DOES AID FOR TRADE PROMOTE EXPORTS OF RECIPIENT COUNTRIES?:

FOCUSING ON ASIA

By

Biryong Han

THESIS

Submitted to

KDI School of Public Policy and Management

In partial fulfillment of the requirements

For the degree of

MASTER OF PUBLIC POLICY

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Approval as of Sep, 2017

ABSTRACT

DOES AID FOR TRADE PROMOTE EXPORTS OF RECIPIENT COUNTRIES?:

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Although Aid for Trade (AfT) is recognized as a reliable source to increase exports by reducing the cost of trade in developing countries, its effectiveness on exports is not sufficiently proven. This paper analyzes whether AfT is effective in increasing export volumes in Asian recipient countries by using the fixed effect panel model and the data from 2006 to 2015. The result reports that overall AfT would not significant impact exports, but *aid disbursed to trade policy and regulations*, would positively and meaningfully affect exports. Through further analysis by the income level of countries, the evidence reveals that *aid to productive capacity* would positively affect export volumes in the relatively lower income group (LICs and LMICs), and that *aid to trade policy and regulations* would be considerably useful for the export growth in the higher income group (HICs and UMIC). These results demonstrate that the impact of AfT on the export volumes in Asian countries would therefore, vary depending on the kinds of AfT received, and recipient country groups divided by income level.

Dedicated to my beloved children, Onyu HAN and Yuha HAN

ACKNOWLEDGEMENTS

Above all, I would like to thank God for giving me the strength to overcome the difficulties in my life. This paper was completed with the support from many people. My major supervisor, professor Kye Woo LEE, provided me with thoughtful advice and sharp analysis which helped me to overcome shortcomings of this paper. Professor Wonhyuk LEE reminded me of the importance of analyzing the logical causal relationships between independent and dependent variables. Also, without the help of my family, this paper could not be completed. I would like to thank my beloved wife, Hye Young PARK for her generous support and extend my gratitude to my parents and parents-in-law who encouraged me all this time. The time spent with my precious friends studying and talking in this school would also be full of unforgettable memories for me.

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1. INTRODUCTION

The purpose of this paper is to analyze and prove that Aid for Trade (AfT) is indeed helpful in increasing recipient countries' export in Asia, and then draw important policy implications on how to allocate AfT resources to improve its effectiveness. Even though AfT has become important as a form of financial assistance to improve exports, AfT's effectiveness including in-depth regional analysis has not been sufficient. This paper fills this gap by analyzing the impact of AfT focusing on Asian recipient countries.

AfT is assisting developing countries in improving their trade capability so that they are able to gain benefit from trade activity. AfT has gained its importance as a crucial resource for economic growth in developing counties by activating free trade, especially after the beginning of the AfT initiative at 2005 WTO Ministerial Declaration in Hong Kong. However, the evidence on whether AfT has a positive effect on promoting trade is insufficient (Calì and te Velde 2011; Vijil and Wagner 2012) with numerous studies showing that the correlation between aid and economic growth is either positive (McPherson Malcolm F. and Rakovski 2001; Gomanee, Girma, and Morrissey 2002), negative (Rajan and Subramanian 2008; Doucouliagos and Paldam 2009), or conditional effective (Burnside and Dollar 2000). Some studies have also attempted to analyze the impact of AfT on exports by regions (Calì and te Velde, 2011; Ferro et al., 2014). However, the analysis focusing on Asian countries are more rare. This is surprising when considering the fact that Asian countries received the largest amount of AfT funds in the period during 2006-2015 among the five regional groups recognized by OECD/WTO (2017). If the allocation of AfT is empirically proven to be effective in promoting exports in Asian recipients, the strategy of using AfT for

developing countries would be justified and should subsequently be sustained and not otherwise.

In this study, the hypothesis that the impact of AfT on the export promotion in Asian countries would differ depending on the AfT's subsets and countries' economic development levels would be tried and proven. To be specific, analysis regarding whether total AfT and each sub-set of AfT (i.e. *aid to productive capacity, aid to economic infrastructure, and aid to trade policy and regulations)* has respectively significant impact on the exports in Asian recipients groups or its groups by income level by using fixed effect panel model would be attempted.

Following the tests, the paper reported the following results: overall, in Asian countries, only *aid to trade policy and regulations* is effective on an increase in exports. An analysis of two income groups, classified by income level of countries, suggests that only *aid to productive capacity* in relatively lower income groups is effective on export volume whereas only *aid to trade policy and regulations* in higher income developing countries has a significant impact on exports.

This paper, first deals with global trends and the statistical background on how AfT has emerged and is executed as a paramount resource to overcome trade restrictions in Section 2. Next, the characteristics, implications, and limitations of previous researches are examined by going through a literature review in section 3. Section 4 describes the data collected, and Section 5 introduces the methodology used in this study. Finally, Section 6 presents the results of an empirical analysis and section 7 makes a conclusion.

2. GLOBAL TREND AND STATISTICAL BACKGROUND

2.1. International Trend of Aid for Trade

The importance of AfT has increased in recent years. Both developed and developing countries have made efforts to reduce tariffs and trade barriers and promote free trade of goods and service through multilateral and bilateral FTAs. Despite these efforts, high trade costs have arisen due to backward transportation infrastructure, time-consuming customs clearance, and limited access to trade-related finance, which have been pointed out as some of the obstacles in trade (OECD 2016). To be specific, high transportation costs and customs clearance of imported and exported goods could cause high prices to be paid by consumers; with exporters facing limited export due to the lower competitiveness of the exported products. In an OECD/WTO AfT monitoring exercise, 87% of 62 developing and least developed country reported that increasing export is the most expected effect from lowering trade cost (OECD/WTO 2015). For these reasons, there has been a desperate need to reduce the trade cost in developing countries, and AfT is recognized as a very useful resource to solve this problem.

