Chapter 8

Globalization and Wage Inequality: Firm-Level Evidence from Malaysia

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CHAPTER 8

Globalization and Wage Inequality: Firm-Level Evidence from Malaysia

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This study attempts to provide an empirical analysis of globalization and wage inequality in Malaysia using three sets of firm-level data from the manufacturing sector. There is some evidence, albeit relatively weak, of a positive relationship between average wage levels and exporting. The evidence on a positive relationship between trade liberalization and wages is stronger especially for skilled workers. However, the hiring of foreign workers is associated with lower average wage levels for skilled workers. Thus, the key policy challenge in Malaysia is the continued emphasis on the enhancement of exporting via trade liberalization without depending on foreign workers.

***Keywords*:** Globalization, Trade, Wage Inequality, Manufacturing

***JEL Classification*:** F12, F16, E24

1. Introduction

The impact globalization on inequality has long been a major topic of interest to policymakers and academic researchers in both developed and developing countries. Underlying this interest is a concern about whether globalization is, on the whole, beneficial. Even though the theoretical arguments highlighting the benefits of trade have been around for a long time, the empirical evidence on the distributive impact of trade continues to be inconclusive.[1] This is partly due the inconsistency between findings from the empirical literature and implications from traditional trade models such as the Heckscher-Ohlin (HO) model.[2] As a consequence, recent theoretical models especially those incorporating heterogeneous firms have taken up the challenge of explaining the impact of trade on wage inequality (Harrison, *et al.*, 2011). For some time, the empirical literature has lagged behind theoretical developments in this area. This is mainly due to the fact that the data required to test the new theories are fairly demanding.

The purpose of this study is to provide further empirical evidence on the relationship between globalization and wage inequality in a developing country by analyzing firm-level data from the Malaysian manufacturing sector. In this study, globalization at the firm-level is a multi-dimensional concept. This study will focus on exporting. Wage inequality is examined in terms of wage distribution across heterogeneous firms (globalized, non-globalized) and heterogeneous workers (with different observable characteristics).

To the author's knowledge, the proposed study will be first study on the topic using Malaysian firm-level data. Malaysia's experience is an interesting one given that it is an Asian developing economy which is smaller than other often-studied middle-income developing countries in South America such as Brazil and Mexico. It also has relatively less unskilled workers compared to other countries in the Southeast

[1] For example, in the *Wealth of Nations*, Adam Smith argued that trade is mutually beneficial (theory of absolute advantage) and can enhance productivity and growth (vent-for-surplus theory). See Hollander (1973, pp.268-269).

[2] Recent empirical literature suggests that the growing wage gap between skilled and unskilled workers in developing countries is inconsistent with the Heckscher-Ohlin (HO) model (Goldberg & Pavcnik, 2007, p.59)

Asian region such as Indonesia. The three datasets used in this study are from the World Bank's *Enterprise Survey* (WBES2006) and the Economic Planning Unit's *Malaysian Knowledge Content Survey* (MKCS2002 and MKCS2006).

A number of specific research questions are posed in this study. These are drawn from the existing literature and selected based on data constraints. The set of research questions addressed in this proposed study comprises the following:

- Do exporters pay higher wages than non-exporters? (exporter wage premium)
- Is wage inequality between high-skilled workers and low skilled workers affected by exporting? (skill wage premium)

This study will also examine additional aspects of globalization such as foreign participation and trade liberalization. The outline for the rest of the paper is as follows. The Malaysian labor market is discussed in Section 2. Section 3 will provide a review of the relevant literature. This will be followed by a discussion of the methodology adopted in this study in Section 4. The findings of this study are reported in Section 5. Policy conclusions are drawn in Section 6. Section 7 concludes the paper.

2. Malaysia: Development and Labor Markets

The Malaysian economy has grown at a relative moderate rate of around five percent since the early 1990s (**Table 1**). This has been accompanied by macroeconomic stability. Both the inflation rate and unemployment rate (which together makes up the "misery index", has be relatively low during this period. There has been, however, a gradual change in the country's economic structure that has raised some concerns amongst the country's policymakers.

