation method is used in all regressions. To analyse if AfT has a stronger impact on exports or imports a Wald test is used to test the null hypothesis of equality of the AfT parameters from all regressions. If the null hypothesis is rejected, there is a difference in the effect of AfT between imports and exports. A stronger effect on imports of the recipients from the donors implies that the donors profit more from the trade relationship than the recipients. Hence, they are the main beneficiaries. The opposite outcome disapproves this sceptical view. The same procedure is applied to all different AfT categories as well as to the different backgrounds. To be able to perform Wald tests, pooled regressions were run. Specifically imports M_{ijt} and exports X_{ijt} are pooled and dummy

variables are created, which indicate if the trade flows are either exports or imports. Subsequently, the explanatory variables are interacted with the dummies. This way one can mimic the regressions for imports and exports in one regression.

5 Results and Discussion

Section 5 presents and discusses the main results of this paper. In the first section the baseline regressions using total AfT are displayed. Section 5.2 covers the results of the subcategories of AfT and the last section provides outcomes of several robustness checks.

5.1 Total Aid for Trade

The results for the baseline regressions are presented in *Table 2.* The table contains the models derived in section 3 and 4, which are estimated using the Poisson method with fixed effects. *Table 2* below shows the coefficients of the explanatory variables for both imports of the recipient country from the donors and exports of the recipients to the donors. Moreover, the p-values of the different Wald tests are provided, indicating whether the coefficients of the import regression differ significantly from those of the export regression. In addition to the model specifications derived in sections 3 and 4, the estimations are performed without the interaction terms.

The interpretation of the results reported in column (1)-(3) is slightly different from the interpretation of the coefficients in column (4)-(6). The marginal effects need to be calculated separately for the results in columns (4)-(6), because the models include interaction terms[9]. The outcome for the simple model specifications in column (1)-(3) exhibits no significant impact of AfT on trade flows. The coefficients of *GE* and *Free* are both negative and significant for the simple models.

The results in columns (4)-(6) show a different picture. As mentioned above the marginal effects of AfT on trade flows are calculated separately and are reported in *Table 3*. The results in column (4) reveal that there is an indirect effect of AfT through complementarities with government effectiveness. The marginal effect of AfT on trade is positive when *GE* takes the value 1. On the other hand the marginal effect turns negative when *GE*=0. As a result, AfT works better when the government in the recipient country acts more effective. The same interpretation applies to the results in column (5). The marginal effect of AfT on trade is positive when *F*=1, consequently Aid for Trade and *Free*

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[9] Note that the calculation of the marginal effect is as follows: marginal effect of AfT on trade $= \beta_2(\text{AfT}) + \beta_3(\text{AfT*GE})\text{*GE}$; and marginal effect of GE on trade $= \beta_5(\text{GE}) + \beta_3(\text{AfT*GE})\text{*AfT}$ (the same applies for the variable Free)

complement each other. Furthermore, the effect seems to be stronger on exports for both outcomes (columns (4) and (5)). The results reported in column (6) encompass the full model specification (eq. (8)). Aid for Trade still exhibits an indirect positive effect through complementarities with government effectiveness. On the other hand, the interaction term of AfT and *Free* does not show any significant effects. Moreover, the marginal effects are positive when *GE* takes the value 1 regardless of the state of *Free*, whereas a negative sign is observed in the case of *GE*=0. Thus, it seems that the effect of government effectiveness is stronger or the variables *GE* and *Free* correlate to some extent. However, the correlation coefficient is 0.5576 and hence is still in an acceptable range. The coefficients of *lnAfT* refer to the unique effect when *GE* and *Free* are zero. The results reveal a negative and significant effect of *lnAfT* when exports are the dependent variable. Correspondingly, in the absence of an effective government and freedom, AfT does not seem to be beneficial for exports. On the other hand, there is no impact of AfT on imports when *GE* and *Free* are zero. The results for the parameters *GE* and *Free* refer to the effects on trade when AfT is zero. The coefficients are negative and significant. However, the marginal effects of GE and Free on trade change with AfT, meaning that the effects of *GE*/*Free* are greater the higher the AfT flows.

All of the model specifications covered in *Table 2* contain the variables *AfT_dummy* and *lnmass*. The coefficients of the dummy variable exhibit a negative and significant sign for regressions having exports as a dependent variable. This outcome suggests that a previous history of aid flows between donor and recipient has a negative impact on exports. The results of the interaction of the GDPs are as expected positive and significant throughout the estimations. Furthermore, the results for the Wald tests are insignificant for almost all coefficients in *Table 2*, indicating that there is no sign of selfishness of donor countries.

