

THE ASSESSMENT OF THE IMPACT OF INTERNATIONAL TRADE AND PROTECTION ON WAGES USING THAI MANUFACTURING SURVEYS

Tran Dang Quan^{1*}, Nguyen Thi Thuong², Ta Quang Kien^{3*}

¹*University of Economic and Technical Industries,*
²*Ministry of Industry and Trade, ³Ministry of Agriculture and Rural Development*

Email*: trandangkuan@gmail.com/kientq.htqt@mard.gov.vn

Received date: 07.03.2015

Accepted date: 09.11.2015

ABSTRACT

The study assessed the impact of international trade and protection on wages across Thai manufacturing industries for years 2000, 2001 and 2003. The authors adopted the literature regressions of this impact on the individual wages based on their characteristics across manufacturing industries. Following this line, the authors proposed estimation for manufactory average wages under control of heterogeneous manufactories by both manufactory and industry characteristics. The authors addressed differences in wages between trading and non-trading (imports or exports) manufactories. Imports and exports were measurements of international trade; tariffs and non-tariff barriers (NTBs) were protection indicators treated as endogenous. The results showed that workers in unprotected, exportable manufacturing industries were paid higher wages than workers in protected industries with similar observable manufactory and industry characteristics. In details, tariffs and NTBs were negatively significant effects on wages. These results are consistent with the previous literatures and of significance to Thai economy.

Keywords: Exports, imports, international trade, manufactory average wages, protection.

Đánh giá tác động của thương mại quốc tế và bảo hộ tới tiền lương sử dụng dữ liệu điều tra ngành công nghiệp sản xuất ở Thái Lan

TÓM TẮT

Nghiên cứu đánh giá tác động của thương mại quốc tế và bảo hộ tới tiền lương qua các ngành sản xuất ở Thái Lan các năm 2000, 2001 và 2003. Tác giả thông qua phương pháp hồi quy của công trình nghiên cứu trước về tác động này đối với tiền lương cá nhân người lao động căn cứ vào các nét đặc trưng riêng của họ qua các ngành sản xuất. Theo nghiên cứu đó, tác giả đề xuất các ước lượng lương trung bình người lao động của nhà máy kiểm soát tính không đồng nhất qua các nét đặc trưng của nhà máy và ngành sản xuất. Tác giả nhấn mạnh sự khác biệt về tiền lương giữa các nhà máy thương mại và phi thương mại (xuất khẩu hoặc nhập khẩu). Xuất khẩu và nhập khẩu đo lường thương mại quốc tế; thuế xuất nhập khẩu và các hàng rào phi thuế quan là các chỉ tiêu đo lường sự bảo hộ được coi như tác nhân bên trong. Các kết quả nghiên cứu cho thấy người lao động ở các ngành không được bảo hộ, có khả năng xuất khẩu được trả lương cao hơn những người lao động ở các ngành được bảo hộ với cùng các đặc điểm quan sát của nhà máy và ngành sản xuất. Chi tiết, thuế xuất nhập khẩu và các hàng rào phi thuế quan có ý nghĩa tác động nghịch tới tiền lương. Những kết quả này là phù hợp với các nghiên cứu trước và có ý nghĩa với nền kinh tế Thái Lan.

Từ khóa: Bảo hộ, lương trung bình nhà máy, nhập khẩu, thương mại quốc tế, xuất khẩu.

1. INTRODUCTION

Thailand is one of the fastest growing economies in the world. The country that has

long recognised the importance of trade policy in development. International trade measurements have been an instrumental in strength competitiveness of domestic manufacturing industries with the world

market. Being deep trade liberalisation economy, Thailand has actively participated in various international forums such as the Uruguay round of multilateral trade negotiations, the Asia-Pacific Economic Cooperation forum (APEC), and the ASEAN Free Trade Area. Remarkably, Thailand acceded to the World Trade Organization (WTO) early on 1st January 1995. Thai Government has implemented various measures in compliance with its commitments to the WTO. Most of the sectors are on the depth of liberalisation. In addition, quantitative restrictions on many sector products have already dismantled and replaced by tariff measures in product lines with the process of agreements. Thailand has attempted its utmost to implement commitments in the WTO quickly and sincerely.

In the context of trade liberalisation, the country has a lot of opportunities to access larger markets from partners in the world due to free trade agreements, and the domestic market also faces with higher competition from overseas products. Gains or losses of free trade regime depend on competitiveness of an economy. In the trends that every country tries to protect weak industries and promote high competitive products of manufacturing industries that could have exported. Political economy of protection evidences has been central of study topics that consider an industry in open economy to decide whether to protect.

Not only effect on economy development, international trade has also influenced behaviours of the enterprises in decision making. One of those is how much salary that enterprises can pay to workers. It explains that the wage payment somewhat depends on decisions of the enterprises and its characteristics. Moreover, the assessment of the impacts of international trade and protection on wages across manufacturing industries allows us to capture the differences in manufactory characteristics. The study approaches are different with previous studies which have concentrated on the effects of international trade and protection on wages by returns to particular worker characteristics (mostly emphasised returns to education and demographic categories).

