The impact of FTA import utilization on firm performance: An assessment of Philippine manufacturing MSMEs[1]

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Despite the substantial liberalization under FTAs,

transfers, increased competition, and access to quality inputs (Holmes and Schmitz 2001, Wagner 2007, Criscuolo and Timmis 2017). Importers gain access to foreign intermediate inputs that are usually of higher quality (Sharma 2016). Wagner (2012) posited that importing intermediate inputs can facilitate knowledge and technology transfers, and allow firms to specialize on activities where they strongly perform.

The self-selection and learning-by-doing hypotheses could be extended to FTA use among traders. Hayakawa (2015) suggested that FTA utilization could affect firm performance by

Philippine Business and Industry (ASPBI) and Census of Philippine Business and Industry (CPBI) of the PSA contain valuable information on firm characteristics (e.g., ownership, employment), as well as various aspects of firm operations (e.g., revenues, value added). These indicators allow for the calculation of various performance indicators, such as productivity and capital intensity.

The linking of the data sets was originally a joint initiative of the PSA and a consortium between the University of the Philippines and Erasmus University of Rotterdam in 2013. In this project, the 1991-2012 trade transactions panel was matched with the 1996-2012 survey/census data (Balaoing-Pelkmans 2017). This paper built on this important development by conducting the merging of the trade and survey/census data sets for the period 2012-2019.[3]

Indicators in Philippine Peso (PhP) were deflated using the implicit price index, obtained from the National Income Accounts of the PSA. The index is disaggregated by 2-digit PSIC code and based on 2018 prices. Meanwhile, trade indicators in US$ were first converted to PhP using the annual average exchange rates from the Bangko Sentral ng Pilipinas (BSP 1 42nr0as (BSPthe

the following formula:

$$\text{خاخثة سي ''O''YÖíòŵìòثة خاخثة طى } \frac{\text{نراقيهم حـ نراسيهم خ خ ـ ا ـ ٥٩}^{\circ}}{\text{نراقيهم حـ ٥٩}} \quad (2)$$

where خاخثة ìهم is the estimated propensity score. After obtaining the weights, a balancing test of covariates was performed to ensure that, on average, FTA starters and non-users would be observationally identical in terms of pre-treatment covariates. Using the weights resulted in the control group being transformed into a representative sample of the treatment group, allowing for the estimation of the average treatment effect on the treated (ATT) (Morgan and Todd 2008).

The PSW method addresses selection bias by controlling observable characteristics. However, bias may still arise from time-invariant unobserved firm-specific effects, hence the weights were used in a DID regression. The DID model is shown in the following equation:

$$\text{خاخثة- طى ثة'' طى خ'' طى ج'' طى يةاخاخثة≠ . أطى ٥ةاخاخثة''O''YÖíòŵìòثة أطى ي أسي خاخثة ẁ} \quad (3)$$

where u is the rescaled time such that firm starts using FTAs at u=1, the performance indicator is denoted by خاخثة ẁ, $\text{٥ةاخاخثة''O''YÖíòŵìòثة}$ is a dummy variable for FTA starter status at u=1 (i.e., 1 if firm i switched from FTA non-user to user; 0 otherwise), يةاخاخثة≠ is the set of ex-ante characteristics in Equation 1, and ثة'' captures the time-invariant firm-specific effects. The year and firm fixed effects show that the DID estimation involved multiple firms started using FTAs at different timings.

Various extensions in the empirical approach were conducted. First, the study looked at the longer-term effects of switching FTA user status; particularly, it evaluated the effects on firms that continued to use FTAs for the second consecutive year.[5] It also examined if stopping FTA (خاخثة''O''YÖíòéìه) use also affect a firm's performance. If starting FTA use is hypothesized to generate performance improvements, then stopping use could potentially lead to lower levels of performance. The sample includes FTA users in year *u=0* that either stopped (treatment) or continued (control) using FTAs in year *u=1*.[6]

4. Empirical Results and Discussion

Preliminary Analysis

FTA users and non-users among MSMEs possessed notable differences in terms of various performance indicators. Table 4 shows that, for the period 2012-2019, MSME users have higher productivity levels than MSME non-users. They also tend to be older and hire more workers. However, the degree of internationalization of MSME firms vis-à-vis non-users was not conclusively greater than non-users. While, on average, they have greater import values, they export less than non-users. Compared to non-users, the bulk of revenues of MSME users come from domestic sales, and foreign ownership was uncommon among users.

[5] In this case, the treatment group consists of non-users that became users at u=1 and continued using FTAs at u=*2*. Meanwhile, the control group are those that never used FTAs throughout the period.

