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How Does Aid For Trade Contribute To ASEAN`s Trading?

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Abstract

The aid for trade program is about helping developing countries to improve their trade abilities. With many developing countries, Asia is one of the largest aids for trade recipients and plays an essential role in world trade. In Asia, ASEAN countries are active aid participant countries and also participate in world trade. This study uses an aid-augmented gravity model to find the relationship between bilateral aid for trade and bilateral trade between recipient ASEAN countries and OECD DAC donors. We consecutively calculate and compare the effects of the overall aid for trade program on trade of ASEAN aid for trade recipients (altogether and recipients grouped by income level) by using data on 8 ASEAN aid recipient countries and 23 OECD DAC donor countries in 1991–2009. We also calculate the effect of disaggregated aid on recipient exports or imports in 2002–2009. We find that, overall, aid for trade has a positive and significant effect on either exports or imports of recipient countries.

However, when differentiating recipients by income level, aid for trade is working well only for lower-middle-incomegroups. Aid for economic infrastructure and technical assistance on trade policy and regulation has a positive and significant effect on recipient exports or imports.
Keywords: aid for trade, ASEAN, recipient exports, recipient import, gravity model

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1.0 Introduction

Some studies have noted that trade can be a powerful engine for enhancing economic growth and poverty reduction (Winters et al., (2004)). However, many developing countries face supply-side and trade-related infrastructure obstacles that limit their ability to connect to international trade. To improve production and export capabilities in developing countries, developed countries provide official development assistance (ODA), specifically, aid for trade (Aft), to developing countries. Aid for Trade has emerged as an essential vehicle for assisting developing countries to improve their trade capacity and to benefit from the expansion of global markets. The Aft initiative has raised significant expectations in the development community, particularly in the recipient economies.

According to some estimates (using the OECD DAC Database), Aid for Trade now constitutes one-third of total official development assistance (ODA) and has likely contributed to improving the trade performance of many developing countries. In recent years, the volume of exports from developing countries has developed consistently faster than the volume of exports from developed countries or from the world as a whole in the most recent year.

Asia is by far the most important exporting region in the developing country group, with a 10 % share of world exports in 1990 (US$ 335 million) that increased to 21 %US$ 2,603 million) in 2009. In developing Asia, ASEAN countries (except BruneiDarussalam and Singapore) are aid for trade recipient countries, and the amount of aid for trade received increases annually. The export/import performance of those ASEAN countries contributes 67% of ASEAN's total annual trade increase.

The aid literature has shown that foreign aid is promoting exports from donor to recipient countries, with the effects varying by donor and over time. Although many reasons could account for such an effect, one is that aid supports overall bilateral trade between donor and recipient. Thus, the logical next question to ask is whether aid is indeed promoting the other side of that bilateral trade, i.e., exports from recipients to donors.

As briefly discussed above, the relationship between bilateral aid for trade provided by OECD donor countries to ASEAN recipient countries and bilateral export/import performance of recipients to donors seem to be important for aid recipient ASEAN countries.Consequently, this study is organized into six sections, including the introduction. Section Two presents the overviews of aid for trade program for developing countries including distribution of Aid for

Trade by income group,sub-categories under the aid for trade program as well as Aid for trade and ASEAN.Section Three examines previous literature reviews. Section Four presents the data we are using in this study and the methodology we use; we set out our main empirical specification and some digressions from it. Section fivepresents the results from the analysis of our model and discussion and addresses a number of robustness issues. Finally, section six concludes the article.

2.0 Overview of aid for trade program

Aid for Trade is part of ODA (approximately 35 % by some estimates) and includes technical trade assistance, trade-related infrastructure and capacity building to contribute to improving the trade performance of many developing countries. The idea of giving aid for trade started from the Uruguay Round (1986–1994) and has become an important feature of world trade rounds, particularly since the Sixth Ministerial Conference in Hong Kong in 2005, This feature is called the Aid for Trade initiative. The original motivation was to grant aid for trade in return for trade concessions made in trade liberalization agreements (Calì& te Velde, 2011).

The objective of the aid for trade Initiative is not to create a new global development fund for trade but rather to expand financial resources devoted to trade as part of existing development strategies. In 2006, the WTO aid for trade Task Force stated, "Projects and programs should be considered Aid for Trade if these activities have been identified as trade-related development priorities in the recipient country's national development strategies."

In 1961, the major donor countries organized the Development Assistance Committee (DAC). The DAC now has 23 member countries. The members of this committee have agreed upon various standards for giving aid and for reporting practices. The OECD gathers the reported data.

Approximately 64% of foreign aid is provided bilaterally, i.e., by a specific donor to a specific recipient. The remaining 36% is provided multilaterally through international agencies such as the World Bank or the IMF (OECD 2013). This present study only focuses on bilateral aid from OECD DAC member donors to ASEAN recipients.

The overall distribution of aid for trade improves annually. The regional distribution of aid for trade is shown in table 2.1. Asia is the largest aid for trade recipient among developing region.

Table 2.1 regional distribution of aid for trade

(Disbursement – USD millions (2011 constant))

Region	2006–2008 avg.	2009	2010	2011
Africa	8153.2	1,1656.5	11870.0	12277.8
America	1739.5	2648.5	3061.1	2928.2
Asia	11455.2	12053.8	13719.6	12897.0
Europe	1428.3	1984.1	2161.1	1690.4
Oceania	317.9	306.9	403.4	437.0

Source: aid for trade at a glance (WTO, OECD 2013)

2.2 Distribution of Aid for Trade by income group

Thereare 5 major groups of aid for trade recipients by income level. They are least-developed countries, other low-income countries, lower-middle-income countries, upper-middle-income countries and the global unallocated group. Aid for Trade disbursements to developing countries increased at an annual rate of 12% between 2006 and 2010, from $20.6 billion to $32.1 billion. The largest recipients in this five-year time period were lower-middle-income countries ($49.2 billion), followed by LDCs ($35.1 billion).

Table 2.2 distribution of aid for trade by income level

(Disbursement value – USD millions (2011 constant))

	2006–2008 avg.	2009	2010	2011	% of total aid
Least-developed countries	6455.5	8722.3	9382.8	9445.0	27%
Other low-income countries	443.6	571.4	776.8	1017.6	2%
Lower-middle-income countries	10301.7	11281.6	13146.7	12742.4	39%
Upper-middle-income countries	4197.4	4908.4	5220.0	4130.6	15%
Global unallocated	3402.8	5694.9	6341.1	6230.3	17%

Source: aid for trade at a glance (WTO, OECD 2013)

2.3 Sub-categories under the aid for trade program

There are three main categories under the aid for trade program. They are aid for Productive capacity building, technical assistance on trade policy and regulations and trade related infrastructure.

Productive capacity building is the type of aid supports developing countries' private sectors in exploiting their comparative advantages and diversifying their exports. The aid supports productive sectors such as agriculture, forestry, fishing, industry, mineral resources and mining. It is targeted at helping enterprises to trade and at creating a favorable business environment.

Technical assistance on trade policy and regulations supports local capacities for developing national trade policies to participate in trade negotiations and to implement trade agreements. This type of aid assists developing countries to develop trade strategies, negotiate trade agreements, and implement outcomes. The aid contributes to government budgets for implementation of the recipients' own trade reforms and of adjustments to accommodate trade policy measures by other countries (e.g. Training, explaining rules and regulations).

Trade-related infrastructure (Economic infrastructure) is the kind of assistance helping countries to build the physical means—transport and storage, communications and energy—to produce and move goods and export them.

In 2006–2011, the disbursement amount of aid for technical assistance for trade policy and regulations contributed the smallest share (3% of total aid), the aid for economic infrastructure contributed the largest share (52% of total aid), and the aid for productive capacity building contributed 45% of total aid.