The contribution is an empirical linkage from Gaston and Trefler (1994) that estimated the impacts of international trade and protection on individuals' wages controlling for their characteristics. The study proposes an estimation of these impacts on manufactory average wages based on manufactory characteristics. The characteristics allow us to address differences in workers' wages between trading and non-trading manufactories. The main questions in this study are whether workers in a heavily protected industry receive higher wages than comparable workers in a less-protected industry; whether workers working for trading- manufactories receive higher wages than non-trading manufactories across manufacturing industries. In order to answer these questions, the study estimates manufactory average wages based on manufactory and industry characteristics. The study then approaches inter-industry wage differentials by estimating wage premiums across industries technique¹. The study treats protection as an industry characteristic and corrects for an endogeneity problem by the simultaneous equations model that previous studies proposed.

The remainder of this study is organized as follows. Section 2 reviews the related literature of the impact of international trade and protection on wages. Section 3 gives econometric methods. Section 4 discusses the data using in this study. Section 5 and 6 report the results and conclusions, respectively.

2. THE RELATED LITERATURE

Most of the econometric studies estimated industry average wages on imports and exports (for example, Colin and Lawrence, 1985; Freeman and Katz, 1991). The evidence pointed to a negative relationship between imports and wages and positive relationship between exports and wages. There were vast evidences of the

¹A wage premium is a portion of a wage that cannot be explained by the worker's characteristics (such as human capital, demography, and occupations) but can be explained by the worker's industry of affiliation (Gaston and Trefler 1994, p. 576).

existence of inter-industry wage differentials (see, e.g., Dickens and Katz, 1986; Kruger and Summers, 1989; Gaston and Trefler, 1994, 1995; Galiani and Sanguinetti, 2003; Goldberg and Pavcnik, 2005).

Gaston and Trefler (1994) investigated the effects of international trade policies on wages in U.S manufacturing industries. The data set combined micro labour market from Current Population Survey (CPS) with comprehensive data on tariffs and non-tariff barriers which are indicators of protection. Their estimations related wage premiums to international trade and protection cross-sectorial. They found a negative correlation between wage premiums which explain for inter-industry wage differentials and tariff protections. It means that workers in an unprotected industry are paid higher wages than in a protected industry. The other finding is that workers in export industries received higher wages than workers with similar observable characteristics in import industries. This correlation is robust to various specification tests and most importantly corrected for the endogeneity of protection.

In addition, Gaston and Trefler (1995) developed a feature model of union-firm bargaining, strategic rivalry between the union of domestic firms with its foreign competitors, and endogenous protection. They focused on the relationship between observable industry characteristics and the wage negotiation of the union and firm. The industry characteristics included tariffs, non-tariff barriers (NTBs), imports, and exports. The precise estimate combined simultaneous determination of union wages, domestic output, foreign output, and level of protection.

In this line of trade policy effects on wages, Goldberg and Pavcnik (2005) exploited drastic trade liberalisation in Colombia to investigate the relationship between protection and industry wage premiums. They linked wage premiums with trade policy in the empirical framework that accounts for the political economy of trade protection. They found that

workers in protected sectors received wages less than workers with similar observable characteristics in unprotected sectors.

Following these impacts, present study investigated the impacts of international trade and protection on manufactory average wages and inter-industry wage differentials called wage premiums². For detail, the econometric methodology are discussed in the section below.

3. ECONOMETRIC METHODOLOGY

In this section, the study proposed an empirical linkage from Gaston and Trefler (1994) who estimated the impacts of international trade and protection on individuals' wages controlling their characteristics across manufacturing industries. The study linked to estimate the impacts of international trade and protection on wage premiums controlling manufactory characteristics.

3.1. Manufactory average wages and wage premiums

Let $i = 1, 2, \dots, I$ index manufactories in industry j . Let $\ln(w_{ijt})$ be the natural logarithm of average real hourly wages of manufactory i in industry j at time t ; H_{ijt} be a vector of characteristics of manufactory i in industry j at time t ; and, P_{jt} be a vector of characteristics of industry j at time t which in this study includes the measurement indicators of international trade and protection. The study estimated the manufactory average wages equation controlling manufactory and industry characteristics by Ordinary Least Square (OLS) (one-step) below.

Manufactory average wages (one-step):

$$\ln(w_{ijt}) = \beta_H H_{ijt} + \beta_P P_{jt} + \varepsilon_{ijt} \quad (3.1)$$

$$i = 1, \dots, I, j = 1, \dots, J.$$

²A wage premium is that portion of a wage that cannot be explained by the worker's characteristics (such as human capital, demographics, and occupations) but can be explained by the worker's industry of affiliation (Gaston and Trefler, 1994, p. 576).

The study also reapplied the estimation of individuals' wages controlling their characteristics by equation (3.1) which previous studies used to compare the results. In this estimation, $i = 1, 2, \dots, I$ index an individual i in an industry j .