[6] The extensions conducted in the empirical analysis were inspired by the study of Baldwin and Yan (2017).

The importance of firm size in FTA use was also assessed, by comparing the characteristics and performance of MSME and large users. On the average, the differences in labor productivity and capital intensity were non-significant between MSMEs and large firms, while large users were significantly older. However, aside from the apparent differences in employment, large firms exhibited greater connection with foreign markets, as their averages in both exports and imports were significantly larger than those of MSME users. Large users had a higher percentage of foreign-owned firms.

Table 4. Differences in Means, Selected Indicators, 2012-2019

	MSME Users	Difference	
		MSME Non-users	Large Users
Labor productivity (thousand PhP, 2018 prices)	1,339.7	534.6***	-106.6
Capital intensity (thousand PhP, 2018 prices)	1,625.2	-144.7	101.6
Total employment (number of workers)	85.5	5.8***	-626.4***
Domestic sales (% of total revenue)	81.2	37.8***	7.6***
Foreign ownership (% of capital participation)	22.4	-34.5***	-11.0***
Age (years)	25.1	7.4***	-3.0***
Exports (thousand PhP, 2018 prices)	106,481.0	-44,881.8*	-1,817,168.2***
Imports (thousand PhP, 2018 prices)	319,233.7	241,439.2***	-1,995,269.0***

Note: A positive value in the difference indicates a higher mean for MSME users; conversely, a negative value connotes lower mean. * and *** denote significance at the 90% and 99% levels, respectively.

Analysis of Empirical Findings

The results of the logit regressions, which served as the basis for the computation of propensity scores, show potential self-selection effects on importers' decision to use FTAs. It can be inferred from the results in Table 5 that foreign ownership and total firm imports were significant determinants of starting and stopping FTA use. Lesser foreign capital participation translated to a significantly higher probability of starting FTA use, while establishing foreign linkages could significantly influence an importer's decision to stop using FTAs. Meanwhile, firm imports were observed to be positive determinants of FTA use. As firms intensified their import activities, they became more likely to start using FTAs. In contrast, firms that lessened their imports were inclined to stop FTA use.

Table 5. Logit Regression Results, Starting and Stopping FTA Use

	FTA Start		FTA Stop	
	1 Year	**2 Years**	**1 Year**	**2 Years**
	(1)	**(2)**	**(3)**	**(4)**
ln(*LaborProductivity*$_{is,t-1}$)	0.094	0.164	-0.041	0.032
	(0.073)	(0.111)	(0.094)	(0.136)
ln(*CapitalIntensity*$_{is,t-1}$)	-0.015	0.010	0.113**	0.093
	(0.032)	(0.049)	(0.047)	(0.072)
Age$_{is,t-1}$	0.015***	0.019**	-0.008	-0.009
	(0.006)	(0.008)	(0.005)	(0.008)
ForeignOwnership$_{is,t-1}$	-1.278***	-1.659***	0.449***	0.632***
	(0.154)	(0.229)	(0.167)	(0.230)
ln(*Imports*$_{is,t-1}$)	0.106***	0.088**	-0.427***	-0.492***
	(0.029)	(0.045)	(0.046)	(0.073)
Industry dummies	Yes	Yes		

import competition due to greater FTA import use could also force firms to seek alternative strategies in order to remain competitive. Thus, policymakers must ensure that necessary support mechanisms are in place to provide a safety net for distressed MSMEs.

Several policy implications could be derived from the analysis of the findings. First, it is imperative to prioritize the easing of FTA procedures and lowering of administrative and compliance costs. The complex process of availing the preferential rates, due to the "noodle bowl effect" of overlapping FTAs, could be reason enough for firms to disregard the benefits of using FTAs (Wignaraja et al. 2011). The Philippines' ratification of the RCEP could be a welcome development in this regard, as the megaregional agreement aims to streamline rules of origin and customs procedures, among others (Malindog-Uy 2022). Second, the Philippine government must intensify policy support to encourage FTA utilization among MSMEs, and ensure that using FTAs would lead to favorable outcomes for these firms. While FTA-specific policies have been initiated during the previous decade (e.g., Doing Business in Free Trade Areas[9]), the government could implement complementary interventions, such as regular monitoring of FTA users, and assisting distressed traders

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Annex 1: Merging of Trade Transaction Data with Annual Survey/Census Data

The merging of the trade transactions data with the ASPBI/CPBI data was conducted by matching the IMP codes with the establishment control numbers (ECN) in the ASPBI/CPBI. The PSA provided a concordance table, consisting of more than 11,000 ECN-IMP matches, which served as the basis for the merging. Prior to merging, the trade transactions were aggregated by IMP code and year, generating firm-level imports, as well as total value of imports under FTAs.