Table 2.3 Disbursement amount of aid for trade by category

USD millions (2011 constant)

	2006–2008 avg.	**2009**	**2010**	**2011**	**% of total**
Trade policy and regulations	773.3	931.5	1237.7	982.5	3%
Economic Infrastructure	12597.4	15123.7	18795.8	17741.0	52%
Building Productive Capacity	11421.2	15086.6	14761.6	14825.0	45%

Source: aid for trade at a glance (WTO, OECD 2013)

2.4 Aid for trade and ASEAN

The **Association of Southeast Asian Nations** (**ASEAN)** was established in 1967 by the signing of the Bangkok declaration. Indonesia, Malaysia, the Philippines, Singapore and Thailand are the founders of ASEAN. The objective of ASEAN is to foster economic growth, social progress, cultural development, regional peace, and collaboration and partnership with the international community. Consequently, Brunei Darussalam-1984, Vietnam-1995 Cambodia, Laos PDR, and Myanmar-1997 have become members of ASEAN. ASEAN covers a land area of 4.4 million km², 3% of the total land area of the world. The member countries have a combined population of approximately 625 million people, 8.8% of the world's population.

Aid for Trade recipients in ASEAN are Cambodia, Indonesia, Laos PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam. On average, in 2006–2011, Vietnam received the largest amount of aid for trade, Indonesia the second largest, and the Philippines the third largest. In 2011, the low-income countries (Cambodia and Myanmar[2]) received 8% of the total aid given to ASEAN (US$ 342.2 million), the lower-middle-income countries (Indonesia, Laos PDR, Philippines and Vietnam) received 85% of the total aid (US$ 3442.5 million), and the upper middle income countries (Malaysia and Thailand) received 7% of the total aid (US$ 272.2 million). An average of 68% of total aid for trade to ASEAN is for economic infrastructure, 25% is for building productive capacity, and 7% is for technical assistance for trade policy and regulations.

3.0 Literature reviews

3.1 Literature on aid and trade

Various literatures must be examined to find the relationship between foreign aid and trade. First, the most widely held view is that aid causes trade, and the most direct channel for this effect is that aid is often tied to exports by a formal agreement. However, although the proportion of bilateral aid that was thus tied or partially tied in the early 1990s was approximately50% (Wagner, 2003), such practices were discouraged by various international

[2] The latest World Bank estimation of Gross National Income per capita (GNI) continues to show improved economic performance in many low-income countries. Bangladesh, Kenya, Myanmar, and Tajikistan now have become lower-middle-income countries, joining those with annual incomes of $1,046 to $4,125 (source: http://www.worldbank.org/en/news/press-release/2015/07/01). However, up to 30 June 2015, Myanmar is in the low income list as classified by the World Bank. Therefore, in our estimation, we categorize Myanmar in the low-income group.

organizations. By the late 1990s, this form of aid had been reduced to 17.7% of the total (Tajoli, 1999).

When aid is not formally tied, there remain at least two reasons to expect a causal link from aid to trade. The first, presuming that aid increases income, is that an increase in the income of the recipients results in an increase in their imports (McGillivray and Morrissey, 1998; Lahiri, Raimondos-Moller, 1997; Lloyd et al., 2000). The second is actually a collection of many different arguments that relate to the establishment of some type of "economic and political link" between donors and recipients. For example, the recipient country may feel obligated to buy from the donor to maintain "good will" and secure the continuity of the aid flow (Wagner, 2003, page 158, also McGillivray and Morrissey, 1998, Lloyd et al., 2000).

Alternatively, a donor may choose to finance development projects that require supplies from industries in which the donor is strong (Wagner, 2003). Moreover, once the donor starts exporting to the recipient, there is an increase in the recipient's exposure to goods from the donor, which may result in future exports (Osei et al., 2004). In contrast, a line of research also exists that favors the opposite direction of causality—from trade to aid. Most of this research consists of models that aim to explain the allocation of aid. In such models, donors prefer to allocate their aid to countries with which they have the most extensive commercial links. This possibly reflects the influence of lobbying groups (McGillivray and Morrissey, 1998; Lloyd et al., 2000; Osei et al., 2004; Morrissy et al., 1992).

There is also the possibility of no relationship (Osei et al.; 2004) or a similar relationship of these two variables (Osei et al., 2004), which could reflect the possibility that different factors determine both aid and trade levels (Wagner, 2003). Finally, the possibility of a negative relationship has also been raised. For instance, 1) trade may be used by donors as an indicator of a recipient's prosperity; therefore, they reduce aid as trade increases (Osei et al., 2004). 2) A donor may use aid as a strategy to promote trade in the countries in which they have smaller market share (Lloyd et al, 2000). Finally, 3) the substitution effect of aid may occur; although output growth generates an increase in overall imports, the recipient can substitute among them, and bilateral trade flows may not increase (Osei et al., 2004). Most empirical studies find some evidence of aid causing trade, in at least part of the sample (e.g., Osei et al., 2004; Lloyd et al., 2000; McGillivray and Morrissey, 1998; Morrissey et al., 1992; and Wagner, 2003).

The papers using the gravity model of trade to analyze the effects of aid include Nilsson (1997),Wagner (2003), Lloyd, Mcgillivray, Morrissey, and Osei (2004), and Silva and Nelson (2012).

Nilsson (1997) was the first author to use the gravity equation to study the effects of aid on trade. The study introduced aid flows into a gravity trade model to test for an aid-trade link between each EU donor and all recipients of EU aid (the sample of recipients thus varied from year to year). Nilsson (1997) found that, on average, a $10 increase in EU bilateral aid was associated with a $26 increase in EU exports, which suggests that aid is trade-creating (but could reflect co-movement of the two variables, with trade having much the greater order of magnitude). The results are strongly suggestive of significant links between bilateral aid and donor exports for Belgium, France, Germany, Italy and the UK; only for France was there evidence of the effect of aid on exports increasing over time, whereas only for the UK was there evidence of this effect decreasing. Following Morrissey (1993b), the approach does not allow one to draw inferences about the direction of causality. Furthermore, all of the studies mentioned here use cross-section or pooled (time series for a cross-section) data.

Wagner's (2003) tests imply that the link between aid and trade is much larger than the official tying percentages suggest. The best estimate is that 35 cents out of every dollar of aid comes directly back to the donor for exports of goods related to the aid-financed project and that another 98 cents finds its way back to the donor for exports of goods not directly linked to aid projects. These measurements exclude exports of services, which most likely constitute a significant part of donors' exports to recipients.

Lloyd, Mcgillivray, Morrissey, and Osei (2004) demonstrated that an empirical link between aid and trade exists (for somedonor-recipient pairs), by using data on aid and trade flows for a sample of four Europeandonors and 26 African recipients in 1969–1995. They found that a statistical link between aid and trade, of whatever form, is the exception rather than the norm. They also found that there is very little evidence that aid creates trade; this argument for tied aid is unproven based on their analysis of aggregate bilateral flows. They also noted that France, unlike the other donors examined, does appear more likely to use trade links as a criterion in determining aid allocations.

Using non-stationary panel (co-integration) estimators to control for omitted variable and endogeneity bias, Nowak-Lehmann et al. (2013) used the gravity model of trade to investigate

the effect of foreign aid on exports of aid recipients to donor countries (123 countries). They found that the net effect of aid on recipient countries' exports is insignificant, both for their sample (of 123 countries) as a whole and for important regional sub-samples. They suggest that exporters in recipient countries are not benefiting from improved trade relations with donors.

3.2 Literature on aid for trade

. Several studies suggest that alternative types of Aid for Trade may have different effects at the macro level on trade-related performance and growth. Evidence of the effectiveness of different types of Aid for Trade flows is mixed, partly because results are not always comparable because different definitions of specific categories of Aid for Trade are used. However, there is some evidence that highly targeted aid flows (e.g., trade facilitation) are more effective. A few studies find that aid to trade-related infrastructure is particularly effective in promoting recipient countries' exports. Evidence of the effectiveness of aid to trade policy and regulations in improving trade-related performance is more mixed.

There is some evidence that certain types of Aid for Trade flows (e.g., aid for infrastructure similar to aid flows for transportation) are more effective in LICs, whereas other aid flows, such as those directed to the business sector, are more effective in higher-income countries.

Among the papers seeking to quantify empirically AfT's effect on trade flows, Wilson et al. (2009) find that assistance directed toward trade facilitation enhances the trade performance of recipient countries. They estimate, with a gravity model, that a one-percent increase in assistance to trade facilitation could generate an increase in global trade of approximately US$ 415 million. Furthermore, the effect of aid directed to the "Trade Policy and regulation" category seems stronger in both robustness and magnitude, with an especially significant effect on aid recipients' exports.

