

INTERNATIONAL TRADE

The impact of aid for trade on the cost and time to trade

The case of Latin America
and the Caribbean

Jung Eun Sohn



UNITED NATIONS

ECLAC

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Abstract

Tariffs and non-tariff barriers having been reduced, the international community seeks to lower other trade transaction costs that are greater in developing countries. As a fruit of the effort, the 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 the cost and time to trade in 30 Latin American and Caribbean countries, where 10% of AfT is destined, for the period between 2004-2010, deploying a panel data fixed-effects model. The empirical results evidence 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 that AfT disbursed to LAC countries has high trade values which does not coincide with the main objective of AfT.

Introduction

Since the early stages of the multilateral trading system, reducing trade costs has been a common interest of the international society. Tariffs have been progressively reduced under World Trade Organization (WTO) agreements; and non-tariff barriers to trade (NTBs) are in the process of being reduced. Now, the remaining challenge is to reduce other trade transaction costs, in particular those related to regulations, the infrastructure, distribution, and communications. These costs can be much higher than traditional trade barriers,¹ and moreover, trade costs in developing countries are even greater than those in high-income countries.² Therefore, it is a critical issue for many developing countries to focus on trade facilitation measures in order to reduce trade costs and benefit from increased competitiveness and trade flows. It has not been easy, however, due to high costs and the complexity of reforms.

In order to support the “right domestic policy framework, institutional capacity and economic infrastructure” of developing countries, the WTO launched an Aid for Trade (AfT) Initiative in 2005 at the Hong Kong 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

It is not only the AfT flows that continue to grow but also donor countries’ focus on the effectiveness of this aid. This is evidenced by the numerous studies on the impact of AfT and trade facilitation. Due to the cross cutting nature of AfT, the studies tend to cover wide ranging issues related to trade, such as trade flows and economic development. However, this study focuses on the analysis of Busse, Hoekstra, and Königer (BHK, 2011) that examines the impact of AfT on more specific and direct trade-related issues: the cost and time to trade. In order to see if a particular category of AfT has a higher impact than others, the paper examines not only AfT as a whole but also two sub-categories of AfT: Aid

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).

for Trade Policy and Regulations and Aid for Trade Facilitation (AfTF). They find that the inflow of AfT into 99 developing countries has a significant impact on reducing the costs of trading using a panel data fixed-effects model. They also show that AfT has a more significant impact in Non-Least Developed Countries and in the top 20 AfT recipient countries.

This paper applies BHK's method to analyze the impact of AfT on reduction of cost and time to trade in 30 Latin America and the Caribbean (LAC) countries, the destination for 10% of the AfT.⁵ Prior to an empirical analysis, the study expects a high level of effectiveness of AfT, in light of some studies that find; (a) aid effectiveness is lower in LDC due to absorption capacity constraints;⁶ (b) agriculture would benefit more from trade facilitation than other manufacturing industries;⁷ and (c) improvement in trade facilitation will lead to greater reduction on import costs than in export costs.⁸ This is because (a) there are not many LDCs in LAC, (b) exports of agricultural goods of LAC countries are greater than manufacturing goods,⁹ and (c) the trade balance in 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 the mixed impact of AfT on cost and time to trade in LAC. On the one hand, AfT surprisingly has a significant impact on increasing the cost; while Aid for Trade Regulation and Trade Facilitation shows a negative (albeit not significant) impact. The study indicates that the reason for the unexpected result is due to the increase in the cost to trade by more than 20% between 2007 and 2013 around the world. On the other hand, AfT demonstrates a highly significant impact on the reducing time to trade which confirms the effectiveness of AfT. So as to highlight the importance of its effectiveness, the study also highlights the findings of APEC on the composition of trade transaction costs, of which cost and time to trade explain about 10% and 90% of costs, respectively.