Table 2: Effect of total AfT on trade

VARIABLES		(1)	(2)	(3)	(4)	(5)	(6)
				Total Aid for Trade			
lnAfT	Imports	0.0070	0.0062	0.0067	-0.0125	-0.0116	-0.0136
		(0.0044)	(0.0044)	(0.0044)	(0.0090)	(0.0097)	(0.0097)
	Exports	0.0019	0.0014	0.002	-0.0164**	-0.0146*	-0.0147*
		(0.0054)	(0.0054)	(0.0055)	(0.0077)	(0.0082)	(0.0083)
	Wald	0.4479	0.4740	0.4941	0.7452	0.8177	0.9282
lnAfTxGE	Imports				0.0274***		0.0303**
					(0.0100)		(0.0137)
	Exports				0.0302***		0.0603***
					(0.0108)		(0.0185)
	Wald				0.8570		0.1895
lnAfTxFree	Imports					0.0243**	-0.0019
						(0.0106)	(0.0151)
	Exports					0.0257**	-0.0316
						(0.0111)	(0.0193)
	Wald					0.9297	0.2173
GE	Imports	-0.407***		-0.473***	-0.792***		-0.893***
		(0.111)		(0.116)	(0.193)		(0.276)
	Exports	-1.024***		-1.079***	-1.455***		-1.906***
		(0.265)		(0.249)	(0.311)		(0.305)
	Wald	0.0251		0.0219	0.0625		0.0133
Free	Imports		-0.521***	-0.601***		-0.772***	-0.616***
			(0.202)	(0.212)		(0.227)	(0.154)
	Exports		-0.676	-0.782*		-0.953**	-0.398
			(0.437)	(0.443)		(0.470)	(0.353)
	Wald		0.7394	0.7032		0.7224	0.5569
AfT_dummy	Imports	-0.0978	-0.117	-0.128	-0.0281	-0.0558	-0.0591
		(0.200)	(0.199)	(0.200)	(0.186)	(0.185)	(0.184)
	Exports	-0.455***	-0.459***	-0.472***	-0.368**	-0.380**	-0.400**
		(0.172)	(0.172)	(0.171)	(0.175)	(0.176)	(0.174)
	Wald	0.1675	0.1862	0.1846	0.1865	0.2070	0.1837
lnmass	Imports	0.609***	0.618***	0.636***	0.678***	0.673***	0.706***
		(0.126)	(0.127)	(0.127)	(0.117)	(0.119)	(0.118)
	Exports	0.647***	0.648***	0.666***	0.708***	0.697***	0.727***
		(0.134)	(0.137)	(0.137)	(0.123)	(0.125)	(0.125)
	Wald	0.5654	0.6541	0.6559	0.6527	0.7255	0.7508
	FE	YES	YES	YES	YES	YES	YES
	Observations	37,301	37,403	37,301	37,301	37,403	37,301
	Nr. of idvar	2,092	2,092	2,092	2,092	2,092	2,092

Note: Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3: Marginal Effects of AfT on Trade

	Exports	Imports
AfT & GE		
GE(min)	-0.0164	-0.0125
GE(max)	0.0138	0.0149
GE(mean)	-0.0123	-0.0087
AfT & Free		
Free(min)	-0.0146	-0.0116
Free(max)	0.0111	0.0127
Free(mean)	-0.0089	-0.0062
AfT & GE & Free		
if GE=1, F=0	0.0456	0.0167
if GE=1, F=1	0.0140	0.0148
if GE=0, F=0	-0.0147	-0.0136
if GE=0, F=1	-0.0463	-0.0155

Note: based on own calculations

The findings reported in *Table 2 and 3* show positive marginal effects of AfT on trade when the government in the recipient country operates effectively. These results are in line with the ones commonly found in the literature, where Heble et al. (2012), Berrittella and Zhang (2014), Hühne et al. (2014), Martínez-Zarzoso et al. (2016) and Cali and te Velde (2011) conclude a positive impact of Aid for Trade on trade flows. On the other hand, the outcomes contradict the findings of Cirera and Winters (2015), who do not find any significant impact of AfT on trade flows in SSA countries. Additionally, the results of this essay are as expected and in line with the findings of the OECD and WTO (2013) who also point out the importance of competent governments for the effectiveness of Aid for Trade. Therefore, it is important for Sub Saharan African countries to establish properly working and reliable governments. This is particularly important as the results in *Table 2* indicate that AfT has a negative impact on exports in the absence of government effectiveness. The conclusion drawn from the results of the Wald tests are consistent with the findings of Hühne et al. (2014), who also cannot support the pessimistic view of self-interested donors. However, these results are contrasting the ones of Bertlehemy (2006), Hoeffler and Outram (2011) and Pettersson and Johansson (2013) who state that donors do not behave altruistic at many times.

Investigating the obtained results and comparing them with the literature one has to conclude that the results are highly dependent on the model specification and the estimation method used. Most of the papers referred to above are using OLS for their main estimations.

Only Martínez-Zarzoso et al. (2016) apply the Poisson method in the context of Aid for Trade as a robustness check and find a positive impact of AfT on exports.

5.2 Subcategories of Aid for Trade

The results of the estimations using the different subcategories of AfT are reported in *Table 4*. The table only contains the full model specifications using both interaction terms of AfT and the complementary variables. Moreover, the marginal effects of AfT on trade flows are calculated separately and are presented in *Table 5*.

The first subcategory of AfT analysed is Aid for Economic Infrastructure. The results can be found in column (1) of *Table 4*. Generally, one can see that the effects are not as pronounced as in the main regressions. Among the main variables of interest only the coefficient of *lnAfTxGE* exhibits a positive and significant sign for imports, indicating that *AfT* and *GE* complement each other. On the other hand there is no sign that AfT works better when the recipient country is classified as free. Moreover, there is no significant impact of *AfT_inf* on trade flows in the absence of government effectiveness and freedom (*GE*=0 and *F*=0). Nevertheless, the marginal effect of Aid for Economic Infrastructure on both exports and imports is positive when *GE* takes the value 1, regardless of the state of *Free*.

The results investigating the effect of Aid for Building Productive Capacity are illustrated in column (2). There is again a weak sign that Aid for Trade and government effectiveness complement each other. The coefficient of *lnAfTxGE* is only positive and significant for the regression having imports as a dependent variable. Again there is no sign that AfT works better when the recipients are seen as free. In contrast to the results in column (1) and (3), *lnAfT* exhibits a negative and significant impact on trade flows when the dummies for government effectiveness and freedom take the value zero. However, the results in *Table 5* reveal that the marginal effect of *AfT_prod* on trade is positive when the recipient country's government is effective. The analysis of the simpler model specifications (eq. (6) and (7)), although not reported in the table, shows a positive and significant effect of AfT through complementarities with *GE* and *Free*.

