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The Impact of the Rise in Chinese Imports on Firms' Performance: A Case Study on Manufacturing Firms in Thailand and the Philippines

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Abstract

The rapid rise of Chinese trade in the world today warrants an examination of its effects on firms' performance. Using firm level data from Thailand and the Philippines, this study analyses the impact of an increase in Chinese import shares on the firms' profitability, sales, costs, innovative activity and labour productivity. The results revealed a negative impact on the firms' profitability, sales and costs. Additionally, labour productivity in terms of added value per cost of worker increased with higher import share. The impact on manufacturing firms alone was similar, except for a positive impact on productivity in terms of both added value and sales.

JEL Classification: F14, F61

Keywords: Trade, Firm Performance, Productivity

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1. Introduction

Over the last decades, China's exports figures have skyrocketed upwards. From 1998 to 2018, China's share of total global merchandise exports increased from 5.3% to 14.6% (UN Comtrade, n.d.). As China increasingly dominates global trade, it is imperative to understand the effect the increase imports from China on firms' performance.

Many studies have found firms' productivity increasing alongside foreign imports (Amiti & Konings, 2016; Bloom, Draca, & Van Reenen, 2016; Keller, 2000; Macdonald, 1994; Thangevelu & Rajaguru, 2004). However, the effect on profitability and innovation of firms varies depending on the source of imports and the country importing the goods. This paper aims to contribute a Southeast Asian (SEA) perspective by using firm-level data to estimate the effects of Chinese imports on the performance of manufacturing firms in Thailand and the Philippines.

To analyse the data, an Ordinary Least Squares (OLS) with Fixed Effects (FE) model and two Instrumental Variable (IV) models were used to estimate the impact on firm performance. Making use of the tariff reduction schedules imposed on ASEAN countries by the ASEAN-China FTA, the changing tariff rates imposed on Chinese imported goods by countries were used as IV for import share. Adopting Anderson & Hsiao (1982), the lag of the import share was also used as an IV for the first differenced import share.

The results indicate that an increase in Chinese import share does cause a decrease in sales and costs for firms. Added Value (AV), a proxy for profitability, was also revealed to be negatively impacted by an increase in Chinese import shares. Due to the way AV was computed, the estimated negative impact suggests that the magnitude of decrease in sales is larger than that of costs. Labour productivity proxied by sales per labour costs was estimated to have a significant positive effect. Even though sales figures were negatively impacted, the overall

positive impact on labour productivity might be due to the decrease in labour costs from higher import shares. No significant impact was found for innovation activity of firms.

In addition, the impact on a subsample of manufacturing firms was studied. The effect of an increase in import share on most performance indicators were identical to that of the full sample. However, while labour productivity proxied with sales was not impacted, productivity proxied with AV had a larger positive magnitude. This could be explained by the greater negative impact on labour costs in manufacturing firms as compared to the full sample. Similar to the full sample, patent activity of manufacturing firms was not impacted.

To understand if there are heterogenous effects across countries, a separate analysis was conducted for each of the countries. Thai firms seem to be affected similarly for the most outcome variables compared to the main regression. This is to be expected as Thai firms form the majority of the firms analysed in the main regression. However, an increase in Chinese import shares appears to negatively impact Thai firms' patent activity as compared to no significant impact in the main regression, warranting a deeper look into the reasons. On the other hand, Filipino firms seem to be largely unaffected by the rise in Chinese import shares. Most outcomes do not have statistically significant results, except for the Added Value (AV) of the firm which appears to be positively impacted by an increase in Chinese import share.

2. Literature Review

The literature on the impact of an increase imports on the productivity, profitability and innovation activities of the firms in the importing country can be split into two main streams of research that attribute effects to: (1) foreign imports raising import competition in the country, (2) higher quality and cheaper imported intermediate inputs used in production.

2.1. Import Competition

There are various ways import competition affects firm performance. Autor et. al. (2017) suggests that the firms' profitability and sales will drop as consumers preferences shift towards imported goods. Another, which stems from basic microeconomic theory, posits that local producers are unable to charge high mark-ups as competition increases with higher foreign imports, resulting in lower sales and profits. The negative relationship between import competition and profitability has been exhibited by Domowitz & Hubbard (1986), Turner

(1980) and Peltonen, Skala, Peltonen, Skala, & Rivera (2008) using data from United States (US) and United Kingdom (UK) and European manufacturing firms' respectively.

With lower profitability, incentive to invest in research and development (R&D) is reduced as well (Autor et al., 2017). Autor et al. (2017) verified that rising levels of Chinese competition resulted in a decrease in patent production amongst US manufacturing firms.

On the other hand, the opposing stream of research argue that the increase in imports increases innovation, productivity and profitability. Aghion et al. (2015) proposed that an increase in competition fosters innovation and productivity growth as firms are forced to engage in vertical innovation and thus increase productivity. Schmidt (1997) and Raith (2003) also suggested that the threat of liquidation and greater incentive from higher import competition push managers to put in more effort to increase profitability, innovation and productivity. The positive relationship between import competition, innovation and productivity had been endorsed by several case studies (Bhattacharya & Bloch, 2004; Bloom et al., 2016; Macdonald, 1994).

Case studies done in this area are primarily focused on manufacturing firms and countries from the global north (Autor et al., 2017; Bloom et al., 2016; Domowitz & Hubbard, 1986; Macdonald, 1994; Turner, 1980). Developing nations in SEA are fundamentally different from the countries in the global north. Thus, results from these studies cannot be extrapolated to determine the impact on firms in developing SEA nations and firms from other industries. The current literature also does not appear to have a cohesive argument on the effects higher import competition has on firms' performance.

Moreover, variables such as import sales ratio (Domowitz & Hubbard, 1986), import penetration ratio (Autor et al., 2017) and growth ratio of imports to shipment (Macdonald, 1994) that were used to proxy for import competition could also proxy for the effect of intermediate inputs as well. For example, in Domowitz & Hubbard (1986), a high import to sales ratio could indicate high import competition which might reduce profitability. At the same time, it also suggests high volumes of imported inputs which could affect costs and profitability. It would be inaccurate to attribute all the effects of increase in imports to import competition alone.