Table 1: Malaysian Economy - Structure and Performance, 2000-2010

GDP Share (%)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agriculture, Livestock, Forestry and Fishing	8.6	8.5	8.3	8.4	8.2	8.0	7.9	7.5	7.5	7.7	7.3
Mining and Quarrying	10.6	10.3	10.2	10.3	10.0	9.5	8.8	8.5	7.9	7.5	7.0
Manufacturing	30.9	29.4	29.0	30.0	30.7	30.7	30.9	29.9	28.8	26.6	27.6
Construction	3.9	4.0	3.9	3.8	3.5	3.3	3.1	3.1	3.1	3.3	3.3
Utilities	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.0	2.9	3.0	3.0
Wholesale and Retail Trade, Hotels and Restaurants	13.4	13.7	13.5	13.0	13.2	13.7	13.8	14.7	15.5	16.0	16.0
Transport, Storage and Communication	7.0	7.4	7.3	7.2	7.3	7.3	7.4	7.5	7.7	8.0	8.0
Finance, Insurance, Real Estate and Business Services	13.5	14.1	14.7	14.5	14.2	14.6	15.0	16.0	16.2	17.2	17.2
Other Services	6.0	6.2	6.1	6.0	5.9	5.8	5.7	5.7	5.7	6.0	5.9
Government Services	6.3	6.6	6.6	6.7	6.6	6.8	7.0	6.9	7.2	7.6	7.5
Less : Undistributed FISIM	4.9	4.9	4.5	4.4	4.2	3.9	3.9	3.9	3.8	4.2	4.1
Plus : Import Duties	1.6	1.6	1.7	1.6	1.4	1.3	1.1	1.1	1.3	1.2	1.3
GDP at Purchasers' Prices	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Annual GDP Growth Rate (%)	8.3	0.5	5.4	5.8	6.8	5.3	5.8	6.5	4.8	-1.6	7.2
Inflation Rate (%)	1.5	1.4	1.8	1.2	1.5	3.0	3.6	2.0	5.4	0.6	1.7

Source: Department of Statistics.

The manufacturing sector's share of GDP has decline in recent years (**Table 2**). The country continues to rely on trade as an important source of economic growth in which the manufacturing sector is a major contributor. In 1990, the sector's share of exports was 81 percent but this had declined to 68 percent by 2010. This trend has alarmed policy makers who are concerned that Malaysia is "deindustrializing" prematurely. As Malaysia is still a middle income country, will this development work against the country progress towards achieving a developed country status? (i.e. the so-called "Middle-Income Trap").

To some extent, this problem is related to the labor market in Malaysia. In the past, the country - a relatively small economy - was driven in no small measure by its export-oriented industrialization policy. At its initial stage, this policy relied on low-skilled assembly operations especially in the electronics and electrical sector. However, over time, as education levels gradually edged upwards - the labour force participation rate began to decline, thus reducing labour supply. This trend is still evident today (**Table 3**). The policy response to this tightening in the domestic labour supply has been a strategy of greater reliance on foreign labour. For example, it has been estimated that foreign workers accounted for as high as 17.5 percent of the labour force in 2008 (World Bank, 2012, p.49). They accounted for a quarter of the labour force in the manufacturing sector (ibid, p.49).

Whilst cheap foreign labour was indeed a early source of the country's manufacturing competitiveness, it has later become an obstacle to efforts to upgrade the manufacturing and other sectors in the economy. Upgrading the country's manufacturing sector requires workers that are productive, innovative and well-paid (World Bank, 2012). Access to cheap foreign labour could have prevented employers from upgrading their production technology (more capital intensive) and investing in human capital development. The country's addiction to cheap foreign labour could also have suppressed wages of lower skilled in the labor market. A consequence of this could be a worsening of wage inequality.

