

THE IMPACT OF AUTHORIZED ECONOMIC OPERATOR ACCREDITATION ON TRADE FACILITATION: THE CASE OF UGANDA

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Abstract

This study examined the likely impact of Authorized Economic Operator (AEO) accreditation on trade facilitation, taking Uganda as a case study. The study assessed the impact of AEO accreditation status on the firms' clearance time of goods at Customs, trade volume, and the Customs revenue paid to government. The study used import and export (Customs) data extracted from Uganda Revenue Authority (URA) Asycuda database and the analysis involved matched difference-in-differences regression.

The results show that firms in Uganda that voluntarily sought and achieved AEO accreditation from URA experienced much reduced clearance time compared to peer firms that are not AEO accredited. The results further indicate that AEO accredited firms in Uganda were experiencing exponential growth in trade compared to peer firms that are not AEO accredited. Finally, the results show that the quantum of tax paid to government by AEO accredited firms was significantly higher than that paid by non-AEO accredited firms.

Based on the results, we conclude that the AEO program in Uganda has led to significant reduction in clearance time and increased trade of accredited firms and government tax revenue.

The study recommends that the government of Uganda through URA should continue promoting and encouraging the international trade community in Uganda to take up AEO accreditation.

1. INTRODUCTION

Authorised Economic Operator is a concept that originates from the World Customs Organization (WCO) 'SAFE' Framework of Standards to Secure and Facilitate Global Trade, which was adopted in 2005 by the WCO Council member countries –including Uganda.¹ SAFE stands for Security and Facilitation in a global Environment. By March 2016, 69 countries including Uganda were implementing the AEO program and 16 other countries were due to join implementation.²

The AEO is a party or entity involved in the international movement of goods in whatever function that has been approved by or on behalf of a national Customs administration as complying to WCO or equivalent supply chain standards.³

Participation in the AEO program is voluntary and at the national level the international trade community (manufacturers, Customs clearing agents, bonded warehouse operators, importers, exporters, transporters and freight forwarders) can only be granted AEO status if they meet the AEO eligibility criteria. Some of the key eligibility requirements include, among others sound, management of commercial records, good financial standing, good cargo and personnel security, and good compliance history with Customs and other government regulatory bodies.⁴

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¹ World Customs Organisation. Compendium of Authorized Economic Operator Programmes (2016). Available at [http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/aeo-compendium-en--2016-\(1\).pdf?la=en](http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/aeo-compendium-en--2016-(1).pdf?la=en) (accessed July 28, 2017).

² Ibid 1.

³ World Customs Organisation (WCO). WCO SAFE Package / AEO Template (2005), available at <http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/%7E/media/C5BFD21DF7FF4E18992EA359DD3E4EDB.ashx> (accessed 15 July 2017).

⁴ WCO. WCO SAFE Package / AEO Template (2006), available at <http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/%7E/media/C5BFD21DF7FF4E18992EA359DD3E4EDB.ashx> (accessed 15 July 2017).

Participants (international trade community) in the AEO program are said to gain from host of short-term and long-term trade facilitation benefits that far exceed the normal procedures provided to the non-AEO.⁵ Short-term trade facilitation benefits include, among others, paperless processing of commercial shipments, remote Customs clearance procedures, expedited cargo release, prioritization in cargo clearance during period of elevated threat conditions, priority response to requests for rulings from Customs authorities. Long-term trade facilitation benefits on the other hand include: reduced cost of doing business, enhanced internal controls, increased turnover, trustworthy and compliant business.

1.1 AEO Implementation in Uganda

The URA launched the AEO accreditation program in 2012. The program was one of the four components of the Customs Business Systems Enhancement Project [CBSEP]⁶ that was implemented from July 2011 to June 2015. The other components of the CBSEP were: upgrade of Customs web-based management system from Asycuda++ to Asycuda World, Electronic Cargo Tracking System [ECTS], and training of Customs officials to implement the three project components. Besides donor financial support, the WCO provided technical support to URA the implementation process in the form of training and provision of relevant technical materials such as the implementation guide, AEO templates, SAFE framework standards and model appeal procedures.⁷

The implementation of the program started with sensitization of individuals, business entities and government departments, involved in international trade, on the benefits of being an AEO and the requirements for accreditation. Some 28 firms involved in Uganda's international trade were accredited between 2012 and 2016. Ten (10) firms were granted AEO status in May 2013, 12 firms in 2014 and 6 in 2016 (Table 1A in Appendix).

The process of AEO accreditation is voluntary, free, and takes a minimum of two

⁵ Ibid 4.

⁶ Uganda Revenue Authority (URA). *Customs Business Systems Enhancement Project Closure Report* (Uganda Revenue Authority, 2016).