2.2. Import of Intermediate Inputs

Like import competition, increased imports of intermediate inputs have ambiguous effects on firm outcomes. With lower tariffs, firms may purchase larger quantities and varieties of intermediate inputs of higher quality at lower prices. Liu & Qiu (2016) posits that firms may conduct R&D using these imported inputs which reduces R&D costs or increases the R&Ds' effectiveness, increasing the incentive to engage in R&D. Intermediate inputs import may also facilitate technology sharing and learning across borders, thus enhancing productivity and innovation (Aghion & Howitt, 1992; Keller, 2000). Studies done on productivity in manufacturing firms from G7 countries (Keller, 2000) and manufacturing plants in Indonesia (Amiti & Konings, 2007) have shown that a rise in intermediate input imports does increase productivity. Alvarez & Robertson's (2004) study on Mexico manufacturing plants has also established that firms which import intermediate inputs tend to have higher innovation activities.

Profitability of firms may also increase with decreasing intermediate inputs cost as production costs of the firm are lowered. At the same time, this may discourage firms from innovating and increasing productivity as they can easily raise profit margins and productivity by importing inputs (Liu & Qiu, 2016). Liu & Qiu's (2016) study on Chinese firms demonstrates that the innovation reduction effect dominates the inducing effect.

Similar to studies on import competition, these studies are mostly based on manufacturing firms only. Moreover, the results pertain more towards the impact of global imports on a country rather than the effect of a single country's imports. These results cannot be generalised to the impact Chinese imports has on all firms.

3. Data

The analysis uses firm-level data from Bureau van Dijk's ORBIS historical database, trade flow data from UN Comtrade and tariff on imports data from Philippine's Tariff Commission and China's Ministry of Commerce.

The Filipino and Thai firm-level data obtained from ORBIS included sales figures, costs of goods, costs of labour, number of patents filed per year and three-digit primary Standard Industrial Classification (SIC). From UN Comtrade, the amount of imports Thailand and

Philippines imported globally and from China up to Harmonised System (HS) 6-digit level of granularity was used.

3.1. Chinese Import Impact

To estimate the effect of Chinese imports on firms, the impact of Chinese imports is approximated using the "value share" approach by Bernard, Jensen, & Schott (2006):

$$IMP_{hkt} = \frac{{V_{hkt}}^{China}}{{V_{hkt}}^{World}}$$

Where ${V_{hkt}}^{China}$represents the value of HS6 product category h, imported by country k from China and ${V_{hkt}}^{World}$represents the total value of product category h country k imports from the world.

Using the HS-SIC concordance by Pierce & Schott (2012), the HS6 codes were matched to three- digit SIC industry classification. To get the import share of each industry, the average Chinese import share of HS6 products corresponding to the industry was taken. The import shares of the industries were matched to the firms' primary SIC industry to get a proxy of Chinese import impact on each firm across time. For firms that have more than one primary industry, an average of the import shares of each industry was taken.

3.2. Tariff on Imports

Chinese import shares and the error terms of the model are likely to be endogenous as reverse causality is present. For example, firms' profitability may be impacted by Chinese import shares. However, firms with higher profitability are more likely to import goods as they can afford it. To address the potential endogeneity issues of directly using the Chinese import shares to estimate the impact, the tariff rates imposed on Chinese imports was used as IV for import share.

As part of the ASEAN-China FTA, the Trade in Goods (TIG) agreement signed in 2004 required the reduction of import tariffs on Chinese goods based on the tariff schedules agreed upon. The TIG agreement was amended in 2006, 2010 and 2012. However, since 2006 there has been no changes to the tariff schedule (ASEAN, 2012). Thus, firm performance shocks experienced from 2012 to 2017 are uncorrelated with the import tariffs that were set in 2006,

satisfying the IV exclusion restrictions. From 2004 to 2019, Thailand and Philippines have increased their Chinese import shares from 8.7% to 21.1% and 6.1% to 22.8% respectively, indicating the effectiveness of tariff removal in increasing Chinese import shares.

As HS classification updates every five years, both the HS-SIC and tariff schedules at HS6 levels were converted to HS6-2012 using concordances by Pierce & Schott (2009) and then matched them to their corresponding SIC industries using concordances by Pierce & Schott (2012). For both countries, the in-quota tariffs were assumed for products that had differential rates. The average tariff rates the SIC industries were subjected to were matched to the firms' primary SIC industry to determine the tariff rates faced by each firm. For firms with more than one primary industry, an average of the tariff rates corresponding to the industries the firm belongs to was taken.

3.3. Costs and Added Value

ORBIS contains firms' yearly sales figures and costs of goods sold. The added value (AV) of the firms was computed by subtracting costs of goods sold from sales ($sales - costs\ of\ goods\ sold$). AV and sales were used to estimate the profitability and output of the firm respectively.

3.4. Labour Productivity

Two measures of labour productivity were used: (1) the ratio of sales and the total costs of employees and (2) ratio of added value to the total costs of employees. Total employee cost is an approximate for the number of man-hours put into the production of goods. Thus, the ratios would be an approximate for output and profits per manhour which is also an estimate for labour productivity. Due to data limitations, only Thai labour productivity was computed.

3.5. Patents

To measure the level of innovation activity in firms, the number of patents filed by the firms was used (Crosby, 2000) at the European Patent Office (EPO). Firms that were reported to have no patents filed at the EPO were assumed to have no patents at all.

3.6. Descriptive Statistics

The data used includes over 1 million observations, 95.7% of which are Thai firms. Firms faced an average of 1.49% Chinese imports exposure and import tariff rates averaging at 0.02% (**Table 1**). Judging by the small standard deviations, firms appeared to be subjected to somewhat equal impact from Chinese imports and tariffs on Chinese imports.

On the other hand, a wide variation in financial outcome variables between firms was observed. Annual sales and VA averaged at USD 2.19M and USD 360k per firm respectively with standard deviations more than 19 times its average. Costs of goods sold also varied greatly between firms with an average of USD 1.83M and a standard deviation of 28 times the average.