What is distinguishable from the previous study of BHK is that time span is expanded from 4 to 7 years, which allows for flexibility in dynamic impacts. Even though AfT was launched in 2005, it is not a new global fund, nor a new aid category but was an integral part of regular Official Development Assistance (ODA).¹² Thus there are no issues in using data before the official launch, beginning of 2005. Moreover, taking into account 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 show effects since its disbursement. Even though BHK has recognized the different reporting periods of data from the World Bank (dependent variables) and OECD (independent variables), they deploy only one nominal year of lag which makes the time period of dependent variables ahead of that of independent variables. This is because the World Bank publishes reports one 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 actually one year and half.

Despite the mixed empirical results on aid variables, the study deduces some interesting interpretations from the other independent variables that can be useful not only for LAC countries but also for the aid donor countries. First, Regulatory Quality shows greater coefficients in exports than imports, which indicates the importance of trade-related regulations in the export sector. Based on the finding, the study recommends LAC 30 to eliminate burdensome trade-related regulations (especially export-related ones), which can increase the cost and time to trade. Secondly, trade values are shown to be significant in increasing the cost to trade and, moreover, have a positive correlation with AfT unlike

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.

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.

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 assume that countries that trade more may have better trade-related facilities and trade-favorable environment, donor countries should consider more carefully which countries are eligible for such an aid.

The paper is structured as follows: in the next section, a review of the literature on the impact of trade facilitation, AfT on trade flows, and economic welfare. Section 3 describes 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.

I. Literature review

Before looking at the impact of AfT, this study will focus on why the trade facilitation is needed and its impact, which will solidify the belief that AfT is necessary. First, there is a review of the literature the impact of trade facilitation on trade flows. Then, in an effort to widen the range of the impact evaluation, the study will move on to its impact on economic welfare.

A. Impact of trade facilitation on trade flows

Wilson, Mann, and Otuski (2005) 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 that an improvement in trade facilitation increases both imports and exports and the increase in trade among 75 countries is predicted to be USD\$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%—Half of which is a result of an improvement of port efficiency.¹³

Iwanow and Kirkpatrick (2007) employ an augmented gravity model to assess the potential gains from trade facilitation reform on export performance. The study finds that an improvement in trade facilitation by 10% would increase exports by 5%. However, the facilitation alone will not bring a significant impact; it should be combined with improvements in the quality of the regulatory environment and transport and communications infrastructure which are equally or more important in stimulating export growth.¹⁴

Hummels (2001) focuses on the role of transport time in international trade, since time is considered a trade barrier. According to his estimation on the value of time saved in shipping time, a

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).

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.

one-day increase in ocean transit reduces the probability of export to the US by 1% (all goods) and 1.5% (manufactured goods). Also, he finds each day spent to ship manufactured goods is equivalent to 0.8% of the value of good, which is valued as a 16% 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 (2006) points out the need of trade facilitation to minimize 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%.¹⁶

B. Impact of trade facilitation on economic welfare

Given the fact that trade facilitation has a positive impact on the increase in trade flows, this paper now focuses on the impact of trade facilitation on economic welfare. Minor and Tsigas (2008) assess the impact of the reduction in time to trade by 50% on GDP and find that the reduction in low —and middle— income countries will bring greater change than in 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% in Sub-Saharan Africa triggers an increase in the share of light and medium manufactures and a decrease in the share of basic commodities.¹⁷

Walkenhorst and Yusui (2003) measure aggregate welfare gains from trade facilitation, which is assumed as a reduction in trade transaction costs by 1% of the value of world trade. These gains are about US\$40 billion and benefit all economies, especially non-OECD economies. Under a 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 about this paper is that it highlights the importance of reducing indirect trade transaction costs, which have been neglected in 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

C. Impact of aid for trade on trade flows

Now that various studies on the impact of trade facilitation have been reviewed, the focus shifts to the impact of aid on trade facilitation reforms. According to BHKs study, —which methodology this study applies— AFT in 99 developing countries has significant impact on reducing cost to import. Further, the two sub-categories of AFT, Trade Policy and Regulations and Trade Facilitation are examined. The former also has stronger impact on cost to import than that to export, while the latter is highly significant at reducing both cost to export and import. Taking into consideration that AFT is one of most precise and narrow AFT categories, the 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 the 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 (2009) find that AFT (Trade Policy and Regulations, Trade Development, and Economic Infrastructure) has a positive impact on both exports and imports of

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).