Vijil and Wagner (2010) derive an equation that explains total value of exports of a country using a classic symmetric constant elasticity of substitution (CES) function. They estimate it using OLS and Two-stage Least Squares (2SLS). Vijil and Wagner (2010) emphasize the importance of aid to trade-related infrastructure (proxies by aid to economic infrastructure) in fostering recipient countries' exports. The results of their empirical assessment indicate that a 10% increase in aid for infrastructure commitments leads to an average increase of the exports to

GDP ratio for a developing country of 2.34%. Conversely, aid directed to trade policy and regulations has a limited effect on developing countries' exports.

Cali and te Velde (2011) assess the effect of different types of aid for trade flows on the economic environment of recipient countries. Using panel data for 130 developing countries, they find that aid for 'trade facilitation' reduces the time and the cost to import. In addition, they test whether aid related to infrastructure and capacity building has an effect on both sectoral and total exports. They find that aid for infrastructure has a significant effect on total exports, whereas aid for capacity building is never significant. Nevertheless, considering the short time span of Aft data and the persistence of aid, dynamic panel generalized method of moments (GMM) techniques may not be recommended for studies on aid effectiveness. Thus, for instance, cross-section calculations could be a better choice.

Helble et al. (2012) extend the traditional gravity model to accommodate Aid for Trade facilitation flows. The calculation methodology is a fixed-effects panel data study. They evaluate the relationship between different categories of Aid for Trade and trade performance of recipient countries. They find that a 1% increase in assistance directed to trade facilitation could generate an increase in global trade of approximately $415 million. However, one aid category, that is, aid directed to trade policy and regulations, appears to have an especially significant effect on recipient countries' exports. Indeed, it is found that a 1% increase in Aid for Trade for policy and regulations could generate an increase in global trade of approximately $818 million.

Using the data from 1962 to 2000 for all countries worldwide with the gravity model, Silva and Nelson (2012) examine the empirical link between foreign aid and trade. They found that aid for trade might be a powerful instrument for assisting developing countries in their attempts to enhance export performance and indicate that a 10 percent increase in aid for infrastructure commitments led to an average increase in the exports over GDP ratio of an aid recipient of 2.34 percent.

Very recently, Pettersson and Johansson (2013) use the gravity model for 184 countries between 1990 and 2005 to consider both trade and aid flows in strictly bilateral terms. They make the important point that bilateral aid is not only positively associated with donor exports to recipients but also positively associated with recipient exports to donors. However, Pettersson and Johansson (2013) do not systematically test whether the effect of AfT on bilateral trade in one direction is significantly stronger than the effect on bilateral trade in the opposite direction.

They found that under the aid for trade program, aid for economic infrastructure has a significantly positive effect on both donor's and recipient's exports.

By using data on all recipients and donors listed in the OECD-DAC international development statistics from 1990 to 2010, Nunnenkamp et al. (2013) test the effect of aid for trade, aid for trade by categories, and recipient by income levels by using the gravity model. They found that the overall Aft program positively affects recipients' exports and imports. They also found that aid for trade can promote the exports of the middle-income countries. They noted that among aid for trade sub-categories, aid for trade policy and regulation has a significantly positive effect on recipient countries' exports.

In contrast to both directions (donor and recipient) considered by Helble et al. (2012) and Pettersson and Johansson (2013), this study tries to evaluate the effects of aid for trade from all donors of the Development Assistance Committee (DAC) on the exports and imports of recipient ASEAN countries to and from all donor countries.

4.0 Data and methodology

4.1 Data

This study uses the gravity model of trade to investigate the relationship between bilateral aid provided by OECD DAC donor countries to ASEAN recipient countries and bilateral export/import between donor and recipient countries. Lists of donor and recipient countries are provided in appendix-4.

This study uses a comprehensive panel dataset on bilateral aid for trade and bilateral trade. For the aggregate level, this study uses annual data from 1991 to 2009. For the disaggregated level, this study uses annual data from 2002 to 2009.

We collect data from a variety of sources. Bilateral export/import data are from the IMF's direction of trade statistics CD Rom. The data on bilateral aid comes from the OECD Development Assistance Committee's online database, International Development Statistics. This database has covered a number of aids for trade activities since the mid-1970s, and reporting to the CRS is improving. In the OECD, data consist of two databases: the Development Assistance Committee (DAC) online database and the Creditor Reporting System (CRS) online database. The DAC provides the volumes of total disbursed aid for trade; therefore, we collect total disbursement aid for trade amounts from DAC. Because the CRS provides the volume of

disaggregated disbursed aid for trade by category, we collected disaggregated aid for trade (by categories) via the CRS. Because the actual disbursement of the funds rather than their commitment is more likely to have an effect, our analysis is based on disbursement data.

GDP data are taken from the IMF world economic outlook (WEO) database. Data for distance are drawn from timeanddate.com. Data for "ever a colonial relationship" and common official language dummies are taken from the distance database at CEPII. Data for RTA are collected from the WTO database. Lists of regional trade agreements in which ASEAN and OCED member countries are included can be seen in appendix 5.

4.2 Theoretical background of the gravity model

The basic gravity model to examine the international trade flow is similar to Newton's law. The fundamental idea of the gravity model is that bilateral trade between two countries is directly proportional to their gross domestic products and negatively correlated to the distance between them. Tinbergen (1962) and Poyhonen (1963) were the first authors to apply the gravity equation to investigate international trade flows. Since then, the gravity model has become a popular tool in empirical foreign trade analysis.

The model has been successfully applied to flows of varying types such as migration, foreign direct investment and, more specifically, to international trade flows. According to this model, exports from country i to country j are explained by their economic sizes (GDP or GNP), their populations, direct geographical distances and a set of dummies incorporating some type of institutional characteristics common to specific flows.

Theoretical support of the research in this field was originally very poor, but since the second half of the 1970s, several theoretical developments have appeared in support of the gravity model. Anderson (1979) made the first formal attempt to derive the gravity equation from a model that assumed product differentiation. Bergstrand (1985, 1989) also discovered the theoretical determination of bilateral trade in a series of papers in which gravity equations were associated with simple monopolistic competition models. Helpman and Krugman (1985) used a differentiated product framework with increasing returns to scale to justify the gravity model.

Deardorff (1995) has proved that the gravity equation describes many models and that it can be derived from standard trade theories. Finally, Anderson and Wincoop (2003) derived an operational gravity model, based on the influence of the constant elasticity of substitution (CES) expenditure system, that can easily be estimated and that helps to solve the so-called border

puzzle. The differences in these theories help to explain the various specifications and some diversity in the results of the model's empirical applications. The international tradeliterature documents a very large number of empirical applications that have contributed to the improvement in performance of the gravity equation.

The present study uses an aid-augmented gravity model of trade to analyze the effect of aid by following Nilsson (1997), Osei, Morrissey, and Lloyd (2004), Wagner (2003) and Pettersson and Johansson (2013). The gravity model explains bilateral trade flows based on the economic sizes of two countries (GDP) and 'distance'. Distance is broadly defined as factors that in different ways act as resistance to trade, such as geographical distance.

Other factors may delay or facilitate a trade relationship, such as the existence of a free trade agreement between trading partners, a common official language, or a former colony. Consistent with this approach, and to investigate the effect of aid for trade on recipient ASEAN countries' export/import performance, this study augments the traditional model with bilateral aid for trade disbursement from specific donors to specific recipient countries.

Moreover, Anderson and van Wincoop (2003) argued that addressing the regional interaction structure is important when calculating gravity equation systems. They show that the inclusion of multilateral resistance terms, i.e., terms which capture the fact that bilateral trade flows depend not only on bilateral trade barriers but also on trade barriers across all trading partners, is crucial to obtain valid result. Therefore, they indicated that including country-specific dummies would also lead to consistent estimates of model parameters. To control for unobserved country and time characteristics (including multilateral resistance as discussed above), Matyas (1997), Feenstra (2002), Helpman, Melitz, and Rubinstein (2008) and Pettersson and Johansson (2013) calculate the gravity model by including exporter, importer fixed effect and time dummies. Therefore, this study uses an aid-augmented gravity model with country fixed effect and time dummies.