Table 1: Summary Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Independent Variables					
Chinese Import Impact (%)	1,004,368	1.49	5.05	0.00	88.07
Tariff Rates (%)	1,004,368	0.02	0.64	0.00	46.786
Dependent Variables					
Sales (Million USD)	1,004,368	2.19	56.1	0.00	27,300.00
Added Value (Million USD)	1,004,368	0.36	7.07	-142.00	2,840.00
Costs of Goods (Million USD)	1,004,368	1.83	52.90	0.00	27,300.00
Number of Patents	1,004,368	0.00023	0.03	0.00	10
$\frac{Sales}{Labour\ Costs}$ *	33,817	59.37	842.71	0.00	71,267.82
$\frac{Added\ Value}{Labour\ Costs}$ *	33,817	12.50	180.09	-618.50	18,572.20

*Due to data limitations, only Thai firm data points were used for computation

Firms also seemed to have very few patents filed per year with an average of 0.000225 patents. This is unsurprising as the average number of patents filed by Thailand and Philippines per year from 2012 (8,194 and 3,747 respectively) (WIPO, n.d.) is miniscule compared to the number of data points used in this analysis.

Thai's labour productivity has large variations across firms. Both labour productivity measures have huge standard deviations with extremely large min-max ranges.

4. Empirical Methodology

To estimate the impact of Chinese imports on the productivity, profitability and innovation activity of these firms, the following models were adopted:

4.1. Ordinary Least Squares Fixed Effects

Consider the OLS-FE model:

$$\ln Y_{ijkt} = \beta\, IMP_{ijkt} + \tau_t + \theta_i + \eta_{kt} + \alpha_{jk} + \varepsilon_{ijkt}$$

where ln (Y_{ijkt}) represents the natural-log transformed[1] dependent variables. IMP_{ijkt} is the impact of Chinese imports for firm i, in industry j, country k and year t. τ_t and θ_i are time and firm-level fixed effects respectively. The control variables include country-year (η_{kt}) and industry-country (α_{jk}) dummy interaction variables to capture country and country-specific industry trends.

Industry j was defined using the 10 industry divisions of SIC. Error terms were clustered at country- industry pair levels to satisfy the Stable Unit Treatment Value Assumption (SUTVA).

For labour productivity variables that only use Thai firm data, the following OLS-FE model was used:

$$\ln Prod_{ijkt} = \beta\, IMP_{ijkt} + \tau_t + \theta_i + \eta_{kt} + \alpha_{jk} + \varepsilon_{ijkt}$$

Where ln $Prod_{ijt}$ represents the natural-log transformed productivity variables. IMP_{ijkt} represents the impact of Chinese imports for firm i, in industry j, and year t. θ_i and μ_j are firm and industry fixed effects. Standard errors are clustered at industry level.

[1] For all dependent variables, to avoid the issue of ln(0), a constant is added to the variable before taking the natural log such that: $Y_{ijkt} + constant = 1$

4.2. Instrumental Variable Model: Using Tariffs as Instrument

To address the potential endogeneity between IMP_{ijkt} and ε_{ijkt} due to reverse causality, a 2-Staged Least Squares (2SLS) Instrumental Variable (IV) model was adopted, using the import tariffs imposed on Chinese goods TAX_{ijkt} as IV for IMP_{ijkt}.
The first and second stage regressions are as follows:

$$First\ stage:\ IMP_{ijkt} = \gamma\, TAX_{ijkt} + \tau_t + \theta_i + \eta_{kt} + \alpha_{jk} + \varepsilon_{ijkt}$$
$$Second\ stage:\ ln\, Y_{ijkt} = \rho\, \widehat{IMP_{ijkt}} + \tau_t + \theta_i + \eta_{kt} + \alpha_{jk} + \varepsilon_{ijkt}$$
$$Reduced\ form:\ ln\ Y_{ijkt} = \lambda\, TAX_{ijkt} + \tau_t + \theta_i + \eta_{kt} + \alpha_{jk} + \varepsilon_{ijkt}$$

where TAX_{ijkt} is the tariff rate imposed on Chinese imports faced by firm i, in industry j, in country k. η_{kt} and α_{jk} are country-year and country-industry interaction variables, and θ_i is firm fixed effects. Standard errors are clustered at the country-industry level to satisfy SUTVA.

For labour productivity variables that only use Thai firm data, the following IV model was used:

$$First\ stage:\ IMP_{ijkt} = \gamma\, TAX_{ijt} + \tau_t + \theta_i + \mu_j + \varepsilon_{ijt}$$
$$Second\ stage:\ ln\, Prod_{ijkt} = \rho\, \widehat{IMP_{ijkt}} + \tau_t + \theta_i + \mu_j + \varepsilon_{ijt}$$
$$Reduced\ form:\ ln\, Prod_{ijt} = \lambda\, TAX_{ijt} + \tau_t + \theta_i + \mu_j + \varepsilon_{ijt}$$

Where ln $Prod_{ijt}$ represents the natural-log transformed productivity variables. θ_i and μ_j are firm and industry fixed effects. Standard errors are clustered at industry level.

For both models, $\widehat{IMP_{ijkt}}$ is the Chinese import shares were estimated based on the first stage regression. $\gamma < 0$ is expected as the cost of imports increases with higher tariffs and hence reduces the amount of imports.

4.3. Instrumental Variable Model: Using Lagged Import Impact as Instrument

Anderson & Hsiao's (1982) method of using the lags as IV was employed. The lag of the Chinese import impact was used as an IV for the first difference in Chinese import impact and assume that errors are sequentially exogenous. The model used is as follows:

$$First\ stage: \Delta IMP_{ijkt} = \gamma\ IMP_{ijkt-1} + \Delta\tau_t + \Delta\eta_{kt} + \Delta\alpha_{jk} + \Delta\varepsilon_{ijkt}$$
$$Second\ stage: \Delta \ln Y_{ijkt} = \rho\ \Delta\ \widehat{IMP_{ijkt}} + \Delta\tau_t + \Delta\eta_{kt} + \Delta\alpha_{jk} + \Delta\varepsilon_{ijkt}$$
$$Reduced\ form: \Delta \ln Y_{ijkt} = \lambda\ IMP_{ijkt-1} + \Delta\tau_t + \Delta\eta_{kt} + \Delta\alpha_{jk} + \Delta\varepsilon_{ijkt}$$

Δ is the first difference operator and IMP_{ijkt-1} represents the one year lagged Chinese import share. $\Delta\tau_t$, $\Delta\eta_{kt}$ and $\Delta\alpha_{jk}$ are time, country-time and country-industry fixed effects. Errors are clustered at country-industry pair level.