The last AfT category analysed is Aid for Trade Policy and Regulation (column (3)). The results exhibit a positive and highly significant coefficient of *lnAfTxGE* in the export

regression, indicating that *AfT_pol* works better when the government in the recipient country acts effectively. There is no significant sign that *AfT_pol* works better when the recipient country is free. Likewise, there is no significant effect of *lnAfT_pol* when both *Free* and *GE* are zero. However, the findings in *Table 5* show a positive marginal effect of *AfT_pol* when *GE* equals 1. Additionally, the marginal effect of AfT on imports is positive even if *GE* is zero.

Another interesting insight of the results in *Table 4* is the significant p-value of the Wald test for the coefficient *lnAfTxGE* in column (3) for the export regression. This means, that the effects on exports and imports are different, and since the export coefficient is significant, it is contrary to the view that donors act self-interested. In fact, the results strengthen the view that donors often act altruistic. However, the remaining p-values of the Wald test are insignificant for the main variables of interest.

The coefficients of the variables *GE* and *Free* refer to the effect when AfT is zero. Both parameters exhibit negative and significant signs throughout the estimations. However, the marginal effects of GE and Free on trade change with AfT. Meaning that the effect of *GE* and *Free* is stronger the higher the value of AfT. Furthermore, the AfT dummy variable has no impact on trade flows, whereas the variable *lnmass* depicts a positive and significant sign in all estimations.

Table 4: Effects of AfT subcategories on trade flows

VARIABLES		Aid for Economic Infrastructure (1)	Aid for Building Productive Capacity (2)	Aid for Trade Policy and Regulation (3)
lnAfT	Imports	-0.00199	-0.0236**	0.0038
		(0.0073)	(0.0092)	(0.0061)
	Exports	0.00183	-0.0193**	-0.0073
		(0.0098)	(0.0094)	(0.0056)
	Wald	0.7587	0.7420	0.1600
lnAfTxGE	Imports	0.0165*	0.0240*	0.0116
		(0.0085)	(0.0131)	(0.0107)
	Exports	0.0107	0.0386	0.0567***
		(0.0135)	(0.0251)	(0.0218)
	Wald	0.7126	0.6051	0.0642
lnAfTxF	Imports	-0.0093	0.0098	0.0038
		(0.0105)	(0.0145)	(0.01)
	Exports	-0.0062	-0.0072	-0.0192
		(0.0159)	(0.0259)	(0.0214)
	Wald	0.8704	0.5616	0.3261
GE	Imports	-0.609***	-0.769***	-0.486***
		(0.162)	(0.247)	(0.120)
	Exports	-1.157***	-1.545***	-1.220***
		(0.214)	(0.427)	(0.299)
	Wald	0.0354	0.1147	0.0197
Free	Imports	-0.526***	-0.695***	-0.606***
		(0.172)	(0.175)	(0.218)
	Exports	-0.750*	-0.650	-0.758*
		(0.430)	(0.420)	(0.450)
	Wald	0.6150	0.9187	0.7511
AfT_dummy	Imports	0.123	0.137	0.184
		(0.170)	(0.150)	(0.152)
	Exports	-0.216	-0.172	0.105
		(0.184)	(0.241)	(0.226)
	Wald	0.1868	0.2859	0.7730
lnmass	Imports	0.615***	0.682***	0.646***
		(0.126)	(0.117)	(0.125)
	Exports	0.642***	0.690***	0.654***
		(0.133)	(0.125)	(0.124)
	Wald	0.6844	0.8976	0.8953
	FE	YES	YES	YES
	Observations	37,301	37,301	37,301
	Nr. of idvar	2,092	2,092	2,092

Note: Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: Marginal effects of AfT on trade

	AfT for Economic Infrastructure		AfT for Building Productive Capacity		AfT for Trade Policy and Regulation	
	Exports	Imports	Exports	Imports	Exports	Imports
if GE=1, F=0	0.0125	0.0145	0.0193	0.0004	0.0494	0.0154
if GE=1, F=1	0.0064	0.0052	0.0121	0.0102	0.0302	0.0191
if GE=0, F=0	0.0018	-0.0020	-0.0193	-0.0236	-0.0073	0.0038
if GE=0, F=1	-0.0043	-0.0113	-0.0265	-0.0138	-0.0265	0.0075

Note: based on own calculations

The findings reported in *Table 4* and *5* are in the majority of cases as expected. Generally, the positive marginal results strengthen the conclusions drawn in section 5.1. Starting with Aid for Economic Infrastructure one can see a weak sign that *AfT* and *GE* complement each other. As a result, aid given to sectors such as Transport and Storage, Communications, and Energy Generation and Supply does not have a strong impact on trade and mainly benefit imports of the recipients but not exports as would be preferred. The findings for the export regression are consistent with the conclusions of Cirera and Winters (2015), who report no significant influences of *AfT_inf* on exports in SSA countries. On the contrary, the majority of researchers conclude that Aid for Economic Infrastructure is particularly important (Cali & te Velde, 2011; Heble et al., 2012; 2014; Hühne et al., 2014; Pettersson & Johansson, 2013; Vijil, 2014). Cali and te Velde (2011) specifically point out the importance of aid given to economic infrastructure. Moreover, they conclude that these particular aid flows are notably important for Sub Saharan African countries.

