THE IMPACT OF AID FOR TRADE ON COST AND TIME TO TRADE:
THE CASE OF LATIN AMERICA AND THE CARIBBEAN

By

SOHN, Jung Eun

THESIS

|Submitted to

KDI School of Public Policy and Management

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Committee in charge:

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ABSTRACT

THE IMPACT OF AID FOR TRADE ON COST AND TIME TO TRADE:
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Tariffs and non-tariff barriers having been reduced, the international society aims at lowering the other trade transaction costs that are greater in developing countries. As a fruit of the effort, WTO launched Aid for Trade (AfT) initiatives in 2005. Due to the considerable amount of AfT, there have been discussions on its effectiveness. This study continues the debate by analyzing the impact of AfT on reducing cost and time to trade in 30 LAC countries, where 10% of AfT destines, for the period of 2004-2010, deploying panel data fixed-effects model. The empirical results evidences that AfT is effective in reducing time to trade that is a much more important factor than cost to trade in composing total trade transaction costs. The study also finds AfT has disbursed to LAC countries with high trade values, which does not coincide with the principle objective of AfT.

ACKNOWLEDGEMENTS

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INTRODUCTION

Ever since the international trade begun, reducing trade costs has been a common interest of the international society. Tariffs have been progressively reduced under WTO agreements; and non-tariff barriers to trade (NTBs) are in process of being reduced. Now the remaining challenge is to reduce other trade transaction costs, which are related to trade regulations, the trade infrastructure, distribution, or communications. These costs can be much higher than traditional trade barriers,[1] and moreover, trade costs in developing countries are even higher than in high-income countries.[2] Therefore, it is a critical issue for many developing countries to take trade facilitation measures so that they can reduce trade costs and enjoy its potential gains such as an increase in trade competitiveness and trade flows. It has not been easy, however, because of high costs and the complexity of reforms.

In order to support the "right domestic policy framework, institutional capacity and economic infrastructure" of developing countries, WTO launched Aid for Trade (AfT) Initiative in 2005 at the Ministerial Conference.[3] Recognizing the importance of AfT for developing countries, AfT flows have been progressively increasing and disbursements reached 32.4 billion US$ (constant 2010 prices) in 2010. This figure explains an increase of 61% since 2005 and also a share of 30% of sector allocable Official Development Assistance (ODA).[4]

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[1] Matthias Busse, Ruth Hoekstra and Jens Königer, "The Impact of Aid for Trade Facilitation on the costs of Trading", Ruhr-University of Bochum, (February 2011): 2

[2] James Anderson and Eric Wincoop, "Trade Costs", Journal of Economic Literature, Vol.42, No.3. (September 2004): 692-693

[3] Pascal Lamy, "Aid for trade can turn possibility into reality", (speech, Global Aid for Trade Review, WTO, November 20, 2007)

[4] Organisation for Economic Co-operation and Development (OECD), "Creditor Reporting System", Creditor Reporting System Aid Activity Database, http://stats.oecd.org/Index.aspx?DatasetCode=CRSNEW, (October 15, 2012)

It is not only the AfT flows that continue to grow but also donor countries' attention on the effectiveness of such an aid, which is shown in the numerous studies on the impact of AfT as well as of trade facilitation. Due to the cross cutting nature of AfT, the studies on its impact tend to cover wide scope of trade, such as trade flows or economic development. However, this study focuses on the analysis of Busse, Hoekstra, and Königer (BHK, 2011) that looks at the impact of AfT on more specific and direct trade-related issue: cost and time to trade. In order to see if a particular category of AfT has higher impact than others, the paper examines not only AfT as a whole but also two sub categories of AfT: Aid for *Trade Policy and Regulations* and Aid for *Trade Facilitation* (AfTF). They find that inflow of AfT into 99 developing countries has a significant impact on reducing costs of trading, using panel data fixed-effects model. They also show the AfT has more significant impact in Non-Least Developed Countries (LDCs) and top 20 AfT recipient countries.

This paper applies the method of BHK to analyze the impact of AfT on reduction of cost and time to trade in 30 Latin America and the Caribbean (LAC) countries, where 10% of the AfT headed in 2010.[5] Prior to the empirical analysis, the study expects high effectiveness of such an aid, in light of some studies that find; 1) aid effectiveness is lower in least developed countries (LDC) due to absorption capacity constraints;[6] 2) agriculture would benefit more from trade facilitation than other manufacturing industries;[7] and 3) improvement in trade facilitation will lead to greater reduction on import costs than in export costs.[8] This is because 1) there are not many LDCs in LAC, 2) exports of agricultural goods of LAC countries are greater than those of manufacturing goods,[9] and 3) trade balance in

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[5]Ibid.
[6]Busse, "Impact of Aid for Trade Facilitation", 16
[7]Kronkarun Cheewatrakoolpong and Danupon Ariyasajjakorn, "The Quantitative Assessment of Trade facilitation benefits in the ASEAN+6", Chulalongkorn University, (March 2012): 1
[8]Bernard Hoekman and Alessandro Nicita, "Assessing the Doha Round: Market Access, Transactions Costs and Aid for Trade Facilitation", World Bank, (April 2009): 14
[9]WTO, "International Trade Statistics 2011", WTO, (2011): 60

LAC is negative in most of the countries except some fuels and mining products exporters,[10] and also cost and time to import is greater than that to export in LAC countries.[11]

The empirical analysis conducted in this paper observes mixed impact of AfT on cost and time to trade in LAC. On the one hand, AfT is surprisingly found to have a significant impact on increasing the cost; while *Aid for Trade Regulation* and *Trade Facilitation* show negative (but not significant) impact. The study suspects that the reason of the unexpected finding lies in the global tendency of the increase in cost to trade by more than 20% between 2007 and 2013. On the other hand, AfT demonstrates a highly significant impact on reducing time to trade, which confirms the effectiveness of AfT in the region. So as to highlight the importance of the effectiveness, the study visits the finding of APEC on the composition of trade transaction costs, of which cost and time to trade explain about 10% and 90%, respectively.

What is distinguishable from the previous study of BHK is that time span is expanded from 4 to 7 years, which permits flexibility of the dynamic impacts. Even though AfT is launched in 2005, it is not a new global fund, nor a new aid category but an integral part of regular ODA,[12] and thus there is no problem in using data before the official launch. Moreover, taking into consideration the data collection time of dependent variables, cost and time to trade, the time lag between independent and dependent variables is modified from one to three years. This is to better capture the actual effect of the aid that requires some time to start to show the effect since disbursement. Even though BHK have recognized the different reporting periods of data from World Bank (dependent variables) and OECD (independent variables), they deploy only one nominal year of lag, which makes the

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[10]United Nations Conference on Trade and Development (UNCTAD), "Merchandise Trade Balance", http://unctadstat.unctad.org/TableViewer/tableView.aspx?ReportId=100, (October 13, 2012)
[11]World Bank, "Doing Business 2010", World Bank, (September 2009): 103-163
[12]OECD/WTO, "Aid for Trade Showing Results", http://www.oecd.org/aidfortrade/49015161.pdf, (July 2011):1

time period of dependent variables ahead that of independent variables. This is because World Bank publishes reports a year earlier than the nominal year of the report, and OECD follows the calendar year. Therefore, the three years of time lag in the study is indeed one and half year.