For productivity variables, the following model was used:

$$First\ stage: \Delta IMP_{ijkt} = \gamma\ IMP_{ijkt-1} + \Delta\tau_t + \Delta\mu_j + \Delta\varepsilon_{ijt}$$
$$Second\ stage: \Delta \ln Prod_{ijkt} = \rho\ \Delta\ \widehat{IMP_{ijkt}} + \Delta\tau_t + \Delta\mu_j + \Delta\varepsilon_{ijt}$$
$$Reduced\ form: \Delta \ln Prod_{ijkt} = \lambda\ IMP_{ijkt-1} + \Delta\tau_t + \Delta\mu_j + \Delta\varepsilon_{ijt}$$

Where $\Delta\ ln\ Prod_{ijt}$ is the first difference of the natural log-transformed productivity variables. $\Delta\tau_t$ and $\Delta\mu_j$ are the time and industry dummies respectively. Errors are clustered at industry level.

For both models, $\Delta\ \widehat{IMP_{ijt}}$ is the first differenced Chinese import share estimate based on the first stage regression. $\gamma < 0$ is expected as the first difference is constructed such that the lag of the variable is negatively related to the first difference.

4.4. Heterogenous Effects: Manufacturing firms and Country-specific effects

To understand the effects on manufacturing industries and draw comparisons with other studies, the impact Chinese imports had on manufacturing firms' performance was estimated

by running the IV regressions using the lagged import share as instrument with truncated datasets. Magnitude and direction of the coefficients will be compared to the main regression to determine the difference in impact. A similar analysis will be conducted on the Thai and Filipino dataset separately to distinguish the effect Chinese imports has on each country's firms.

5. Results

5.1. Ordinary Least Squares Fixed Effects

Patents, Sales, Costs and AV

Across the various specifications of the OLS-FE model, the coefficients' magnitudes and directions are largely consistent. In all models, an increase in Chinese import shares had a statistically significant positive impact on the number of patents filed (**Table 2**). For every 1 percentage-point (pp) increase in Chinese import impact, the number of patents increased by only 0.0007%, which may not economically significant. On the other hand, an increase in import shares by 1 pp decreased sales and costs by 0.34 to 0.35% and 0.43 to 0.45% respectively. The impact on VA is statistically insignificant, which may be because of sales and costs cancelling each other out.

Labour Productivity

Labour productivity proxied by both VA and sales seem to have a consistent negative impact when Chinese import shares increase; an increase in Chinese import shares by 1 pp is related to 0.54% decrease in productivity by sales and a 0.02% decrease in productivity by AV (**Table 3**). The impact on productivity by sales has a sizable magnitude that appears economically significant, unlike the impact on productivity by AV.

Table 2: OLS Estimates of Impact on Patents, Sales, Costs and Added Value

Panel A: Within firm Estimates with Time effects				
	(1)	(2)	(3)	(4)
Dependent Variables:	ln(Patents)	ln(Sales)	ln(Costs)	ln(AV)
IMP	6.01e-06***	-0.00350***	-0.00431***	1.97e-06
	(1.14e-06)	(0.000718)	(0.000530)	(4.06e-06)
Observations	1,004,368	1,004,368	1,004,368	1,004,368
Number of firms	422,461	422,461	422,461	422,461
Panel B : Within firm Estimates with Time and Country-time Effects				
	(1)	(2)	(3)	(4)
Dependent Variables:	ln(Patents)	ln(Sales)	ln(Costs)	ln(AV)
IMP	6.53e-06***	-0.00337***	-0.00417***	2.47e-06
	(8.25e-07)	(0.000688)	(0.000517)	(4.11e-06)
Observations	1,004,368	1,004,368	1,004,368	1,004,368
Number of firms	422,461	422,461	422,461	422,461
Panel B : Within firm Estimates with Time, Country-time and Industry-Time Effects				
	(1)	(2)	(3)	(4)
Dependent Variables:	ln(Patents)	ln(Sales)	ln(Costs)	ln(AV)
IMP	6.53e-06***	-0.00337***	-0.00447***	2.48e-06
	(8.25e-07)	(0.000688)	(0.000312)	(3.68e-06)
Observations	1,004,368	1,004,368	1,004,368	1,004,368
Number of firms	422,461	422,461	422,461	422,461

Standard errors in parentheses are clustered at country-industry level
*** p<0.01, ** p<0.05, * p<0.1

Table 3: OLS Estimates of Effect on Labour Productivity

Panel A: Within firm Estimates with Time effects		
	(1)	(2)
Dependent Variables:	ln(Prod) by Sales	ln(Prod) by AV
IMP	-0.00542***	-0.000151***
	(0.000568)	(3.26e-05)
Observations	33,817	33,817
Number of firms	20,259	20,259
Panel B : Within firm Estimates with Time and Industry Effects		
	(1)	(2)
Dependent Variables:	ln(Prod) by Sales	ln(Prod) by AV
IMP	-0.00542***	-0.000151***
	(0.000568)	(3.26e-05)
Observations	33,817	33,817
Number of firms	20,259	20,259

Standard errors in parentheses are clustered at industry level
*** p<0.01, ** p<0.05, * p<0.1

5.2. Instrumental Variable (IV) using Tariffs as Instrument

The F statistic values of the first stage regressions (**Table 4** Column 1 and **Table 5** Column 1) are above 10. However, judging by the small coefficient size of the first stage regressions, tariff rates might be a weak instrument for Chinese import share; a 10 pp increase in tariff only decreases the import share by 0.22 pp and 0.37 pp for the Thai sample.

Patents, Sales, Costs and AV

As more control variables were included, the statistical significance of the results drop off completely, suggesting that the results are not robust.

Compared to the OLS regression which had coefficients up to 0.004 in magnitude, the coefficients of the IV model are significantly larger with a maximum of 0.36 in magnitude. In particular, a 1 pp increase in import shares is estimated to decrease sales by 36.5%, more than 100 times the OLS estimate of a 0.34% decrease.