The previous studies also mentioned the role of international trade effects on wages that emphasised the difference between trading and non-trading manufacturing industries³. Furthermore, theoretical model has shown a strategy of wage payment for workers by foreign investment manufactories that have to pay tax, and its rival-domestic manufactories did not have to pay tax in domestic market. It implies that those characteristics of manufactories affected its strategy to maximise profits⁴. Thus, the study proposes vector H_{ijt} - manufactory characteristics dealing with its decision making that includes: trading manufactory dummy, foreign investment manufactory dummy to address different impacts on wages by trading and non-trading, foreign investment and non-foreign investment manufactories; It also captures the type of the manufactories (outsource, assemble, import or export products etc.) to decide whether to trade or wage payment for workers. For more detail of vector H_{ijt} using in manufactory average wages equation, the study reports in next chapter of the results. To estimate manufactory average wage equation, the one-step estimator is consistent. But if there are errors that are shared by all manufactories within industry, the standard errors will be biased. The two-step of inter-industry wage differentials-wage premiums approach corrects for this bias (Gaston and Trefler 1994; 1995).

Wage premiums (two-step):

$$\ln(w_{ijt}) = \beta_H H_{ijt} + w_{jt}^* D_j + \varepsilon_{ijt},$$

$$i = 1 \dots, I, \quad j = 1, \dots, J. \text{ (step 1)} \quad (3.2)$$

$$w_{jt}^* = \beta_p P_{jt} + u_{jt} \quad j = 1, \dots, J. \text{ (step 2)}$$

Where w_{jt}^* is the wage premium of an industry j at time t ; and P_{jt} includes measurement indicators of international trade and protection for industry j at time t that are NTBs, tariffs, imports, exports, import growth and intra-industry trade; D_j is a dummy for industry j . The set of import growth and intra-industry trade variables is to determine international trade and protection in cross-industry that affect on imports by protection. Note that the study includes the measure of historical industry performance and the trade-related alternative measure of industry shrinkage is growth in imports; intra-industry trade also captures shrunk production or expanded trade within the industry. In the stage 1, the log of worker average real hourly wages of manufactory is estimated on manufactory characteristics and D_j industry dummies with coefficients w_{jt}^* , the coefficients w_{jt}^* are called wage premiums. In the second stage, w_{jt}^* is estimated on measurement indicators of international trade and protection. Wage premiums are systematically correlated with unobserved worker attributes as would result from a worker sorting process based on unobserved ability. This is still an unresolved issue in the literatures (See Gibbons and Katz 1992; Gaston and Trefler 1994, 1995, etc.).

3.2. The endogeneity of protection

Many political economy theories predicted that the level of wages influences the decision to protect an industry. To determine the role of industry characteristics such as trade and protection in wage determination, the previous studies used the inter-industry wage differentials approach (e.g. Dickens and Katz, 1987; Gaston and Trefler, 1994, 1995; Galiani and Sanguinetti, 2003). The present study also adopted the wage premium estimation to test whether workers in a heavily protected industry are paid higher wages, *ceteris paribus*.

The study adopted wage premiums as indicators explaining for inter-industry wage differentials, which are calculated as industry dummy coefficients of manufactory average

³See Chris Milner and Peter Wright (1998); Gaston and Trefler (1995) model etc.

⁴See Gaston and Trefler (1995) theoretical model

wages estimation in the first stage, equation (3.2). The study followed H-O theorem that a country will export goods using factor-intensive and import the relative goods under free trade. Furthermore, by Rybczynski (1951) theorem stated that an increase in a factor endowment will increase the output of the industry using it-intensive and decrease the output of other industry. Thus, the study used imports and exports as international trade measurements that are shared by industry output. The consideration in an interaction of imports and exports with outputs explains for an argument that if industries have imported and exported more or less products, it could has shrunk or expanded domestic production, respectively. Therefore, it affected on labour demand and then wage payment for workers in those industries. The study expects that the level of exports positively affects the workers' wages. In order to show this, the study estimated wage premiums on measurement indicators of international trade and protection. The present study proposed the simultaneous equations model that previous studies estimated to show the impacts of international trade and protection on wage premiums across industries. In this estimation, tariffs and NTBs measure protection were corrected for the endogeneity problem.

The evidence of the endogeneity was provided by Baldwin (1985), Trefler (1993), Gaston and Trefler (1994, 1995) who found that policy-makers consider industry average wages to decide whether to protect an industry. To examine endogenous protection, the study run Two-Stage Least Squares (2SLS) to simultaneously estimate wage premiums, tariffs, and NTBs equations below

$$\begin{aligned}
 w_{jt}^* &= \theta_t + \beta_1 tariffs_{jt} \\
 &\quad + \beta_2 NTBs_{jt} \\
 &\quad + \beta_P P_{jt} \\
 &\quad + \epsilon_{wjt} \\
 tariffs_{jt} &= \alpha_t + \beta_{wt} w_{jt}^* + \beta_{zt} Z_{jt} + \epsilon_{jt} \quad (3.3) \\
 NTBs_{jt} &= \alpha_n + \beta_{wn} w_{jt}^* + \beta_{zn} Z_{jt} + \epsilon_{jt}.
 \end{aligned}$$

Where w_{jt}^* is the wage premium of an industry j at time t ; P_{jt} be vector of characteristics of industry j at time t which in this estimation includes measurement indicators of international trade; P_{jt} includes import and export shares, import growth and intra-industry trade; Z_{jt} is a vector of the determinants of tariffs and NTBs in industry j at time t as suggested by protection literature that argues whether to protect industry (see Gaston and Trefler, 1994). The study identified tariff and NTB equations by excluding tariffs from the NTB equation and NTBs from the tariff equation. The 2SLS estimation of the wage premium equation, however, are unaffected by these exclusion restrictions. The 2SLS estimation of the wage premium equation is equivalent to instrumental variables estimation using P_{jt} and Z_{jt} to instrument tariffs and NTBs. The argument is that politicians consider the composition of workers employed in an industry. This study considers a set of the instruments of vector Z_{jt} that consists of industry characteristics data averaged over manufactories in the industry.