4.3 Methodology

To obtain the elasticity of exports or imports of recipients with respect to the explanatory variables, this study is based on the gravity model and is developed from previous studies; it is applied to the 8 ASEAN countries following the examples of J. Pettersson and L. Johansson (2013). To make consistent estimates of model parameters and to control for unobserved country and time characteristics (including multilateral resistance such as the relationship between

geographical distance, historical or cultural similarity, or worldwide common factor in each year), this study includes exporter and importer fixed effects and time dummies (Pettersson& Johansson, 2013). The equation is as follows;

$$lnX_{ijt} = \lambda_i + \gamma_j + \delta_t + \beta_1 lnAid_{it} + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + \beta_4 lndist_{ij} + \beta_5 colony + \beta_6 comofflan + \beta_7 RTA + \varepsilon_{ijt} \text{ ----------(1)}$$

The above equation (1) explains that bilateral export or import performance has been influenced by the gross domestic products of aid recipient countries and aid granted countries, bilateral aid received by recipient countries, and bilateraldistance[3]. Sub index '**i'** represents recipient countries, '**j'** the donor country, and't'the period. '**GDP'** is the Gross domestic product of the respective country, '**dist'** is the distance between the two countries (in kilometers between the economic centers of the respective countries), '**colony'** and '**comofflan**' are dummies taking the value of one if the two countries ever had a colonial link and share a common official language, respectively. '**RTA**', finally, is a dummy variable equal to one if the two countries are members of the same regional trade agreement.

$'X'_{ijt}$represents either the exports of recipient country '**i'** in year '**t'** to all donor countries '**j'**, or the imports of recipient country '**i'** in year '**t'** from all donor countries '**j'**; $\lambda_i, \gamma_j$are importer and exporter fixed effects and $\delta_t$are time dummies. Aid_{it} is the main explanatory variable of principal interest, defined as total aid for trade received by country **i** from all donor countries **j**.

4.3.1 Sub-samples of recipient countries

To examine the effect of aid for trade on recipients by income levels, this study re-calculates the empirical model for various sub-samples of recipient countries. With this approach, we can evaluate whether total aid for trade is especially effective where it is needed most. First, this study differentiates all recipient countries into three income groups. Following the World Bank classification, low-income countries are GNI per capita ($1,045 or less), lower-middle-income countries are GNI per capita ($1,046 to $4,125), and upper-middle-income countries are GNI per capita ($4,126 to $12,745). Throughout the observation periods, Low-income

[3]Forall cases in which aid is reported to be zero or negative or is not reported at all. In all of these cases, we have set Aid = 1 so that the log of aid equals zero.

economies are Cambodia and Myanmar[4], Lower-middle-income economies are Indonesia, Laos PDR, the Philippines and Vietnam, and Upper-middle-income economies are Malaysia and Thailand.

4.3.2 Disaggregated aid

When evaluating the growth effects of aid, it has been shown to be important to disaggregate aid (e.g., Clemens et al., 2004). There is reason to believe that this also applies to recipient and donor exports. To capture the effect of specific types of aid under the aid for trade program, this study disaggregates aid for trade into three major sub-categories. They are aid for economic infrastructure, aid for productive capacity building and aid for technical assistance for trade policy and regulations received by country **i** from all donor countries **j.** The equation is as follows:

$$lnX_{ijt} = \lambda_i + \gamma_j + \delta_t + \beta_1 lnAidp_{it} + \beta_2 lnAideco_{it} + \beta_3 lnAidtp_{it} + \beta_4 lnGDP_{it} + \beta_5 lnGDP_{jt} + \beta_6 lndist_{ij} + \beta_7 colony + \beta_8 comoffla n + \beta_9 RTA + \varepsilon_{ijt} \text{ ------ (2)}$$

$\boldsymbol{X_{ijt}}$ represent either the exports of recipient country **i** in year **t** to all donor countries **j**, or the imports of recipient country **i** in year **t** from all donor countries **j**; λ_i, γ_j are importer and exporter fixed effects, and δ_t are time fixed effects. $\boldsymbol{Aidp_{it}}$ is the disbursement amount of aid for productive capacity building received by country **i** from all donor countries **j**. $\boldsymbol{Aideco_{it}}$ is the disbursement amount of aid for economic infrastructure received by country **i** from all donor countries **j**.$\boldsymbol{Aidtp_{it}}$ is the disbursement amount of aid for technical assistance on trade policy and regulations received by country **i** from all donor countries **j**.

5.0 Analysis and discussion

5.1 Results for overall sample of recipients and donors (aggregate level)

The effects of total aid for trade on recipient exports and imports (baseline results, total sample) are shown in table 5.2. To handle a potential endogeneity problem with aid flows on exports and imports of recipient countries, the result (2) uses a one-year lagged for aid

[4]According to its World Bank classification, Myanmar has been included in lower-middle-income countries since 1 July2015. However, throughout the study period (1991–2009), Myanmar was included in the low-income group. Therefore, this study includes Myanmar in the low-income countries group.

variable.The results show the regression coefficient and statistically significant level of individual independent variables in 1991–2009.

During the observation period, the results indicated that the overall bilateral aid for trade program has a significantly positive effect on ASEAN trade at the 1% level. This effect is much higher for bilateral imports. In quantitative terms, if ASEAN countries receive a 1% increase in aid for trade, bilateral exports from recipient to donor will increase by 0.05%, and bilateral imports will increase by 0.1%. The sign for distance is consistent with the theory, i.e., negative and significant. Historical relationship between countries (i.e., colony) has a significantly positive effect on effectiveness of aid for trade on a recipient's exports or imports. The common official language also has a significantly positive effect on both recipient's exports and imports.

Table 5.2 Effects of total aid for trade on recipient exports and imports (baseline results, total sample)

Variable		Dependent variable (recipient's exports (log))		Dependent variable (Recipient's imports (log))	
		Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
cons	β_0	13.42*** (1.645)	13.94*** (1.667)	9.01*** (1.296)	8.752*** (1.327)
$\ln Aid_{it}$	β_1	0.058*** (0.015)	-	0.098*** (0.014)	-
$\ln Aid_{it-1}$		-	0.052*** (0.015)	-	0.101*** (0.014)
$lnGDP_{it}$	β_2	-0.22 (0.014)	-0.023 (0.014)	0.009 (0.015)	0.005 (0.014)
$lnGDP_{jt}$	β_3	-0.019 (0.047)	-0.011 (0.047)	-0.056 (0.039)	-0.051 (0.039)
$\ln dist_{ij}$	β_4	-1.533*** (0.191)	-1.527*** (0.195)	-0.928*** (0.143)	-0.867*** (0.147)
$colony$	β_5	0.388*** (0.076)	0.347*** (0.075)	0.533*** (0.079)	0.537*** (0.081)
$comoffLan$	β_6	0.641*** (0.109)	0.61*** (0.111)	0.962*** (0.098)	0.978*** (0.101)
RTA	β_7	-0.207 (0.162)	-0.208 (0.157)	-0.051 (0.141)	-0.024 (0.137)
R^2		0.8397	0.8475	0.8686	0.8741
F-statistic		391.75	399.29	409.5	412.13
Prob. > F		0.0000	0.0000	0.0000	0.0000
No obs.		3491	3307	3491	3307

Source: calculation with STATA 12 software (Note: Regressions include exporter and importer fixed effects and time dummies (not shown). Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01)

5.2 Results for the effect of aggregated aid for trade on recipient (by income level)

When we differentiate recipients by income level, the significantly positive effects on recipient exports or imports shown above for the overall sample do not hold for the low-income or upper-middle-income groups—independent of whether aid for trade is lagged by one year.