Patents and AV had a significant negative impact for the first two regression only (Panel A and B), indicating that the results are not robust. It can be inferred that there are no effects on patents and AV. The estimates of impact on costs were all insignificant and thus it is unlikely that there is an impact on costs.

Labour Productivity

For labour productivity proxied by sales, 1 pp increase in Chinese import share decreases it by 34.6%. The impact is very large compared to the OLS estimate of a 0.015% decrease.

The impact on labour productivity proxied by AV seems more plausible; a 1 pp increase results in a 1.2% decrease in productivity by AV, which is about twice the OLS estimate of 0.54% decrease.

Tariffs were a plausible IV for Chinese import share given the increase in import shares from China after tariffs were removed over time. However, the estimates empirically show that it is a weak IV for Chinese import shares. The estimated results are incorrect and not plausible economically.

Table 4: IV Estimates of Effects on Patents, Sales Costs and Added Value using Tariff as IV

Panel A: Within firm Estimates with Time effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	IMP	ln(Patents)	ln(Sales)	ln(Costs)	ln(AV)
IMP	-	-0.000274***	-0.367***	-0.0169	-0.0265***
		(1.87e-05)	(0.0251)	(0.0150)	(0.00152)
TAX	-0.0218***				
	(0.00356)				
F Statistic	3,568	-	-	-	-
p-value	0.00	-	-	-	-
Observations	1,004,368	1,004,368	1,004,368	1,004,368	1,004,368
Number of firms	422,461	422,461	422,461	422,461	422,461
Panel B: Within firm Estimates with Time and Country-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	IMP	ln(Patents)	ln(Sales)	ln(Costs)	ln(AV)
IMP	-	-0.000264***	-0.365***	-0.0147	-0.0265***
		(1.52e-05)	(0.0242)	(0.0136)	(0.00151)
TAX	-0.0218***				
	(0.00356)				
F Statistic	3,568	-	-	-	-
p-value	0.00	-	-	-	-
Observations	1,004,368	1,004,368	1,004,368	1,004,368	1,004,368
Number of firms	422,461	422,461	422,461	422,461	422,461
Panel C: Within firm Estimates with Time, Country-year and Industry-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	IMP	ln(Patents)	ln(Sales)	ln(Costs)	ln(AV)
IMP	-	-0.000829	-1.232	-0.770	-0.0294
		(0.0763)	(116.2)	(87.95)	(1.667)
TAX	-0.0221***				
	(0.00331)				
F Statistic	3,568	-	-	-	-
p-value	0.00	-	-	-	-
Observations	1,004,368	1,004,368	1,004,368	1,004,368	1,004,368
Number of firms	422,461	422,461	422,461	422,461	422,461

Standard errors in parentheses are clustered at country-industry level
*** p<0.01, ** p<0.05, * p<0.1

Table 5: IV Estimates of Effects on Labour Productivity using Tariff as IV

Panel A: Within firm Estimates with Time effects			
	(1)	(2)	(3)
Dependent Variables:	IMP	ln(Prod) by Sales	ln(Prod) by AV
IMP	-	-0.346***	-0.0122***
		(0.0626)	(0.00143)
TAX	-0.0372***		
	(0.00504)		
F Statistic	10,832	-	-
p-value	0.00	-	-
Observations	33,817	33,818	33,819
Number of firms	20,259	20,260	20,261
Panel B: Within firm Estimates with Time and Country-year Effects			
	(1)	(2)	(3)
Dependent Variables:	IMP	ln(Prod) by Sales	ln(Prod) by AV
IMP	-	-0.346***	-0.0122***
		(0.0626)	(0.00143)
TAX	-0.0372***		
	(0.00504)		
F Statistic	10,832	-	-
p-value	0.00	-	-
Observations	33,817	33,818	33,819
Number of firms	20,259	20,260	20,261

Standard errors in parentheses are clustered at industry level
*** p<0.01, ** p<0.05, * p<0.1

5.3. Instrumental Variable (IV) using lags as Instrument

The F-statistic of the first stage regressions (**Table 5** Column 1 and **Table 6** Column 1) are above 10. The model estimates a 0.12 pp decrease in the change in import shares when Chinese import shares last year increases by 1 pp. The coefficients are much larger than when using tariff as an IV (0.022 pp decrease in import share for a 1 pp increase tariffs).

Patents, Sales, Costs and AV

The coefficients are in the same direction and of similar magnitudes across all the variations of IV regressions done except for the impact on costs.

Unlike the positive effect on patents filed found via OLS, none of the coefficients are statistically significant in the IV model. Based on these results, it can be inferred that increased import share has no effect on patenting activity.

The coefficients for sales are consistently negative but becomes significant in the regression with full control variables (Panel C), implying that a 1 pp increase in change in import shares results in a 0.82% decrease in change in sales. The negative impact is consistent with the estimates from the OLS model.

The effect of changes in Chinese import shares on change in cost of goods appears to fluctuate around 0% for regressions in panel A and B. However, it becomes statistically significant in the last regression (Panel C); 1 pp increase in change in import share leads to a 1.08% decrease in costs, which is in line with the negative impact estimates from OLS. As the change in import share increases by 1 pp, the change in AV decreases by 0.004%. Although the impact is miniscule, it indicates that negative impact on sales is slightly stronger than the negative effect on costs. In the OLS model, no significant impact was found for AV.

Labour Productivity

Based on the regression with only time effects (**Table 7** panel A), change in productivity proxied by sales has a positive significant impact with an increase in change of import shares. However, the coefficient loses its significance as more control variables are included. Hence, it can be deduced that productivity proxied by sales is not affected by import shares, contradicting the negative estimates found by the OLS model.

Productivity proxied by AV has a positive impact that remains significant even with the added control variables; a 1 pp increase in change in import share increases the labour productivity proxied by AV by 0.02 to 0.09% (**Table 7** Column 2). However, the small magnitude might not have a significant economic impact. Unlike the IV model, the OLS model estimates a negative impact (**Table 3** Column 2).