4. THE DATA

A key feature of this study is to combine detailed data on international trade and protection with micro data on individual workers and manufactory characteristics. All data of individual workers and Thai manufactories are across about 120 manufacturing industries at 4-digit of International Standard Industrial Classification (ISIC). Micro data on individual workers, manufactory characteristics were collected from two different sources, namely Thai Labour Force Survey (LFS) and Manufacturing Industry Survey (MIS). The data on individuals' wages and their characteristics were from LFS.

The study used LFS of the years 2000, 2001 and 2003 to obtain a final sample of 185.330 individual worker surveys. The data allows us to control individual heterogeneity within an

industry and across industries based on their characteristics in the estimations. The study selected this period to investigate after Asian Crisis in 1997 and be consistent with the data of MIS which were collected from available surveys of 2000, 2001 and 2003. In order to get the data of manufactory characteristics across industries, the study also used MIS data of the years 2000, 2001 and 2003 with a total of 25,594 manufactories. It also corresponds with the LFS data and measurement indicators of international trade and protection at 4-digit ISIC.

The Data of international trade and protection measurements came from several sources. Tariffs and non-tariff barriers (NTBs) are protection indicators that were collected from the United Nations Conference on Trade and Development (UNCTAD) database on Trade Control Measures. NTBs were reported as a trade restriction which included price-control measures, finance-control measures, and quantity-control measures. The data indicates that NTBs were measured as coverage ratios of an industry's imports subjected to a NTB. Tariffs were measured as average import-weighted of the tariffs on all line items feeding into an industry. Imports and exports collected from WTO Trade Database at 4-digit ISIC were reported at aggregate level for all commodities of an industry. Import growth is the calculation of imports in present year less imports in previous year. Intra-industry trade is defined in the usual way as $1 - \frac{|x_j - m_j|}{x_j + m_j}$, where x_j is exports and m_j is imports of industry j . All variables are average values for each industry at 4-digit ISIC code to match with LFS and MIS data.

Figure A1 (Appendix A) below illustrates industry average tariffs and manufactory average wages calculating from MIS data by industries to show a relationship between tariffs and manufactory average wages. It showed that industries with high tariff rates paying lower wages for workers. For example, beverage industries (313), tobacco industries (314) with high tariff rates pay lower wages for workers than low tariff industries such as

chemical industries (351), machinery industries (382), fabricate metal products industries (381) with highest wage payment. These facts suggest that there is a negative correlation between protection and manufactory average wages across Thai manufacturing industries.

Figure B1 (Appendix B) shows that trading manufactories pay higher wages than non-trading manufactories in all industries. That is an important role of trade flows on wage payments for manufacturing sectors. The figure highlights wages disparity of Tobacco industries between non-trading and trading manufactories. It explains the fact that almost tobacco products depended on importing overseas. Equivalently, Figure B2 also shows that foreign investment manufactories pay higher wages than non-foreign investment manufactories in all industries. It is useful to early predict that trading and foreign investment manufactories as industry characteristics positively effect on worker's wages in the estimation. For further, the authors report estimation results in section below, instantly.

5. THE RESULTS

In this section, first, the authors report the results of regressions on both individual's wages and manufactory average wages on its characteristics. Then, the authors approach a regression on wage premiums across industries. The estimated coefficients shown in Table 1 are reported by two different OLS estimations that are individual's wages on their characteristics and manufactory average wages on its characteristics. The estimated results of individual's wages reported in Column (1) are comparable with manufactory average wages results which are reported in Column (2) in the same Table 1. The authors estimated manufactory average wages equation by OLS with characteristics of each manufactory and industry dummies which its coefficients are being wage premiums. Let consider negative coefficients of tariffs and NTBs variables which

measure protections in both estimations of individual's wages and manufactory average wages. The estimated coefficients of tariffs (-0.2306) and NTBs (-0.2424) with individual's wages equation, -0.5301 and -0.8033 with estimated manufactory average wages equation were significant, respectively. Exports were positively significant in both estimations. The coefficients of exports were 0.0236 and 0.0591 with estimated individual's wages and manufactory average wages equation, respectively.

Imports had positive effects on wages in both estimations. The coefficients of imports were 0.0196 and 0.0232 from the estimations of individual's wages and manufactory average wages, respectively. But, the statistic was insignificant in manufactory average wage

estimation. Thus, it is not satisfied to conclude that imports had positive effect on manufactory average wages with identical observable manufactory's characteristics.

Table 2 reported the 2SLS results for wage premiums equation. For easy comparison, the OLS results of manufactory average wages estimation are shown in Column (2) in Table 1. Column (2a) showed results of the wage premiums equation by 2 steps, NTBs and tariffs had negative effect on wage premiums and the statistics were significant. Both export and import coefficients had positive significant impacts on wage premiums. It showed that these coefficients across industries are similar to impacts that were estimated by individual's wages and manufactory average wages controlling its characteristics.