Despite the mixed empirical results on aid variables, the study deduces some interesting interpretations from the other independent variables that can be useful for not only LAC countries but also aid donor countries. Firstly, *Regulatory Quality* shows greater coefficients in export than import, which indicates the importance of trade-related regulations in the export sector. Based on the finding, study recommends LAC 30 to relax burdensome trade-related regulations (especially export-related ones), which can increase cost and expand time to trade. Secondly, trade values are shown to be significant on increasing cost to trade, and moreover, to have positive correlation with AfT not like any other independent variables. This leads us to a conclusion that AfT is heading to LAC countries that already have high trade values. As we can assume that countries that trade more may have better trade-related facilities and trade-favorable environment, donor countries should consider more carefully who are eligible for such an aid.

The paper is structured as follows; in the next section, the literature on the impact of trade facilitation, AfT on trade flows as well as economic welfare is reviewed. Section 3 follows then the hypothesis, data and empirical methods employed in this paper. Section 4 presents major findings from the empirical analysis. The paper concludes with discussion over the results and some policy implications for both LAC countries and donor countries.

LITERATURE REVIEW

Before looking at the impact of AfT, this study will focus on why the trade facilitation is needed and what impact it has, which will give us a strong belief in the need of AfT.   Firstly, some previous literature regarding the impact of trade facilitation on trade flows will be referred.   Then, widening the range of the impact, the study will move on to its impact on economic welfare.

1. Impact of Trade Facilitation on Trade Flows

Wilson, Mann, and Otuski carry out a comprehensive study on estimation of the relationship between trade facilitation, which is categorized in port efficiency, customs environment, regulatory environment, and service sector infrastructure, and trade flows in manufactured goods across 75 countries.   The study concludes the improvement in trade facilitation increases both imports and exports, and the increase in trade among 75 countries is predicted to be $377 billion.   They also find that among four categories of the trade facilitation, infrastructure and port efficiency have greater impacts than the other two.   Then they set up a scenario in which some of Asia Pacific Economic Cooperation (APEC) members whose trade facilitation capacity is below average improve their capacity halfway to the average.   As a result, intra-regional trade is expected to increase by 21%, of which half is coming from the improvement of port efficiency.[13]

Iwanow and Kirkpatrick employ an augmented gravity model to assess the potential gains from trade facilitation reform on export performance.   The study finds the

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[13] John S. Wilson, Catherine L. Mann, and Tsunehiro Otsuki, "Assessing the Benefits of Trade Facilitation: A Global Perspective", *The World Economy* Vol. 28, No. 6 pp. 841-871, (June 2005)

improvement in trade facilitation by 10 percent would increase exports by 5 percent. However, the facilitation alone will not bring a significant impact and should be combined with improvements in quality of regulatory environment and transport and communications infrastructure that are equally or more important to stimulate export growth.[14]

Hummels focuses on the role of transport time in international trade, since time is considered as a trade barrier. According to his estimation on the value of time saved in shipping time, a one-day increase in ocean transit reduces the probability of export to the US by 1 percent (all goods) and 1.5 percent (manufactured goods). Also, he finds each day spent to ship manufactured goods is equivalent to 0.8 percent of the value of good, which is worth a 16 percent tariff. Based on the findings, he expects the decline in shipping prices will help the export of time-sensitive goods such as manufactures to grow.[15] The study of Djankov, Freund, and Pham points out the need of trade facilitation in minimizing time delays in trade by finding one additional day of delay before shipment decreases trade by at least 1 percent. What may be interesting for developing countries is that the delay has a great impact on time-sensitive goods, such as agricultural products, that are expected to reduce by 6 percent.[16]

2. Impact of Trade Facilitation on Economic Welfare

Given the fact that trade facilitation has positive impact on the increase in trade flows, this paper now focuses on the impact of trade facilitation on economic welfare. Minor and Tsigas access the impact of the reduction in time to trade by 50 percent on GDP and find the reduction in low and middle income countries will bring greater change than in

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[14] Tomasz Iwanow and Colin Kirkpatrick, "Trade facilitation, regulatory quality and export performance", Journal *of International Development*, Volume 19, Issue 6, (August 2007): 735-753.
[15] Hummles David, "Time as a Trade Barrier", Purdue University, (July 2001)
[16] Simeon Djankov, Caroline Freund, and Cong S. Pham, "Trading on Time", World Bank Policy Research Working Paper 3909, (May 2006)

high income countries. Based on the result, the authors stress the importance of trade facilitation in developing countries. Furthermore, the study argues lower export delays would diversify exports, proving the reduction in time to export by 50 percent in Sub-Saharan Africa triggers an increase in the share of light and medium manufactures and a decrease in share of basic commodities.[17]

Walkenhorst and Yusui measure aggregate welfare gains from trade facilitation, which is assumed as a reduction in trade transaction costs by 1 percent of the value of world trade. These gains are about US$40 billion and benefit all economies, especially non-OECD economies. Under the scenario that takes into account the impact of trade facilitation not only on the economy but also on the diversity of sectors and traders, LAC is expected to have the second highest income effects among Non-OECD regions.   What is interesting of this paper is that they highlight the importance of reducing indirect trade transaction costs, which have been neglected by many of earlier analysis.   They argue that the reduction in the indirect costs, notably caused by border waiting times, will bring greater impact on economic welfare than that in direct trade transaction costs.[18]

3. Impact of Aid for Trade on Trade Flows

Now that various studies on the impact of trade facilitation have been reviewed, the focus is moved on to the impact of aid for such a trade facilitation reforms.   According to the study of BHK, from which this study adopts the methodology, AfT in 99 developing countries has significant impact on reducing cost to import.   Further, the two sub categories of AfT, *Trade Policy and Regulation*s and *Trade Facilitation* are examined. The former also has stronger impact on cost to import that that to export, while the latter is

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[17] Peter Minor and Marinos Tsigas, "Impacts of Better Trade Facilitation in Developing countries", (Research report submitted to GTAP 11th Annual Conference, Helsinki, Finland, May 2008)

[18]Walenhorst Peter and Yasui Tadashi, "Quantitative Assessment of the Benefits of Trade Facilitation", TD/TC/WP(2003)31/FINAL, OECD, (2003)

highly significant at reducing both cost to export and import. Taking into consider AfTF is one of most precise and narrow AfT categories, authors highlight the importance of targeting AfT for a significant impact on the cost to trade. On the other hand, in the analysis of the impact of AfT on time to trade, only aid for *Trade Policy and Regulations* has a significant impact on reducing time to export. What also differs from the estimation of cost to trade is that regulatory quality is more significant in lowering the time to trade, especially to export.