In 2005, WTO established "Aid for Trade Initiative" at the Hong Kong Ministerial Declaration, taking into consideration the importance of strengthening the trade capacity for developing countries through supporting "supply-side capacity" and "trade-related infrastructure." However, supporting trade policy and regulation including trade facilitation has also become more important except with regards to production capacity and trade infrastructure. In December 2013, the WTO Trade Facilitation Agreement (TFA) was concluded in Bali, and entered into force in February 2017. This Agreement was aimed at

pushing for a rapid customs clearance in order to reduce the trade costs of the member countries, including for developing countries, and contained 35 technical trade facilitation measures for this purpose. Donor and recipient countries responded that *aid to trade facilitation*, a subcategory of *aid to trade policy and regulation,* was a top priority among AfT programming in the 2017 AfT monitoring exercise (OECD/WTO 2017). The OECD/WTO also highlighted the importance of *aid to trade facilitation* including digital connectivity. In addition to ongoing physical infrastructure investment, improving digital connectivity is becoming crucial to market access and export growth. Digital trade (i.e. e-commerce) overcomes physical trade constraints and helps developing countries to engage in low-cost trade activities. In order to activate the demand-supply side of the digital age, it is imperative to establish institutional mechanisms, through *aid to trade facilitation* for ICT infrastructure investment, capacity development for technology utilization, electronic payment, and new transaction security.

In addition, "increasing aid-for-trade support for (least) developing countries" was also on the 90th agenda of the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, which was announced in July 2015 (United Nations 2015). The agenda was also adopted as one of detailed targets in Sustainable Development Goal (SDG) 8 for achieving the SDGs in September 2015 (Lammersen and Roberts 2015).

2.2. Statistical background and evidences

Numerous statistical evidence has shown that the AfT has been becoming more imperative. From 2006 to 2015, 146 developing countries have received AfT disbursements.

Based on the actual disbursements sourced from Official Development Assistances (ODA), the AfT disbursements amounted to USD 39.8 billion in 2015 (2015 constant price), which is almost 90% increase from the 2006-08 average (USD 21.0 billion), and the aggregated aid assistances is USD 298.3 billion (OECD/WTO 2017).

By region, Asian countries have received USD 113.88 billion (41.5%), the largest disbursements of total USD 275 billion omitted unspecified regional groups, followed by Africa (USD 106.43 billion, 38.7%), Europe (USD 27.07 billion, 9.9%), Americas (USD 23.96 billion, 8.7%), and Oceania (USD 3.39 billion, 1.2%) (Figure 1). Among Asian countries, the assistance was disbursed the most for South and Central Asia (51.1%), followed by East Asia (34.4%) and the Middle East Asia (12.7%). Asian countries account for the six out of the top ten countries such as India, Vietnam, Afghanistan, Iraq, Pakistan and Indonesia in the most AfT assistances (OECD/WTO 2017).

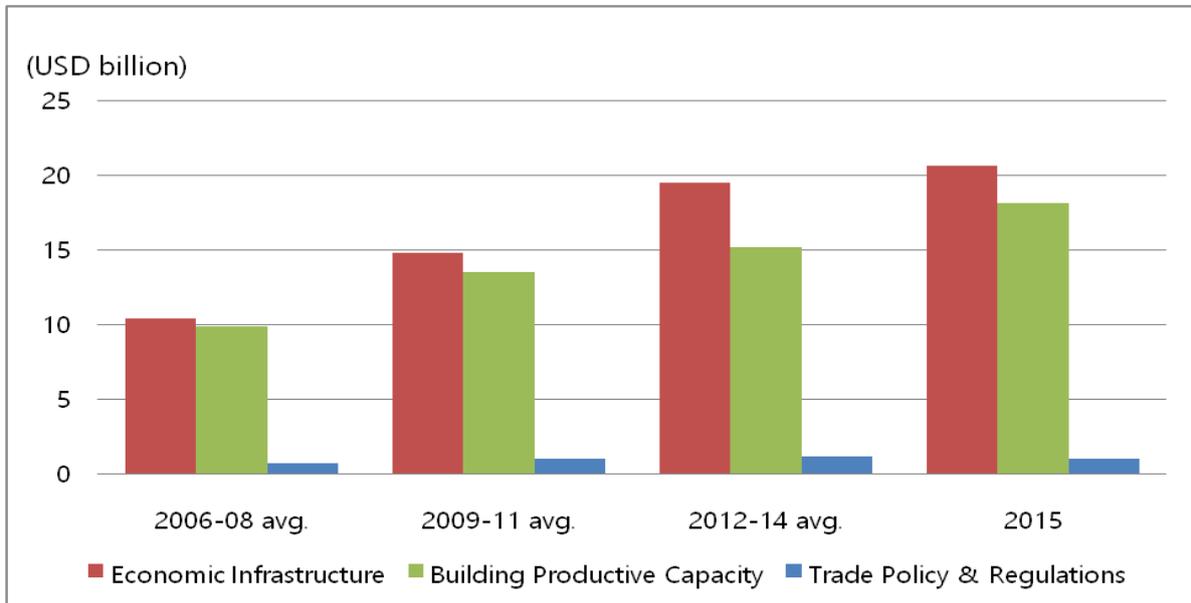Figure 1. Share of total aid-for-trade disbursements by region (2006-2015)
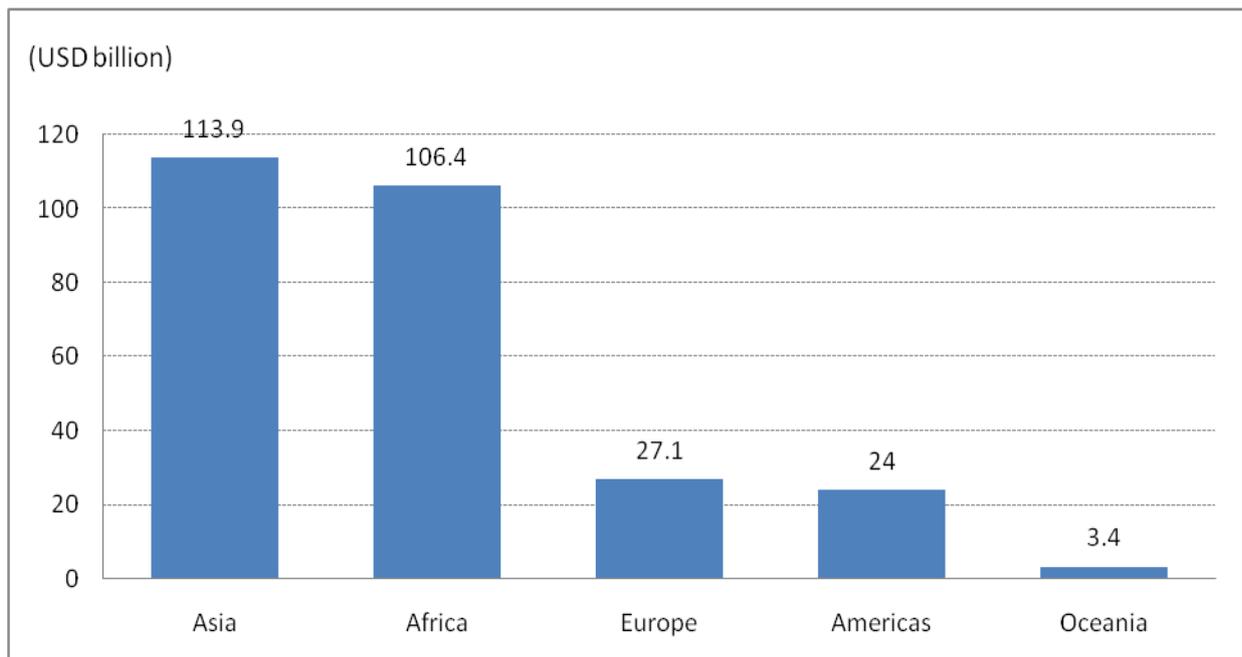
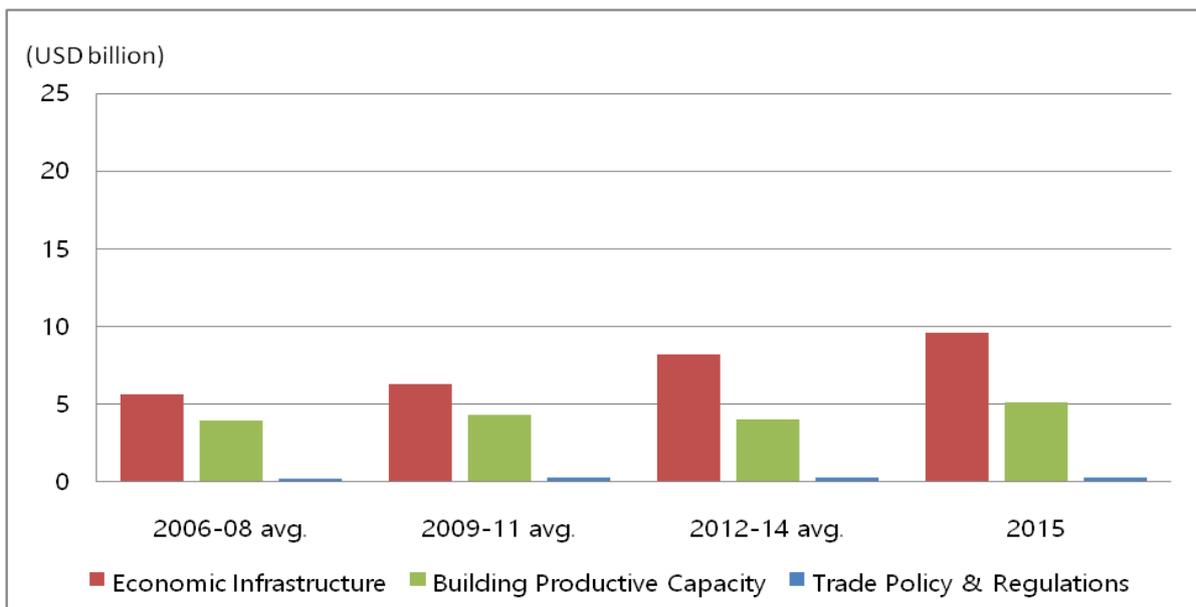Source: Own illustration, based on the data from OECD/WTO (2017)