The findings in the literature are mixed when the subcategory Aid for Building Productive Capacity is used for the analysis. Hühne et al. (2014) and Martínez-Zarzoso et al. (2016) find a positive impact of this measure on trade flows, whereas Cirera and Winters (2015), Cali and Razzaque (2013) and Cali and te Velde (2008) cannot find any significant effects of *AfT_prod* on exports in SSA countries. The results in this essay show a negative effect of *AfT_prod* on trade flows in the absence of an effective government and freedom in the recipient country (*GE*=0, *F*=0). On the other hand, when the government in the recipient country is operating effectively (*GE*=1), the marginal effect of AfT on trade is positive. Therefore, the positive and significant impact on imports of AfT through complementarities with *GE* is consistent with some the findings in the academic literature (Hühne et al., 2014; Martínez-Zarzoso et al., 2016).

Aid for Trade Policy and Regulations appears to be particularly important for exports from recipients to donor countries. *Table 4* above reveals that AfT works better in an environment where the government is effective. Hence, AfT has a positive effect on exports indirectly through the complementarity with *GE*. This positive finding coincides with the results of Cali and te Velde (2008) and Hühne et al. (2014). On the other hand, Martínez-Zarzoso et al. (2016) and to some extent Cali and te Velde (2011) report no effects of *AfT_pol* on trade flows. Moreover, the Wald test statistics negate the pessimistic view of self-interested donors, which confirms the conclusions of Hühne et al. (2014). The findings in this essay point out the importance of aid provided to support trade policy and planning, trade facilitation, trade education/training and negotiations for regional and multilateral trade agreements in Sub Saharan African countries.

Summing up, one has to bear in mind that the results are dependent on the setup of the investigation, meaning that different model specifications as well as different estimation methods can lead to strikingly different results. As a result, further research is needed in this area to get a better picture of the trade effects of Aid for Trade.

5.3   Robustness Checks

To check the validity of the main results several robustness checks are performed. First the model specifications are estimated using Ordinary Least Squares, because it is the method used in most of the studies analysed in section 2. To deal with zero trade flows the censoring method is employed. Although this procedure is not ideal it is commonly used in the literature. The results of the different estimations are summarized in *Table A3* in the Appendix and are slightly different than the findings of the main regressions. When the OLS method is applied, AfT works better when the NGO Freedom House categorizes the recipient country as free. Hence, AfT exhibits a positive and significant impact on trade flows through complementarities with *Free*. This outcome can be found for all categories of AfT except for *AfT_pol*. The analysis of the full specification using total AfT reveals a positive marginal effect of AfT on trade when GE equals 1 (*Table A4*). The same pattern applies to *AfT_inf* and *AfT_pol (Table A5)*. On the contrary, *AfT_prod* only exhibits a positive marginal effect on trade when *Free* takes the value one. Moreover, one can find a negative effect of *AfT_prod* and *AfT_pol* on trade in the absence of government effectiveness and freedom (GE=0, F=0). Furthermore, the Wald test statistics do not reveal any differences between the AfT coefficients of the import and export regressions. Hence,

the results do not support the pessimistic view of self-interested donors. Altogether, the OLS results confirm the positive effect of AfT on trade, but in contrast to the Poisson results it stems from complementarities with *Free* and not *GE*.

As another robustness check the model specification is extended by lagged values of the variable AfT. This approach is used in several other studies such as Hühne et al. (2014), Martínez-Zarzoso et al. (2016), Cali and te Velde (2011) and Cirera and Winters (2015), mainly as a solution to the problem of endogeneity. The estimations are again performed using the Poisson method. The results are summarized in *Table A6* in the Appendix. Moreover, the estimations are only obtained for the full model specification using one and two lags, respectively. The results are not significantly different from the findings in the main regressions. The coefficients of the lagged AfT variables are only significant for the first lag in the export regression using *AfT_pol*, although negative. Moreover, *lnAfT_prod* exhibits again a negative and significant impact on trade when *GE* and *Free* are zero. In contrast to the OLS results, AfT displays a positive impact on trade through complementarities with government effectiveness. The p-values of the Wald tests still do not show any signs of self-interested donor behaviour.

Lastly, the trade effect of AfT has been analysed for different subsamples to further investigate the validity of the results. The full model specification using total AfT is estimated with the Poisson method. First, following the approach of Cirera and Winters (2015) the models had been estimated for the main recipients of AfT[10]. The results are reported in *Table A7* column (1). The findings do not reveal any significant effects of AfT on trade flows. The same pattern applies to the regression looking at the main donors[11] (column (2)). Moreover, the Wald test does not show any significant signs for both regressions. In a last step the model specification using total AfT is analysed for different donors according to their classification as egoistic and altruistic. This is done to shed more light on the discussion of self-interested donors. The distinction between the donors follows the approach of Berthelemy (2006) who states that Switzerland, Austria, Ireland, and the Nordic donors are behaving altruistic in contrast to Australia, France, Italy, and partly Japan and the United States who are seen as egoistic. Switzerland and Norway are taken as examples of altruistic countries, whereas Japan and France are chosen to analyse egoistic