Table 1. Estimation results of Individual's wages and manufactory average wages

Individual's Wage (1)		Manufactory average wage (2)	
Independent variable	Coefficients	Independent variables	Coefficients
Experience (years)	0.0433 (0.0004)***	Manufactory age	-0.0002 (0.0016)
Experience squared	-0.0007 (-0.000)***	Manufactory size	0.0338 (0.0063)***
Married	0.0235 (0.0032)***	Foreign Investment Manufactory	0.1270 (0.0554)**
Household head	0.0892 (0.0035)***	Trading manufactory	1.7918 (0.0373)***
Fulltime	-0.2580 (0.0040)***	Male worker fraction	0.0041 (0.0001)***
Years of schooling	0.0861 (0.0006)***	State owner	0.7181 (0.2346)***
Male worker	0.1462 (0.0032)***	Urban	0.3262 (0.3237)***
State worker	0.3306 (0.0214)***	Skilled worker	0.8773 (0.5111)***
White collar	0.2976 (0.0045)***	Fraction	
Urban worker	0.0789 (0.0029)***		
Engineer & Scientist	0.2936 (0.0147)***		
Tariff	-0.2306 (0.0121)***	Tariff	-0.5301 (0.1364)***
NTB	-0.2423 (0.0079)***	NTB	-0.8033 (0.0910)***
Export	0.0235 (0.0018)***	Export	0.0591 (0.0202)**
Import	0.0196 (0.0047)***	Import	0.0232 (0.0213)
Import Growth	-0.0032 (0.0012)**	Import Growth	0.0164 (0.0112)
Intra-Industry Trade	0.0291 (0.0054)***	Intra-Industry Trade	-0.0487 (0.0623)
Intercept	2.2362 (0.0098)***	Intercept	10.7902 (0.000)***
Observation	506.755 (LFSs)	Observation	25.594 (MIS)

Note: *** and ** are significant at 1%, 5% conventional.

Industry dummy coefficients aren't reported; standard errors in parenthesis.

The wage premium estimation results are reported in Column (2b). The authors estimated simultaneous equation model (SEM) by 2SLS for wage premiums across industries, where vector Z_{jt} are industry characteristics including variables: Industry average manufactory age, industry average manufactory size, industry average fraction of skilled workers, industry fraction of state owner manufactories, industry fraction of trading manufactories, and industry fraction of foreign investment manufactories.

NTBs and tariffs exerted negative significant effect on wage premiums. It implied that workers at highly protected industry were paid lower than less protected industry with identical observable characteristics by various estimations. The authors used Hausman test to examine the null hypothesis that is consistent due to the endogeneity of tariffs and NTBs. The test failed to reject the null

hypothesis that $\chi^2 = 5.95$ at convention. Thus, the endogeneity of protection problem does not lead to inconsistent and biased estimates. In addition, export and import coefficients had smaller positive impact and were significant. It indicated that workers at exportable manufacturing industries were paid higher wages than non-exportable manufacturing industries for all estimations. The positive coefficients of imports can explain in case of many manufactories imported raw materials or components of products to assemble or outsource in the data surveys of Thai manufacturing industries. Those manufactories could have created more job demand in production, hence higher wages for workers. Most of the results are consistent with the results reported elsewhere and Thai economy situation, a country of deep trade liberalization.

Table 2. Wage premium estimation results

	Manufactory average wage	Wage premium (2)	
	(1)	(2a)	(2b)
Tariff	-0.5301 (0.1364)***	-0.0508 (0.0158)***	-0.0481 (0.0018)***
NTB	-0.8034 (0.0910)***	-0.3946 (0.0116)***	-0.8262 (0.0484)***
Export	0.0591 (0.0202)**	0.0528 (0.0023)***	0.0374 (0.0046)***
Import	0.0232 (0.0213)	0.0520 (0.0025)***	0.0087 (0.0046)**
Import growth	0.0164 (0.0112)	-0.0075 (0.0011)***	-0.0072 (0.0021)**
Intra-industry Trade	-0.0487 (0.0623)	0.0761 (0.0069)***	0.0815 (0.0135)***
Intercept	10.7902 (0.000)***	-0.4088 (0.0062)***	0.7481 (0.000)***
Observations	25.954 (MIS)	25.954 (MIS)	360

Note: (1) The coefficients of manufactory characteristics (β_H) are reported in Column (2) Table 1.

(1), (2a) estimated using variables controlling manufactory characteristics.

(2a) Industry wage premiums generated at first step not reported.