Figure 2. Aid for Trade Sector Disbursements (2006 - 2015)
(Constant 2015 USD billion)

A. All recipient countries

Source: Own illustration, based on the data from OECD/WTO (2017)

B. Asian countries

Source: Own illustration, based on the data from OECD/WTO (2017)

The fund of AfT has been statistically divided by three big categories such as *aid to trade policy and regulations* (A_{TPR}), *aid to productive capacity* (A_{PC})*, and aid to economic infrastructure* (A_{INF}). As shown in Figure 2, each type of AfT by sector showed an overall increase trend except for A_{TPR}. Among the total AfT funds, A_{INF} occupied the largest portion, followed by A_{PC}, and A_{TPR} which was an extremely small amount compared to the others.

In Asian countries, the trend has been the same as the global analysis, but each share of AfT's subset is slightly different. From 2006 to 2015, the share of A_{INF}, A_{PC}, and A_{TPR} is respectively 61.3% (USD 69.8 billion), 36.6% (USD 41.7 billion), and 2.1% (USD 2.4 billion) in Asian countries whereas the share is 52% (USD 155 billion), 44.9% (USD 133.9 billion) and 3.1% (USD 9.4 billion) in all recipient countries. Given the relative ratios, the difference between A_{INF} and A_{TPR} in Asia is greater than the one in all beneficiary countries.

According to quantitative analysis, the OECD/WTO (2013) reported that the one dollar of total AfT was associated with increasing export volume of developing countries by approximately eight dollars. As for qualitative evidence, 117 case stories in 2015 reported that AfT has had the ripple effects on export growth as well as export market diversification by reducing trade cost (OECD/WTO 2015).

3. LITERATURE REVIEW

Although there have been many studies on the relationship between the effectiveness of aid and economic growth, there have also been disagreements over the extent of aid effectiveness. One of the reasons is that there are various independent variables such as GDP, inflation, institutional quality, colonial history, and so on that are used to quantify aid

effectiveness. Also, as growth is indirectly linked to various types of aids, it makes the effectiveness of aid more complex (Calì and te Velde 2011). For example, aid disbursed to health promotion and aid spent to primary education provisions each have their own direct purposes, which also can have an indirect impact on growth. Consequently, it is not surprising that this complexity has caused some controversial results related to aid effectiveness. On the other hand, the primary objective of AfT is after all, to improve trade performance, which could then show a clear relationship between AfT's effectiveness and trade performance. Therefore, by focusing on the hypothesis that AfT affects export performance, this study should provide more definitive results and implications than the previous extensive study of relation between aid and growth.

3.1. Mechanism of Aid for Trade Affecting Trade Performance

AfT could be used to solve various problems that currently limit trade. For instance, te Velde (2008) states that various governance and market failures can be remedied through intervention of relevant policies and activities, and AfT could be seen as useful resources to support these policies and activities. (te Velde 2008; quoted in Calì and te Velde 2011, p.727). For example, in the case of governance failure, heavy administrative procedures would limit trade activities due to longer processing time and more costs in trade. In this case, a policy simplifying the administrative procedures and regulation could resolve the failure, and here, *aid to trade facilitation* would be a useful resource to support such a policy. Additionally, in market failure cases, outdated infrastructure could limit the trade volume by increasing the time to transport goods. One way to solve this constraint is to implement policies that provide incentives for Public-Private Partnerships (PPP) projects investing in infrastructure, which in

turn, could be supported by *aid to economic infrastructure*. As such, in these ways, AfT could be used to promote trade by supporting activities to eliminate trade-related barriers, which would then eventually lead to an increase in exports.