Theeffect of aid for trade only works well for the lower-middle-income countries group. Aid for trade has a significantly positive effect on recipient exports or imports. The results indicate that if the amount of aid for trade received by the lower-middle-income countries increases by 1%, their exports to donor countries will increase by 0.12%, and their imports from donor countries will increase by 0.13%. Consistent with the theory, distance has a significantly negative effect on both exports and imports. Common official language has a significantly positive effect on both exports and imports. The recipients' own GDP is positively correlated only with their imports, at the one-percent level of significance. Colonial relationship between countries has a significantly positive effect only for the recipient's imports.(see table 5.3 & 5.4)

Table 5.3 Effects of aid for trade on recipient exports (income groups of recipients)

Variable		Low income		Lower-middle income		Upper-middle income	
		Result 1	Result 2	Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
cons	β_0	-36.835 *** (6.455)	-37.19*** (6.372)	14.18*** (2.514)	14.64*** (2.527)	14.55*** (3.048)	14.54*** (3.044)
$\ln Aid_{it}$	β_1	- 0.065 (0.035)	-	0.145*** (0.026)	-	-0.012 (0.021)	-
$\ln Aid_{it-1}$		-	- 0.054 (0.037)	-	0.121*** (0.124)	-	-0.002 (0.021)
$lnGDP_{it}$	β_2	- 0.185** (0.029)	-0.191*** (0.029)	0.012 (0.02)	0.015 (0.019)	-0.0005 (0.034)	-0.0009 (0.033)
$lnGDP_{jt}$	β_3	0.125 (0.117)	0.121 (0.119)	- 0.074 (0.063)	-0.056 (0.061)	-0.047* (0.027)	-0.056** (0.027)
$\ln dist_{ij}$	β_4	4.44 (0.735)	8.715* (1.171)	-1.689*** (0.299)	-1.738*** (0.302)	-0.866** (0.368)	- 0.826** (0.371)
$colony$	β_5	0.145 (0.287)	0.37*** (0.128)	0.052 (0.129)	0.011 (0.13)	0.233* (0.139)	0.196 (0.139)
$comoffla$	β_6	-	-	0.639*** (0.134)	0.600*** (0.134)		
RTA	β_7	-0.904** (0.429)	-0.96** (0.417)	- 0.101 (0.205)	-0.103 (0.19)	- 0.305 (0.194)	-0.305 (0.189)
R^2		0.6664	0.6804	0.8114	0.8240	0.8771	0.8792
F-statistic		73.34	77.21	167.55	179.07	366.49	353.54
Prob. > F		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No obs.		873	827	1744	1652	873	827

Table 5.4 Effects of aid for trade on recipient imports (income groups of recipients)

Variable		Low income		Lower-middle income		Upper-middle income	
		Result 1	Result 2	Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
cons	β_0	- 8.016 (6.30)	- 9.158 (6.448)	11.55*** (1.669)	12.33*** (1.672)	13.69*** (2.147)	12.97*** (2.142)
$\ln Aid_{it}$	β_1	0.033 (0.041)	-	0.152*** (0.020)	-	0.027 (0.019)	-
$\ln Aid_{it-1}$		-	0.037 (0.043)	-	0.133*** (0.019)	-	0.031 (0.020)
$lnGDP_{it}$	β_2	0.037 (0.029)	0.028 (0.029)	0.070*** (0.016)	0.086*** (0.016)	0.027 (0.033)	0.023 (0.031)
$lnGDP_{jt}$	β_3	- 0.041 (0.093)	-0.025 (0.092)	-0.081 (0.048)	-0.065 (0.049)	-0.005 (0.034)	-0.012 (0.035)
$\ln dist_{ij}$	β_4	1.22* (0.72)	1.421** (0.737)	-1.309*** (0.194)	-1.377*** (0.195)	-0.877*** (0.258)	- 0.768*** (0.262)
$colony$	β_5	0.653*** (0.159)	0.625*** (0.116)	0.427*** (0.123)	0.467*** (0.123)	0.359*** (0.117)	0.325*** (0.045)
$comoffla$	β_6	-	-	0.999*** (0.109)	1.008*** (0.111)	-	-
RTA	β_7	- 0.692** (0.283)	- 0.653** (0.282)	-0.181 (0.141)	-0.154 (0.133)	0.021 (0.144)	0.014 (0.141)
R^2		0.6885	0.7035	0.8551	0.8590	0.9005	0.9034
F-statistic		63.16	68.04	218.45	225.4	433.49	429.78
Prob. > F		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No obs.		873	827	1744	1652	873	827

Source: calculation with STATA 12 software (both table 5.3&5.4)
(Note: Regressions include exporter and importer fixed effects and time dummies (not shown). Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01)

5.3 Results for disaggregated aid on recipient countries

Among the three subcategories of aid for trade, aid for economic infrastructure and aid for technical assistance on trade policies and regulations have significantly positive effects on recipient exports or imports (see table 5.5). The result indicates that if a donor provides a 1% increase in aid for economic infrastructure, the exports from recipient to donor will increase by 0.002%, and bilateral imports will increase by 0.01%. If the donor increases aid for technical assistance on trade policies and regulations by 1%, the bilateral exports from recipient countries will increase by 0.02%, and bilateral imports will increase by 0.01%.Distance has a significantly negative effect on disaggregated aid. The colonial relationship and common official language have significantly positive effects on both recipient exports and imports.

Table 5.5 Effects of disaggregated aid on recipient exports & imports, total sample

Variable		Dependent variable (recipient's exports (log))		Dependent variable (Recipient's imports (log))	
		Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
cons	β_0	19.79*** (2.462)	20.57*** (2.566)	6.645*** (1.845)	7.179*** (1.95)
$lnAidp_{it}$	β_1	-0.031 (0.022)	-	-0.017 (0.016)	-
$lnAidp_{it-1}$		-	-0.043 (0.018)	-	-0.04 (0.016)
$lnAideco_{it}$	β_2	0.004 (0.020)	-	0.028* (0.014)	-
$lnAideco_{it-1}$		-	0.002* (0.019)	-	0.005* (0.015)
$lnAidtp_{it}$	β_3	0.041 (0.029)	-	0.052** (0.024)	-
$lnAidtp_{it-1}$		-	0.019* (0.027)	-	0.011* (0.017)
$lnGDP_{it}$	β_4	-0.017 (0.032)	-0.028 (0.033)	- 0.013 (0.028)	-0.028 (0.028)
$lnGDP_{jt}$	β_5	0.043 (0.067)	0.015 (0.071)	0.091 (0.062)	0.097 (0.069)
Ln$dist_{ij}$	β_6	-2.068*** (0.282)	-2.054*** (0.294)	-0.599*** (0.198)	-0.694** (0.208)
$colony$	β_7	0.217 (0.124)	0.316** (0.122)	0.386*** (0.091)	0.559*** (0.091)
$comoflan$	β_8	0.311** (0.133)	0.275* (0.16)	0.88*** (0.127)	0.949*** (0.139)
RTA	β_9	-0.092 (0.148)	-0.069 (0.158)	0.032 (0.114)	0.026 (0.115)
R^2		0.8787	0.8794	0.9204	0.9189
F-statistic		259.61	257.68	297.25	272.89
Prob. > F		0.0000	0.0000	0.0000	0.0000
No obs.		1464	1283	1464	1283

Source: calculation with STATA 12 software

(Note: Regressions include exporter and importer fixed effects and time dummies (not shown). Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01)

5.4 Robustness

To check robustness, we test with OLS (without fixed effect) and OLS regression with country pair fixed effect and time dummies for the whole process as shown in the previous section (i.e., both aggregate level and disaggregated level; recipient by income level, sub-categories under aid for trade). The estimation results from OLS without fixed effect are quite similar to the results from regression with countries and time fixed effect. For aggregate level

(see appendix- 1), aid for trade has a significantly positive effect on exports or imports of recipient countries. For the result for calculation of recipient by income level (see appendix 2&3), it is also shown that aid for trade is working well for the lower-middle-income countries group. Within the sub-categories of aid for trade (see appendix 4), aid for economic infrastructure and technical assistance on trade policy and regulations have significantly positive effects on both exports and imports of recipient countries. However, the estimation results from OLS regression with country pair fixed effect and time dummies (see appendix 5 -8) show that quite different from the main findings. This will be the research for future study.

To test the robustness for disaggregated aid, we create a cross dummy for aid and gdp of recipient countries (because the interest of this study is the effect of aid on recipient countries' exports/imports) and calculate by including this cross dummy, countries and time fixed effect. Unfortunately, the results (see appendix9) are not significant for both categories. This situation may be due to limitations of the data; there is no change in the export/import structure of recipient countries. This situation may be a question for further study.