Helbe, Mann, and Wilson find that AfT (*Trade Policy and Regulations*, *Trade Development,* and *Economic Infrastructure*) has a positive impact on both exports and imports of aid recipient countries. Moreover, the study argues that AfT is important to promote exports to the developed world on the basis of the finding that the relationship of aid and exports is stronger than that of aid and imports. This analysis is innovative in the sense that they categorize AfT so as to see if the impact varies with the type of certain aid flow; the estimation shows that *narrow* AfT (*Trade Policy and Regulations*) is positively associated with exports and *broad* AfT (*Trade Development* and *Economic Infrastructure*) with imports. Also, *soft* aid for facilitating trade, such as education and training, administration, is positively and significantly related to imports; and infrastructure related *hard* aid is not statistically associated with trade flows.[19]

Cali and Te Velde also finds aid for trade facilitation is effective in reducing the costs of trading. Therefore, they claim that it is possible to expect substantial return on such type of aid in developing countries, and also AfT can have a positive impact if it is well targeted. Moreover, AfT has a positive and significant impact on exports, driven by *aid for economic infrastructure*, whereas *aid for productive capacity* is proven to be not

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[19]Helbe Matthias, Mann Catherine, and Wilson John S., "Aid for Trade Facilitation", World Bank Policy Research Working Paper 5064, (October 2009): 7, 10-14

effective on exports. On this basis, the study concludes with a suggestion on improving infrastructure, as a constraint on promoting exports, in Africa, where the effects of such type of aid is greater than other regions.[20]

METHODOLOGY AND DATA

1. Methodology

This study follows the fixed effects panel data model that is employed in Busse, Hoekstra, and Königerm's paper. This model is known to be effective to figure out the causes of changes within a sample. It is because "the fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics such as culture, religion, gender, or race."[21] As all the variables used here are time-invariant, this model is appropriate for the aim of the study that aims at assessing the impact of change of AfT inflows on change of cost and time to trade of the region.

The specification of the model is as follow:

$$\text{Cost (Time)}_{it} = \beta_i + \beta_1 \text{AID}_{it-1} + \lambda X_{it-1} + \text{YEAR}_t + \varepsilon_{it}$$

"where the dependent variable $Cost\ (Time)_{it}$ stands for either cost (or time) of trading of country i in period t and AID_{it-1} being the main variable of interest (AfT, Trade Policy or Trade Facilitation). β_i represents the country fixed-effect and X_{it-1} is a set of other control variables that includes GDP per capita (gdppc), the value of merchandise trade (trade), regulatory quality (regqual). $YEAR_t$ is a full set of time dummies which is supposed to capture period specific effects and changes

[20]Massimiliano Cali and Dirk Willem Te Velde, "Does aid for trade really improve trade performance?", World Development, 39(5), (September 2010):733-738
[21]Ulrich Kohler, Kreuter Frauke, *Data Analysis Using Stata*, Stata press, (2008), 245

in the cost and time of trading over time. ε_{it} stands for the error term."[22]

All the independent variables are lagged, since the disbursement of aid and its actual effect on target does not occur at the same time. Moreover, BHK point out the different reporting periods of cost and time to trade variables (from World Bank) and aid variables (from OECD). The World Bank publishes cost and time required to export and import in every September in the Doing Business Report after completing data collection from June to May. On the other hand, OECD updates aid-related-data based on calendar year. In other words, the latest one is called Report 2013, published in September 2012 and based on the data from June 2011 to May 2012. In this paper, the dependent variables are from 2007 to 2013, and all the independent variables are from 2004 to 2010; therefore, an "apparent" time lag of three years indeed is that of only one year and half.

2. Data

1) Dependent variables

In this paper, 30 Latin American and the Caribbean (LAC) countries' cost and time needed for trade transaction are used as dependent variables. The data is taken from one of ten sub-indicators of Doing Business Report of the World Bank: *Trading across Borders*. In order to calculate the data, the Bank measures the cost and time associated with trading (both exports and imports) goods by sea transport. For the credibility of the indicators, cost and time to trade are measured by "a standardized, hypothetical cargo of widely-traded and non-perishable merchandise moving between the largest business city and its nearest container port".[23] Thanks to the complexity of the measurements, real costs of trade are expected to have high correlation with the surveyed theoretical costs of the report.[24]

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[22]Busse, "Impact on Aid forTrade Facilitation":8
[23] APEC Policy Support Unit, "Aggregate Measurement of Trade Transaction Costs in APEC 2007-2010", APEC#211-SE-01.09, (August 2011):9
[24]Busse, "Impact of Aid for Trade Facilitation":5

Trade costs, which are named as *CostExp, CostImp* in this paper, are measured by the fees levied on a 20-foot container in US$.   The methodology tries to capture the real cost to trade by not including customs tariffs and duties, ocean transport time, or bribes.   Time to trade variables are labeled *TimeExp* and *TimeImp*, and reported in calendar days.   The effort to reflect the real time to trade is also shown in excluding fast-track procedures applied only to certain firms and sea transport time, and including waiting time between procedures.

The paper analyzes the indicators of the period 2007-2013.   Among 33 LAC, Bahamas, Barbados, and Cuba were subtracted from the observation owing to lack of available information.   In the study of BHK, 99 developing countries are collected as a sample, including 33 Least Developed Countries (LDCs).   Taking into account that there is only one LDC (Haiti) in the sample of 30 LAC countries, this paper is expected to find some different results from that of the study of BHK.   As the goal of this assessment lies in finding policy implication on AfT towards LAC region, the different results will permit us to set proper regional strategies.