Table 2: Malaysian Economy - Export Structure, 2000-2010

Export Composition	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Food	1.7	2.0	2.1	2.1	2.1	2.0	1.9	2.3	2.7	2.9	2.8
Beverages and Tobacco	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Crude Materials, Inedible	2.8	2.3	2.4	2.6	2.6	2.6	2.9	2.7	2.7	2.4	3.0
Mineral Fuels, Lubricants, etc.	9.6	9.7	8.6	10.1	11.6	13.4	13.7	14.4	18.3	14.4	16.0
Animal and Vegetable Oils and Fats	3.5	3.7	5.0	6.1	5.5	4.6	4.7	6.5	8.6	7.9	8.5
Chemicals	3.8	4.3	4.7	5.2	5.6	5.8	5.6	6.0	6.0	6.0	6.3
Manufactured Goods	6.9	7.2	7.0	7.0	7.7	7.3	8.1	8.7	8.9	8.9	8.8
Machinery and Transport Equipment	62.5	60.7	60.2	56.8	54.5	54.0	52.5	49.0	43.2	46.8	43.9
Miscellaneous Manufactured Articles	8.0	8.7	8.5	8.5	8.6	8.4	8.5	8.6	8.4	9.4	9.5
Miscellaneous Transactions and Commodities	0.8	1.1	1.2	1.3	1.4	1.5	1.7	1.4	0.9	0.8	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8
Manufacturing Export Share (%)	81.3	80.9	80.4	77.5	76.5	75.5	74.7	72.3	66.5	71.2	68.5

Source: Department of Statistics.

Table 3: Malaysia - Population and Labour Market Indicators, 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
0-14 Years	8,003	7,880	7,893	7,891	7,881	7,857	7,824	7,791	7,757	7,724	7,828
15-64 Years	14,560	15,293	15,846	16,400	16,955	17,510	17,857	18,203	18,547	18,890	19,079
65+ Years	932	950	989	1,029	1,069	1,110	1,151	1,193	1,236	1,282	1,427
Total Population ('000)	23,495	24,123	24,727	25,320	25,905	26,477	26,832	27,186	27,541	27,895	28,334
Population Growth Rate (%)	2.5	2.6	2.5	2.4	2.3	2.2	1.3	1.3	1.3	1.3	1.6
0-14 Years (%)	34.1	32.7	31.9	31.2	30.4	29.7	29.2	28.7	28.2	27.7	27.6
15-64 Years (%)	62.0	63.4	64.1	64.8	65.5	66.1	66.6	67.0	67.3	67.7	67.3
65+ Years (%)	4.0	3.9	4.0	4.1	4.1	4.2	4.3	4.4	4.5	4.6	5.0
Total Population (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Labor Force ('000)	9,556	9,699	9,886	10,240	10,346	10,413	10,629	10,890	11,028	11,315	11,517
Labour Force Participation (%)	65.4	64.9	64.4	65.2	64.4	63.3	63.1	63.2	62.6	62.9	62.7
Total Employment ('000)	9,269	9,357	9,543	9,870	9,980	10,045	10,275	10,538	10,660	10,897	11,129
Unemployment Rate (%)	3.0	3.5	3.5	3.6	3.5	3.5	3.3	3.2	3.3	3.7	3.4
Employment in Manufacturing ('000)	2,174	2,184	2,069	2,131	2,023	1,989	2,083	1,977	1,945	1,807	1,880
Manufacturing Employment Share (%)	23.5	23.3	21.7	21.6	20.3	19.8	20.3	18.8	18.2	16.6	16.9
Growth in Total Employment (%)		0.9	2.0	3.4	1.1	0.7	2.3	2.6	1.2	2.2	2.1
Growth in Manuf Employment (%)		0.5	-5.3	3.0	-5.1	-1.7	4.7	-5.1	-1.6	-7.1	4.0

Source: Department of Statistics.