The merging of the two data sets substantially excluded firms in the sample. Table 2 shows that the 2012-2019 survey/census panel data consists of 45,010 observations. Merging with the imports data retained only 28.7% of the observations. Looking at the sectoral distribution of firms, it can be observed that the most notable differences between the original survey/census data and the matched data were in the food manufacturing and electronics sectors. Food products accounted for 22.6% of the total number of observations. After matching with imports data, the percentage of food manufacturing observations decreased 12.5%. In contrast, the share of electronics sectors noticeably increased from 4.9% in the survey/census data to 11.3% in the matched panel data.

Annex Table 1. Distribution of Firms by Manufacturing Sector, 2012-2019

2-digit PSIC Code	Description	ASPBI/ CPBI	Merged with Imports
C10	Food Products	22.6	12.5
C11	Beverages	2.5	0.5
C12	Tobacco Products	0.3	0.4
C13	Textiles	3.6	3.5
C14	Wearing Apparel	6.5	6.4
C15	Leather and Related Products	2.3	1.7
C16	Wood and Wood Products	3.3	2.2
C17	Paper and Paper Products	2.9	3.7
C18	Printing and Reproduction of Recorded Media	3.1	1.3
C19	Coke and Refine Petroleum Products	0.4	0.4
C20	Chemicals and Chemical Products	5.5	5.9
C21	Pharmaceutical Products	1.1	1.4
C22	Rubber and Plastic Products	6.6	9.5
C23	Other Non-metallic Mineral Products	4.3	3.1
C24	Basic Metals	3.6	4.5
C25	Fabricated Metal Products	6.8	8.0
C26	Computer, Electronic and Optical Products	4.9	11.3
C27	Electrical Equipment	3.1	4.9
C28	Machinery and Equipment nec	3.3	4.1
C29	Motor Vehicles, Trailers and Semi-trailers	2.3	4.4
C30	Other Transport Equipment	1.3	1.8
C31	Furniture	3.3	2.8
C32	Other Manufacturing	4.1	4.6
C33	Repair and I[1ED 20/Lang (en-US)b4 G[ )]T.		

Annex Table 2. Variable Operationalization

Variable	Definition
$LaborProductivity_{is,t}$	Value-added per permanent worker
$CapitalIntensity_{is,t}$	Total book value of tangible and intangible assets, divided by number of permanent workers
$Employment_{is,t}$	Total number of permanent workers
$ExportIntensity_{is,t}$	FOB value of goods exported, as percentage of total revenue
$Imports_{is,t}$	Total FOB value of goods imported
$Age_{is,t}$	Age in year t (number of years)
$ForeignOwn_{is,t}$	Foreign ownership

Annex Table 3. Weighted DID Results, Starting and Stopping FTA Use, Large Firms

	FTA Start		FTA Stop	
	1 year	2 years	1 year	2 years
	(1)	(2)	(3)	(4)
ln(*LaborProductivity*$_{is,u}$)				
$ATT_{FTAstart}$	0.031	0.040	0.116	0.309*
	(0.056)	(0.133)	(0.118)	(0.159)
Observations	2,133	1,385	1,413	1,009
R-squared	0.883	0.943	0.915	0.956
ln(*CapitalIntensity*$_{is,u}$)				
$ATT_{FTAstart}$	0.141	0.423	-0.006	-0.269
	(0.099)	(0.259)	(0.164)	(0.545)
Observations	2,143	1,390	1,414	1,015
R-squared	0.891	0.937	0.938	0.944
ln(*Employment*$_{is,u}$)				
$ATT_{FTAstart}$	-0.025	-0.118	-0.031	0.057
	(0.038)	(0.088)	(0.076)	(0.211)
Observations	2,155	1,399	1,421	1,017
R-squared	0.941	0.980	0.971	0.984
ExportIntensity$_{is,u}$				
$ATT_{FTAstart}$	-0.023	0.004	-0.006	0.015
	(0.019)	(0.004)	(0.005)	(0.015)
Observations	2,155	1,399	1,421	1,017
R-squared	0.156	0.680	0.790	0.794
ln(*Imports*$_{is,u}$)				
$ATT_{FTAstart}$	0.505***	2.466***	-0.774***	-2.336**
	(0.180)	(0.841)	(0.203)	(1.202)
Observations	2,155	1,399	1,421	1,017
R-squared	0.893	0.926	0.956	0.952

Note: Time, industry, and firm fixed effects were included. Standard errors are reported in parentheses. *, **, and *** denote

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