2)   Independent variables: AfT, Policy and Reg, AfTF

According to the World Bank, the objectives of AfT should encompass "i) trade and regulations, ii) trade development activities, iii) support to address supply-side constraints such as infrastructure, iv) support for micro and macro-economic adjustment, and v) commodity price stabilisation".[25]   Based on these objectives and WTO's AfT Task Force, BHK illustrate Categories of AfT as follow:[26]

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[25]   World Bank, "Trade Progress Report: The Doha Development Agenda and Aid for Trade: Hong Kong and Beyond", DC20006-0005, Washington DC, (April 2006):19

[26]   Busse, "Impact of Aid for Trade Facilitation":6

Figure 1: Aid for Trade Categories
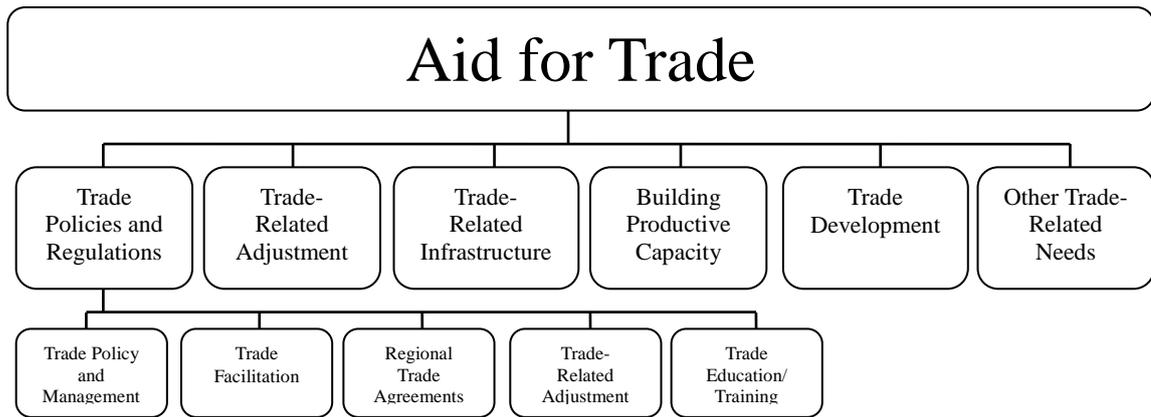
Source: Busse, Hoekstra, and Königer (2011)

This figure indicates AfT covers broad trade-related categories: Trade Policies and Regulations, Infrastructure, Capacity Building, and Training human resources, and so on. Among various categories, this study firstly looks at the total AfT in the region in order to estimate its broad effects on cost and time to trade.   Then it moves on to *Trade Policy and Regulations* and *Trade Facilitation*, which are expected to have a stronger effect on the dependent variables due to their specificity.

The data is collected from OECD's Creditor Reporting System (CRS) Aid Activities database, which contains comprehensive aid related data such as sectoral and geographical aid information as well as its tiedness, channel, purpose, policy objective, and so on.   The data contains aid inflows in 30 LAC countries in the period of 2004-2010, which aims at matching the period employed for cost and time to trade with a lag of one year and half. The time lag between dependent and independent variables is above-mentioned in the section of methodology.

The broadest aid variable, AfT, covers all trade-related ODA and makes up 31.3% of the total sector allocable aid (disbursements, in constant 2010 prices) in American region and 30.6% in all developing countries in 2010.   The second variable concerning *Trade*

Policy and Regulations, which focuses on how trade is administrated, amounts 1.2% of AfT (3.8% of total sector allocable aid) flowed into America on the same year.[27]   According to the analysis of BHK, such specific funding will lead to avoid generic aid effectiveness concerns due to less heterogeneity of aid channels and motives.   Lastly, the *Trade Facilitation* variable, which is under the category of *Trade Policies and Regulations,* is expected to have even more direct influence on improving efficiency of trading.   The goal of this type of aid is to lower trade transaction costs, including simplification and harmonization of trade procedures (such as custom valuation, licensing procedures, transport formalities, payments, and insurance).   Its amount is 0.13% of AfT (0.43% of total sector allocable aid) in America and recorded "at the lowest possible level of AfT".[28] The AfTF disbursed in American region is smaller than that flowed into all developing countries, where reached 1% of AfT, that is 0.3% of total aid, as AfTF.   The following table shows the detailed information, such as more specific classification of types of AfT and values of each type, in LAC.

Table 1: Overview of Aid for Trade in Latin America and the Caribbean
ODA Disbursements: US$ millions, 2010 constant prices

	2004	2005	2006	2007	2008	2009	2010
Trade Policy and Regulations							
Transport policy and administrative management	19.30	26.42	20.42	18.13	26.07	118.80	28.21
Trade facilitation	9.08	7.18	3.70	16.12	21.85	24.16	13.29
Regional trade agreements (RTAs)	5.43	5.41	16.37	35.50	5.57	16.24	13.36
Multilateral trade negotiations	0.50	0.46	1.12	1.86	0.53	0.59	1.40
Trade education/training	2.23	1.09	1.23	0.90	1.12	3.59	5.57
Sub-total	**36.54**	**40.56**	**42.84**	**72.51**	**55.14**	**163.38**	**61.82**
Sub-total (%)	**2.8%**	**3.4%**	**3.6%**	**4.3%**	**2.9%**	**6.4%**	**2.0%**
Economic Infrastructure							
Transport & Storage	176.63	180.75	188.48	220.44	335.03	537.36	622.27
Communications	29.28	57.00	39.04	40.17	33.52	52.69	42.52
Energy	39.64	54.82	73.74	269.32	202.00	344.28	554.90

[27] OECD Creditor Report System (2012)
[28]Busse, "Impact of AfTF":7

Banking & Financial Services	72.11	82.71	109.74	125.30	262.85	320.19	265.94
Business & Other Services	57.32	89.50	60.76	55.88	89.54	135.63	163.42
Sub-total	**374.98**	**464.78**	**471.76**	**711.10**	**922.93**	**1390.16**	**1649.05**
Sub-total (%)	**28.9%**	**39.2%**	**39.2%**	**42.1%**	**48.1%**	**54.5%**	**54.4%**
Building Productive Capacity							
Agriculture	656.21	428.57	441.48	626.66	649.11	699.86	640.68
Forestry	51.80	50.66	41.78	53.77	47.11	64.68	312.57
Fishing	49.38	30.15	36.40	61.97	41.50	26.78	69.93
Industry	93.00	142.78	127.55	126.29	164.41	157.27	234.51
Mineral Resources & Mining	21.37	16.87	19.32	18.57	16.61	20.07	16.99
Tourism	13.31	11.24	21.18	17.79	21.08	29.99	47.29
Sub-total	**885.07**	**680.27**	**687.71**	**905.06**	**939.81**	**998.65**	**1321.98**
Sub-total (%)	**68.3%**	**57.4%**	**57.2%**	**53.6%**	**49.0%**	**39.1%**	**43.6%**
Aid for Trade Proxies Total	**1296.59**	**1185.61**	**1202.30**	**1688.67**	**1917.89**	**2552.18**	**3032.85**
Total Sector Allocable Aid	**5459.72**	**5784.46**	**6313.68**	**6487.13**	**7997.47**	**8606.60**	**9925.84**

Note: The aid types of the table are the same as those in the AfT Fact Sheet, Latin America
 and the Caribbean Region of OECD[29]
Source: Own tabulation, based on OECD CRS (2013)

These aid variables are amount disbursed and deflated in million USD at constant 2010 prices. BHK decide to use accumulated value of aid (only for the observed period in the analysis), expecting the disbursements in previous years will have impacts on dependent variables due to lasting effect. In other words, cost and time to trade reflect not a single year of aid inflow but all of previous years together. Therefore, they claim that stock of aid inflows is appropriate to "account for the dependency of trade costs on aid".[30]

3) Other control variables

What would be other factors that determine cost and time to trade? This study follows the selection of BHK: GDP per capita (*gdppc*), trade volume (*trade*), and regulatory quality (*regqual*) of 30 LAC countries.