3.2 The Conditional Effectiveness of Aid for Trade

There have been many papers regarding the impact of aid on economic growth. However, as Vijil and Wagner (2012) indicate, surveys on whether AfT has had a positive effect on promoting trade is insufficient. Nevertheless, there is previous research that has pointed out that AfT is 'conditionally effective' in promoting export in developing countries depending on the type of AfT, and the income level of recipient countries.

3.2.1 The Effectiveness of AfT on Total Exports or Cost and Time of Trade

To start, studies on the effectiveness of AfT have usually attempted to analyze the impact of a specific AfT type on 'export' or 'cost and time of trade' which would be recognized as the elements affecting the amount of exports. Helble et al. (2012) showed that US 1 dollar of *aid to trade facilitation* (A_{TF}), which is related to policy reform and a subset of *aid to trade policy and regulations* (A_{TPR}), resulted in a US\$ 1.33 increase in exports in recipient countries by using a fixed effect model. Moreover, other types of aid are more correlated with increasing imports rather than exports. In conclusion, this meant that A_{TF} was more effective in improving balance of trade in developing countries. Calì and te Velde (2011) examined whether A_{TPR} and its subcategory, A_{TF}, has had a significant impact on trade cost based on the data set of 130 countries from 2005 to 2009. Using regression analysis, the data

of A_{TPR} excluded A_{TF}. As a result, only A_{TF} showed a significant effect on trade cost, which was consistent with the conclusions of the paper by Busse et al.(2012). Next, the authors also found that only *aid for economic infrastructure* (A_{INF}) showed a significant impact on export volume, which has same conclusion with the study of Vijil and Wagner (2012), but that *aid for productive capacity* (A_{PC}) does not. In addition, Busse et al.(2012) accurately describes the impact of AfT on the cost and time of trade in developing countries using the fixed effect model. Total AfT and its two subcategories such as A_{TPR} *and* A_{TF} were used as independent variables in this study. In conclusion, the entire AfT and its two categories could be said to be effective in lowering trade costs, but not in reducing the time to trade. Vijil and Wagner (2012) had also found that A_{INF} positively affects exports through increasing the level of infrastructure by using the two-Stage Least Squares (2SLS) method. Although those papers show meaningful results with regards to the microeconomic impacts of specific AfT, there are fewer analyses on the impact of AfT on exports by sector.

3.2.2 The Effectiveness of AfT and Its Components on Sectoral Exports

These studies have further refined the impact of AfT on exports by dividing exports into sector type. Hühne et al. (2014) analyzed each impact of specific AfT, classified by four independent variables such as total AfT and its subsets, A_{INF}, A_{PC} and A_{TPR}, on exports of both primary commodities and manufactured goods. As a result, all types of AfT have had a significant effect on increasing export of manufactured goods, but not on primary commodities. Moreover, Ferro et al. (2014) also arrived at the same result as Hühne et al. (2014) even though they used a different methodology. The former had illustrated the impact of the subsets of AfT on exports, a new attempt that has not used before. They analyzed the

impact of aid for five service sectors, including transportation and storage, energy, banking and financial services, communications, and business and other services, on manufacturing exports of 132 countries from 2002 to 2008. By doing so, they argued that aid to the transportation and energy sectors are most effective on manufacturing exports. These studies provide a basis for future research on providing a meaningful guide to the effectiveness of AfT on the subdivision of manufactured export goods.

3.2.3 The Effectiveness of AfT by Recipients' Income Level

Next, some researchers have argued that the effect of AfT differs by the income level of the recipient countries. Busse et al. (2012) examined the effects of AfT on trade costs into two groups: Least Developed Countries (LDCs) and non-LDCs. They concluded that there is no significant effect of AfT on LDCs, which is not due to their own capacity but rather because of the much lower amount of AfT, that is, the amount of AfT above threshold is required. Ferro et al. (2014) analyzed the impact of aid disbursed to service sectors on exporting manufacturing products in three income groups such as low, middle, and upper middle-income groups. It was found that the aid for banking and financial services has had a positive effect on low income countries, while aid for business and other services has had a negative effect. In case of upper middle-income countries, the result is reversed. This implies that financial accessibility is more important than the other service sectors for low-income countries, but that aid for business development becomes increasingly important as their economy expands. In conclusion, those studies show that the effect of AfT varies depending on the economic situation of the recipient countries.

4. METHODOLOGY

The study employs the fixed effect panel model adopted from Calì and te Velde (2011) and revised it as appropriate for this paper. The reduced form of the equation for total AfT is as follows:

$$E_{it} = \alpha_i + \gamma \ln(AfT)_{it-x} + BX_{it} + \lambda_t + \varepsilon_{it} \qquad (1)$$

Dependent variable E_{it} represents the log of exports of country i in period t. $\ln(AfT)_{it-x}$ is the log of total AfT, a main explanatory variable of interest, and applied as lagged by one or two years (i.e. $x = 1$ or $x = 2$). The reason lagged variable is employed is that it takes time for AfT to have an impact on exports going through numerous funded trade-related projects or programs. Moreover, the usage of time lag alleviates the possible reverse causality problem, thus making the correlation between AfT and export clearer. X_{it} stands for a variety of control variables such as (log of) GDP per capita, population (million), and economic freedom. α_i indicates the country fixed-effect which controls time-invariant characteristics such as each country's geography, colonial history, and so on. whereas λ_t control time-varying factor such as financial crisis in 2008 as year-fixed effect. ε_{it} represents the error term.