⁷ URA. *Evaluation of the Managing Compliance Programme (2011/12-2014/15). Final Report* (URA, 2015).

months.⁸ It involves the following six steps: submission of a written expression of interest to URA Commissioner of Customs, preliminary consultation with Customs AEO team, filling-in forms – with supporting documents (on sound management of commercial records, good financial standing and good compliance history with Customs and other government regulatory bodies), vetting of eligibility of the applicant, on-site inspection of applicant premises to confirm information provided in the application, and authorization/approval of the entity as AEO by Commissioner of Customs.

Accounts from firms that have received AEO accreditation suggest that the accreditation process of in Uganda is cumbersome, laden with indirect costs that adversely affect small and medium scale businesses, and lengthy - taking not less than six months.⁹ Conformity to security standards is considered the most costly eligibility criteria, as it requires the firms' premises to abide by the minimum business partnership management procedures, conveyance and container security, physical access controls, procedural security, information technology (IT) security, and personnel security.

1.2 Problem Statement

Delays in Customs clearance of goods lead to significant costs to firms involved in international trade and loss of tax revenue to governments'.¹⁰ There are over 400 firms involved in international trade based in Uganda, however only 28 firms were AEO accredited by end of 2016 suggesting a low uptake of the AEO accreditation program in Uganda, despite its benefits. The low uptake implies that the cost of Customs clearance remains high, which negatively impacts the government's tax revenue.

1.3 Objective of the Study

The overall objective of the study was to assess the impact of AEO accreditation on

⁸ Additional information on AEO accreditation process can be obtained at <http://web.ura.go.ug/Pages/Guides%20for%20Importation%20of%20Goods%20to%20Uganda/Authorized%20Economic%20Operator.aspx> (accessed 15 July 2017).

⁹ This is not the prescribed way for referencing electronic resources. Please refer to the guideline it provides clear details on how to reference the different sources.

¹⁰ Organization of Economic Cooperation and Development (OECD). The Costs and Benefits of Trade Facilitation (OECD, October 2005). Available at <http://www.oecd.org/trade/facilitation/35459690.pdf> (accessed 4 March, 2017).

trade facilitation in Uganda. The specific objectives of the study were to examine:

- (i) The impact of AEO accreditation on clearance time as a measure of trade facilitation.
- (ii) The impact of AEO accreditation on firm's trade volume.
- (iii) The impact of AEO accreditation on the amount of Customs taxes paid by firms.

2. REVIEW OF LITERATURE

According to article 7.7 of the World Trade Agreement (WTO) Trade Facilitation Agreement (TFA),¹¹ eligible authorized operators are required to have in place trade facilitation measures that include: appropriate record of compliance with Customs and related regulations, financial solvency including the provision of sufficient security such as guarantee bonds where necessary, supply chain security management systems, and IT system for safe keeping of data and documentation to allow for internal controls.¹²

Studies conducted by the Organization for Economic Cooperation and Development¹³ and the World Bank¹⁴ have argued that clearance delays have an impact on clearance costs. This includes compliance costs related to information requirements, and other costs arising from procedural delays and lost business opportunities. The studies further estimate that border-related costs and expenses arising from clearance delays range between 2% to 15 % of the total value of goods traded goods. On the other hand,

¹¹ The TFA entered into force on 22 February 2017 and applies only to the WTO members that have accepted it. Details of the article 7 of the TFA is available at https://www.wto.org/english/docs_e/legal_e/tfa-nov14_e.htm#art7 (accessed 15 July 2017).

¹² WCO, *Customs-Business Partnership Guidance* (WCO, June 2015). available at <http://www.wcoomd.org/en/media/newsroom/2015/july/~media/E2B8A58843F44C55AD21BBE9BA2672B3.ashx> (accessed 28 July, 2017).

¹³ Ibid 10.

¹⁴ World Bank, *Turning the Tide in Turbulent Times: Leveraging Trade for Kazakhstan's Development* (World Bank, 2017).

inefficient border procedures in some African countries account for lost government revenue in excess of 5% of gross domestic product.¹⁵

Hummels and Schaur studied the impact of time delays as a cost on the value of goods in transit.¹⁶ The results of their study indicate that each day in transit is worth 0.6% to 2% of the value of the good, and that long transit delays significantly lower the likelihood of a country exporting the good in question.