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).

recipient countries. Moreover, the study argues that AfT is important to promote exports to the developed world on the basis that the relationship of aid and exports is stronger than that of aid and imports. This analysis is innovative in the sense of it categorizes 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 (2010) also find aid for trade facilitation is effective in reducing the costs of trading. Therefore, they claim that it is possible to expect a substantial return from 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 not to be as effective on exports. On this basis, the study concludes with a suggestion to improve infrastructure in Africa, as a constraint on promoting exports, where the effects of such type of aid are greater than in other regions.²⁰

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.

²⁰ Massimiliano Cali and Dirk Willem Te Velde, “Does aid for trade really improve trade performance?”, World Development, 39(5) (September 2010):733-738.

II. Methodology and data

A. 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 in figuring out the cause 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-variant, 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:

$$\text{Cost (Time)}_{it} = \beta_0 + \beta_1 \text{AID}_{it-3} + \lambda X_{it-3} + \text{YEAR}_t + \varepsilon_{it}$$

"where the dependent variable Cost (Time)_{it} stands for either cost (or time) of trading of country i in period t and AID_{it-3} being the main variable of interest (AfT, Trade Policy or Trade Facilitation). β_0 represents the country fixed-effect and X_{it-3} 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 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 The World Bank) and aid variables (from OECD). The World Bank publishes cost and time required to export and import 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

²¹ Ulrich Kohler, Kreuter Frauke, Data Analysis Using Stata, Stata press, (2008), 245.

²² Busse, "Impact on Aid for Trade Facilitation":8.

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 is actually that of only one year and a half.

B. Data

1. Dependent variables

In this paper, 30 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 goods (both exports and imports) 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

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 BHK study given that the goal of this assessment lies in finding policy implications of AfT on the LAC region, the different results will permit us to develop proper regional strategies.

C. Independent variables: AfT, policy and regulations, 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 illustrates Categories of AfT as follows.²⁶

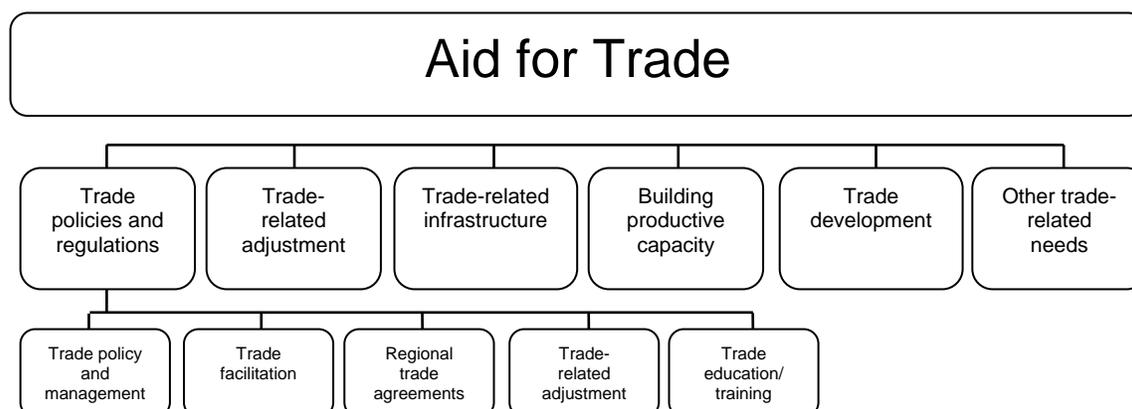
²³ APEC Policy Support Unit, “Aggregate Measurement of Trade Transaction Costs in APEC 2007-2010”, APEC#211-SE-01.09, (August 2011):9.

²⁴ Busse, “Impact of Aid for Trade Facilitation”:5.