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[10] Ethiopia, Tanzania, Ghana, Mozambique, Uganda, Madagascar, Mali, Kenya, Senegal, Burkina Faso, Zambia, Nigeria, Cameroon, Benin
[11] Japan, United States, France, Germany

countries. The results for Switzerland and Norway are reported in *Table A7* columns (3) and (4). One can see that AfT exhibits a positive impact on trade through complementarities with GE but reveals a negative influence in the context of freedom. Moreover, the Wald test statistics are significant, indicating that *lnAfTxGE* has a significantly higher effect on exports than on imports for the estimations of Switzerland. This result proves the picture of an altruistic donor. Furthermore, there is also a positive effect of AfT on trade in the absence of *GE* and *Free* for Switzerland and Norway. Moreover, the marginal effect of AfT on trade is positive for exports for both countries. Looking at the outcomes for Japan and France (columns (5) and (6)) one can find no effect of AfT on trade for Japan. On the other hand, the results for France reveal that AfT has a positive impact on exports in the context of freedom. Additionally, the marginal effect of AfT on trade is positive when *Free* takes the value one. However, the effect of AfT on imports is negative when government effectiveness is taken into account. As a result one cannot confirm nor deny the view that France is egoistic. The results obtained for the different donors prove that there is a difference between donor behaviour, and also that some donors are in fact altruistic.

Summing up, the robustness checks almost led to the same results as the baseline regressions. This is in particular the case when the Poisson method is applied. Using OLS leads to a slightly different conclusion. The pessimistic view of self-interested donors cannot be affirmed in most of the robustness checks. Furthermore, a difference in donor behaviour can also be shown.

6 Conclusion

Generally, development assistance and specifically Aid for Trade aim at improving the economic situation in the recipient country. This is particularly important for developing countries that are facing economic challenges such as poor trade performance, high trade costs and low growth rates. Most Sub Saharan African countries are among the least developed countries in the world and are facing these kinds of obstacles. As a result, aid provided to improve infrastructure and enable trade facilitation is notably important for these countries (Karingi & Leyaro, 2010). These circumstances induced the WTO to establish the Aid for Trade program in 2005. Since the establishment of the program several studies analysing the effectiveness of AfT have emerged. Most of the studies find positive effects of AfT on trade, but there are also papers finding no effects at all (OECD & WTO, 2011b).

To shed more light on this topic the present paper investigates the trade effect of AfT on trade and whether it generates more exports of recipients than exports of donors. In addition, the analysis focuses on countries with different institutional settings to see if they behave differently. The theoretical framework of the analysis is based on the gravity equation. In contrast to the majority of papers the Poisson method is used to perform the estimations. The findings generally confirm the positive view that AfT is beneficial for trade (Heble et al., 2012; Berrittella & Zhang, 2014; Hühne et al., 2014; Cali & te Velde, 2011). The results for total AfT flows suggest that AfT exhibits an indirect effect on trade through complementarities with *GE*. The marginal effect of AfT on trade is positive when *GE* takes the value 1, meaning that AfT works better when governments in aid receiving countries are operating effectively. Furthermore, the effect is stronger on exports when the full model specification is analysed. The Wald test statistics do not provide evidence that donors are self-interested. Moreover, the effects of AfT on trade are less pronounced when AfT is divided into several subcategories. Aid for Economic Infrastructure and Aid for Building Productive Capacity only exhibit a positive effect on imports and on the condition that the government acts effectively. These findings are in line with Cirera and Winters (2015) and Cali and Razzaque (2013) who cannot find an effect of *AfT_prod* on exports for SSA countries. On the other hand, one can find a strong positive effect on exports when Aid for Trade Policy and Regulation is taken into account. As seen for overall *AfT*, *AfT_pol* and government effectiveness complement each other. Furthermore, the marginal effect of *AfT_pol* is positive for exports regardless of the states of *Free* and *GE*. The effect on

exports is statistically stronger than on imports, showing that donors are not egoistic. These findings are in line with the conclusions of Hühne et al. (2014). The results obtained in this essay are particularly interesting in the context of SSA. Aid for Trade is working better in an environment where the recipient country's government acts effectively. However, in the sample analysed only 13.73% of the countries are classified having an effective government. Hence, it is important for these countries to improve the reliability of their governments and enhance public and civil services. Cali and te Velde (2011) note that aid given to infrastructure is particularly important for SSA countries. However, the results in this essay do not find significant effects of *AfT_inf* on exports. Furthermore, the findings show that Aid for Trade Policy and Regulation exhibits a positive impact on exports of the recipient countries, even though this category receives the lowest share of AfT flows. Hence, donors should put an increased focus on this AfT category.

In any case, one has to bear in mind that the results are heavily dependent on the model specification as well as on the econometrical method applied. This points to the fact that further research is needed in this area in order to get a better picture of the effects of Aid for Trade. Particularly, the effects of AfT in least developed countries are important, because these countries receive the highest shares of AfT but also because aid is needed most in these regions and hence should be beneficial.

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Appendix

Table A 1: List of Recipients and Donors

Recipients		Donors
Benin	Namibia	Australia
Botswana	Niger	Austria
Burkina Faso	Nigeria	Belgium
Burundi	Rwanda	Canada
Cameroon	Sao Tome and Principe	Czech Republic
Cape Verde	Senegal	Denmark
Central African Republic	Seychelles	Finland
Chad	Sierra Leone	France
Comoros	South Africa	Germany
Congo	Swaziland	Greece
Côte d'Ivoire	Tanzania	Iceland
Djibouti	Togo	Ireland
Eritrea	Uganda	Italy
Ethiopia	Zambia	Japan
Gabon	Zimbabwe	Korea
The Gambia		Luxemburg
Ghana		Netherlands
Guinea		New Zealand
Guinea-Bissau		Norway
Kenya		Poland
Lesotho		Portugal
Liberia		Slovak Republic
Madagascar		Slovenia
Malawi		Spain
Mali		Sweden
Mauritania		Switzerland
Mauritius		UK
Mozambique		US