According to the Compendium of Authorized Economic Operator Programs, in 2014, a total of 26 countries were implementing AEO programs.¹⁷ That included 9 countries in the Americas and Caribbean Region, one country (Jordan) in Middle East and Northern Africa Region, two countries (Uganda and Kenya) in East and Southern Africa Region, 9 countries in Asia Pacific Region, and 5 countries in Europe Region. However, by March 2016, 69 countries were implementing the AEO program and 16 countries were slated to start implementation.¹⁸

The first group of countries to implement the AEO program on a full-scale or pilot basis included Canada, Japan and the European Union.¹⁹ In East Africa, Kenya was the first country to implement the AEO program in 2010 followed by Uganda in 2012 and Burundi in 2013.²⁰

The implementation of the AEO program around the world has been associated with mixed experiences and benefits. There's mixed perceptions with respect to the benefits of AEO accreditation compared to the time, effort and costs associated accreditation process. According to the WCO, certification as an AEO is an arduous task in which firms invest heavily, yet Customs administrators often fail to offer substantial benefits

¹⁵ OECD, 'Trade Facilitation Indicators: The Potential Impact of Trade Facilitation on Developing Countries' Trade' (Trade Policy Paper No. 144, OECD, January 2013).

¹⁶ Hummels, David, and Georg Schaur. 'Time as a Trade Barrier' (2013) 103(7) *American Economic Review* 2935-59.

¹⁷ WCO, 'World Customs Organisation'. Available at https://www.icao.int/Meetings/AirCargoDevelopmentForum-Togo/Documents/AEO-Compendium_ed_2014.pdf (accessed 28 July, 2017).

¹⁸ WCO, 'Compendium of Authorized Economic Operator Programmes', (WCO, 2016). Available at [http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/aeo-compendium-en--2016-\(1\).pdf?la=en](http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/aeo-compendium-en--2016-(1).pdf?la=en) (accessed 28 July, 2017).

¹⁹ Ibid 17.

²⁰ Ibid 18.

in the form of trade facilitation.²¹ The WCO has credited this challenge to the slow uptake of AEO programs worldwide.

The Australian Customs and Border Protection Service commissioned a survey on industry attitudes toward an AEO just two years after the implementation of its pilot AEO program first in 2006/7 and later in 2009/10. The results of the two surveys consistently showed that none of the industry executives surveyed considered that an Australian AEO scheme would offer net benefits.²² Instead, the executives believed that the scheme's costs would outweigh potential benefits.

Djankov, Freund and Pham²³ estimated the effect of time delays on the volume and value of exports in 126 countries (including Uganda) using the difference gravity equation – a variant of the gravity model. The results of their study found that a 1% increase in export time in a landlocked country reduced trade by 1%; and generally that time delays hurt trade.

Fernandes, Hillberry and Alcántara²⁴ used a two-stage least squares regression method to estimate the impact of reduction in physical inspection rates on Customs clearance and volume of trade in Albania. The results of their study show that conditional reductions in physical inspection rates lead to significantly lower delays in Customs for Albanian imports. Further, the results show that reduced delays in Customs increased imports through increased number of firms involved in shipping and the number of shipments.

²¹ Details on this subject are at <http://tfig.unece.org/contents/authorized-economic-operators.htm> (accessed 28 July, 2017).

²² George Barker, 'A Survey of Australian Industry Attitudes to Authorised Economic Operator Schemes' (Australian National University, 30 August 2011).

²³ Simeon Djankov, Caroline Freund and Cong S. Pham, 'Trading On Time' (2010) 92(1) *Review of Economics And Statistics* 166, 173.

²⁴ Ana Margarida, Fernandes; Henry Russell, Hillberry; and Alejandra Alcantara, Mendoza, 'Trade effects of customs reform: evidence from Albania' (Policy Research working paper no. WPS 7210: Impact Evaluation series, World Bank Group, 2015). Available at <http://documents.worldbank.org/curated/en/713351468190188513/Trade-effects-of-customs-reform-evidence-from-Albania> (accessed 28 July 2017).

Tegneman and Tryggvason²⁵ conducted a qualitative survey among 10 executives of Swedish AEO certified firms to understand their perceptions regarding the costs and benefits of the firms being AEO accredited. The authors' report indicates that Swedish industry executives were generally satisfied with benefits that come with being AEO accredited. For example, it is reported that AEO certification provided the firms with some form of quality approval/stamp. That AEO certified firms trading partners considered them to be safe and secure –which in turn increased the volume of trade. On the issue of costs, the executives of AEO firms considered the effort and time expended in the accreditation process to be substantial compared financial outlay.

Improving trade facilitation through AEO accreditation mechanisms plays a critical role improving the income of accredited firms as well national revenue. According to Hoekman and Shepherd²⁶ the national income effects of improved trade facilitation can be up to two or three times as great as those that would result from removing all tariffs on manufactured goods globally.