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.

DIAGRAM 1
AID FOR TRADE CATEGORIES



Source: Busse, Hoekstra, and Königer (2011).

This diagram 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 first 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, among other things. The data contains aid inflows in 30 LAC countries for the period 2004-2010, which aims at matching the period employed for cost and time to trade with a lag of one year and a half. The time lag between dependent and independent variables is mentioned in the methodology section.

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 the Latin 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 to 3.8% of AfT (1.2% of total sector allocable aid) flowed into Latin America in the same year.²⁷ According to the analysis of BHK, such specific funding will lead to avoid concerns about generic aid effectiveness 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 0.43% of AfT (0.13% of total sector allocable aid) in Latin America and recorded "at the lowest possible level of AfT."²⁸ The AfTF disbursed in Latin American region is smaller than that which flowed into all developing countries, where it reached 1% of AfT (that is 0.3% of total aid) as AfTF. The following table shows detailed information including more specific classifications of types of AfT and values of each type for LAC.

²⁷ OECD Creditor Report System (2012).

²⁸ Busse, "Impact of AfTF":7.

TABLE 1
OVERVIEW OF AID FOR TRADE IN LATIN AMERICA AND THE CARIBBEAN:
ODA DISBURSEMENTS

(Millions of dollars at constant 2010 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
Subtotal	36.54	40.56	42.84	72.51	55.14	163.38	61.82
Subtotal (%)	2.80	3.40	3.60	4.30	2.90	6.40	2.00
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
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
Subtotal	374.98	464.78	471.76	711.10	922.93	1 390.16	1649.05
Subtotal (%)	28.90	39.20	39.20	42.10	48.10	54.50	54.40
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
Subtotal	885.07	680.27	687.71	905.06	939.81	998.65	1 321.98
Subtotal (%)	68.30	57.40	57.20	53.60	49.00	39.10	43.60
Aid for trade proxies total	1 296.59	1 185.61	1 202.30	1 688.67	1 917.89	2 552.18	3 032.85
Total sector allocable aid	5 459.72	5 784.46	6 313.68	6 487.13	7 997.47	8 606.60	9 925.84

Source: Author, based on OECD CRS (2013).

Note: The aid types in the table are the same as those in the Aft Fact Sheet, Latin America and the Caribbean Region of OECD, <http://www.oecd.org/dac/aidfortrade/39464494.pdf>.

These aid variables are among disbursed and deflated in millions of dollars at constant 2010 prices. BHK decided to use the accumulated value of aid (only for the observed period in the analysis), with the expectation that the disbursements in previous years will have an impact on dependent variables due to a lasting effect. In other words, cost and time to trade reflect not only a single year of aid inflow but all previous years combined. Therefore, they claim that the stock of aid inflows is appropriate to “account for the dependency of trade costs on aid”.²⁹

²⁹ Ibid.

D. Other control variables

What other factors could 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.

This paper expects that the high income of a country is related to the more trade-favorable facilities and a higher cost and time to trade. Moreover, high incomes may also 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 note the link between high income and labor costs, which leaves room for a possibly ambiguous impact of income on trade costs, but not on time to trade. Also, according to Cali and Te Velde, a higher GDP per capita tends to be positively related to higher costs of non-tradable goods, and thus, to higher exporting costs.³⁰

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

The last 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.”³¹ It is not directly related to trade issues but it provides a big picture of the possible hindrance of rapid trade procedures which will lead to delays in trade. Thus, the higher value in the regqual variable which represents government’s better administration in the trade-related-private sector is expected to be associated with less costs and a shorter time to trade.

E. Descriptive statistics of variables

As briefly mentioned above, the sample size, period and characteristics of this study are different from that of BHK. The detailed difference is shown in table 2.

Even with an expanded period span from four to seven years—compared to the BHK study—table 2 shows that 30 LAC 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 2002-2005 and El Salvador appears in top 20 recipients in 2007. However, no LAC country is included in the top 20 list of AfT recipients (by commitments a disbursements) in 2009.³²

This is especially noticeable in aid for Trade Policy and Regulations, brings the question if the difference comes from already well-established trade-related policies in LAC 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.³³ 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.