The paper expects the higher the income of a country is related to the better trade-favorable facilities and the higher cost and time to trade. Moreover, high incomes may also

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[29]http://www.oecd.org/dac/aidfortrade/39464494.pdf
[30]Ibid.

suggest greater efficiency in procedures concerning trade, such as documentation, customs clearance and inspections, port and terminal handling, and so on. On the other hand, the authors remind the association of high income and labor costs, which leaves rooms for possibility of an ambiguous impact of income on trade costs, but not on time to trade. Also, according to Cali and Te Velde, higher GDP per capita tends to be positively related to higher costs of non-tradable goods, and thus, to higher exporting costs.[31]

The trade volume can also have positive and negative effects on time to trade. On the one hand, the authors argue the greater trade volume realize economies of scale in trading due to lower costs and efficiency in procedures. On the other hand, increase in trade volume may generate congestions, which possibly prolong time to trade.

The last other control variable is regulatory quality, one of the governance indicators of the World Bank, which "captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development."[32] It is not directly related to trade issues, but it gives us a big picture of the possible hindrance of rapid trade procedures, which will lead to delays in trade. And thus, higher value in *regqual* variable, which represents government's better administration in the trade-related-private sector, is expected to be associated with less costs and shorter time to trade.

4) Descriptive statistics of variables

As shortly mentioned above, the sample size, period and characteristics of this study are different from that of BHK. The detailed difference is shown in the following table.

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[31]Cali and TeVelde, "Does aid for trade really improve trade performance?", 733
[32] World Bank, "Description of methodology: Government effectiveness", available at: http://info.worldbank.org/governance/wgi/pdf/ge.pdf, (2012)

Table 2. Descriptive statistics of variables

Variable	Mean	Std.Dev.	Minimum	Maximum
Independent variables (constant 2010 USD Million)				
AfT	172.4 (373.4)	244.7 (604)	0.4 (2.2)	1,300.4 (4,895.33)
Trade Policy and Regulations	4.9 (8.9)	7.4 (26.29)	0 (0)	40.4 (302.6)
AfTF	1.3 (1.2)	3.6 (2.9)	0 (0)	26.3 (36)
Dependent variables				
CostExp [$, deflated using the US Consumer Price Index(CPI)]	1,147.9 (1,443.4)	427.4 (852.8)	363.6 (390)	2697.9 (5,293.8)
CostImp ($, deflated using the CPI)	1,463.5 (1,723.1)	568.4 (1,053.1)	481.8 (385)	2987.5 (5,922.6)
TimeExp (days)	19 (31.7)	8.5 (16.8)	8 (9)	49 (89)
TimeImp (days)	21.7 (37)	11.7 (20)	9 (9)	71 (104)
trade (USD Billion, deflated using the CPI)	44.3 (62.9)	101.7 (205)	0.2 (0.17)	614.7 (2,466.9)
Gdppc (constant 1990 USD)	4,787.5 (1,676.5)	2,982.5 (1,924.5)	396.5 (102.8)	14,576.5 (10,513)
regqual	-0.002 (-0.42)	0.647 (0.6)	-1.589 (-2.13)	1.535 (1.58)

Note: 1) The values in parenthesis are data of the sample of the 99 developing countries employed in the study of Busse, Hoekstra, and Königerm (2011). The time span of the sample is four years, whereas that of this paper is seven years.

2) Three aid variables of the paper are aid inflows in 30 LAC countries for seven years; while those of BHK are for four years.

Even with the expanded period span from four to seven years, compared to the study of BHK, the table 2 shows that LAC 30 countries receive much smaller amount of aid (that is cumulative) than 99 developing countries. In fact, LAC countries have not been popular AfT recipients; only Bolivia is in top 25 AfT recipients in 2002-05, and El Salvador also appears in top 20 recipients in 2007. However, no LAC country is found in the list of top 20 AfT recipients (by commitments nor disbursements) in 2009.[33]

This is especially noticeable in aid for *Trade Policy and Regulations*, which leads us to wonder if the difference comes from already well-established trade-related policies in LAC

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[33] OECD, "Aid for Trade at a Glance 2007, 2009, and 2011"

30 in comparison with other developing countries. However, the Global Competitiveness Index 2012-2013 shows that the condition of trade-related policies or regulations in LAC shown in *Prevalence of Trade Barriers and Burden of Customs Procedures* indices is worse than that in the seven ASEAN countries.[34] Thus, the small inflow of aid for *Trade Policy and Regulations* can be considered as lack of interests of developed countries in this sector in LAC 30.

Cost and time to trade in LAC 30 are less than those in 99 developing countries; more precisely, average costs of export and import in LAC are 21.6 and 15.1 percent lower, respectively, and the average time of trade is lower by about 40%. When looking at the values of standard deviation, which are almost half in the LAC 30 sample, it is certainly convincing that LAC enjoys much lower cost and time to trade than other developing countries in general. This is also shown in the great difference between values of maximum variables of cost and time to trade.

In case of *Trade* variable, which represents trade values, the values of LAC 30 are smaller than that of 99 developing countries. This is probably because there are included nine countries that have a population of less than one million people in this study. These countries are not studied in the paper of BHK "in order to preclude any asymmetric effects".[35] When excluding the nine countries, the level of trade values of the rest of LAC countries becomes almost same as that of 99 developing countries. According to the estimation for two samples, however, excluding nine countries does not change the significance of coefficients of the results.

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[34]In order to match the level of GDP per capita of two regions, Singapore is excluded (According to the same sources, GDP pc of the same period of two regions is similar: $4,318.2 in LAC 22 and $5,461.7 in ASEAN 7). Also, Lao PDR and Myanmar are not in the group sample, since they are not included in the Report. Thus, the seven ASEAN members are Brunei Darussalam, Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Vietnam. The average rank of *Prevalence of Trade Barriers* index of LAC 23 is 88 out of 144 countries, while that of ASEAN 7 us 74. In case of *Burden of Customs Procedures* index, the average rank of LAC 23 is 88, whereas that of ASEAN is 78.

[35] Busse, "Impact of Aid for Trade Facilitation":5

Lastly, the GDP per capita is the variable that shows the greatest difference between LAC 30 and 99 developing countries.   The table shows that the average income per capita of LAC 30 is more than double than 99 developing countries, and minimum value of GDP per capita variable is almost quadrupled.   In sum, 30 LAC countries trade less and earn more income than 99 developing countries.   In addition, it is found that LAC 30 have better regulatory quality than 99 developing countries.