6.0 Conclusions

6.1 Summary and conclusions

Astrade can be a powerful engine for developing countries, the Aid for Trade initiative has raised important expectations in the development community, particularly in the recipient economies. In developing the Asia region, ASEAN countries are active aid for trade participants and energetically participate in world trade.

In this study, we use an aid-augmented gravity model to study the relationship between bilateral aid and bilateral trade in ASEAN countries. We used nearly twenty years of annual data from the period 1991–2009 to investigate the contribution of the total aid for trade program on ASEAN trading. For specific aid categories, we use annual data from the period 2002–2009 within the limitations of data availability.

Throughout the observation period, we find that the total aid for trade (AfT) has a significantly positive effect on ASEAN trade (exports or imports). This finding is similar to that of Nunnenkamp, Hühne, and Meyer (2013). In contrast with their findings, the effect of aid for trade on recipient imports is stronger than on recipient exports. In quantitative terms, the baseline calculation suggests that a doubling of total aid for trade would imply that recipient exports

increase by approximately five percent and recipient imports would increase by approximately ten percent.

It is not surprising that if ASEAN countries receive more aid from a donor, their bilateral imports will also increase because donors provide aid as a type of assistance for infrastructure or technical assistance. We cannot deny that aid for trade is promoting bilateral trade between partners. This finding noted that an increased aid relationship is related to a reduction in the effective cost of distance, which indicates greater bilateral trade. According to Pettersson and Johansson (2013), one reason for the effect of aid on recipient bilateral exports to be small is that aid (although targeted at trade facilitation) may primarily affect trade between the recipient and its neighboring countries and not necessarily trade between the recipient and the donor. It is arguably the effect of aid on the total and not the bilateral level of exports that is of greatest importance for development.

We also test the effect of overall aid for trade on recipients by income group. The aid for trade program has a significantly positive effect only for the lower-middle-income countries (LMIC) group. This finding is consistent with the previous finding of Nunnenkamp et al. (2013). We can say that if the amount of AfT received by LMIC increases by 1%, their bilateral exports will increase by 0.12% and bilateral imports by 0.13%. Gross domestic product of recipient countries also contributes to the effectiveness of aid for trade in the recipient imports sector. In the observation period, 70% of aid flow to ASEAN goes to LMICs. The colony and common official language have significantly positive effects for that country group. Therefore, historical relationships can improve the relationship among countries, and common language can ease communication between donor and recipient and can contribute to the effectiveness of aid.

Subsequently, to capture which type of aid can support ASEAN trade, we disaggregate aid for trade into three subcategories: ‘economic infrastructure’, ‘productive capacity building’ and ‘technical assistance for trade policy and regulations’. The calculation results indicate that aid for economic infrastructure and technical assistance for trade policy and regulations have significantly positive effects on ASEAN’s trade. This is in line with similar findings by Calì and teVelde (2011), Helble et al. (2012) and Pettersson and Johansson (2013).

Aid for economic infrastructure is a type of assistance to support infrastructure for developing countries. In 2002–2009, it constituted 67% of total aid. The calculation results

showthat if ASEAN countries receive a 1% increase in this type of aid, their exports to donor countries will increase by 0.002% and their imports from donors will increase by 0.01%.

Throughout the observation periods, aid for technical assistance on trade policy and regulations only contribute to the smallest portion (7% of total aid for trade flow to ASEAN). However, the calculation results show that if ASEAN countries that receive this type of aid receive a 1% increase, bilateral exports will increase by 0.02% and bilateral imports will increase by 0.01%. This type of aid is directed at improving the trade policy system in countries—their ability to navigate TBT[5], SPS[6], and TRIPS[7]. These types of aid flows are focused on customs, transparency, and government procurement. Aid is directed toward learning to negotiate market access, implement RTAs, address dispute settlement, and handle accession issues to focus on the country trading system itself. For that reason, this aid might have a relatively stronger relationship to trade flows because it is targeted directly at trading system issues.

6.2 Limitation of the study

This study tries to find the effect of aid only on bilateral trade between donor and recipient. The effect of aid may also be prominent in recipient's total trade with partner countries. Future research may ascertain whether aid for trade is working well for a recipient's total trade.

Throughout the calculation for effects of aid for trade on recipient by income level, aid for trade has no significant effect for trade in the low income and upper-middle-income groups. However, we cannot say that aid for trade is not working well for those country groups. Our analysis covers the related aid items, but the greater part of our period of observation precedes the official launch of the initiative in 2005. Future research may provide additional insight into whether those countries can enjoy the effect of aid for trade on their trade once sufficiently long time series covering the post-2005 period become available.

Among sub-categories of aid for trade, we cannot find any clear picture on aid for productive capacity building. Because this category supports the productive sectors in recipient countries, the outcomes from this category may lead to local consumption. Therefore, whether

[5] Technical barriers to trade (TBTs), a category of nontariff barriers to trade, are the widely divergent measures that countries use to regulate markets, protect their consumers, or preserve their natural resources (among other objectives), but they also can be used (or perceived by foreign countries) to discriminate against imports to protect domestic industries.

[6] Sanitary and phytosanitary (SPS) measures are measures to protect humans, animals, and plants from diseases, pests, or contaminants.

[7] TRIPS sets down minimum standards for many forms of intellectual property (IP) regulation as applied to nationals of other WTO Members.

recipient countries can produce more is the most important question. Future research may ascertain whether this type of aid can contribute to production sectors when the data for specific production sectors in ASEAN are available.

6.3 Policy implications

Aid for trade tends to be positive and economically important. The effect of aid for trade is different depending on the type of aid and the income level. Nevertheless, our analysis points to some tentative policy implications.

Although the aid for trade program is effective overall for ASEAN countries, it is not working well for low-income countries and upper-middle-income countries. For that reason, those countries should try to promote the relationship with their donor. Throughout the calculation for overall ASEAN countries; the results show that the effect of aid for trade is more significant on import performance. Therefore, we can say that the countries still must promote their exports to their donor.

For export promotion, the trade-related ministries or organizations should emphasize systematic research about partner countries' market information. By using the outcomes based on the research, the concerned ministries or organizations should provide guidance to export promotion.

Throughout all calculations, the colony and common official language dummy have significantly positive effects on ASEAN trade. Thus, ASEAN countries should try to improve customer relations and adaptability to changes in demand.

Because private sector involvement is an important role to identify what the barriers are for traders and to monitor whether aid programs actually eliminate these, ASEAN countries should try to increase private sector awareness and understanding, and mainstream trade information via domestic knowledge-sharing programs.

To meet technical standards in high-value export markets, concerned ministries or organizations should request donor countries to provide technical training for both private and public sectors.

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Appendix 01: List of variables and expected signs

Sr.	Variable	Explanation	Expected sign
1	X_{ijt}	bilateral exports / imports of recipient from donor (US$ in millions)	Dependent variable
2	Aid_{it}	Bilateral total aid for trade disbursement received by recipient from donor (US$ in millions)	+
3	$Aidp_{it}$	Bilateral aid (building productive capacity) disbursement received by recipient (US$ in millions)	+
4	$Aideco_{it}$	bilateral aid (for economic infrastructure) disbursement received by recipient (US$ in millions)	+
5	$Aidtp_{it}$	bilateral aid (for trade policy and regulation) disbursement received by recipient (US$ in millions)	+
6	GDP_{it}	Gross domestic product of recipient countries (US$ in millions)	+
7	GDP_{jt}	Gross domestic product of donor countries	+
8	$dist_{ij}$	Distance between countries (i) and (j) in kilometers	-
9	Colony	Dummy	+
10	Common off	Dummy	+
11	RTA	Dummy	+

Appendix 02: Effects of total aid for trade on recipient exports and imports (baseline results, total sample)