³⁰ Cali and TeVelde, “Does aid for trade really improve trade performance?”, 733.

³¹ World Bank, “Description of methodology: Government effectiveness”, available at: <http://info.worldbank.org/governance/wgi/pdf/ge.pdf>, (2012).

³² OECD, “Aid for Trade at a Glance 2007, 2009, and 2011.”

³³ 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 Viet Nam. The average rank of Prevalence of Trade Barriers index of LAC 23 is 88 out of 144 countries, while that of ASEAN 7 is 74. In case of Burden of Customs Procedures index, the average rank of LAC 23 is 88, whereas that of ASEAN is 78.

TABLE 2
DESCRIPTIVE STATISTICS OF VARIABLES

Variable	Mean	Std.Dev.	Minimum	Maximum
Independent variables (at constant 2010 dollars)				
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)
Trade (billions of dollars, deflated using the CPI)	44.3 (62.9)	101.7 (205)	0.2 (0.17)	614.7 (2 466.9)
Gdppc (at constant 1990 dollars)	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)
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)	2 987.5 (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)

Source: Own tabulation based on data collection (All dependent variables from WB 2013, aid variables from OECD CRS 2012, trade from UNCTAD 2012B, gdppc from UNCTAD 2012C, and regulatory quality from WB 2012), Data in parenthesis from BHK 2011.

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

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 a much lower cost and time to trade than other developing countries in general. This is also seen in the vast difference between values of maximum variables of cost and time to trade.

In the 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 it includes nine countries that have a population of less than one million people. These countries are not studied in BHK's paper "in order to preclude any asymmetric effects".³⁴ When excluding the nine countries, the level of trade values of the rest of LAC countries becomes almost the 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.

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.

³⁴ Busse, "Impact of Aid for Trade Facilitation":5.

III. Empirical results

A. 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. This study focuses on Aid for trade policy and regulations and trade facilitation, and three aid variables are examined separately (see table 3).

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

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

Despite the expected ambiguous impact of the values of trade variables, these are positive and highly significant (at 1% level) in all regressions. This is different than the results of BHK's study, in which the trade coefficient is positive and significant when AfT is negative and significant. Besides this one regression, trade is found to have a negative effect on the 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 when 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 variables suggest that values of trade are statistically significant and have positive effect on the 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

Source: Author based on the regression results.

Notes: ** 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 out to have a positive effect on cost to trade. Does it mean that a country that receives more AfT there are more costs to trade needed? In order to answer 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	1.0000
GDPpc	-0.3781	0.2258	1.0000	...
Reg Qual	-0.1417	0.0691	0.5847	1.0000

Source: Author based on the regression results.

This can be explained by the concentration of aid, since what the positive correlation of AfT and trade suggests is that a considerable amount of AfT goes to the countries with high trade values. Among 210 observations of the sample (30 countries for seven years), 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 the top seven AfT

recipients in LAC 30 between 2004 and 2010, accounting for 63.2% of total disbursements. They also account for 29.5% of total values of trade of the sample; when excluding Haiti, which is the only LDC in the sample, six account for 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 could have better trade-related facilities and focus more attention on improving them since they engage in trade more frequently than countries with low trade values. In other words, aid seems to be distributed with a goal of greater effectiveness who need it most.

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 are significant. In the case of Trade Policy and Regulations, the coefficient is positive in the cost to export and turns out to be negative in the cost to import. Since the coefficient for Trade Facilitation in the cost to import (-7.841) is greater than in the 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 BHK's estimation. In their study, the most specific aid variable, Trade Facilitation, is significant at a 1% level, while Trade Policy is significant at a 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 aid has no significant impact on reducing the cost to trade in LAC 30.