EMPIRICAL RESULTS

1. Cost to trade

This section shows results of the panel data estimation for determinants of cost and time to trade, such as values of trade, GDP per capita, regulatory quality, and aid for trade. The main interest variable, AfT, is composed of many sub-aid categories, of which this study focuses on *Aid for Trade Policy and Regulations* and *Trade Facilitation*, and three aid variables are examined separately (Table 3).

As the study has anticipated that GDP per capita would have ambiguous impact on cost to trade owing to better infrastructure, greater efficiency and higher income, coefficients for the income measurement are not significant in all regressions.

In case of the regulatory quality variable, all coefficients show negative signs. Only when AfT is highly significant at 1% level, however, the regulatory quality is also significant to cost to export.   Likewise, the coefficients for the other aid variables are greater in cost to export than in that to import.   This explains the importance of the quality of trade regulations in the export sector.

Despite the expected ambiguous impact of values of trade variable, *Trade* variables are positive and highly significant (at 1% level) in all regressions.   This distinguishes from the results of the study of BHK, in which the *Trade* coefficient is positive and significant

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when AfT is negative and significant.   Besides this one regression, Trade is found to have negative effect on cost to trade.   They conduct further estimation to see if any changes are made when excluding Trade and AfT.   When the trade variable is excluded, results for AfT are not different; but excluding the aid variable, *Trade* turns to be insignificant.   Based on this finding, BHK suggest a unidirectional collinearity problem between *Trade* and AfT.

This paper also follows the same procedures and finds the significance of coefficients of variables do not differ even excluding AfT and *Trade* separately, and thus the sample of LAC 30 is free from the collinearity problem.   Therefore, the high significance of coefficients of *Trade* variable suggests values of trade is statistically significant and have positive effect on cost to trade.

Table 3. Aid for Trade and the Costs of Trading

Independent variables	Dependent variables					
	CostExp	CostImp	CostExp	CostImp	CostExp	CostImp
GDPpc (t-3)	0.0646 (0.0402)	0.0473 (0.044)	0.0477 (0.0406)	0.0282 (0.0444)	0.0485 (0.0405)	0.0342 (0.0441)
Trade (t-3)	2.9072*** (0.5455)	2.3045*** (0.597)	3.1888*** (0.545)	2.6074*** (0.5955)	3.188*** (0.5442)	2.5849*** (0.5919)
Regulatory Quality (t-3)	-159.634** (81.3429)	-114.5519 (89.0244)	-121.624 (82.4971)	-70.693 (90.1348)	-116.3337 (81.9152)	-59.5191 (89.0985)
Aid for Trade (t-3)	0.3038*** (0.1184)	0.3173** (0.1296)				
Aid for Trade Policies & Regulations (t-3)			0.4165 (3.1934)	-0.5483 (3.489)		
Aid for Trade Facilitation (t-3)					-2.0487 (5.5682)	-7.841 (6.0565)
Observations	210	210	210	210	210	210
Countries	30	30	30	30	30	30
R^2 (within)	0.50	0.48	0.49	0.47	0.49	0.47

Note: ** significant at 5% level; *** significant at 1% level; standard errors are reported in parenthesis; constant term and time dummies are not shown; and the time lag is written as 3 years but in real term (taking into consider the difference of data collection), is one year and half.

Looking at the variables of interest, Aid, what is surprising is that AfT turns to have positive effect on cost to trade.   Does it mean that in a country that receives more AfT, more costs to trade are needed?   In order to give an answer to this question, the study focuses on

correlations among variables as well as concentration of this aid.   AfT and trade values have a positive correlation, whereas the aid variable is negatively correlated with GDP per capita and regulatory quality of LAC 30.   Detailed correlation is shown in the following table:

Table 4. Correlation among AfT, Trade, GDP pc, and Regulatory Quality

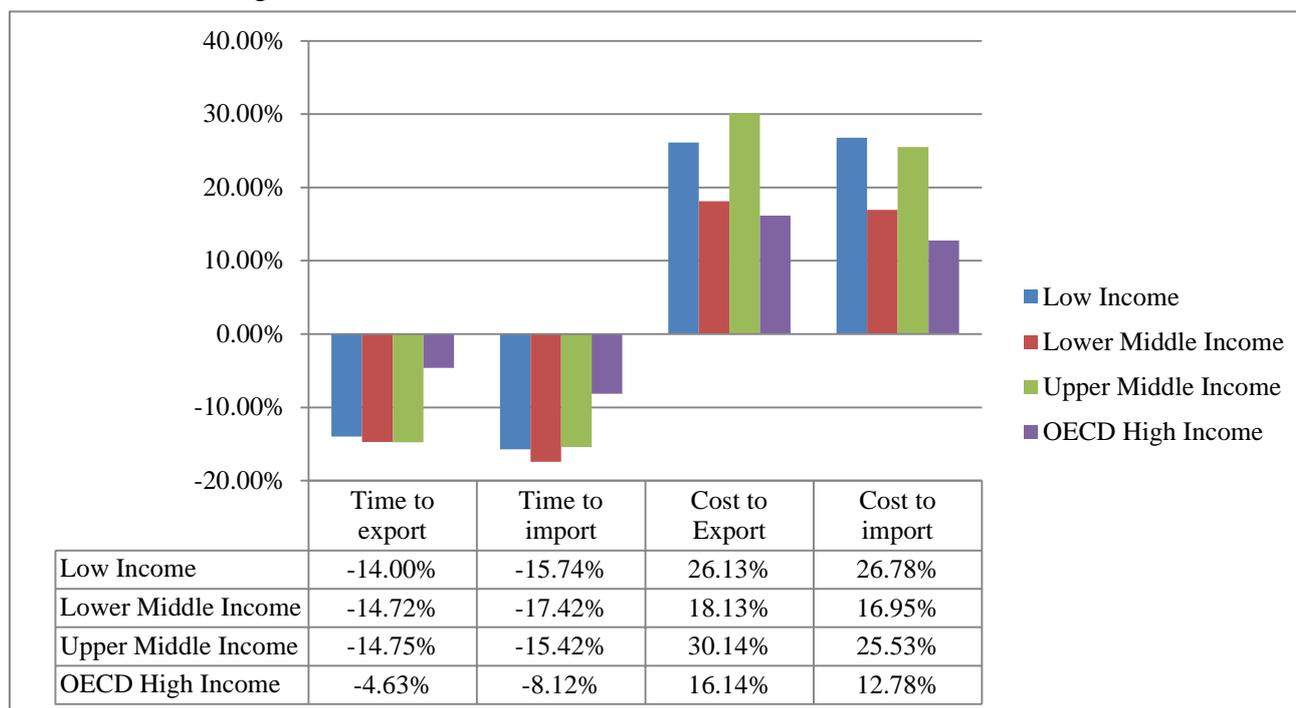|	AfT	Trade	GDPpc	Reg Qual
AfT	1.0000			
Trade	0.0918	1.0000		
GDPpc	-0.3781	0.2258	1.0000	
Reg Qual	-0.1417	0.0691	0.5847	1.0000