There are currently very few studies which have examined these issues in great detail. Almost all rely on industry-level analysis e.g. Athukorala & Devadason (2012) and Mohamad (2010) or the use of household surveys data e.g. Said and Hamid (2011). Athukorala & Devadason (2012) provide industry-level evidence on the negative impact of foreign workers on wages of unskilled workers. This is borne out by the changes in average wage across occupational categories in the manufacturing sector during the period 2000-2005 (which roughly also coincides with of this study's data coverage).

Average wages at the managerial as well as the technical and supervisory levels seemed to have grown faster than for clerical, general and production workers (**Table 4**). A more qualitative analysis was undertaken by Mohamad (2010) who argued that wage inequality worsened during the 1995-2007 period and that this might be due to industry-level effects and job characteristics. In another study, Said & Hamid (2011) argued that micro-level evidence based on household surveys point to decreasing demand for professional workers (rather than technical workers) due to changes in technology.

There is clearly a need for more detailed micro-level evidence on wage inequality in the Malaysian manufacturing sector. The use of industry-level data precludes insights related to worker and firm characteristics whilst household survey lacks information on firm characteristics. A fuller picture awaits pending detailed studies utilizing worker and firm level data. This is the gap that the current study hopes to bridge. Current theoretical and empirical developments based on the heterogeneous firms framework further provides deep interpretation and insights. These are reviewed next.

Table 4: Labour Force Composition in Malaysian Manufacturing, 2000 and 2005

	2000			2005			Change (%)		
	Workers	Wages	Ave Wage	Workers	Wages	Ave Wage	Workers	Wages	Ave Wage
Managerial and professional	85,978	5,642,073	65,622	121,404	8,929,661	73,553	41.2	58.3	12.1
Technical and supervisory	174,631	4,725,659	27,061	190,918	5,856,233	30,674	9.3	23.9	13.4
Clerical and related occupation	98,740	1,735,504	17,577	108,532	2,245,188	20,687	9.9	29.4	17.7
General workers	55,536	713,899	12,855	73,145	1,044,571	14,281	31.7	46.3	11.1
Production/operative workers directly employed	1,030,773	12,038,029	11,679	966,571	12,459,342	12,890	-6.2	3.5	10.4
Production/operative workers directly employed through contractors	97,441	1,196,136	12,275	173,080	2,101,914	12,144	77.6	75.7	-1.1

Source: Department of Statistics.

3. Literature Review

The literature on globalization and inequality has primarily focused on the relationship between trade and wage inequality. The theoretical developments in recent years have evolved towards a stronger micro-foundational approach - one based on heterogeneous firms and more recently, heterogeneous workers in imperfect labour markets. Even though early empirical works by Bernard & Jensen (1995, 1999) predates Melitz's (2003) seminal theoretical contributions on heterogeneous firms, empirical analysis incorporating labour market imperfections is relatively recent. Thus, until recently, the empirical literature has lagged behind theoretical developments due the intensive data requirements of testing the new theories. The body of existing literature on micro analysis (theoretical and empirical), whilst not vast, is fairly substantial and has grown rapidly in recent years.

Given the diversity in the existing theoretical and empirical literature, it is perhaps useful to highlight some of the key elements within the literature. The first relates to "globalization". There are at least three distinct modes of globalization that have been analysed within the literature, namely, trade (exporting and/or importing), ownership (FDI) and offshoring (outsourcing and/or insourcing). Most studies have focused on exporting. As for "wage inequality", this has been analysed in terms of wage inequality between firms (with different modes of globalization), within firms (with composition of workers e.g. non-production/production, low/high skill, and occupational categories), within groups (across workers with identical observable characteristics) and between groups (across occupations/education background, workers with different characteristics).

In what follows, a review of some of the key micro theoretical and empirical contributions that are relevant to this study is undertaken.[3] For greater clarity, the review is divided into theoretical and empirical contributions (even though some works combine both elements). This will facilitate a discussion on the interactions between the two.

[3] For a more comprehensive review, the reader is referred to Harrison, *et al*. (2011).