Variable		Dependent variable (recipient's exports (log))		Dependent variable (Recipient's import (log))	
		Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
cons	β_0	-14.21*** (1.645)	-14.25*** (1.699)	-10.043*** (1.494)	-10.06*** (1.536)
lnAid_{it}	β_1	0.063*** (0.018)	-	0.095*** (0.018)	-
lnAid_{it-1}		-	0.082*** (0.019)	-	0.114*** (0.019)
$lnGDP_{it}$	β_2	0.672*** (0.022)	0.646*** (0.021)	0.704*** (0.022)	0.679*** (0.021)
$lnGDP_{jt}$	β_3	0.939*** (0.029)	0.933*** (0.029)	0.796*** (0.028)	0.783*** (0.029)
Ln$dist_{ij}$	β_4	- 0.12 (0.178)	- 0.074 (0.184)	- 0.435*** (0.161)	- 0.387* (0.166)
$colony$	β_5	0.487*** (0.157)	0.426*** (0.161)	0.497*** (0.163)	0.447*** (0.169)
$comoffla$	β_6	0.747*** (0.123)	0.729*** (0.126)	1.219*** (0.126)	1.214*** (0.131)
RTA	β_7	0.634*** (0.162)	0.675*** (0.168)	1.449*** (0.163)	1.467*** (0.151)
R^2		0.5460	0.5444	0.5729	0.5683
F-statistic		396.53	386.92	469.34	452.87
Prob. > F		0.0000	0.0000	0.0000	0.0000
No obs.		3491	3307	3491	3307

(Note:OLSregression without fixed effect, Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01 source: calculation with STATA 12 software)

Appendix 03: Effects of aid for trade on recipient exports (income groups of recipients)

Variable		Low income		Lower-middle income		Upper-middle income	
		Result 1	Result 2	Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
Cons	β_0	-7.473** (2.892)	-37.18*** (6.372)	-13.642*** (1.963)	14.64*** (2.527)	- 3.736* (1.655)	14.539*** (3.048)
lnAid_{it}	β_1	- 0.009 (0.031)	-	0.247*** (0.029)	-	0.015 (0.022)	-
lnAid_{it-1}		-	-0.053 (0.037)	-	0.121*** (0.024)	-	-0.001 (0.022)
$lnGDP_{it}$	β_2	0.003 (0.022)	-0.191*** (0.029)	0.070*** (0.016)	0.015 (0.019)	0.027 (0.033)	-0.009 (0.033)
$lnGDP_{jt}$	β_3	0.967*** (0.054)	0.120 (0.119)	0.887*** (0.042)	-0.055 (0.061)	1.014*** (0.034)	-0.056** (0.027)

Ln$dist_{ij}$	β_4	-0.403 (0.289)	4.50 (0.721)	- 0.059 (0.212)	-1.738*** (0.302)	- 0.405* (0.175)	-0.825** (0.371)
$colony$	β_5	0.487*** (0.199)	0.017 (0.263)	0.312 (0.213)	0.011 (0.125)	0.669*** (0.088)	0.196 (0.139)
$comoflan$	β_6	-	-	0.956*** (0.128)	0.600*** (0.134)	-	-
RTA	β_7	- 0.309 (0.199)	-0.916** (0.417)	0.635*** (0.213)	-0.102 (0.190)	0.925*** (0.123)	-0.305 (0.189)
R^2		0.4622	0.6804	0.5565	0.8240	0.6859	0.8792
F-statistic		81.05	77.21	259.88	179.07	212.29	353.54
Prob. > F		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No obs.		873	827	1744	1652	873	827

(Note:OLSregression without fixed effect, Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01 source: calculation with STATA 12 software)

Appendix 04: Effects of aid for trade on recipient imports (income groups of recipients)

Variable		Low income		Lower-middle income		Upper-middle income	
		Result 1	Result 2	Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
Cons	β_0	5.902*** (2.932)	-9.585 (6.44)	-7.611*** (1.792)	12.33*** (1.672)	- 2.819 (1.695)	12.974*** (2.142)
lnAid_{it}	β_1	0.019 (0.033)	-	0.267*** (0.026)	-	0.06*** (0.022)	-
lnAid_{it-1}		-	0.037 (0.043)	-	0.133*** (0.019)	-	0.032 (0.020)
$lnGDP_{it}$	β_2	-0.033 (0.026)	0.027 (0.029)	0.583*** (0.036)	0.086*** (0.016)	0.084* (0.039)	0.023 (0.031)
$lnGDP_{jt}$	β_3	0.699*** (0.043)	-0.025 (0.092)	0.697*** (0.036)	-0.065 (0.049)	1.015*** (0.034)	-0.012 (0.035)
Ln$dist_{ij}$	β_4	- 1.849*** (0.313)	1.42* (0.736)	- 0.472** (0.197)	-1.376*** (0.195)	- 0.611*** (0.176)	-0.767*** (0.262)
$colony$	β_5	1.357*** (0.173)	0.625*** (0.157)	0.503*** (0.149)	0.467*** (0.122)	0.549*** (0.109)	0.325*** (0.110)
$comoflan$	β_6	-	-	1.469*** (0.130)	1.008*** (0.110)	-	-
RTA	β_7	0.854*** (0.237)	-0.653 (0.282)	1.149*** (0.191)	-0.153 (0.133)	1.197*** (0.117)	0.014 (0.142)
R^2		0.5051	0.7035	0.5964	0.8590	0.7099	0.9034
F-statistic		125.23	68.04	337.72	225.40	240.35	429.78
Prob. > F		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No obs.		873	827	1744	1652	873	827

(Note:OLSregression without fixed effect, Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01 source: calculation with STATA 12 software)

Appendix 05: Effects of disaggregated aid on recipient exports & imports, total sample

Variable		Dependent variable (Recipient's exports (log))		Dependent variable (Recipient's imports (log))	
		Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
cons	β_0	- 11.39*** (2.081)	- 14.082*** (2.175)	6.645*** (1.845)	- 8.471*** (1.92)
$lnAidp_{it}$	β_1	- 0.12* (0.036)	-	- 0.133 (0.034)	-
$lnAidp_{it-1}$		-	-0.042 (0.035)	-	-0.090 (0.032)
$lnAideco_{it}$	β_2	0.07** (0.131)	-	0.063** (0.027)	-
$lnAideco_{it-1}$		-	0.016 (0.033)	-	0.033 (0.029)
$lnAidtp_{it}$	β_3	0.043 (0.048)	-	0.073* (0.044)	-
$lnAidtp_{it-1}$		-	-0.046 (0.035)	-	-0.028 (0.029)
$lnGDP_{it}$	β_4	1.121*** (0.027)	1.116*** (0.029)	1.22*** (0.025)	1.210*** (0.027)
$lnGDP_{jt}$	β_5	0.842*** (0.045)	0.963*** (0.047)	0.743*** (0.038)	0.870*** (0.042)
Ln$dist_{ij}$	β_6	- 0.18*** (0.218)	- 0.686*** (0.229)	- 1.346*** (0.198)	-1.334*** (0.202)
$colony$	β_7	0.399** (0.187)	0.411** (0.193)	0.342 (0.091)	0.483* (0.237)
$comofflan$	β_8	0.311 (0.249)	0.609** (0.278)	1.076*** (0.268)	1.486*** (0.316)
RTA	β_9	0.191 (0.196)	0.413* (0.200)	0.885*** (0.168)	1.062*** (0.171)
R^2		0.6511	0.6149	0.6921	0.6515
F-statistic		259.61	275.56	297.25	317.01
Prob. > F		0.0000	0.0000	0.0000	0.0000
No obs.		1464	1283	1464	1283

(Note:OLSregression without fixed effect, Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01 source: calculation with STATA 12 software)

Appendix 06: Effects of aid for trade on recipient exports (income groups of recipients)

Variable		Low income		Lower-middle income		Upper-middle income	
		Result 1	Result 2	Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
Cons	β_0	-8.902 (6.607)	-7.229 (6.62)	-39.625*** (6.039)	-42.038*** (5.178)	- 3.584** (1.485)	-3.149** (1.465)
lnAid_{it}	β_1	- 0.121 (0.041)	-	0.109*** (0.025)	-	-0.025 (0.022)	-