(2b) Tariffs and NTBs treated as endogenous, β_z not reported

Hausman test $Prob > \chi^2 (5.95) = 0.000$

*** and ** : significant at 1% and 5% level of probability respectively; standard errors in parenthesis.

6. CONCLUSIONS

This study exploited Thai trade policy to examine the impacts of international trade and protection on wages for both manufactory average wages and wage premiums across industries. The authors estimated manufactory average wages with identical observable characteristics of heterogeneous manufactories. It highlighted the importance of trade flows and literature models predicted. At second stage, the authors adopted regressions on wage premiums across industries. In these estimations, tariffs and NTBs were protection indicators treated as endogenous. The key important finding is that workers in sectors with high protection received lower wages. To arrive at these findings, the authors combined detailed information on manufactory and industry characteristic that control observingly heterogeneous manufactory across industries. The panel data across industries allowed us to exploit unobservable heterogeneity and political economy of protection. In addition, exports and imports were indicators that measure international trade. Exports had positively significant impacts on wages. It indicated that Thailand had large opportunities to access the world market under free trade and, hence, gained from trade for workers in those industries. Imports had also positive impacts on individual's wages, manufactory average wages and wage premiums. But, the statistic was insignificant at manufactory average wages estimation. It means that there was no impact of imports on manufactory average wages across Thai industries estimation. In summary, import coefficients had positive significant impacts on individual's wages and wage premiums across estimations of industry level for the 2000 to 2003 period. The positive import coefficients were attributable to raw materials that were imported by manufacturing industries in the data surveys. It also implied that Thai domestic products could be able to compete with oversea products.

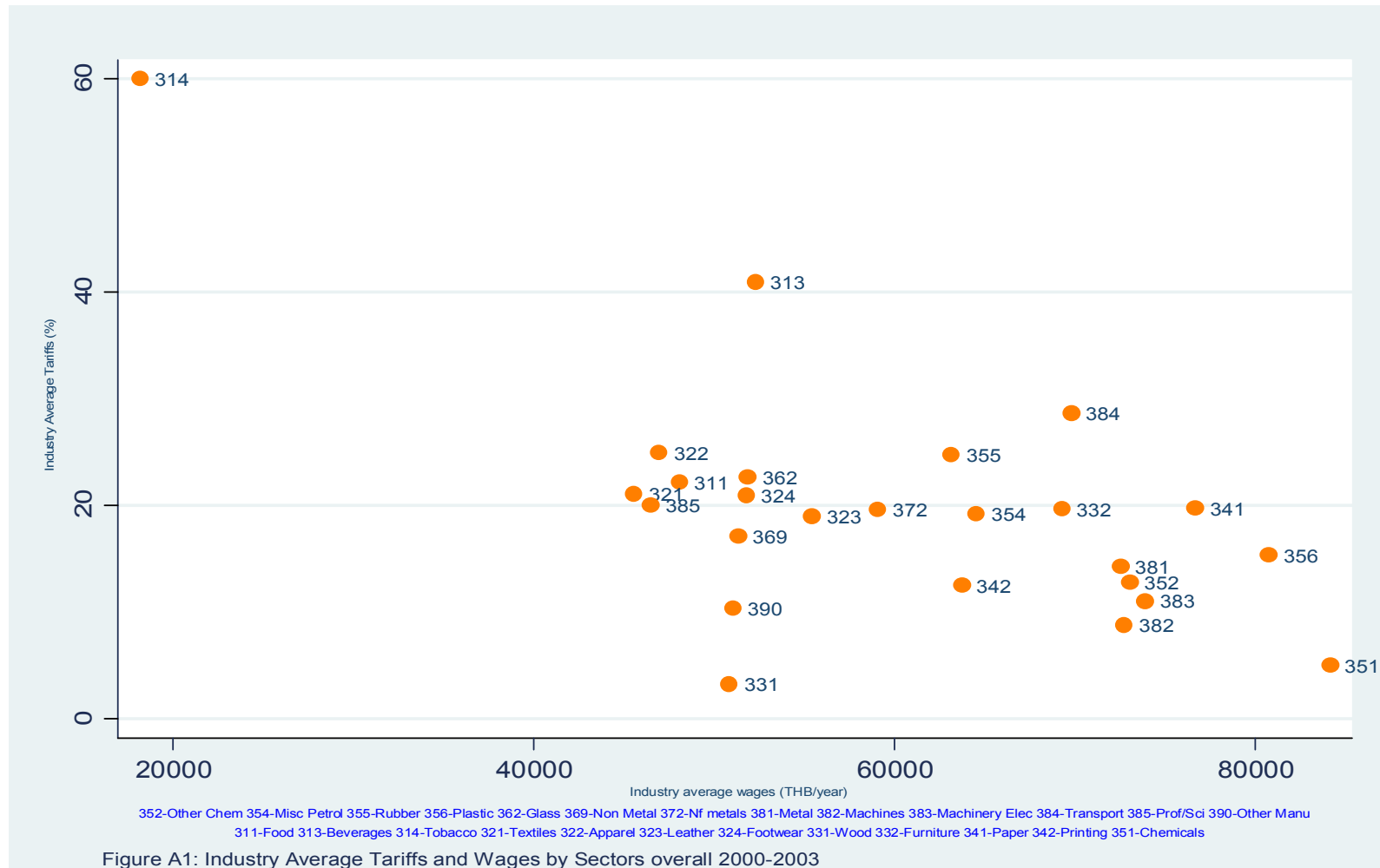
These findings could be benefits for policy-makers in Thailand and other developing

countries in general to design appropriate trade policies that are beneficial to workers. They should realise that liberalised trade policies by the dismantled non-tariff barriers and reduced tariff lines following the schedule of free trade commitments might increase wages for workers. In addition, there is a need to issue policies that can help improve the competitiveness with overseas products of manufacturing industries.