This can be explained by the concentration of the aid, since what the positive correlation of AfT and *Trade* suggest is considerable amount of AfT goes to the countries with high trade values.   Among 210 observations (30 countries for seven years) of the sample, 10% of the highest values (21 observations from the top) account for 45% of total AfT, which are distributed to seven countries: Bolivia, Peru, Nicaragua, Brazil, Colombia, Honduras, and Haiti.   In fact, they are top seven AfT recipients in LAC 30 between 2004 and 2010, explaining 63.2% of total disbursements.   They also account for 29.5% of total values of trade of the sample; when excluding Haiti, which is only LDC in the sample, six countries explain 29.4% of total trade values of LAC 30.   This can be a controversial issue, in a sense that the countries with high trade values would have better trade-related facilities and put more attention to improve them, since they engage more frequently in trade than the countries with low trade values.   In other words, aid seems to be distributed in order to seek for great effectiveness, not targeting the most needed ones.

In the regressions with the most specific scope of AfT, *Trade Facilitation*, the coefficients have negative signs, corresponding to the expectations.   However, none of them is significant.   In case of *Trade Policy and Regulations*, the coefficient is negative in cost to export and turns to be negative in cost to import.   Since the coefficient for Trade Facilitation in cost to import (-7.841) is greater than in cost to export (-2.0487), specific categories of AfT seem to have greater impact on cost to import than that to export.

Insignificance of the aid variables is also a difference from the estimation of BHK. In their study, the most specific aid variable, *Trade Facilitation*, is significant at 1% level, while *Trade Policy* is significant at 10% level.   Based on the results, they conclude that AfT has a significant impact on cost to trade when AfT is highly targeted.   Unfortunately, this is not the case for LAC 30.   Whether it is AfT as a whole or a specific category within AfT, such an aid has no significant impact on reducing cost to trade in LAC 30.

In order to find out the difference of the results, the study looks at the global trend of changes in cost and time to trade for the same period (from Doing Business Report 2007 and 2013).   According to the Figure 2 below, cost to both export and import has been increased throughout all regions, and the changes in cost to export are slightly greater than that to import.   Also, low and upper middle countries have experienced higher changes in cost to trade than lower and high-income countries.   On the other hand, time to trade has been decreased, and changes are slightly greater for import than for export.   Here, low and middle-income countries have enjoyed greater change than high-income countries.   In conclusion, the cost incurred in both export and import has been increasing in every region, whereas the time needed for trade has been decreasing.   What this finding implies to the study is significant; the fact that AfT has positive impact on cost to trade is not shocking, rather it can be accepted as an inevitable result of increasing cost to trade.

Figure 2. International Trend of Cost and Time to Trade, 2007-2013

	Time to export	Time to import	Cost to Export	Cost to import
Low Income	-14.00%	-15.74%	26.13%	26.78%
Lower Middle Income	-14.72%	-17.42%	18.13%	16.95%
Upper Middle Income	-14.75%	-15.42%	30.14%	25.53%
OECD High Income	-4.63%	-8.12%	16.14%	12.78%

Source: Doing Business, World Bank (2013)[36]

Moreover, Asian-Pacific Economic Cooperation (APEC) finds cost to trade plays much less important role than time to trade in composing trade transaction costs in the assessment on their Trade Facilitation Action Plans. In lieu of using face values of cost and time to trade from *Trading across Borders,* they estimate 1) value of time, weighting time to trade data in *Trading across Borders* by ad valorem tax equivalents of time taken by each member of APEC, and 2) monetary costs by multiplying unit cost for trade by the number of standard container, which is also called twenty-foot equivalent units (TEU) of both out- and in-bound. [37] This accurate estimation finds that costs of trading accounts only 11.7% of trade transaction costs, whereas value of time taken in trade explains 88.3%.

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[36] World Bank, "Historical Data Sets and Trends Data", Doing Business, (2013) , http://www.doingbusiness.org/custom-query

[37] For more detailed explanation, see APEC (2011)

2. Time to trade

Now that we have recognized the dominant role of time in composing trade transaction costs, the paper focuses on the impact of AfT on time to trade. In order to do so, the study adopts the same methodology of which the only difference is the change in dependent variables from cost to trade to time to trade; and the result is shown in the Table 5.

Table 5. Aid for Trade and the Time to trade

Independent variables	Dependent variables					
	TimeExp	TimeImp	TimeExp	TimeImp	TimeExp	TimeImp
GDPpc (t-3)	0.0007 (0.0006)	0.0012 (0.0008)	0.0011 (0.0006)	0.0018** (0.0008)	0.0013** (0.0006)	0.002** (0.0008)
Trade (t-3)	0.0184** (0.0082)	0.0187** (0.0103)	0.0103 (0.0086)	0.0089 (0.0107)	0.0094 (0.0086)	0.0075 (0.0108)
Regulatory Quality (t-3)	-2.236 (1.2186)	1.142 (1.53)	-3.15** (1.3003)	0.1642 (1.6211)	-3.2508** (1.2923)	-0.2327 (1.6274)
Aid for Trade (t-3)	-0.0094*** (0.0018)	-0.012*** (0.0022)				
Aid for Trade Policies & Regulations (t-3)			-0.0739 (0.0503)	-0.131** (0.0628)		
Aid for Trade Facilitation (t-3)					-0.1232 (0.088)	-0.0917 (0.1106)
Observations	210	210	210	210	210	210
Countries	30	30	30	30	30	30
R^2 (within)	0.42	0.48	0.34	0.41	0.33	0.40

Note: ** significant at 5% level; *** significant at 1% level; standard errors are reported in parenthesis; constant term and time dummies are not shown; and the time lag is written as 3 years but in real term (taking into consider the difference of data collection), is one year and half.

GDP per capita and Trade variables have positive coefficient in all regressions, of which some are significant at 5% level. Increase in income may be related to more imports (as well as higher trade values), which produce congestion at ports or border. Also, when GDP increases, it is very likely that export also boosts; and when capital is accumulated, more capital-oriented products are likely to be produced and trade values will increase. For such a delicate product, there must be some rigorous procedures to trade. All these are how higher GDP per capita and trade values are related with longer time to trade.