$\ln Aid_{it-1}$		-	- 0.125 (0.043)	-	0.081*** (0.023)	-	-0.009 (0.022)
$lnGDP_{it}$	β_2	-0.181** (0.027)	-0.184*** (0.026)	0.017 (0.016)	0.017 (0.014)	-0.003 (0.032)	-0.009 (0.031)
$lnGDP_{jt}$	β_3	0.132 (0.109)	0.117 (0.115)	-0.069 (0.054)	-0.053 (0.055)	-0.045 (0.027)	-0.056** (0.027)
$\ln dist_{ij}$	β_4	1.057 (0.800)	0.900 (0.806)	4.66 (0.730)	4.976*** (0.623)	1.349 (0.169)	1.338*** (0.169)
$colony$	β_5	0.926* (0.496)	0.962 (0.263)	0.912 (0.674)	0.500 (0.573)	-1.495*** (0.145)	- 1.497*** (0.150)
$comofflan$	β_6	-	-	3.589*** (0.767)	3.091*** (0.664)	-	-
RTA	β_7	- 0.926** (0.370)	-0.927** (0.345)	-0.221 (0.143)	-0.221* (0.132)	-0.302 (0.180)	-0.304* (0.176)
R^2		0.7165	0.7322	0.8651	0.8786	0.8908	0.8931
F-statistic		83.32	87.25	186.19	191.82	398.42	382.48
Prob. > F		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No obs.		873	827	1744	1652	873	827

Source: calculation with STATA 12 software

(Note: Regression include exporter-importer country pair fixed effect and time dummies (not shown), Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01)

Appendix 07: Effects of aid for trade on recipient imports (income groups of recipients)

Variable		Low income		Lower-middle income		Upper-middle income	
		Result 1	Result 2	Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
Cons	β_0	1.332 (2.945)	2.135 (2.848)	-23.142*** (3.515)	-24.833*** (3.304)	- 2.955** (1.143)	2.912*** (1.117)
$\ln Aid_{it}$	β_1	0.047 (0.040)	-	0.131*** (0.026)	-	0.014 (0.022)	-
$\ln Aid_{it-1}$		-	0.048 (0.044)	-	0.107*** (0.021)	-	0.020 (0.022)
$lnGDP_{it}$	β_2	0.037 (0.027)	0.026 (0.026)	0.089*** (0.013)	0.087*** (0.013)	0.031 (0.031)	0.025 (0.029)
$lnGDP_{jt}$	β_3	-0.042 (0.086)	-0.025 (0.085)	- 0.078* (0.043)	-0.063 (0.044)	-0.004 (0.026)	-0.012 (0.026)
$\ln dist_{ij}$	β_4	0.080 (0.376)	- 0.007 (0.364)	2.883*** (0.418)	3.114*** (0.391)	1.138*** (0.135)	1.158*** (0.135)
$colony$	β_5	-0.008 (0.269)	0.019 (0.265)	0.904** (0.352)	0.719** (0.319)	-1.193*** (0.108)	-1.22*** (0.106)
$comofflan$	β_6	-	-	3.296*** (0.385)	3.057*** (0.110)	-	-
RTA	β_7	- 0.693** (0.269)	-0.657** (0.259)	-0.157 (0.114)	-0.125 (0.103)	0.023 (0.129)	0.014 (0.126)
R^2		0.7367	0.7574	0.8945	0.8994	0.9109	0.9137

F-statistic	70.34	75.8	243.86	249.59	507.16	496.9
Prob. > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No obs.	873	827	1744	1652	873	827

Source: calculation with STATA 12 software

(Note: Regression include exporter-importer country pair fixed effect and time dummies (not shown), Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01)

Appendix 08: Effects of disaggregated aid on recipient exports & imports (total sample)

Variable		Dependent variable (Recipient's exports (log))		Dependent variable (Recipient's imports (log))	
		Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
Cons	β_0	- 48.064*** (2.723)	- 48.045*** (2.737)	-32.912*** (3.374)	- 31.75*** (3.135)
$lnAidp_{it}$	β_1	- 0.040 (0.015)	-	0.000 (0.127)	-
$lnAidp_{it-1}$		-	-0.045 (0.016)	-	-0.001 (0.015)
$lnAideco_{it}$	β_2	0.022 (0.017)	-	-0.013 (0.011)	-
$lnAideco_{it-1}$		-	0.010 (0.015)	-	0.019 (0.029)
$lnAidtp_{it}$	β_3	-0.049 (0.048)	-	-0.003 (0.015)	-
$lnAidtp_{it-1}$		-	-0.045 (0.015)	-	-0.019 (0.011)
$lnGDP_{it}$	β_4	-0.021 (0.017)	-0.032** (0.014)	-0.025 (0.017)	-0.028* (0.016)
$lnGDP_{jt}$	β_5	0.055 (0.041)	- 0.025 (0.039)	0.092* (0.048)	0.098* (0.055)
Ln$dist_{ij}$	β_6	5.914 (0.31)	6.077*** (0.310)	4.075*** (0.378)	3.95*** (0.362)
$colony$	β_7	-0.886*** (0.142)	-0.992*** (0.134)	0.254 (0.175)	0.191 (0.172)
$comofflan$	β_8	0.676*** (0.149)	0.552*** (0.137)	2.279*** (0.197)	2.103*** (0.194)
RTA	β_9	0.158 (0.094)	-0.121 (0.192)	0.043 (0.095)	0.024 (0.089)
R^2		0.9522	0.9594	0.9635	0.9665
F-statistic		861.7	809.74	547.36	491.41
Prob. > F		0.0000	0.0000	0.0000	0.0000
No obs.		1464	1283	1464	1283

Source: calculation with STATA 12 software

(Note: Regression include exporter-importer country pair fixed effect and time dummies (not shown), Result (2) uses one year lagged for aid. Standard errors in parentheses *p < 0.1, **p < 0.05, ***p < 0.01)

Appendix 09:Effect of disaggregated aid on recipient exports/imports (calculation with cross dummy)

Variable		Dependent variable (Recipient's exports (log))		Dependent variable (Recipient's imports (log))	
		Result 1	Result 2	Result 1	Result 2
		Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)	Coefficient (S.E)
Cons	β_0	19.322*** (2.532)	21.081*** (2.659)	7.299*** (1.878)	7.52*** (1.985)
$lnaidp_{it}$	β_1	-0.043 (0.018)	-	-0.034 (0.015)	-
$lnaidp_{it-1}$		-	-0.049 (0.019)	-	-0.040 (0.016)
$lnaideco_{it}$	β_2	-0.006 (0.021)	-	0.013 (0.015)	-
$lnaideco_{it-1}$		-	-0.023 (0.019)	-	0.003 (0.015)
$lnaidtp_{it}$	β_3	-0.037 (0.026)	-	-0.009 (0.021)	-
$lnaidtp_{it-1}$		-	-0.029 (0.019)	-	-0.015 (0.017)
$lngdp_{it}$	β_4	-0.038 (0.035)	-0.048 (0.034)	-0.034 (0.029)	-0.041 (0.029)
$lngdp_{jt}$	β_5	0.051 (0.067)	-0.013 (0.071)	0.096 (0.062)	0.095 (0.069)
$lndist_{ij}$	β_6	-0.043** (0.285)	-2.096** (0.299)	-0.695** (0.2)	-0.715 (0.209)
RTA	β_7	-0.122 (0.152)	-0.094 (0.155)	0.008 (0.12)	0.007 (0.118)
Colony	β_8	0.315** (0.117)	0.325** (0.121)	0.549*** (0.086)	0.559*** (0.091)
Comofflan	β_9	0.299* (0.139)	0.286* (0.149)	0.992*** (0.13)	0.949*** (0.139)
Aidpgdp	β_{10}	1.25e-08 (677e-09)	9.79e-09 (6.41e-09)	-6.30e-09 (4.2e-09)	-7.89e-09 (4.28e-09)
Aidecogdp	β_{11}	3.48e-09 (2.74e-09)	5.13e-09 (2.85e-09)	2.34e-09 (1.69e-09)	3.22e-09 (1.74e-09)
Aidtpgdp	β_{12}	1.59e-07 (1.33e-07)	1.88e-09 (1.25e-07)	2.34e-09 (1.69e-09)	1.86e-07 (1.01e-07)
R^2		0.8782	0.8803	0.9179	0.9190
F-statistic		301.27	268.56	336.99	294.45
Prob. > F		0.0000	0.0000	0.0000	0.0000
No obs.		1464	1283	1464	1283

(Source: calculation with STATA 12 software, Aidpgdp = aidp * gdpi, Aidecogdp = aideco * gdpi, Aidtpgdp = aidtp * gdpi, Regression includes exporter, importer fixed effect and time dummies. Result (2) uses one year lagged for aid flows, *p < 0.1, **p < 0.05, ***p < 0.01)