REFERENCES

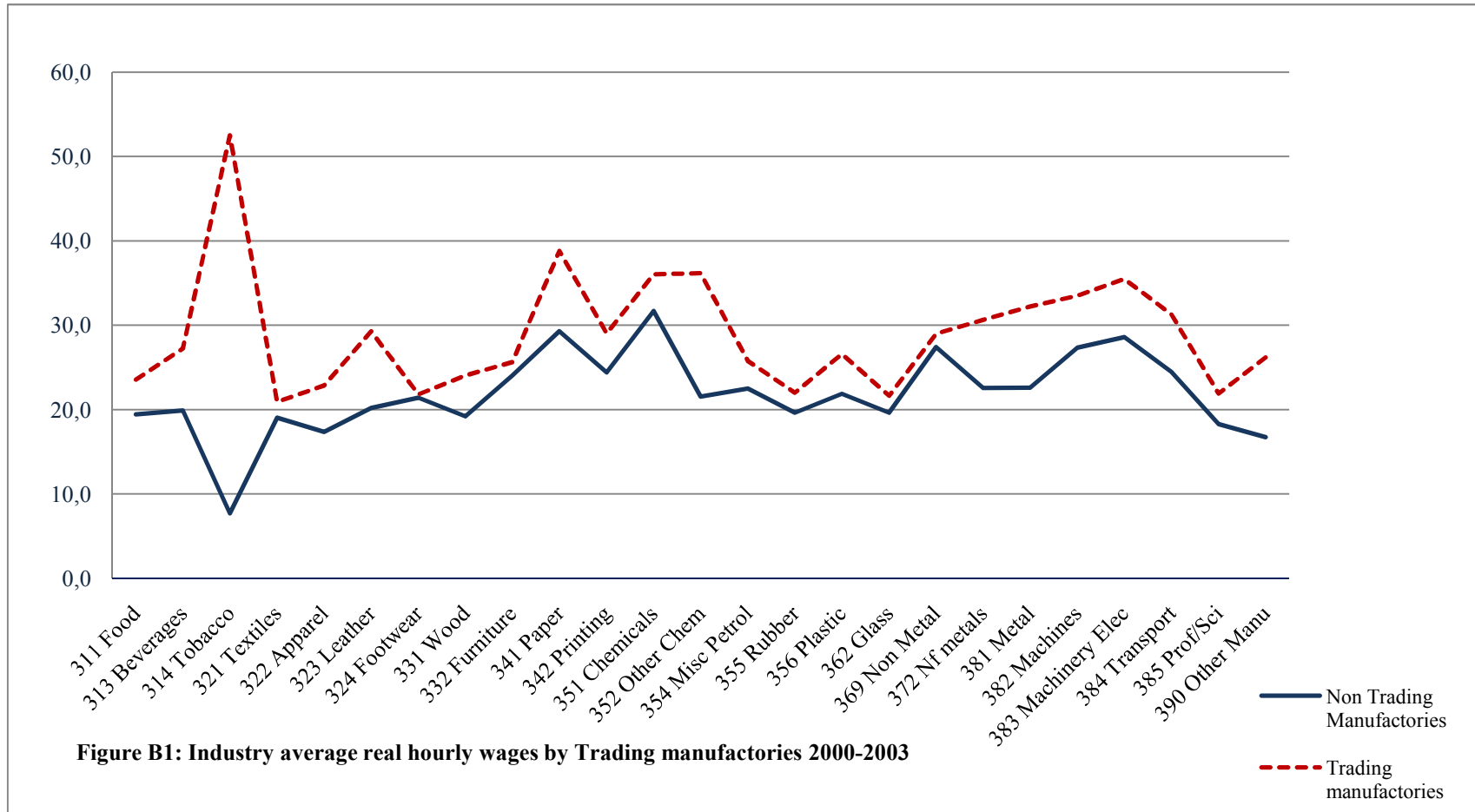
- Athukorala, P., J. Jogwanich and A. Kohpaiboon (2004). "Tariff reform and the structure of protection in Thailand", Unpublished report for World Bank (Bangkok), Thailand.
- Daniel Trefler (1993). "Trade liberalization and the Theory of Endogenous Protection: An Econometric Study of U.S. Import Policy", *Journal of Political Economy*, 101(1): 138-160.
- Dickens, William T., and Lawrence F. Katz (1987). "Inter-Industry Wage Differences", *Unemployment and the Structure of Labor Markets*, New York: Basil Blackwell, pp. 48-89.
- Gibbons, Robert, and Lawrence F. Katz (1992). "Does unmeasured Ability Explain Inter-Industry wage Differentials?", *Review of Economic Studies*, 59(3): 15-35.
- Juthahip Jongwanich and Archanun Kohpaiboon (2007). "Determinants of protection in Thailand manufacturing", *Economic papers*, 26(3): 276-294.
- Noel Gaston and Daniel Trefler (1993). "Tariffs, Nontariff Barriers to Trade, and Workers' wages", *Studies in Labor Economics*, pp. 72-110.
- Noel Gaston and Daniel Trefler (1994). "Protection, trade, and Wages: Evidence from U.S. Manufacturing." *Industrial and Labor Relations Review*, 47(4): 574-593.
- Noel Gaston and Daniel Trefler (1995). "Union wage Sensitivity to Trade protection: Theory and Evidence". *Journal of International Economics*, 39: 1-25.
- P.K. Goldberg and N. Pavcnik (2005). "Trade, wages, and the political economy of trade protection: evidence from the Colombian trade reforms", *Journal of International Economics*, 66: 75-105.
- Sebastian Galiani, Pablo Sanguinetti (2003). "The impact of trade liberalization on wage inequality: Evidence from Argentina", *Journal of Development Economics*, 72: 497-513.
- Wooldridge, J. M. (2002). "Econometric analysis of cross section and panel data", Massachusetts: MIT Press.