As for sub-sets of AfT, more complex form of the equation is employed as follows:

$$E_{it} = \alpha_i + \gamma_1 \ln(A_{INF})_{it-x} + \gamma_2 \ln(A_{PC})_{it-x} + \beta_1 \ln(A_{TPR} = positive)_{it-x}$$
$$+ \beta_2 Dummy(A_{TPR} = 0)_{it-x} + BX_{it} + \lambda_t + \varepsilon_{it} \qquad (2)$$

In equation (2), A_{INF} stands for aid spent to economic infrastructure, A_{PC} for aid spent to productive capacity building, and A_{TPR} for aid spent to trade policy and regulations. In case of A_{TPR}, the following methodology is introduced (Wagner 2003; Quoted in Calì and te Velde 2011, pp. 729-730). Dummy variable is used for solving the problem of 'zero' value (or

missing data), which mean the loss of variable is occurred when zero is converted into natural logarithms. The value of dummy become zero when A_{TPR} has positive numbers and 1 if otherwise. In the results, β_1 represents elasticity of exports and β_2 adjusts the constant value. When compared to A_{INF} and A_{PC}, the amount of A_{TPR} is smaller in total, which includes some missing data, and therefore the adjustment is needed. The missing data in A_{INF} and A_{PC} is negligible and remaining parts are the same as the equation (1).

Next, for the analysis by income level of Asian countries, the countries are classified by four income groups such as low-income countries (LICs), lower-middle income countries (LMICs), upper-middle income countries (UMICs), and high-income countries (HICs) based on World Bank categories. The countries with meager amounts of AfT during the analysis period (2006-2015) are basically excluded from the analysis. Also, some panels including missing data of total AfT or export and the data of outliers such as North Korea, which has a distinctive political and economic system and a number of missing data, are also ruled out. In conclusion, 14 countries were excluded among a total of 48 Asian countries and thus, only 34 countries were analyzed (Table 1).

Furthermore, the methodology used in this paper is somewhat different from the one Calì and te Velde (2011) introduced. First, this paper controls for the impact of ATPR on exports, but Calì and te Velde did not. They used ATPR as an independent variable of interest in the analysis of correlation between ATPR and the cost and time of trade. When analyzing the effect of specific type of AfT on exports, only AINF and APC are used. Thus, the impact of ATPR on exports is not directly controlled, which might cause potentially biased results, even though the researcher employed the fixed effect model.

Table 1. Target Countries of Interest by Income Level

Classification by Income level	Countries (number of countries)
LICs	Afghanistan, Nepal (2)
LMICs	Armenia, Bangladesh, Bhutan, Cambodia, India, Indonesia, Mongolia, Myanmar, Pakistan, Philippines, Sri Lanka, Syrian Arab Republic, Tajikistan, Timor-Leste, Uzbekistan, Kyrgyz Republic, Lao PDR, Vietnam, Yemen, Rep. (19)
UMICs	Azerbaijan, Georgia, Iraq, Jordan, Kazakhstan, Lebanon, Malaysia, Maldives, Thailand, Turkmenistan, China, Iran, Islamic Rep. (12)
HICs	Oman (1)

Note: excluded country list (14 countries): Bahrain, Brunei Darussalam, Taipei, Hong Kong, Israel, South Korea, Kuwait, Macau, Qatar, Saudi Arabia, Singapore, United Arab Emirates, West Bank and Gaza Strip, North Korea
Source: World Bank WDI

5. DATA DESCRIPTION

5.1 The Description of Variables

Data resources are obtained from OECD, World Bank, and Heritage Foundation. First, the data on AfT, main explanatory variables, were taken from OECD Creditor Reporting System (CRS). Data on the aid flows used, come from ODA and actual disbursements data are utilized instead of the data for commitments, for practical analysis. The data are gained as current values and converted into constant ones by using Consumer Price Index (CPI, constant in 2010) obtained from World Bank.

In this paper, each amount of AfT subset as well as the total amount of AfT are used as independent variables. WTO organized the AfT Task Force team after introducing AfT initiative in 2005. AfT Task Force team basically defined AfT as program and project aids focusing on trade-related developments in the development strategy of recipient countries, and conceptually separated AfT into six subsets: (1) trade development; (2) trade policy and regulations; (3) trade-related infrastructure; (4) trade-related adjustment; (5) building productive capacity; and (6) other trade-related needs (OECD/WTO 2007). However, as mentioned above, AfT is statistically divided into three big categories (a) trade policy and regulations (including trade-related adjustment, and trade facilitation which has recently received attention); (b) economic infrastructure; (c) productive capacity building according to OECD CRS. The statistical classification would be used to analyze the effect of AfT in this paper.

Table 2. Aid for Trade Categories

AfT categories	AfT sub-categories (CRS code)
ECONOMIC INFRASTRUCTURE	TRANSPORT AND STORAGE (210)
	COMMUNICATIONS (220)
	ENERGY GENERATION AND SUPPLY (230)
BUILDING PRODUCTIVE CAPACITY	BANKING AND FINANCIAL SERVICES (240)
	BUSINESS AND OTHER SERVICES(250)
	AGRICULTURE (311)
	FORESTRY (312)
	FISHING (313)
	INDUSTRY (321)
	MINERAL RESOURCES AND MINING (322)
	TOURISM (332)
TRADE POLICY AND REGULATIONS	TRADE POLICY AND REGULATIONS (331) - TRADE POLICY AND ADMINISTRATIVE MANAGEMENT (33110) - TRADE FACILITATION (33120) - REGIONAL TRADE AGREEMENTS (RTAS) (33130) - MULTILATERAL TRADE NEGOTIATIONS (33140) - TRADE-RELATED ADJUSTMENT(33150) - TRADE EDUCATION/TRAINING (33181)

Note: *aid to trade facilitation* and *aid to trade-related adjustment* are statistically involved in *aid to trade policy and regulations*
Source: Own illustration, based on the OECD CRS (http://www.oecd.org/aidfortrade/data/)

To be specific*, aid for economic infrastructure* consists of energy generation and supply (CRS code: 230), communications (220), and transport and storage (210). Next, *aid for building productive capacity* includes business and other services (250), banking and financial services (240) and, and various assistances for each production sectors. Finally, *aid for trade policy and regulations* contains trade education/training (33181), trade-related adjustment (33150), multilateral trade negotiations (33140), regional trade agreements (33130), trade facilitation (33120), and trade policy and administrative management (33110). Table 2 presents AfT categories and its subsets including their CRS codes.

Secondly, the control variables are GDP per capita, population, and economic institution. To be more concrete, GDP per capita (constant 2010 US$, converted by using CPI) and population (million) data, which represent the market size of one country affecting the export volume, are obtained from World Development Indicator (WDI) of World Bank. The index of Economic Freedom is also used as an institutional index taken from Heritage Foundation. The index is largely divided into four categories such as rule of law, government size, regulatory efficiency and open markets with total 12 sub-indicators and evaluated through quantitative and qualitative methods. The total score is graded on the scale of 0 to 100 points, which is used as a proxy for economic institution.