Variables	Description	Source
Imports	Imports of recipient country from the partner country	http://comtrade.un.org
Exports	Exports of recipient country to the partner country	http://comtrade.un.org
AfT	Aid for trade measure= AfT_inf+AfT_prod+AfTpol (all AfT measures in current US dollars)	https://stats.oecd.org/qwids/
AfT_inf	Measure for Economic Infrastructure consisting of: Transport and Storage (210), Communications (220), and Energy Generation and Supply (230)	https://stats.oecd.org/qwids/
AfT_prod	Measure for Building Productive Capacity consisting of: Banking and Financial Services (240), Business and Other Services (250), Agriculture (311), Forestry (312), Fishing (313), Mineral Resources and Mining (322), Industry (321), and Tourism (332).	https://stats.oecd.org/qwids/ (values in parentheses are CRS Codes)
AfT_pol	Measure for Trade Policies and Regulations (331)	https://stats.oecd.org/qwids/
Mass (GDPr x GDPp)	Product of the GDPs of the recipient and the donor countries (in current US dollars). Based on own calculations. GDPs are obtained from the World Bank.	http://data.worldbank.org/data-catalog/world-development-indicators
GE (government effectiveness)	Estimates of the original variable take values between [-2.5;2.5] where -2.5 is weak and 2.5 is strong government performance. A dummy variable was created at the cut-off 0. It takes the value 1 when then recipient country has an effective government, meaning that the original estimate is between 0 and 2.5.	http://info.worldbank.org/governance/wgi/index.aspx#home
Free	Combined rating for Political Rights and for Civil Liberties published by the NGO Freedom House. A dummy is created taking the value 1 if country is free according to Freedom House.	https://freedomhouse.org/report-types/freedom-world
AfT_dummy	Dummy variable taking the value 1 after the first donation has been made	Own calculation

Table A 3: Effects of AfT and subcategories on trade using OLS

VARIABLES		(1)	Total AfT (2)	(3)	AfT_inf (4)	AfT_prod (5)	AfT_pol (6)
lnAfT	Imports	0.0045	-0.0178	-0.0173	-0.0055	-0.0309**	-0.0779**
		(0.0139)	(0.0154)	(0.0150)	(0.0169)	(0.0152)	(0.0331)
	Exports	0.0006	-0.0181	-0.0204	-0.0192	-0.0361**	-0.128***
		(0.0138)	(0.0148)	(0.0147)	(0.0167)	(0.0148)	(0.0310)
	Wald	0.8419	0.9911	0.8831	0.5667	0.8085	0.2674
lnAfTxGE	Imports	0.109**		0.0239	0.0896	0.0112	0.131
		(0.0545)		(0.0527)	(0.0556)	(0.0568)	(0.117)
	Exports	0.121**		0.0369	0.0856	0.0253	0.149
		(0.0559)		(0.0517)	(0.0583)	(0.0549)	(0.116)
	Wald	0.8743		0.8608	0.9605	0.8587	0.9123
lnAfTxF	Imports		0.164***	0.153***	0.0682**	0.160***	0.123
			(0.0399)	(0.0382)	(0.0342)	(0.0392)	(0.0778)
	Exports		0.166***	0.148***	0.0525*	0.157***	0.0494
			(0.0396)	(0.0342)	(0.0314)	(0.0341)	(0.0765)
	Wald		0.9749	0.9236	0.7346	0.9449	0.5001
GE	Imports	-1.186***		-0.913***	-0.962***	-0.846**	-0.855***
		(0.342)		(0.353)	(0.308)	(0.341)	(0.281)
	Exports	-0.776**		-0.395	-0.380	-0.324	-0.283
		(0.346)		(0.337)	(0.308)	(0.322)	(0.278)
	Wald	0.3974		0.2874	0.1783	0.2641	0.1440
Free	Imports		-0.673**	-0.694**	-0.227	-0.622*	-0.220
			(0.343)	(0.338)	(0.330)	(0.336)	(0.327)
	Exports		0.211	0.257	0.734**	0.323	0.753**
			(0.341)	(0.335)	(0.313)	(0.330)	(0.310)
	Wald		0.0643	0.0427	0.0329	0.0418	0.0290
AfT_dummy	Imports	-0.169	-0.157	-0.161	0.673**	0.213	1.618***
		(0.275)	(0.273)	(0.273)	(0.310)	(0.278)	(0.415)
	Exports	-0.275	-0.293	-0.265	0.946***	0.137	1.949***
		(0.268)	(0.265)	(0.267)	(0.310)	(0.271)	(0.408)
	Wald	0.7810	0.7174	0.7830	0.5357	0.8438	0.5707
lnmass	Imports	1.145***	1.141***	1.130***	1.187***	1.137***	1.217***
		(0.207)	(0.207)	(0.206)	(0.208)	(0.206)	(0.206)
	Exports	1.116***	1.073***	1.086***	1.105***	1.091***	1.152***
		(0.212)	(0.212)	(0.211)	(0.211)	(0.211)	(0.208)
	Wald	0.8043	0.5584	0.7054	0.4703	0.6870	0.5661
	Constant	-48.12***	-47.23***	-47.04***	-49.04***	-47.41***	-50.83***
		(9.621)	(9.614)	(9.566)	(9.628)	(9.568)	(9.513)
	FE	YES	YES	YES	YES	YES	YES
	Observations	42,840	42,952	42,840	42,840	42,840	42,840
	R-squared	0.104	0.110	0.107	0.106	0.106	0.108
	Number of idvar	2,408	2,408	2,408	2,408	2,408	2,408