APPENDIX A



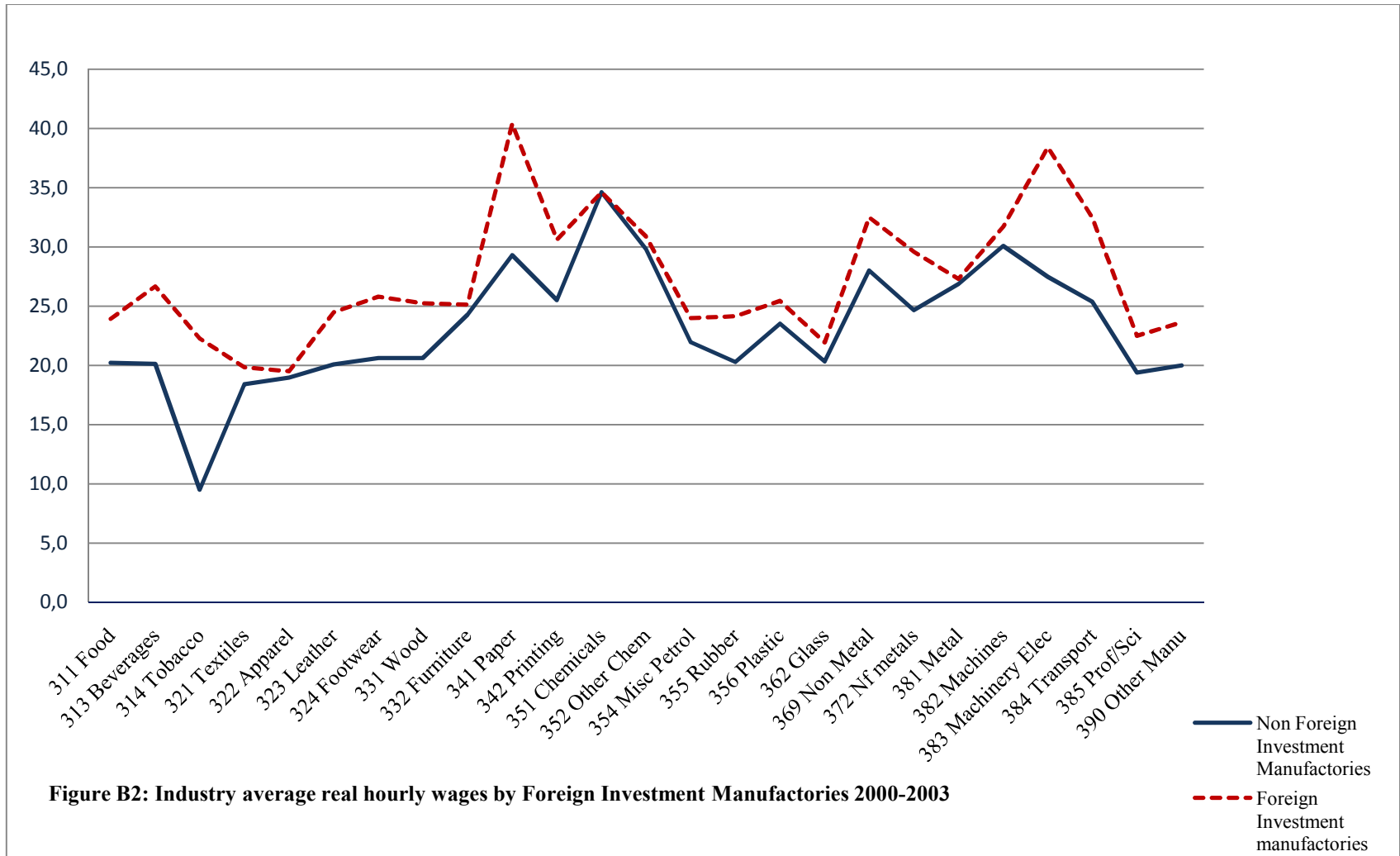
Source: The authors calculated at 3 digits level aggregate of ISIC from UNCTAD TRAINS and Thai MIS 2000-2003 (25,594 manufactory surveys)

APPENDIX B



Source: The authors calculated at 3-digit level aggregate of ISIC from Thai MIS 2000-2003 (25,594 surveys)

The Assessment of The Impact of International Trade and Protection on Wages Using Thai Manufacturing Surveys



Source: The authors calculated at 3-digit level aggregate of ISIC from Thai MIS 2000-2003 (25,594 surveys)