Lastly, the dependent variable as used here, is the total amount of merchandise export acquired from World Bank WDI. The export data, in common with AfT data, also converted into constant values from current ones by using CPI index (constant in 2010). The Table 3 represents the summary of main variables used in this paper.

Table 3. Descriptive Statistics for the Main Variables

Variable	Mean	Std. Dev.	Min.	Max.	Obs.	Data Source
Total Aid for Trade (constant 2010 US$ millions)	336.68	496.7	0	3,088.10	340	OECD CRS
Aid for Economic Infrastructure (constant 2010 US$ million)	212.06	333.81	0	2,111.72	340	OECD CRS
Aid for Building Productive Capacity (constant 2010 US$ million)	119.46	182.38	0	1,024.64	340	OECD CRS
Aid for Trade Policy and Regulations (constant 2010 US$ million)	5.16	8.2	0	49.66	340	OECD CRS
Population (million)	112.51	300.01	0.33	1,371.22	340	World Bank WDI
GDP per capita (constant 2010 US$)	3,492.87	3,776.35	0	23,678.71	340	World Bank WDI
Economic Freedom Index [0; 100]	50.67	17.97	0	73	340	Heritage Foundation
ln (merchandise exports in constant 2010 US$)	22.96	2.36	15.94	28.48	340	World Bank WDI

Note: Zero value of AfT is replaced by 1 before taking the log transformation. However, some panels with a couple of zero value of AfT were omitted from analysis, thus the remained zero values are negligible.

5.2 Differences from Previous Research Data

This study not only modified and applied the methodology of Calì and te Velde, but also used different variables from the researchers. To be specific, the coverage of analysis of this paper is 34 Asian countries whereas Calì and te Velde covered almost 100 developing countries. Also, they only dealt with the period between 2002 and 2007, which might make it difficult to draw valid results as it is only from a short period of time. Therefore, this paper deals with 10 years, from 2006 to 2015, after the AfT initiative was launched in 2005.

In terms of other control variables, the Real Effective Exchange Rate (REER) and (log of) market potential measure (MP) were not employed, whereas Cali and te Velde used those variables. As for REER which is the alternative variable of CPI, the observation is significantly limited, and the usage of it does not have a considerably different effect on the coefficient of AfT compared to the usage of CPI. Also, CPI is already applied by computing

constant value of AfT, GDP per capita and exports in equations (1) and (2) in this paper. MP is Distance weighted values of GDP, but MP's observation is limited and uses GDP per capita instead. Moreover, GDP per capita might affect the exports enough without the need to consider MP (Table 4 and 5 reveals this result).

6. EMPIRICAL RESULTS

6.1 Overall Analysis

Table 4 shows the results for equations (1) and (2). The impact of total AfT and specific type of AfT, that is, A_{TPR}, A_{INF}, and $A_{PC,}$ on exports are analyzed respectively. Time lag (t-1, t-2) are reflected in AfT variables. Fixed effect panel model (including state and time fixed effects) is used and OLS results are also reported as for a comparison.

Generally, total AfT (comprised of $A_{INF,}$ $A_{PC,}$ and A_{TPR}) has no discernible effect on increasing exports albeit the coefficient of one indicates positive value (column 1). Among the three specific types of AfT, which are lagged by one year, however, the coefficient of A_{TPR} is only significant (at the 5 percent level) and has a bigger magnitude than the other types of AfT, A_{INF} and $A_{PC.}$ The coefficient, as A_{TPR} has positive value, which suggests that an additional 100% of A_{TPR} brings out a 2.9 percent increase in merchandise exports on average. Each coefficient of A_{INF} and A_{PC} presents a positive impact on export, but is not significant at conventional level (column 2). In case of each type of AfT that is lagged by two years, every variable is not significant (column 3). To be specific, the coefficients of A_{PC} and A_{TPR} remain positive, but the one of A_{INF} is negative. Also, the two year lagged variables also have less magnitude compared to one year lagged ones.

It should be noted that the coefficient of $A_{TPR} = 0$ dummy, non aid dummy, as Calì and te Velde (2011) pointed out, could be identified better by considering the coefficients of $\ln(A_{TPR} = positive)$ together. To be specific, there is a difference in coefficients (lagged one year) between the logged exports as A_{TPR} is positive and the logged exports as A_{TPR} is zero by $0.229*\ln(A_{TPR}) + 0.413$. Since both are significant values, it could be concluded that $(0.229)*\ln(A_{TPR}) + 0.413$ is the total coefficient of A_{TPR} on the export volume, which is larger than when considering A_{TPR} alone. Considering the two-year lagged variables in this way, the differences between each logged export volume of A_{TPR} in positive or zero is $0.019*\ln(A_{TPR}) + 0.340$. However, as the coefficient (0.019) of $\ln(A_{TPR} = positive)$ is not significant and $A_{TPR}=0$ dummy is significant, the conclusion is that the total coefficient of A_{TPR} is just 0.340.

Next, the results of control variables are reported as expected. Population (million) and logged GDP per capita, which represents the market size of a country, are highly significant at the 1 percent level. However, the magnitude of population is close to zero whereas logged GDP per capita has significant magnitude. It is also interesting to note that the economic freedom variable used as an indicator of the economic institution is very significant (at the 1 percent level) and positively affects export growth in all regressions. This result was supported by Massa's study (2013) which stated that institutional quality enhances the effectiveness of aid (for trade facilitation) on exports. Economic freedom index as used in the analysis is an indicator of how free environment a country or individual has in production, distribution and consumption of various goods, which shows that exercising individuals' economic rights seem effective in increasing exports.