Table 6: IV Estimates of Effects on Patents, Sales Costs and Added Value using Lags as IV

Panel A: Within firm Estimates with Time effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-1.26e-05	-0.00171	-7.85e-05	-4.01e05***
		(1.58e-05)	(0.00579)	(0.00665)	(1.40e-05)
IMP_{-1}	-0.119***				
	(0.00943)				
F Statistic	11,866	-	-	-	-
p-value	0.00	-	-	-	-
Observations	530,535	530,535	530,535	530,535	530,535
Number of firms	309,757	309,757	309,757	309,757	309,757
Panel B: Within firm Estimates with Time and Country-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-1.35e-05	-0.00169	3.02e-05	-3.94e-05**
		(1.37e-05)	(0.00594)	(0.00705)	(1.68e-05)
IMP_{-1}	-0.198***				
	(0.0225)				
F Statistic	58,000	-	-	-	-
p-value	0.00	-	-	-	-
Observations	530,535	530,535	530,535	530,535	530,535
Number of firms	309,757	309,757	309,757	309,757	309,757
Panel C: Within firm Estimates with Time, Country-year and Industry-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dept Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	2.78e-05	-0.00815***	-0.0108***	-4.17e-05***
		(2.10e-05)	(0.000649)	(0.00178)	(1.21e-05)
IMP_{-1}	-0.195***				
	(0.0186)				
F Statistic	105	-	-	-	-
p-value	0.00	-	-	-	-
Observations	530,535	530,535	530,535	530,535	530,535
Number of firms	309,757	309,757	309,757	309,757	309,757

IMP_{-1} is the 1 year lag of Chinese import shares
Standard errors in parentheses are clustered at country-industry level
*** p<0.01, ** p<0.05, * p<0.1

Table 7: IV Model Estimates of Effects on Labour Productivity using Lags as IV

Panel A: Within firm Estimates with Time effects			
	(1)	(2)	(3)
Dependent Variables:	Δ ln(IMP)	Δln(Prod) by Sales	Δln(Prod) by AV
Δ IMP	-	-0.0153*	0.000912***
		(0.00852)	(0.000232)
IMP_{-1}	-0.135***	-	-
	(0.0102)		
F Statistic	698.34	-	-
p-value	0.00	-	-
Observations	13,158	13,158	13,158
Number of firms	9,512	9,512	9,512
Panel B: Within firm Estimates with Time and Country-year Effects			
	(1)	(2)	(3)
Dependent Variables:	Δ ln(IMP)	Δln(Prod) by Sales	Δln(Prod) by AV
Δ IMP	-	0.00184	0.000201***
		(0.00291)	(3.76e-05)
IMP_{-1}	-0.214***	-	-
	(0.00589)		
F Statistic	420,000	-	-
p-value	0.00	-	-
Observations	13,158	13,158	13,158
Number of firms	9,512	9,512	9,512

Standard errors in parentheses are clustered at industry level
*** p<0.01, ** p<0.05, * p<0.1

5.4. Heterogeneous Effects: Manufacturing firms

Patents, Sales, Costs and AV

The directions of impacts on patents, sales, costs and VA are largely identical to the results from the main regression; no effect on number of patents filed was found, while sales, AV and costs were all estimated to have negative impacts. A 1 pp increase in the change in import share results in a 0.86% (**Table 8**, Panel C, Column 2) decrease in change in sales which is slightly higher than the 0.81% decrease estimated for the full sample (**Table 6**, Panel C, Column 3). The coefficients for AV and costs were also slightly larger in magnitude for the manufacturing subsample compared to the full sample.

Table 8: IV Estimates of Patents, Sales Costs and Added Value of Manufacturing Firms

Panel A: Within firm Estimates with Time effects					
	(1)	(2)	(3)	(4)	(5)
Dept Variables:	ΔIMP	Δln(Patents)	Δln(Sales)	Δln(Costs)	Δln(AV)
IMP	-	3.25e-05	-0.00870***	-0.0119***	-4.10e-05***
		(2.73e-05)	(0.000934)	(0.00276)	(1.14e-05)
IMP_{-1}	-0.179***				
	(0.000281)				
F Statistic	1,080,000	-	-	-	-
p-value	0.00	-	-	-	-
Observations	89,603	89,603	89,603	89,603	89,603
Number of firms	50,768	50,768	50,768	50,768	50,768
Panel B: Within firm Estimates with Time and Country-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dept Variables:	ΔIMP	Δln(Patents)	Δln(Sales)	Δln(Costs)	Δln(AV)
IMP	-	2.40e-05	- 0.00866***	-0.0120***	-4.28e-05***
		(2.07e-05)	(0.000990)	(0.00289)	(1.39e-05)
IMP_{-1}	-0.180***				
	(0.000118)				
F Statistic	866,667	-	-	-	-
p-value	0.00	-	-	-	-
Observations	89,603	89,603	89,603	89,603	89,603
Number of firms	50,768	50,768	50,768	50,768	50,768
Panel C: Within firm Estimates with Time, Country-year and Industry-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dept Variables:	ΔIMP	Δln(Patents)	Δln(Sales)	Δln(Costs)	Δln(AV)
IMP	-	2.42e-05	-0.00866***	-0.0119***	-4.37e-05***
		(2.09e-05)	(0.000986)	(0.00287)	(1.46e-05)
IMP_{-1}	-0.180***				
	(0.000114)				
F Statistic	3,200,000	-	-	-	-
p-value	0.00	-	-	-	-
Observations	89,603	89,603	89,603	89,603	89,603
Number of firms	50,768	50,768	50,768	50,768	50,768

Standard errors in parentheses are clustered at country-industry level
*** p<0.01, ** p<0.05, * p<0.1

Labour Productivity

Unlike the full sample regression where no significant effects were found, an increase in change in Chinese import share is estimated to positively impact labour productivity proxied by sales (0.34%). Moreover, the positive impact from a 1 pp increase in change in Chinese import share on labour productivity proxied by AV is much smaller for manufacturing firms (0.006%) than for firms in the full sample (0.02%).