The foregoing literature highlights the mixed reviews of AEO benefits. To push the agenda of AEO accreditation forward, it is therefore critical that further reviews of the benefits of the AEO program are undertaken and shared.

²⁵ Oliver Tegneman and Sindri Tryggvason, 'Authorised Economic Operator: Looking into the current perception and the future of the AEO program in Sweden' (Master Degree Project, University of Gothenburg, 2015) Available at https://gupea.ub.gu.se/bitstream/2077/39952/1/gupea_2077_39952_1.pdf (accessed 28 July 2017).

²⁶ Bernard M, Hoekman and Ben Shepherd, 'Who profits from trade facilitation initiatives?' (European University Institute Working Paper No. 2013/49) Available at https://www.sasec.asia/uploads/publications/RSCAS_2013_49.pdf (accessed 27 July 2017).

3. METHODOLOGY

This section presents the theoretical foundation of the model used in the analysis, and the source of data. Furthermore, the section also provides an explanation on what was involved in data processing.

3.1 Theoretical Model

This study used the matched difference-in-differences (matched DD) method to estimate the trade facilitation benefits that accrue to AEO accredited firms compared to peer non-AEO accredited firms in Uganda that are involved international trade. The matched DD method is a robust method that is highly recommended Khandker, Koolwal & Samad.²⁷ Gertler, Martinez, Premand, Rawlings & Vermeersch²⁸ and widely used Bergemann, Fitzenberger & Speckesser, Cattaneo, Galiani, Gertler, Martinez & Titiunik.²⁹

2009; Okoboi, Kuteesa & Barungi;³⁰ Okoboi and Mawejje³¹ in non-experimental longitudinal (panel data) impact studies.

Matched DD method involves two steps. The first step involves use of the propensity score matching (PSM) data analysis technique to generate a comparison group of sample observations –that prior to implementation of a program, have similar characteristics as sample observations that is exposed to the program (treatment group). The second step in the matched DD method is the actual determination of impact of a program –through the difference in difference (DD) regression analysis of matched data, on the group that was exposed to the program (treatment group) in comparison to

²⁷ Khandker, S. R., Koolwal, G. B., & Samad, H. A. , *Handbook on Impact Evaluation: Quantitative Methods and Practices* (World Bank, 2010)

²⁸ Gertler, P., J, Martinez, S., Preman, P., Laura B. Rawlings, Christel M. J. Vermeersch, *Impact of Evaluation in Practice* (Washington, DC: World Bank, 2011).

²⁹ Bergemann, A., Fitzenberger, B., & Speckesser, S., ‘Evaluating the Dynamic Employment Effects of Training Programs in East Germany Using Conditional Difference–in–Differences’ (Discussion Paper No. 04-41. Centre for European Economic Research, 2004). Available at <ftp://ftp.zew.de/pub/zew-docs/dp/dp0441.pdf> (accessed 11 July 2017).

³⁰ Okoboi, G., Kuteesa, A., & Barungi, M., *The impact of the national agricultural advisory services Program on household production and welfare in Uganda* (Washington D.C.: African Growth Initiative at Brookings, 2013).

³¹ Okoboi, G., & Mawejje, J. (2016, January 19). The impact of adoption of power factor correction technology on electricity peak demand in Uganda’ (2016) 5(3) *Journal of Economic Structures*, 4-3.

the other group that was not exposed to the program. The advantage of the matched DID method is that the likely observable heterogeneity in the initial conditions is done away with to ensure that the comparison group is similar to the treatment group Khandker et al.³²

The impact analysis approach assesses the double effect of with-without and before-after scenario of the intervention. The intervention in this case being AEO accreditation program. AEO accreditation program was launched in 2012. Therefore rolling out AEO accreditation program represents the treatment and in our case, the treatment group (with treatment) are firms enlisted in the AEO scheme and the comparison group (without treatment) are firms not enlisted in the scheme. The period before 2012 represents the before treatment scenario and 2012 onwards represents the after treatment scenario.

In order to identify the comparison group that have similar characteristics as the treatment group, the first step of our analysis involved using the propensity score algorithm to extract from our data, a batch of firms (comparison group) with similar baseline or pre-treatment characteristics as those enrolled in AEO (treatment group). The PSM algorithm as adapted from Rosenbaum and Rubin³³ is presented in equation (1).

$$P(X) = \Pr(T = 1|X) = E(t|X) \quad (1)$$

Where $P(X)$ is the propensity score, \Pr is the probability, $T = \{0, 1\}$ is an indicator of exposure to treatment (i.e. enrolment in AEO: $T = 1$ if firm accredited AEO, 0 otherwise, and X is a vector of background characteristics before exposure to treatment. E is the mathematical expectation symbol. Equation 1 states that the probability (\Pr) of a firm participating in AEO, given its pretreatment background characteristics (X) is the conditional mean of the treatment (T).