Note: Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A 4: Marginal effects of total AfT on trade (OLS)

	Exports	Imports
AfT & GE		
GE(min)	0.0006	0.0045
GE(max)	0.1216	0.1135
GE(mean)	0.0172	0.0195
AfT & Free		
Free(min)	-0.0181	-0.0178
Free(max)	0.1479	0.1462
Free(mean)	0.0190	0.0189
AfT & GE & Free		
if GE=1, F=0	0.0165	0.0066
if GE=1, F=1	0.1645	0.1596
if GE=0, F=0	-0.0204	-0.0173
if GE=0, F=1	0.1276	0.1357

Note: based on own calculations

Table A 5: Marginal effects of AfT subcategories on trade (OLS)

	AfT_inf		AfT_prod		AfT_pol	
	Exports	Imports	Exports	Imports	Exports	Imports
if GE=1, F=0	0.0664	0.0841	-0.0108	-0.0197	0.0210	0.0531
if GE=1, F=1	0.1189	0.1523	0.1462	0.1403	0.0704	0.1761
if GE=0, F=0	-0.0192	-0.0055	-0.0361	-0.0309	-0.1280	-0.0779
if GE=0, F=1	0.0333	0.0627	0.1209	0.1291	-0.0786	0.0451

Note: based on own calculations

Table A 6: Effect of total AfT on trade including lags

| | | Including 1 lag of AfT | | | | Including 2 lags of AfT | | | |
| | | Total AfT | AfT_inf | AfT_prod | AfT_pol | Total AfT | AfT_inf | AfT_prod | AfT_pol |
VARIABLES		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lnAfT	Imports	-0.0139	-0.0021	-0.0237***	0.0039	-0.0139	-0.0022	-0.0237***	0.004
		(0.0096)	(0.007)	(0.0092)	(0.0062)	(0.0096)	(0.0070)	(0.0092)	(0.0064)
	Exports	-0.0146*	0.0027	-0.0195**	0.0009	-0.0144*	0.00313	-0.0195**	0.0006
		(0.0082)	(0.01)	(0.0094)	(0.0067)	(0.0083)	(0.0098)	(0.0094)	(0.0068)
	Wald	0.9585	0.6981	0.7455	0.7361	0.9658	0.6650	0.7490	0.7124
lnAfT$_{-1}$	Imports	0.0048	5.21e-05	0.0024	-0.0013	0.0047*	-6.90e-05	0.0022	-0.0013
		(0.0031)	(0.0033)	(0.0037)	(0.0077)	(0.0028)	(0.0032)	(0.0032)	(0.005)
	Exports	-0.0012	-0.0086	0.0014	-0.0228***	0.0002	-0.008	0.0016	-0.0251***
		(0.0045)	(0.0076)	(0.0049)	(0.0070)	(0.0038)	(0.0072)	(0.0037)	(0.008)
	Wald	0.3473	0.3023	0.8801	0.0401	0.4011	0.3277	0.9093	0.0092
lnAfT$_{-2}$	Imports					0.0006	0.0004	0.0007	5.70e-05
						(0.0036)	(0.0038)	(0.0039)	(0.0105)
	Exports					-0.0056	-0.0034	-0.0008	0.0055
						(0.0055)	(0.0057)	(0.0058)	(0.009)
	Wald					0.3439	0.5610	0.8297	0.6994
lnAfTxGE	Imports	0.0300**	0.0166**	0.0235*	0.0121	0.0300**	0.0168**	0.0235*	0.0118
		(0.0136)	(0.00838)	(0.0131)	(0.0107)	(0.0136)	(0.0084)	(0.0131)	(0.0112)
	Exports	0.0604***	0.0136	0.0380	0.0674***	0.0609***	0.0128	0.0381	0.0664***
		(0.0184)	(0.0143)	(0.0249)	(0.0248)	(0.0185)	(0.0142)	(0.0249)	(0.0249)
	Wald	0.1824	0.8582	0.6059	0.0442	0.1763	0.8133	0.6028	0.0503
lnAfTxFree	Imports	-0.0021	-0.0094	0.0098	0.0038	-0.0022	-0.0095	0.0098	0.0038
		(0.0151)	(0.0103)	(0.0146)	(0.0101)	(0.0151)	(0.0102)	(0.0146)	(0.0106)
	Exports	-0.0317*	-0.0082	-0.0068	-0.0288	-0.0318	-0.0070	-0.0069	-0.0285
		(0.0193)	(0.0158)	(0.0260)	(0.0228)	(0.0193)	(0.0164)	(0.0260)	(0.0227)
	Wald	0.2191	0.9509	0.5720	0.1909	0.2211	0.9002	0.5688	0.1980
GE	Imports	-0.895***	-0.599***	-0.766***	-0.478***	-0.891***	-0.598***	-0.766***	-0.479***
		(0.275)	(0.160)	(0.247)	(0.118)	(0.274)	(0.160)	(0.247)	(0.118)
	Exports	-1.909***	-1.174***	-1.543***	-1.257***	-1.911***	-1.172***	-1.543***	-1.262***
		(0.306)	(0.222)	(0.427)	(0.317)	(0.305)	(0.220)	(0.427)	(0.317)
	Wald	0.0131	0.0316	0.1145	0.0192	0.0124	0.0307	0.1142	0.0185
Free	Imports	-0.606***	-0.518***	-0.693***	-0.598***	-0.603***	-0.516***	-0.694***	-0.599***
		(0.153)	(0.174)	(0.175)	(0.223)	(0.154)	(0.173)	(0.177)	(0.223)
	Exports	-0.394	-0.744*	-0.654	-0.735	-0.391	-0.754*	-0.653	-0.735
		(0.353)	(0.440)	(0.421)	(0.452)	(0.350)	(0.439)	(0.422)	(0.450)
	Wald	0.5666	0.6195	0.9312	0.7757	0.5624	0.6003	0.9268	0.7767
AfT_dummy	Imports	-0.0827	0.126	0.125	0.195	-0.0794	0.128	0.123	0.192
		(0.185)	(0.172)	(0.152)	(0.159)	(0.186)	(0.172)	(0.155)	(0.163)
	Exports	-0.396**	-0.195	-0.178	0.125	-0.392**	-0.194	-0.176	0.123
		(0.178)	(0.182)	(0.247)	(0.233)	(0.178)	(0.182)	(0.251)	(0.229)
	Wald	0.2223	0.2093	0.3016	0.8093	0.2205	0.2071	0.3147	0.8109
lnmass	Imports	0.702***	0.607***	0.681***	0.664***	0.697***	0.604***	0.681***	0.661***
		(0.119)	(0.128)	(0.118)	(0.119)	(0.121)	(0.129)	(0.119)	(0.117)
	Exports	0.732***	0.644***	0.692***	0.688***	0.735***	0.645***	0.693***	0.681***
		(0.125)	(0.131)	(0.124)	(0.117)	(0.123)	(0.130)	(0.124)	(0.115)
	Wald	0.6507	0.5732	0.8739	0.7119	0.5354	0.5225	0.8470	0.7457
	FE	YES	YES	YES	YES	YES	YES	YES	YES
	Observations	37,300	37,300	37,300	37,300	37,299	37,299	37,299	37,299
	Nr of idvar	2,092	2,092	2,092	2,092	2,092	2,092	2,092	2,092