Table 9: IV Model Estimates of Effects on Labour Productivity of Manufacturing Firms

Panel A: Within firm Estimates with Time effects			
Dependent Variables:	(1) ΔIMP	(2) Δln(Prod) by Sales	(3) Δln(Prod) by AV
ΔIMP	-	0.00333*** (0.000215)	6.18e-05*** (9.77e-06)
IMP_{-1}	-0.223*** (3.37e-05)		
F Statistic	1,000,000	-	-
p-value	0.00	-	-
Observations	2,903	2,903	2,903
Number of firms	1,997	1,997	1,997
Panel B: Within firm Estimates with Time and Country-year Effects			
Dependent Variables:	(1) ΔIMP	(2) Δln(Prod) by Sales	(3) Δln(Prod) by AV
IMP	-	0.00335*** (0.000215)	6.25e-05*** (9.77e-06)
IMP_{-1}	-0.223*** (7.87e-05)		
F Statistic	2,550,000	-	-
p-value	0.00	-	-
Observations	2,903	2,903	2,903
Number of firms	1,997	1,997	1,997

Standard errors in parentheses are clustered at industry level
*** p<0.01, ** p<0.05, * p<0.1

5.5. Heterogenous Effects: Country-specific Effects

Due to data limitations, only the effects on patent activity, sales, costs of goods and AV can be compared across the two countries.

Thailand

Compared to the main regression, Thai firms appear to be impacted similarly; an increase in import share decreases sales, costs and the AV of Thai firms. The only difference is that an increase in Chinese import shares seem to negatively affect Thai firms' patent activity. A 1pp increase in change in import share increases the number of patents filed by 1.83e-04% (**Table 10**, Panel C, Column 1). Despite the extremely small magnitude, the results should not be negated as the small magnitude is a result of the low firms with patents. In the main regression, there was no statistically significant impact observed.

Philippines

The F-statistic of the first stage regressions (**Table 11**, Column 1) for all models were above 10 except for the model for within firm estimates with time, industry and industry-year effects (**Table 11**, Panel C, Column 1). Thus, analyses will be based off estimates from the model for within firm estimates with time and industry effects (**Table 11**, Panel B).

Unlike the results from the main regression, Filipino firms appear to be mostly unaffected by the increase in Chinese import shares; there were no statistically significant results for the regressions on patent activity, sales and costs of goods sold. However, the AV of the firm appears to be positively impacted with an increase in Chinese import share (**Table 11**, Panel B, Column 5). This is unlike the case in the main regression and the Thai subsample regression where a negative statistically significant impact was observed.

Table 10: IV Estimates of Patents, Sales Costs and Added Value of Thai Firms

Panel A: Within firm Estimates with Time effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	1.51e-06	-0.0155**	-0.0137*	-0.0237***
		(3.95e-06)	(0.00696)	(0.0076)	(0.00479)
IMP_{-1}	-0.130***				
	(0.0201)				
F Statistic	6.50E+08	-	-	-	-
p-value	0.00	-	-	-	-
Observations	1,185,979	1,185,979	835,839	722,914	674,354
Number of firms	496,816	496,816	362,786	319,544	302,361
Panel B: Within firm Estimates with Time and Industry Effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-2.07e-07	-0.0187***	-0.0146***	-0.0141***
		(2.11e-06)	(0.00287)	(0.00352)	(0.00280)
IMP_{-1}	-0.197***				
	(0.0357)				
F Statistic	5.00e+09	-	-	-	-
p-value	0	-	-	-	-
Observations	1,185,979	1,185,979	835,839	722,914	674,354
Number of firms	488,567	488,567	357,633	315,219	298,352
Panel C: Within firm Estimates with Time, Industry and Industry-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dept Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-1.83e-06***	-0.0260***	-0.0225***	-0.0206***
		(3.71e-07)	(0.00110)	(0.00194)	(0.00113)
IMP_{-1}	-0.200***				
	(0.0347)				
F Statistic	33.3	-	-	-	-
p-value	0	-	-	-	-
Observations	1,185,979	1,185,979	835,839	722,914	674,354
Number of firms	488,567	488,567	357,633	315,219	298,352

IMP_{-1} is the 1-year lag of Chinese import shares

Standard errors in parentheses are clustered at country-industry level

Table 11: IV Estimates of Patents, Sales Costs and Added Value of Filipino Firms

Panel A: Within firm Estimates with Time effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-0.0194	-0.0434	0.701	0.0672**
		(0.0619)	(0.0385)	(2.321)	(0.0332)
IMP_{-1}	-0.0540*				
	(0.0314)				
F Statistic	24,967	-	-	-	-
p-value	0	-	-	-	-
Observations	113,750	113,750	67,525	113,688	64,408
Number of firms	28,105	28,105	23,619	28,103	22,994
Panel B: Within firm Estimates with Time and Industry Effects					
	(1)	(2)	(3)	(4)	(5)
Dependent Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-0.00235	-0.0647	0.00184	0.0195***
		(0.00192)	(0.0395)	(0.0645)	(0.00619)
IMP_{-1}	-0.119**				
	(0.0473)				
F Statistic	71253.46	-	-	-	-
p-value	0	-	-	-	-
Observations	113,750	113,750	67,525	113,688	64,408
Number of firms	27,761	27,761	23,350	27,760	22,730
Panel C: Within firm Estimates with Time, Industry and Industry-year Effects					
	(1)	(2)	(3)	(4)	(5)
Dept Variables:	Δ IMP	Δ ln(Patents)	Δ ln(Sales)	Δ ln(Costs)	Δ ln(AV)
Δ IMP	-	-0.00229	-0.0717*	-0.0167	0.0319***
		(0.00186)	(0.0412)	(0.0115)	(0.00217)
IMP_{-1}	-0.121***				
	(0.0464)				
F Statistic	6.82	-	-	-	-
p-value	0.009	-	-	-	-
Observations	113,750	113,750	67,525	113,688	64,408
Number of firms	27,761	27,761	23,350	27,760	22,730

IMP_{-1} is the 1-year lag of Chinese import shares

Standard errors in parentheses are clustered at country-industry level

6. Discussion

6.1. Analysis of Main Results

Based on the results of the IV model using lagged import share as the instrument and full set of control variables (Table 6 Panel C, Table 7 Panel C), the following reasons are proposed to interpret the findings:

Sales was shown to decrease with an increase in Chinese import shares. A possible explanation could be that an increase in import shares resulted in higher import competition which then drove prices down, thus reducing the total amount of sales (Turner, 1980). Alternatively, consumers may have shifted their preferences to cheaper and bigger variety of goods from China instead (Bena & Simintzi, 2015), resulting in lower quantities sold and produced which led to lower sales figures.