3.1. Theoretical Literature

The starting point for most studies is Melitz's (2003) seminal contribution which highlighted how trade can result in resource re-allocation within an economy with heterogeneous firms. The paper is an important antecedent to the existing literature on globalization and wage inequality in terms of what is modelled (heterogeneous firms, productivity, selection and exporting) and what is left un-modelled (heterogeneous workers and imperfect labour market). A key element of Melitz's model that continues to influence the existing literature is the role of firm heterogeneity in exporting. In particular, only firms that are more productive will export after incurring a fixed cost (with the less productive firms exiting or serving the domestic market only). In Melitz (2003), workers are assumed to be identical and the labour market, perfect and frictionless. Wage inequality was not a focus of the paper, a challenge taken up by subsequent works.

The post-Melitz (2003) challenge in theorizing the impact of trade on wage inequality has focused on the modelling of the labour market and how it is linked to exporting. There is significant diversity in terms of how the labor market is modelled. The various models differ in terms of how the labor market is modelled.

In an early paper by Yeaple (2005), the labour market was assumed to be perfect (as did Melitz) and workers heterogeneous. In the study, workers are assumed to differ in terms of skill level (in terms of observable characteristics or some measure of quality of ability). Firm heterogeneity takes the form of identical firms adopting different production technology (high-tech/low-tech). Only firms employing high-technology and highly skilled workers will export. The theory predicts the existence of wage inequality across firms (exporters and non-exporters) and within firms (wage premium paid to skilled workers).

A slightly different model is that of Verhoogen (2008) in which firms are heterogeneous due to differences in productivity (exogenously determined and interpreted as entrepreneurial ability). In the paper, more productive firms will choose to produce higher quality products by hiring more skilled workers (white-collar)

compared to less-skilled workers (blue-collar). Thus, the theory predicts that wage premium for skilled workers to increase with exporting (due to quality upgrading).

In other works, the labor market is assumed to be imperfect (determination of wages) and with frictions (matching of workers with firms). In Davidson, *et al*. (2008), firms are ex ante identical but become heterogeneous through exogeneously determined adoption of technology (high-tech and low-tech firms). Heterogeneous workers (low/high-skilled) are randomly matched to firms. High-tech firms will export when matched with high-skilled workers. The theory predicts wage inequality between firms such that exporters will pay higher wages than non-exporters. Furthermore, the wage inequality within group (low/high-skilled wage premium) worsens as the outside opportunity of high-skilled managers in low-tech firms increase.

Egger & Kreickemeier (2009) assume that firms are heterogeneous in terms of productivity and workers are identical (ex ante). However, labour market is imperfect in the sense that efficiency wages are determined by firm-level productivity (exogeneously determined) through a fair-wage mechanism. This implies that wage inequality across firms is determined by differences in productivity. Furthermore, within-group (workers with same characteristics) are driven by differences in firms' productivity and exporting status.

In Amiti & Davis (2012), workers are identical but their wages are functions of firm performance through a fair-wage constraint. Firms are assumed to be heterogeneous in terms of productivity and firm-specific cost of penetrating foreign markets. Their theory predicts wage inequality between firms such that firms that export a larger share of their output or imports a higher share of inputs will have higher wages.

By far the most ambitious approach is that of Helpman, *et al*. (2010) who modelled labor market imperfections (wage bargaining) with frictions (search and match). In their model, exporting is driven by firm-level productivity that is assumed to follow a Pareto distribution. Firms with higher productivity and revenues (from exporting) have greater means to screen and pay for higher ability workers. Thus, for a given firm-level productivity, exporters pay higher wages. In addition, trade worsens wage inequality within each group of workers.

3.2. Empirical Literature

The empirical literature on trade and wage inequality is influenced by both the theoretical models advances as well as data availability. The latter is particularly crucial. The data used in existing studies are either plant/firm-level data or matched employer-employee data. Earlier published studies tend to use plant/firm-level data which can be used to understand wage inequality between firms (average wage differences exporters and non-exporters) and within firms (wage premium). Such analyses can also be undertaken with matched employer-employee data. However, in addition to these, matched employer-employee data can be used to investigate wage inequality in the context of labour market imperfections and frictions. These issues are analysed in terms of inequality in residual wages across worker groups and the presence of positive sorting (matching of workers to firms) in the labour market. In what follows, an attempt is made to link, as far as possible, the theories that are tested using the two types of data.