³² Shahidur R. Khandker , Hussain A. Samad and Gayatri B. Koolwal, ‘Handbook on Impact Evaluation: Quantitative Methods and Practices’ (World Bank, October 2009).

³³ Paul R. Rosenbaum, Donald B. Rubin *Biometrika*, ‘The Central Role of the Propensity Score in Observational Studies for Causal Effects’ (Vol. 70, No. 1., Apr., 1983),41-55.

Having obtained two groups of firms with similar characteristics except their status of enrolment in AEO, the second step of our analysis involved estimating a Ravallion³⁴DD regression equation (equation 2) to assess the beneficial trade facilitation, trade growth and Customs revenue increase prospects associated with URA rollout of AEO accreditation program.

$$Y_{im} = \alpha + \phi T_{im} t_{im} + \beta T_{im} + \delta t_{im} + \varepsilon_{im} \quad (2)$$

Where, Y is the outcome variable, T is the variable representing exposure to treatment (i.e. whether or not firm enrolled in AEO), t is the time dummy variable representing the period before (t=0) enrolment and after (t=1) enrolment in AEO, and the coefficient of the interaction of T and t (Φ) is the estimate of the impact of treatment on outcome Y.

The subscripts *i* and *m* on the variables in equation (2) are panel data notations, where *t* stands for the number of individual observations (individual dimension) and number of time periods (time dimension). As indicated in section (2.3), this study involved analysis of a panel data of 26,800 to 33,800 firms whose data had been collected over a period of 108 months (January 2008 to December 2016).

3.2 Empirical Models

Based on the general formulation in equation (1) and available data, the specific PSM model estimated was a probit model stated in equation 3:

$$Pr(T_{im}) = \beta_0 + \beta_1 TV_{im} + \beta_2 tax_{im} + \varepsilon_{im} \quad (3)$$

Where, $Pr(T)$ is the dependent variable – denoting the probability (Pr) of T; T is a dummy representing the treatment that is; the rollout of AEO accreditation program. Specifically $T=1$ if the firm is AEO accredited and $T=0$ if not AEO accredited; TV is the value of goods declared at Customs by the firm in a month and tax is total tax paid on goods declared. In this case, we assume that firms are similar based on their commercial characteristics – similar value of and tax on goods traded. ε is the error term representing any other factors not included in equation (3) but may have impact

³⁴ Ibid 33.

on the dependent variable. i is the panel data notation for number observations and m number of months.

For the DID regression model in equation 2, the specific models we estimated are presented in equation 4a to 4c. That is:

$$TF_{im} = \alpha_0 + \alpha_1 T_{im} * t_{im} + \alpha_2 T_{im} + \alpha_3 t_{im} + \omega_{im} \quad (4a)$$

$$TV_{im} = \phi_0 + \phi_1 T_{im} * t_{im} + \phi_2 T_{im} + \phi_3 t_{im} + \vartheta_{im} \quad (4b)$$

$$CT_{im} = \gamma_0 + \gamma_1 T_{im} * t_{im} + \gamma_2 T_{im} + \gamma_3 t_{im} + \mu_{im} \quad (4c)$$

Where, the dependent variable (TF) in Eq. (4a) measures trade facilitation and is represented by clearance time in days. That is the time taken by a firm to clear goods at any of the 37 Customs collecting stations/borders out of which, 6 are OSBPS (One Stop Border Posts). The clearance time is determined from the time the firm lodges the tax assessment/clearance documents with URA to the time the goods exit URA Customs jurisdiction.

T , as explained above is a dummy representing the treatment: $T=1$ if the firm is AEO registered and $T=0$ if not AEO registered;

t is a dummy representing the before and after implementation of the AEO accreditation program: $t=1$ if year is January 2012 to December 2016 (the time after rollout of AEO accreditation program) and $t=0$ if the year January 2008 to December 2011 (the time before rollout of AEO accreditation program).

$T*t$ represents an interaction term between T (whether or not a firm is AEO) and t (period when or not firm operates as AEO)

ω , ϑ and μ are error terms representing any other factors not included in the respective specified equations above; $\alpha_0 \dots \alpha_3$, $\phi_0 \dots \phi_3$ and $\gamma_0 \dots \gamma_3$ are parameters to be estimated; and $i = 1, 2, \dots, n$ is number of observations from first to the last (n) and $m = 1, 2, \dots, m$ is the time in months from January 2008 to December 2016.