Costs were also shown to experience a negative impact with an increase in the import shares from China which aligns with Magyari (2017). One of the many plausible explanations could be that higher Chinese import share correlates with an increase in cheap intermediate inputs from China, thus reducing production costs for firms.

The coefficients of the regressions show that added value of the firm decreases with an increase in Chinese import shares. With both costs and sales estimated to decrease when import shares increase, we can deduce that the negative impact on sales is stronger than the negative impact on the costs of goods for firms, resulting in the negative impact on AV

Labour productivity proxied by AV was estimated to increase with the increase in Chinese import shares, aligning with many studies on productivity (Amiti & Konings, 2016; Bloom, Draca, & Van Reenen, 2016; Keller, 2000; Macdonald, 1994; Thangevelu & Rajaguru, 2004). The results may be surprising as the effect of import shares on AV is negative. To understand why, I ran an IV regression using lags as IV with labour costs as my dependent variable and included all control variables (**Appendix Table 1** Column 1). The impact on Chinese import shares on labour costs was negative. Hence, with both the numerator and denominator of labour productivity proxied by AV affected negatively by import shares, the overall effect on labour productivity becomes positive.

The lack of effect on number of patents filed may be due to the negative and positive influence of higher Chinese import shares on innovation activities cancelling each other out. Thus, there was no estimated impact on patent activities overall.

For most of the estimates from the IV regressions using lags as IV, the estimated effects were different from that of OLS-FE model. It suggests that the IV model likely corrected for endogeneity in the OLS-FE model, hence providing more accurate estimates.

6.2. Heterogenous Effect: Manufacturing Firms

The effect of import share on profitability, sales and costs of manufacturing firms were largely identical to that of the main regression. It is possible that the effects on the sample of firms were mostly driven by the effects on these manufacturing firms which explains the similarity in magnitude.

However, the effect on both labour productivity measures appears to diverge from the main regression. Labour productivity proxied by sales had a positive impact for manufacturing firms but no significant impact for firms in the full sample. Labour productivity proxied by AV was also smaller in magnitude compared to the estimate for the full sample. By running an IV regression on labour costs for the manufacturing firms (**Appendix Table 1** Column 2 in Appendix), I found that the magnitude of negative impact on labour costs was slightly higher for manufacturing firms than for the full sample of firms, thus explaining the discrepancies.

6.3. Heterogenous Effect: Country Specific Effects

With most of the sample comprising of Thai firms, it was expected that the results from the Thai subsample regression remained mostly the same as the main regression. However, contrary to the main regression, a negative impact on patent activity in Thailand was found. More research could be conducted in this area to understand the mechanisms in which the influx of Chinese imports affects innovation levels and patent activity amongst Thai firms.

As for Filipino firms, the increase in import share did not have any significant impact on patent activity, sales and costs of goods, unlike the case in Thailand where they were negatively affected. What was surprising was the positive relationship Chinese import share had on AV, even though there was no significant impact on sales and costs of goods. A possible explanation

for such a discrepancy would be the differences in sample used for analysis for each outcome variable. Due to the availability of the data, the number datapoints for each outcome variable was different, with the cost outcome having the smallest number of firms analysed. It is likely that data availability inadvertently caused some selection bias, resulting in no significant impact found for sales and costs but a positive impact for AV.

6.4. Limitations of the Study

The study could be improved upon in several areas. In particular, the inferences from the IV model, assumptions made for the Anderson & Hsiao (1982) methodology and the dependent variables used.

Despite the F statistic value being more than 10, there may be some concerns over how small the coefficient of the first stage regression is and that it may be a weak IV. However, to ensure that the results are robust, Anderson & Rubin (1949) statistics could be used instead for inferences instead. Alternatively, bootstrapped standard errors may be used to ensure robustness of results.

To adopt Anderson & Hsiao's (1982) methodology, the errors were assumed to be sequentially exogenous. It is possible for past values of Chinese import shares or past industry trends to be endogenous to the error terms in period t, thus violating sequential exogeneity. Further statistical tests will need to be conducted for verification of this assumption.

Innovation activity was proxied by the number of patents filed by the firms at the EPO and not in other patent offices. Firms that did not file patents with the EPO were assumed to have no patents under their name which has might have underestimated the actual number of patents filed by the firm. A solution to rectify would be to use patent data from WIPO instead which provides a better global coverage.

Labour productivity was the only form of productivity analysed in this paper. A more comprehensive productivity variable such as Total Factor Productivity (TFP) could be used to provide a wider perspective on the effect of productivity of firms. To achieve this, the Olley & Pakes (1992) method could be employed to obtain a TFP estimate.

7. Conclusion

In this paper, the effect of an increase in import share from China on firms from Thailand and Philippines was investigated. Using both OLS and IV models and novel data from Thai and Filipino firms, a higher import share from China was found to result in a decrease in the amount of sales and costs of the goods sold. The overall impact on profitability of the firm as estimated by added value was positive, presumably because the negative impact on the costs of goods was greater in magnitude than the impact on sales. There was no significant impact on patent activity for the firms, possibly because both positive and negative influences cancel out each other.

The paper could be further extended by exploring the mechanisms in which Chinese imports affect profitability, sales, costs and labour productivity by using only import shares or tariffs of imported primary inputs (Alvarez & Robertson, 2004). In addition, the impact on firms from other SEA countries could be investigated so as to understand the impact of Chinese imports on SEA as a whole.

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Appendix Table 1: IV Model Estimates of Effects on Labour Costs using Lags as IV

	(1)	(2)
Dependent Variables:	Δ ln(Labour)	Δ ln(Labour)
ΔIMP	-0.00323*	-0.00361***
	(0.00189)	(6.74e-05)
Data	All Thai Firms	Thai Manufacturing Firms
Observations	13,158	89,603
Number of firms	9,512	50,768