Table 4. The Impact of AfT on Total Exports (2006-2015)

	(1) FE	(2) FE	(3) FE	(4) OLS	(5) OLS
$\ln(\text{AfT})_{t-1}$	0.022			0.176***	
	(0.024)			(0.064)	
$\ln(A_{INF})_{t-1}$		0.002			0.069
		(0.016)			(0.083)
$\ln(A_{PC})_{t-1}$		0.022			-0.062
		(0.027)			(0.106)
$\ln(A_{TPR} = \text{positive})_{t-1}$		0.029**			0.214***
		(0.014)			(0.073)
Dummy $(A_{TPR} = 0)_{t-1}$		-0.413***			0.107
		(0.101)			(0.640)
$\ln(A_{INF})_{t-2}$			-0.018		
			(0.017)		
$\ln(A_{PC})_{t-2}$			0.018		
			(0.027)		
$\ln(A_{TPR} = \text{positive})_{t-2}$			0.019		
			(0.013)		
Dummy $(A_{TPR}=0)_{t-2}$			-0.340***		
			(0.096)		
Pop (million)	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln GDPpc	0.137***	0.121***	0.130***	0.386***	0.394***
	(0.025)	(0.025)	(0.025)	(0.072)	(0.074)
Economic Freedom	0.007***	0.006***	0.007***	0.019***	0.016***
	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)
Observation	336	336	337	336	336
Countries	34	34	34	34	34
R-sq. (within)	0.4452	0.4844	0.4709		
R-squared				0.3836	0.3975

Notes: Standard errors in parentheses; *significant at 10 percent level; **significant at 5 percent level; ***significant at 1 percent level; fixed effect regressions include year and country fixed effects; time dummies and constant term are not shown.

6.2 Analysis by Income Level of Countries

Table 5 reports the impact of the three types of AfT on export volume in country groups by income level. In fact, the total number of groups divided by national income is four (LICs, LMICs, HICs, and UMICs), but the number of LICs and HICs among the Asian countries is too small to be empirically analyzed. Therefore, income countries are divided into two groups and relatively classified into higher income groups (HIC + UMICs: 13 countries) and lower income ones (LICs + LMICs: 21 countries). As in Table 4, the same independent and dependent variables were used and the state and period effects are controlled using the fixed effects model.

The analysis of the AfT subcategories' impacts on exports by income-divided countries yields that A_{PC} in a lower income group and A_{TPR} in a higher income groups have a very positive and visible effect on exports. The result from analysis in the total number of Asian countries seems to be influenced by the coefficient of A_{TPR} in the higher income group. More specifically, only the lower income group has a positive and significant coefficient (at 5 percent level) of A_{PC} with a one-year time lag. Also, the magnitude of A_{PC} coefficient is very large as compared to other specific AfT variables. An additional 100% of A_{PC} results in a 12.3% increase in exports on average. Nevertheless, the coefficient of A_{PC} in higher income groups is so small that the overall coefficient of A_{PC} in Asian countries seems to be insignificant. The impact of A_{TPR} with the same time lag is positive and not significant in lower income group. However, in the Asian countries with relatively higher income, the coefficient of A_{TPR} has a highly imperative and positive impact on the export volumes in the analysis with not only one-year but also two-year time lags. Each A_{INF} with one or two-year time lag has positive or negative coefficient, but insignificant in both income groups.

Table 5. The Impact of AfT on Exports by Income Level of Countries

	LICs + LMICs		HIC + UMICs	
	(1)	(2)	(4)	(4)
	FE	FE	FE	FE
$\ln(A_{INF})_{t-1}$	-0.010		0.006	
	(0.036)		(0.010)	
$\ln(A_{PC})_{t-1}$	0.123**		0.006	
	(0.059)		(0.017)	
$\ln(A_{TPR} = positive)_{t-1}$	0.009		0.030***	
	(0.024)		(0.011)	
Dummy $(A_{TPR} = 0)_{t-1}$	-0.421*		-0.269***	
	(0.248)		(0.063)	
$\ln(A_{INF})_{t-2}$		-0.032		-0.005
		(0.042)		(0.010)
$\ln(A_{PC})_{t-2}$		0.073		0.007
		(0.056)		(0.016)
$\ln(A_{TPR} = positive)_{t-2}$		-0.009		0.023**
		(0.023)		(0.010)
Dummy $(A_{TPR}=0)_{t-2}$		-0.492*		-0.264***
		(0.256)		(0.058)
Pop (million)	0.000**	0.000**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
ln GDPpc	0.089***	0.098***	0.323***	0.341***
	(0.031)	(0.031)	(0.056)	(0.055)
Economic Freedom	0.008***	0.010***	-0.004**	-0.004**
	(0.003)	(0.003)	(0.002)	(0.002)
Observation	210	210	126	127
Countries	21	21	13	13
R-sq. (within)	0.4082	0.3907	0.8469	0.8451

Notes: Standard errors in parentheses; *significant at 10 percent level; **significant at 5 percent level;   ***significant at 1 percent level; fixed effect regressions include year and country fixed effects; time dummies and constant term are not shown.

7. CONCLUSION

Many international organizations and donor countries believe that AfT plays an essential role in the development of recipient countries through supporting export promotion. Nevertheless, AfT's effectiveness, especially focused on Asian countries, is not sufficiently proven because of scarce evidence. To fill this gag, the impact of specific type of AfT on the export in Asian recipient countries has been scrutinized including an analysis according to the income level of counties.

Table 6. Summary of Results for the Impact of Specific AfT on Exports in Asian Countries

	A_{INF}	A_{PC}	A_{TPR}
All Recipient Countries	insignificant	insignificant	**Significant with (t-1)**
Lower Income Groups (LICs + LMICs)	insignificant	**Significant with (t-1)**	insignificant
Higher Income Groups (HIC + UMICs)	insignificant	insignificant	**Significant with (t-1) and (t-2)**

Notes: (t-1) and (t-2) means one-year time lag and two-year time lag respectively.

The results in this paper reported that AfT does not have a significant impact on the export promotion of the recipients as a whole. However, as shown in Table 6, *aid for trade policy and regulation*, a subset of AfT, has a positive and critical impact on exports. The export elasticity is 0.03 when *aid for trade policy and regulation* is not zero. The many case studies presented by Asian Development Bank (ADB) also support this empirical result (2012). One of the successful cases is the ASEAN-EU program for Regional Integration Support (APRIS Ⅱ), a three-year program from 2006 to 2009 and which could be categorized as one of the subsets of *aid for trade policy and regulation* (ADB/WTO 2012). The project's main purpose was to establish the ASEAN Economic Community (AEC) and

build up strong overall relations between the EU and ASEAN using technical assistance such as customs and trade facilitation, standards, and conformance, capacity building, and so on. The APRIS Ⅱ was evaluated as an effective and sustainable project. Therefore, it is surprising that *aid for trade policy and regulation* has been found to be helpful in increasing exports, even though the amount is relatively small (US$ 9.4 billion, 3.1% of total AfT disbursement) as compared to two different types of AfT from 2006 to 2015.