In order to detect the differences between the results, the study looks at the global trend of changes in the cost and time to trade for the same period (from Doing Business Report 2007 and 2013). According to figure 1, cost to both export and import has been increasing in 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 the 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 imports than for exports. Here —low and middle— income countries have enjoyed greater change than high-income countries. In conclusion, the cost incurred in both exports and imports 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.

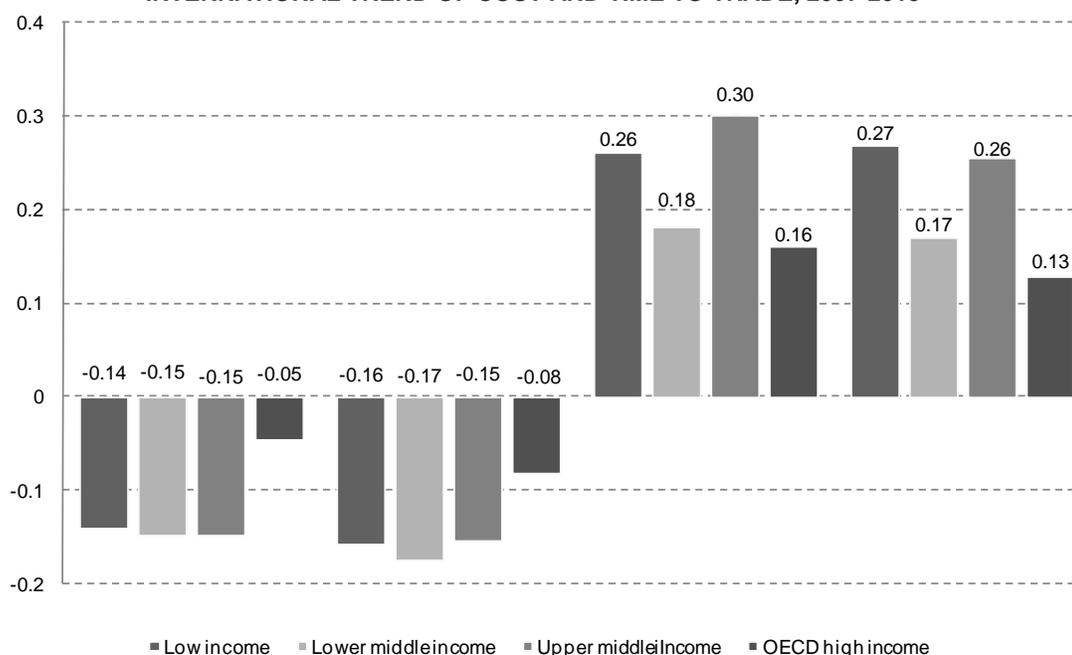
Moreover, APEC finds that the cost to trade plays a much less important role than the time to trade in a trade transaction costs in the assessment of their Trade Facilitation Action Plans. In lieu of using face values of cost and time to trade from *Trading across Borders*, they estimate 1) value of 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.³⁵ This accurate estimation finds that the costs of trading account for only 11.7% of trade transaction costs, whereas the value of time taken to trade accounts for 88.3%.

B. Time to trade

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

³⁵ For more detailed explanation, see APEC (2011).

FIGURE 1
INTERNATIONAL TREND OF COST AND TIME TO TRADE, 2007-2013



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

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 ^a (0.0008)	0.0013 ^a (0.0006)	0.002 ^a (0.0008)
Trade (t-3)	0.0184 ^a (0.0082)	0.0187 ^a (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 ^a (1.2923)	-0.2327 (1.6274)
Aid for trade (t-3)	-0.0094 ^b (0.0018)	-0.012 ^b (0.0022)				
Aid for trade policies & regulations (t-3)			-0.0739 (0.0503)	-0.131 ^a (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

Source: Author based on the regression results.

^a significant at 5% level.

^b 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 consideration the difference of data collection), it is one year and half.

GDP per capita and trade variables have a positive coefficient in all regressions of which some are significant at a 5% level. Increase in income may be related to more imports (as well as higher trade values), which produce congestion at ports and borders. Also, when GDP increases, it is very likely that exports are also boosted; 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.