Same as in cost to trade, Regulatory quality has greater impact in reducing time to

export than that to import. Coefficients for time to export are significant when time to export is regressed on Trade Policy and Regulations and Trade Facilitation. This result suggests again that export sector will be benefited from a country's own efforts to improve trade regulations. Many scholars recognize the importance of these efforts; Dani Rodrik argues that it is not only "enhanced market access" what a country needs "to render economic openness viable and growth", but it is also "institutional reforms at home."[38]

Focusing on the aid variables, what is notable is that coefficients for AfT turn to be negative and significant on time to export and import, which means that AfT has a significant effect on reducing time to trade. Despite only the coefficient for Trade Policy and Regulations is significant, all the other aid variables have minus sign coefficients. This is good news in a sense that this will be free from the confusion that plus sign of coefficients for aid variables on cost to trade generate. Moreover, as we have seen in the study of APEC, time to trade is much more important than cost to trade in composing trade transaction costs.

Then why the two narrow categories of AfT (Trade Policy and Regulations and Trade Facilitation) does not show significant impact? This is one of the most different results, compared to the study of BHK, which results in the more specific the category of aid, the greater coefficients. When they divide the aid recipients into LDCs and non-LDCs and replicate the analysis, they observe all the aid variables are highly significant in non-LDCs (whereas not significant in LDCs) and also, aid flows to non-LDCs are greater on average. Accordingly, the study argues "aid flows only become effective when they reach a certain (threshold) level."[39] The lower aid flows to LAC30 than 99 developing countries might indicate that inflows of AfT into the region are not sufficient to be a trigger of reducing cost and time to trade.

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[38]Rodrik Dani, "The Global Governance of Trade. As if Development Really Mattered.", UNDP, (October 2001), retrieved from
http://www.lse.ac.uk/collections/globalDimensions/seminars/trade/UNDPtrade.pdf
[39] Busse, "Impact of Aid for Trade Facilitation": 16

To sum up, the impact of AfT on cost and time to trade turns to be a mixed result. It is surprising that AfT coefficient is significant but positive, which suggests that it has impact on raising cost to trade. Taking into consider the global trend of growing such a cost, however, it is not surprisingly rather reasonable. To the contrary, AfT coefficient for time to trade is significant and negative, which confirms the impact of AfT on reducing trade transaction costs of which time to trade is more important composing factor. Besides AfT, no other aid variables have significant impact (except that of Trade Policy and Regulations on time to import). This might be due to low aid inflows into the region that hinders from showing effectiveness.

CONCLUSION

The international trade permits each and every country, including developing ones, to better off by selling their products of comparative advantage and buying the products without such an advantage. However, trade barriers and high trade transaction costs hinder developing countries from taking advantage of trade. In order to support developing countries in 1) recognizing the role of trade in development, 2) "building the supply-side capacity and trade-related infrastructure", and therefore 3) engaging better in trade and enjoying greater benefits from it,[40] WTO launched Aid for Trade (AfT) initiatives in Hong Kong Ministerial Conference in 2005. Ever since, donor countries are progressively increasing the aid disbursements, which explains now one third of the total sector allocable ODA. In line with the increase, the effectiveness of AfT has become an interesting and important issue for the donor countries.

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[40] WTO, "Ministerial Declaration", WT/MIN(05)/DEC, (December, 2005), available at: http://www.wto.org/english/thewto_e/minist_e/min05_e/final_text_e.htm

10% of AfT is heading to Latin America and the Caribbean (LAC) region, where trade values and GDP per capita are higher than the average of developing countries and includes only one LDC, which is Haiti. According to some studies that argue aid effectiveness is greater 1) in non-LDCs than in LDCs, 2) in agriculture than in manufacturing, and 3) in the reduction of import costs than that of export costs, AfT is expected to show great effectiveness in LAC,[41] and thus, should be distribute more in the region.

In order to analyze the effectiveness, this paper adopts the empirical method employed in the paper of Busse, Hoekstra, and Königer (BHK): panel data fixed-effects model. Then, this is applied to the sample of 30 LAC countries. BHK analyze the impact of AfT (as well as aid for *Trade Policy* and *Trade Facilitation*) on cost and time consumed in trade transaction in 99 developing countries, using data of *Trade across Borders* of World Bank. The analysis confirms that AfT is effective in reducing cost to trade, and the impact is greater when the aid is specific, in other words, highly targeted. On the other hand, they fail to find significant impact of AfT on the reduction of time to trade. Moreover, the study finds significant impact of the aid in non-LDCs and top 20 recipients on reducing cost to trade, whereas no such significance has been found in the regressions of LDCs and the sample without top 20 recipients.

According to the empirical results of this paper, AfT shows mixed impact on cost to trade. AfT has a significant but surprisingly plus sign of coefficients, which suggest that AfT has a significant impact on increasing cost to trade. When the category becomes narrower, however, the coefficients turn to be negative and greater (but not significant). The study visits data of *Trade across Borders* in order to see if there is certain pattern of changes in cost to trade, since the result is opposite of what the study has expected. It is found out that cost to trade have been increasing, whereas time to trade has been decreasing throughout

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[41] For more detailed argument, look at page 2 of this paper.

all the regions.   What is good news about this is that APEC finds that cost to trade explains only 10% of total trade transaction costs, while time to trade makes up the rest, 90%.   AfT has a negative and highly significant impact on time to trade, which can be an evidence of the effectiveness of AfT in the region.   Taking into consider the important role of time to trade in the composition of trade transaction costs, the study concludes AfT indeed is effective in reducing total trade transaction costs.   The coefficients for narrower aid categories than AfT (*Trade Policy and Regulations* and *Trade Facilitation*) are also negative, but only one regression shows a significant coefficient.

In case of both cost and time to trade, the impact of aid variables except AfT is not as significant as that of AfT.   This paper suspects that the reason might lie in small amount of aid, comparing to the aid inflows to 99 developing countries employed in BHK's study. After finding out no significant impact of AfT in LDCs where receives less AfT than non-LDCs, they argue that the effectiveness of aid becomes visible when the aid inflows reach a certain level.

The impact of AfT in LAC 30 on reducing cost and time to trade is not as great as that is shown in 99 developing countries.   Even though it looks disappointing, the results the study finds are still valuable and instructive.   First of all, the impact of *Regulatory Quality* is higher in cost and time to export than those to import, which underlines the importance of good trade-related regulations in export sector.   Taking this into account, LAC 30 should eliminate burdensome regulations in order to facilitate export and try to create a favorable environment for export.   Second of all, trade values and GDP per capita turn to have impact on increasing cost and time to trade despite the expected ambiguous impact.   Trade values, *inter alia*, are significantly effective on the increase in cost to trade.   In order to understand this unidirectional result, the paper looks at the structure of trade and aid in LAC 30.   The correlation of Trade and AfT is positive, whereas that of the rest of independent variables and

AfT is negative. This might be because the countries with high trade values receive considerable amount of AfT, which does not fit the original aim of such an aid to target the most needed ones. The countries with high trade values might already equip with good trade-related facilities as well as high willingness to improve them. Therefore, donor countries should seek not only for the effectiveness but also for the condition and needs of LDCs that should be principle beneficiaries of AfT.

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