The coefficients of the interaction term (that is α_1 , ϕ_1 and γ_1) represent the estimate of the impact of the firm's accreditation as an AEO on trade facilitation, trade volume and

Customs revenue paid.

Equation (3) was estimated using the probit propensity score matching (PSM) model while Equations (4a) to (4c) were estimated using the bootstrapped ordinary least squares (OLS) regression.

3.3 Data and Source

The study used import and export (Customs) data for the period January 2008 to December 2016 (108 months). The data was generated from the URA Asycuda³⁵ databases. Over 10 million individual trade flow records were extracted from Asycuda databases, exported into STATA SE 14 for further management before analysis. Data management involved conversion of string variables into numerical data (floats), conversion of daily records (aggregation or averaging) into monthly records. For example, clearance time variables that appear in Customs database as non-numerical characters were de-stringed (converting into numerical variables); daily transaction records for each firm were collapsed into monthly records through aggregation of records by firm and by month; clearance time per transaction was converted into a monthly average for each firm.

After the data management processes, our final tally of observations ranged between 26,800 to 33,800 with about six key variables as indicated in Table 2A of summary statistics in the appendix

³⁵ Asycuda is an acronym that stands for Automated System for Customs Data. The current version of that URA is using is Asycuda World. Before 2013, URA was using Asycuda++.

4. RESULTS AND DISCUSSION

The DID regression results of the impact of AEO accreditation on firm's clearance time, trade volume and tax revenue paid by firms involved in Uganda's international trade is presented in Table 1. In the table, the impact of AEO accreditation on firm's clearance time is shown in Part A, trade volume in Part B, and tax revenue in Part C. Based on the Wald-chi statistics in all the panels that were statistically significant, it can be concluded that the overall model estimates were robust.

Estimated coefficients of the impact variable (interaction term) in all the equations (in all the panels) had the expected signs and were statistically significant at less than 1% level of significance. This clearly suggests that there are significantly higher trade facilitation benefits that accrue to firms on one hand and government on the other when firms involved in international trade are AEO accredited. However, to fully appreciate the quantitative impact of AEO accreditation program on trade facilitation, we used the fractional polynomial analysis (graphical) method to compare and contrast the trade facilitation outcomes of AEO and non-AEO accredited firms. This analysis and explanation is presented below.

Table 1: Impact of Rollout ASYCUDA World and AEO Accreditation On Trade Facilitation, Trade Volume And Customs Taxes Paid

	Dependent variables								
Explanatory variable	Part A: Clearance time (days)			Part B: Ln (trade value)			Part C: Ln (total tax paid)		
	Coef.	Bootstrap Std. Err.	Z	Coef.	Bootstrap Std. Err.	z	Coef.	Bootstrap Std. Err.	z
AEO	-5.10***	1.50	-3.4	0.15**	0.07	2.27	0.29***	0.11	2.73
Time	-17.61***	1.14	-15.4	0.83***	0.02	34.33	0.15***	0.03	4.7
AEO*Time	-11.67***	1.63	-7.15	0.79***	0.09	9.08	1.20***	0.11	10.5
Constant	22.91	1.15	20.01	7.33	0.02	436.04	19.74	0.02	803.47
Number of obs.	29,608			33,309			25,692		
Replications	50			50			50		
Wald chi ² (3)	362.22***			2623.08***			1097.54***		

Prob > chi2	0	0	0
R-squared	0.021	0.056	0.025
Adj R-squared	0.021	0.056	0.025

Note: **, *** implies statistically significant at 5% and 1% respectively

4.1 Impact of AEO Accreditation on Clearance Time

Figure 1 compares the average time taken by AEO accredited and non-AEO accredited firms to clear goods at URA Customs through green and red channels. The results in Figure 1B, show that before introduction of the AEO accreditation program, firms that eventually became AEO accredited on average took more time (about 20 days) to clear goods compared to peer firms (18 days). However, after accreditation, the same firms took much lower time (about 3 days) to clear goods compared to 5 days clearance time for peer non-AEO accredited firms. This result suggests that AEO accredited firms enjoyed lower clearance time, which as suggested by the AEO implementation guideline,³⁶ could be beneficial in increasing the flow of trade.