On a general level, a number of theories such as Yeaple (2005), Verhoogen (2008) and Davidson, *et al.* (2008) predict differences in wages paid by exporters and non-exporters. This is associated with the demand for more skilled workers due to firms adopting more advanced technology (Yeaple, 2005 and Davidson, *et al*., 2008) or produce higher quality goods (Verhoogen, 2008). There are at least two empirical approaches to test these predictions, namely exporter wage premium and skill wage premium.

3.2.1. Wage Inequality Between Firms - Exporter Wage Premium

The most commonly used approach is to test for exporter wage premium by regressing average wage levels of firms against a proxy for exporting. The early empirical papers using this approach pre-dates Melitz (2003). Using pooled plant-level data from the US during 1976-1987, Bernard & Jensen (2005) finds evidence of exporter wage premium. The study also found that the exporter wage premium is lower for two worker categories, namely, production and non-production workers. These results confirm the importance of worker composition.

More recent studies on exporter wage premium has utilized panel data using two types of alternative specifications – level (w_{it}) and differences (Δw_{it}). In the recent

study by Amiti & Davis (2012) using Indonesian panel data, trading status variables (exporting, importing) are interacted with changes in output and input tariffs (respectively) to examine how tariff changes affect wages. The study found that reductions in output tariffs increase wages in exporting firms whilst reduction in input tariffs reduces wages in import-competing firms. In another study by Frias, *et al*. (2012), exporter wage premium do not vary significantly across different quantiles of within firm wage distribution.

More recent studies using matched employer-employee data have extended the Bernard & Jensen (2005) approach in two ways. In Schank, *et al*. (2007), Munch & Skaksen (2008) and Martins & Opromolla (2012), the worker-exporter wage premium is estimated by regressing individual wages against exporting status, other firm characteristics and individual characteristics. Using German plant-level data, Schank, *et al*. (2007) found evidence of worker-exporter wage premium for both blue-collar and white-collar workers. The inclusion of an interacting exporting and skill intensity variable in Munch & Skaksen (2008) suggests that the worker-exporter wage premium is due to high-skill intensity in exporting Danish firms. In addition, Martins & Opromolla (2012) find the wage premium for export-only Portuguese firms are due to firms' characteristics such as size and sales. Another form of extension involves investigating the causal relationship between wages and exporting. In Schank, *et al.* (2007), the use of export entry (starter) variable in estimating the exporter wage premium enable the authors to show that higher wages preceeded exporting, thus confirming the existing evidence of selection to export (Greenaway & Kneller, 2007). Finally, to take into account endogeneous mobility of workes, matching fixed effects can be included. This is undertaken in the study by Frias, *et al*. (2012) which uses Mexican matched employer-employee data. Their study found that the incorporation of matching fixed effects reduces the impact of tariff reductions on the exporter wage premium.

3.2.2. Wage Inequality Within Firms - Skill Wage Premium

Another approach to test for differences in wages in exporting and non-exporting firms is through detection of the presence of wage skill premium for exporters. Both Verhoogen (2008) and Amiti & Cameron (2012) provides some evidence of this albeit their approaches are slightly different. In Verhoogen (2008), changes in the wage ratio

(for white collar/blue collar workers) are regressed against export share and other firm characteristics. In Amiti and Cameron (2012), both export status and an interactive export share-output tariff variable is used. Productivity appears to be an important explanatory variable within the wage skill premium literature. This is not surprising given the importance of productivity within the heterogeneous firm literature.

4. Methodology

4.1. Framework of Analysis

A framework of analysis to study relationship between globalization and trade can be drawn based on the existing theoretical and empirical literature. Underlying almost all the models is firm heterogeneity that based on differences in productivity due to adoption of technology (Yeaple, 2005 and Verhoogen, 2008).