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A 7: Effect of total AfT on different recipients and donors

VARIABLES		Main Recipents (1)	Main Donors (2)	Switzerland (3)	Norway (4)	Japan (5)	France (6)
lnAfT	Imports	-0.0074	-0.0094	0.154***	-0.275***	-0.0095	0.0077
		(0.0086)	(0.0136)	(0.0233)	(0.0782)	(0.0313)	(0.0182)
	Exports	-0.0029	-0.0158*	0.0201	1.255***	-0.0713*	-0.0082
		(0.0089)	(0.009)	(0.0196)	(0.196)	(0.0399)	(0.0210)
	Wald	0.7051	0.6856	0.0000	0.0000	0.2417	0.5733
lnAfTxGE	Imports	-0.0028	0.0308	-0.290***	0.376***	0.0441	0.0132
		(0.0167)	(0.0201)	(0.0814)	(0.102)	(0.0396)	(0.0081)
	Exports	0.108*	0.0275	0.109***	0.193	0.0550	-0.0333**
		(0.0610)	(0.0298)	(0.0182)	(0.199)	(0.0776)	(0.0169)
	Wald	0.0785	0.9271	0.0000	0.3466	0.9006	0.0113
lnAfTxF	Imports	-0.0077	0.0043	0.135	0.239***	-0.0171	0.0041
		(0.0143)	(0.0226)	(0.0959)	(0.0804)	(0.0403)	(0.0158)
	Exports	-0.0268	0.0267	-0.117***	-1.091***	0.0762	0.0599**
		(0.0196)	(0.0292)	(0.0343)	(0.188)	(0.0812)	(0.0301)
	Wald	0.4176	0.5377	0.0013	0.0000	0.2896	0.0854
GE	Imports	-0.431*	-1.063**	9.989***	-4.547***	-1.406**	-0.547***
		(0.259)	(0.444)	(1.653)	(1.278)	(0.664)	(0.196)
	Exports	-2.652***	-2.185***	-2.510***	-2.180	-1.380	-1.164***
		(0.987)	(0.664)	(0.311)	(2.721)	(1.300)	(0.270)
	Wald	0.0293	0.1562	0.0000	0.4000	0.9859	0.0587
Free	Imports	-0.0648	-0.669***	-0.318	-9.353***	-0.795	-0.147
		(0.130)	(0.187)	(0.965)	(1.199)	(0.739)	(0.253)
	Exports	-0.171	0.284	-2.048***	-0.159	-1.458	0.256
		(0.325)	(0.476)	(0.426)	(1.894)	(1.632)	(0.461)
	Wald	0.7568	0.0585	0.1339	0.0000	0.7047	0.4294
AfT_dummy	Imports	0.0375	-0.300	-1.668	1.611	0.889	-0.0207
		(0.159)	(0.414)	(1.520)	(1.215)	(1.049)	(0.599)
	Exports	-0.0148	-0.378	-0.425	-3.637**	2.079**	-0.104
		(0.242)	(0.303)	(1.085)	(1.483)	(1.025)	(0.401)
	Wald	0.8622	0.8679	0.3190	0.0277	0.3954	0.9081
lnmass	Imports	0.511***	0.709***	1.201***	2.575**	0.686***	1.122***
		(0.157)	(0.170)	(0.432)	(1.091)	(0.145)	(0.165)
	Exports	0.555***	0.667***	1.301***	3.514**	0.404	1.134***
		(0.161)	(0.119)	(0.462)	(1.410)	(0.249)	(0.181)
	Wald	0.6586	0.6068	0.7305	0.1509	0.1420	0.9289
	FE	YES	YES	YES	YES	YES	YES
	Observations	13,806	5,851	1,386	1,351	1,441	1,476
	Number of idvar	767	329	78	76	81	83

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1