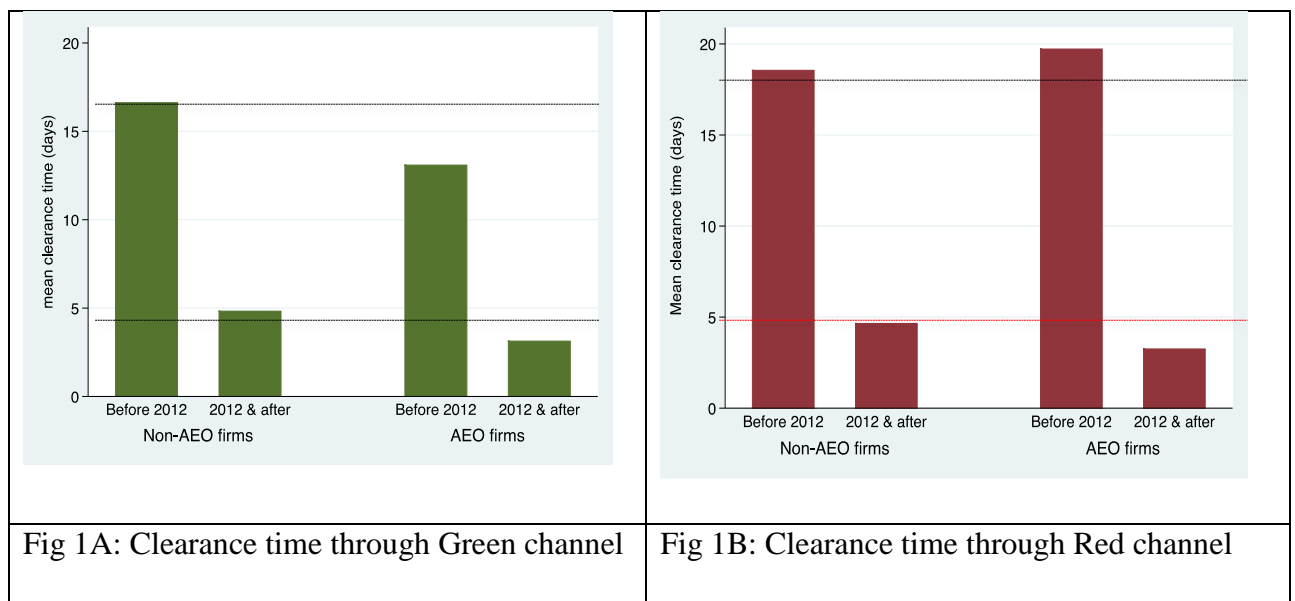


Figure 1: Impact of AEO accreditation on clearance time

³⁶ Ibid 3

4.2 Impact of AEO Accreditation on Firm's Trade Volume and Tax Paid

Figure 2A shows the trend (value) of Customs bound goods of AEO accredited and non-AEO accredited firms and Figure 2B shows total tax paid on Customs bound goods by AEO accredited and non-AEO accredited firms; before and after URA implementation of AEO accreditation program in 2012. The results suggest that before AEO program implementation, both AEO and non-AEO accredited firms had comparable monthly trade turnover and taxes paid with respect to Customs bound goods. After URA rollout of AEO accreditation, however, firms that became AEO accredited were associated with increasingly higher monthly trade volumes (turnover) and taxes paid on Customs bound goods compared to non-AEO accredited firms.