One more thing worth noting is that the empirical results in Asian countries are different from the ones on sub-Saharan Africa (SSA). Cali and te Velde (2011)'s paper revealed that *aid disbursed to economic infrastructure* was exclusively effective on exports in SSA whereas it was not the case in Asia. Thus, this fact might indicate each geographical region would be best suited to a specific AfT type.

Furthermore, on examination of the effect of the specific AfT used at the country level, only *aid for productive capacity* is effective for exports in the relatively lower income group (LICs and LMICs), and only *aid for trade policy and regulations* positively affects the export growth in higher income group (HICs and UMIC). This result is consistent with ADB's explanation that the Asia (and the Pacific) experience demonstrated that a small amount of AfT could be optimally distributed when taking into consideration the characteristics of individual countries such as income level, and so on. (ADB/WTO 2012). It suggests that the main restrictive factor of export might be the lack of production capacity in case of the countries with lower income, while the ones with higher income may have somewhat adequate production capacity, but that the trade-related policy hinders market access and the lack of human resources might be a limitation in the promotion of exports.

For further study, it is necessary to conduct more precise research on detailed effectiveness of AfT for the proper allocation strategy of trade-related ODA. To put it concretely, it should be scrutinized as to which sector of *aid for productive capacity* (i.e. agriculture, forestry, fishing, industry, and so on) has a more imperative impact on trade performance of LICs and LMICs in Asia. Moreover, in the same way, it should be studied as to which subsets of *aid for trade policy and regulation (i.e. trade facilitation, regional trade agreements, trade-related adjustment)* would be more effective in exports in UMICs and HICs. If other regions except for Asia and SSA are examined, it would also be helpful to identify the specific AfT required for each region in order to increase exports. As such, it is the conclusion that AfT should be continued but be concentrated on particular types of AfT suited to each region.

BIBLIOGRAPHY

Asian Development Bank. 2012. *Aid for Trade in Asia and the Pacific Its Role in Trade-Driven Growth,*WTO, Geneva / ADB Publishing, Philippines.

Burnside, Craig, and David Dollar. 2000. "Aid, Policies and Growth." *American Economic Review* 90(4): 847-868.

Busse, Matthias, Ruth Hoekstra, and Jens Königer. 2012. "The Impact of Aid for Trade Facilitation on the Costs of Trading." *Kyklos* 65 (2): 143–63. doi:10.1111/j.1467-6435.2012.00531.x.

Calì, Massimiliano, and Dirk Willem te Velde. 2011. "Does Aid for Trade Really Improve Trade Performance?" *World Development* 39 (5): 725–40. doi:10.1016/j.worlddev.2010.09.018.

Dirk Willem te Velde 2008. Financing international public goods a framework to address aid for trade. In D. Njinkeu, & H. Cameron (Eds.), *Aid for trade and development.* Cambridge: Cambridge University Press. Quoted in Calì, Massimiliano, and Dirk Willem te Velde. 2011. "Does Aid for Trade Really Improve Trade Performance?" *World Development* 39 (5): 725–40. doi:10.1016/j.worlddev.2010.09.018.

Doucouliagos, Chris (Hristos), and Martin Paldam. 2009. "The Aid Effectiveness Literature - The Sad Result of 40 Years of Research." *SSRN Electronic Journal* 23 (December): 433–61. doi:10.2139/ssrn.1147611.

Ferro, Esteban, Alberto Portugal-Perez, and John S. Wilson. 2014. "Aid to the Services Sector: Does It Affect Manufacturing Exports?" *The World Economy* 37 (4): 530–41. doi:10.1111/twec.12151.

Gomanee, Karuna, Sourafel Girma, and Oliver Morrissey. 2002. "Aid , Investment and Growth in Sub-Saharan Africa," no. September 2002: 19–21.

Helble, Matthias, Catherine L. Mann, and John S. Wilson. 2012. "Aid-for-Trade Facilitation." *Review of World Economics* 148 (2): 357–76. doi:10.1007/s10290-011-0115-9.

Hühne, Philipp, Birgit Meyer, Peter Nunnenkamp, Philipp Hühne, Birgit Meyer, and Peter Nunnenkamp. 2014. "Aid for Trade : Assessing the Effects on Recipient Exports of Manufactures and Primary Commodities to Donors and Non-Donors," no. 1953. doi:10.4337/9781783474592.00018.

Lammersen, Frans, and Michael Roberts. 2015. "Aid for Trade 10 Years on: Keeping It Effective." *OECD Development Policy Papers* 1 (1). doi:10.1787/5JRQC6Q4XXR5-EN.

McPherson Malcolm F., and Tzvetana Rakovski. 2001. *Understanding the Growth Process in Sub-Saharan Africa: Some Empirical Estimates.*

OECD/WTO. 2017. *Aid for Trade at a Glance 2017: Promoting Trade, Inclusiveness and Connectivity for Sustainable Development*, WTO, Geneva/ OECD Publishing, Paris. http://dx.doi.org/10.1787/aid_glance-2017-en

OECD/WTO. 2016. *Aid for Trade and the Sustainable Development Agenda: Strengthening Synergies*, OECD Publishing, Paris. http://dx.doi.org/10.1787/69af6b8e-en

OECD/WTO. 2015. *Aid for Trade at a Glance: Reducing Trade Costs for Inclusive Sustainable Growth*, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/aid_glance-2015-en

OECD/WTO. 2007. *Aid for Trade at a Glance 2007: 1st Global Review*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264043220-en

Rajan, Raghuram G, and Arvind Subramanian. 2008. "Aid and Growth: What Does the Cross-Country Evidence Really Show?" *Review of Economics {&} Statistics* 90 (4): 643–65. doi:10.1162/rest.90.4.643.

United Nations. 2015. "Addis Ababa Action Agenda of the Third International Conference on Financing for Development." *Conference Report* 53 (9): 1689–99. doi:10.1017/CBO9781107415324.004.

Vijil, Mariana, and Laurent Wagner. 2012. "Does Aid for Trade Enhance Export Performance? Investigating the Infrastructure Channel." *World Economy* 35 (7): 838–68. doi:10.1111/j.1467-9701.2012.01437.x.

Wagner, D. (2003). Aid and trade – An empirical study. Journal of the Japanese and International Economies, 17(2), 153-173. Quoted in Calì, Massimiliano, and Dirk Willem te Velde. 2011. "Does Aid for Trade Really Improve Trade Performance?" *World Development* 39 (5): 725–40. doi:10.1016/j.worlddev.2010.09.018.