Similar to the 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 this dependent variable is regressed on Trade Policy and Regulations and Trade Facilitation. This result suggests again that the export sector will benefit from a country's own efforts to improve trade regulations. Many scholars recognize the importance of these efforts; Dani Rodrik argues that a country needs not only "enhanced market access" to render economic openness viable and growth", but also "institutional reforms at home."³⁶

Focusing on the aid variables, what is notable is that coefficients for AfT turn out to be negative and significant on time to export and import which means that AfT has a significant effect on reducing the time to trade. The rest of the aid variables have minus sign coefficients of which only the coefficient for Trade Policy and Regulations is significant. In other words, these regressions are free from the confusion that the plus sign of coefficients for aid variables that the cost to trade generates. Moreover, as we have seen in the study of APEC, time to trade is much more important than the cost to trade in composing trade transaction costs.

Then why do the two narrow categories of AfT (Trade Policy and Regulations and Trade Facilitation) not show significant impact? This is a markedly different result, compared to the BHKs study, which concludes that the more specific the category of aid the greater the coefficients. When they divide the aid recipients into LDCs and non-LDCs and replicate the analysis, they observe that all the aid variables are highly significant in non-LDCs (but 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."³⁷ The lower aid flows to LAC 30 than to 99 developing countries might indicate that inflows of AfT into the region are not sufficient to trigger a reduction in costs and time to trade.

To sum up, the impact of AfT on cost and time to trade is 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 consideration the global trend of increasing such a cost, however, it is not surprising but rather reasonable. To the contrary, the 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 a more important composing factor. Besides AfT, no other aid variables have a 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.

³⁶ 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>.

³⁷ Busse, "Impact of Aid for Trade Facilitation": 16.

IV. Conclusion

International trade permits each and every country, including developing countries, to better off by selling the products in which they have a comparative advantage and buying the products in which they have a comparable advantage. However, trade barriers and high trade transaction costs hinder developing countries from taking advantage of trade. In order to support developing countries in (i) recognizing the role of trade in development, (ii) “building the supply-side capacity and trade-related infrastructure”, and therefore (iii) engaging better in trade and enjoying greater benefits from it,³⁸ the WTO launched Aid for Trade (AFT) initiatives in Hong Kong Ministerial Conference in 2005. Ever since, donor countries are progressively increasing aid disbursements which accounts to 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.

Ten percent of AFT is destined to the Latin America and the Caribbean region where trade values and GDP per capita are higher than the average of developing countries and includes only one LDC (Haiti). According to some studies that argue aid effectiveness is greater (i) in non-LDCs than in LDCs, (ii) in agriculture than in manufacturing, and (iii) in the reduction of import costs than that of export costs, AFT is expected to show great effectiveness in LAC,³⁹ and thus, should be distributed 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 the cost and time consumed in trade transactions in 99 developing countries using data of *Trade across Borders* of the 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, their 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.

³⁸ 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.

³⁹ For more detailed argument, look at page 2 of this paper.

According to the empirical results of this paper which focuses on LAC 30 countries, AfT shows a mixed impact on the 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 out 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 determined that the cost to trade has been increasing, whereas time to trade has been decreasing in all the regions. Moreover, according to APEC, the cost to trade explains only 10% of total trade transaction costs, while time to trade makes up the remaining 90%. On the other hand, AfT has a negative and highly significant impact on time to trade, which can be evidence of the effectiveness of AfT in the region. Taking into consideration 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 the 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 no finding of a significant impact of AfT in LDCs which receive 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 of the study 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 exports and try to create a favorable environment for exports. Second of all, trade values and GDP per capita have an impact on the increasing cost and time to trade despite the initially 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 the rest of independent variables and AfT are negative. This may be because the countries with high trade values receive a 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 be equipped with good trade-related facilities as well as greater willingness to improve them. Therefore, donor countries should not only seek effectiveness but also a better understanding of the conditions and target the needs of AfT recipient countries.

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