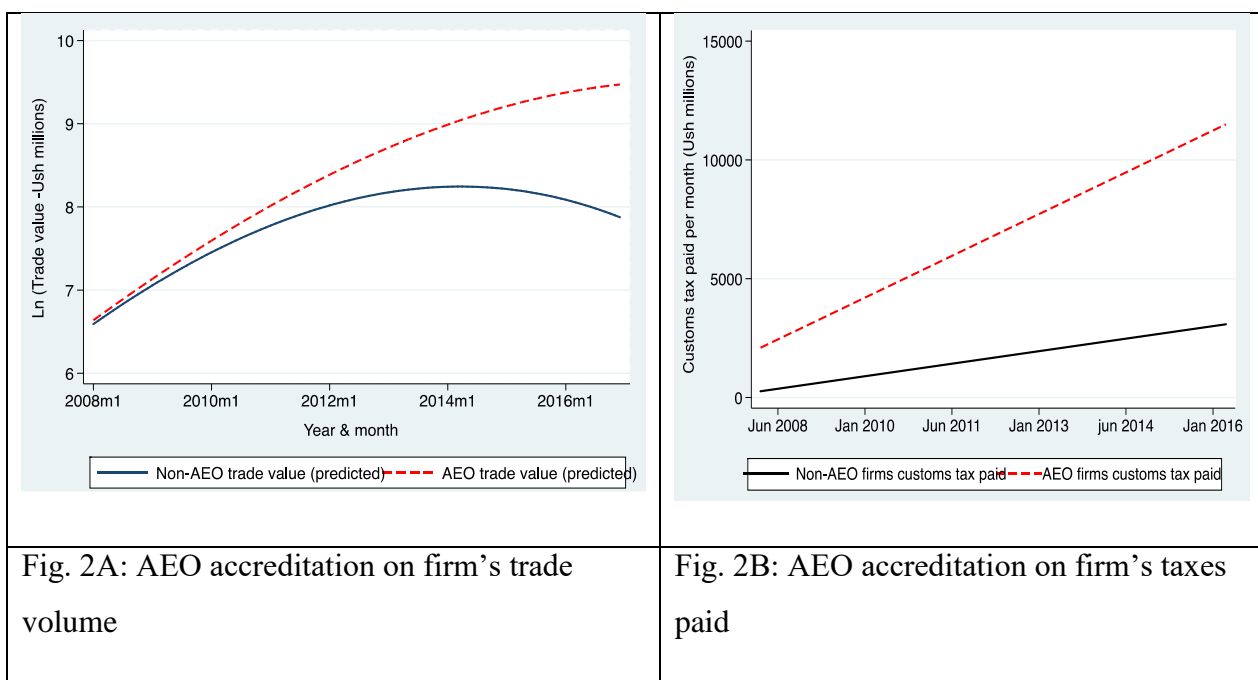


Figure 2: Impact of AEO accreditation on firm's trade volume and taxes paid

5. CONCLUSION AND POLICY IMPLICATIONS

The results of this study show that firms that voluntarily sought and achieved AEO accreditation from URA are reaping benefits that come with expedited cargo release

and exponential growth in trade volumes that they have registered compared to peer firms that are not AEO accredited. Besides, the results show that the quantum of tax paid to government by AEO accredited firms was significantly higher compared to peer firms that are not AEO accredited.

In conclusion, we find that the AEO accreditation program in Uganda has been a success. The study recommends that the government of Uganda through URA should continue promoting and encouraging the international trade community in Uganda to take up AEO accreditation.

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APPENDIX

Table 1A: List of AEO Accredited Firms

S/No.	Company Name	Date of accreditation
1	British America Tobacco	9 th May 2013
2	Nice House of Plastics	9 th May 2013
3	Uganda Batteries Limited	9 th May 2013
4	Jesa Farm Dairy	9 th May 2013
5	Roofings Uganda Limited	9 th May 2013
6	DHL Global Forwarders	9 th May 2013
7	Unifreight Cargo Handling	9 th May 2013
8	Steel and Tube Industries Limited	9 th May 2013
9	Toyota Uganda Limited	9 th May 2013
10	Bollere Africa Logistics	9 th May 2013
11	Spedag interfreight Uganda Ltd	22 nd September 2014
12	General Machinery Ltd	22 nd September 2014
13	Victoria Pumps Ltd	22 nd September 2014
14	Victoria Motors Ltd	22 nd September 2014
15	Victoria Engineering Ltd	22 nd September 2014
16	Victoria Equipment Ltd	22 nd September 2014
17	Rapid Kate Services Uganda Ltd	22 nd September 2014
18	Multilines International Ltd	22 nd September 2014
19	Daks Couriers Ltd	22 nd September 2014

20	Union Logistics Uganda Ltd	22 nd September 2014
21	Bemuga Forwarders Ltd	22 nd September 2014
22	DHL International Ltd	22 nd September 2014
23	Huawei Technologies Uganda Company Limited	15 th April 2016
24	Umeme Ltd	15 th April 2016
25	ThreeWays Shipping Services Limited	15 th April 2016
26	Kenfreight Uganda Limited	15 th April 2016
27	Mitchell Cotts Uganda Limited	15 th April 2016
28	Roofings Rollings Mills Limited	15 th April 2016

Table 2A: Summary Statistics of Data Used In Analysis

Variable	Unit of measure / description	Obs	Mean	Std. Dev.	Min	Max
AEO (T)	T=1 if firm AEO and T= 0 if firm non-AEO	33,811	0.074	0.261	0	1
Trade facilitation (TF)	Clearance time in days	29,608	11.561	62.842	0.00	1855.46
Time (t)	t=1 if year Jan 2012 -Dec 2016 and t= 0 if year Jan 2008 -Dec 2011	33,811	0.603	0.489	0	1
Channel	Green=1, blue=2, yellow=3, red=4	27,602	3.21	1.09	1.00	4.00
av_val_usd	Uganda shillings, millions	33,198	0.74	7.98	0.00	826.00
av_tot_tax	Uganda shillings, millions	26,844	13.20	62.30	0.00	6180.00
Trade volume (TV)	Uganda shillings, millions	33,582	10700.00	69900.00	0.00	6790000.00
val_usd	Uganda shillings, millions	33,582	213.00	1370.00	0.00	146000.00
Total tax paid (TR)	Uganda shillings, millions	33,582	2150.00	12300.00	0.00	716000.00