Following Melitz (2003), only firms with higher productivity are capable of exporting due to fixed costs of exporting. It also possible that firms ability to export is due their capability to produce high quality products. However, firms can only achieve higher productivity and higher product quality when they employ highly skilled workers (or those with higher human capital). As exporting is associated with higher revenues, exporting could provide incentives to exporting firms to search for and employ higher skilled workers (Helpman, *et al*., 2010).

The above set-up implies that exporters are likely to pay higher wages than non-exporters. This leads to a prediction on the existence of exporter wage premiums. As exporters also demand more skilled workers, there is also likely to be a skill premium in both exporting and non-exporting firms.

4.2. Empirical Methods

The choice of empirical methods used in this study is based on prevailing approaches within the empirical literature, which in turn, is determined by theoretical considerations and data constraints. A stochastic dominance test is first used to

ascertain whether unconditioned wage levels are different between exporters and non-exporters. This is to be followed by econometric analysis of wage inequality between firms and within firms.

(a) Wage Levels and Globalization

The first task in this study is to determine whether there is differences in wage levels across firms with different globalization status such as exporting status and foreign/local ownership. This can be undertaken by employing a stochastic dominance test of the average wage distribution for exporters over the wage distribution for non-exporters.

Let F and G be the cumulative distribution functions of average wage (w) for exporters and non-exporters. The first-order stochastic dominance of F relative to G implies that:

$$F(w) - G(w) = 0 \qquad (1)$$

for all values of w, with strict inequality for some w.

The Kolgomorov-Smirnov test can be used for this purpose. Several measures of wage differences can be used, name:

- Average wage level - calculated by dividing total remunerations by total number of workers. This can be undertaken using both the MKCS and WBES datasets.
- Average wage level of workers in a given occupational category. The WBES data can be used to compute the average wage levels for different occupational categories such as management, professional, skilled, unskilled and unskilled.

The definitions are summarized in **Table 5**.

Table 5: Summary Explanations of Selected Variables

MKCS2002 & MKCS2006	
lnAveWage	Natural logarithm of average wage
Size	Total number of full time employees
R&D	1 for firms undertaking R&D activities, zero otherwise
Computer Use	Percentage of employees using computer at least once a week
Export Dummy	1 for firms exporting, zero otherwise
Export Share	Percentage share of exports in total revenues
Protect	Effectively applied tariffs obtained from World Bank's WITS database
RER	Effective real exchange rate

WBES2006	
lnAveWage	Natural logarithm of average wWage
Size	Size Total number of full time employees
R&D	1 for firms undertaking R&D activities, zero otherwise
Age Firm	Age of firm in 2006
Export Dummy	1 for firms exporting, zero otherwise
Export Share	Effectively applied tariffs obtained from World Bank's WITS database
Export Share	Percentage share of exports in total revenues
Management	Persons making management decisions (exclude supervisors)
Professional	Trained and certified specialists outside of management such as engineers,
	accountants, lawyers, chemists, scientists, software programmers.
	Generally, Professionals hold a University-level degree.
Skilled Production	Skilled production Skilled Production workers are technicians involved directly in the production
	process or at a supervisory level and whom management considers to be skilled.
Unskilled Production	Persons involved in production process whom management considers to be unskilled.
Non-production	Support, administrative, sales workers not included in management or among professionals.

Source: Author's compilation.

The data from the WBES2006 can be used to undertake the above tests to ascertain whether average wage levels in foreign-owned firms differ from those in locally-owned firms. Note that the results of these tests do not shed light on the sources of such differences. They merely indicate whether there are differences in wages between firms with different globalization status.

(b) Wage Inequality Between Firms: Exporter Wage Premium

Wage inequality between exporters and non-exporters can be estimated using specifications similar to the ones first used by Bernard & Jensen (1995), later extended in the works by Amiti & Davis (2012) and Frias, *et al.* (2012).

The specifications essentially entails regressing average firm wage against variables representing exporting (status or export share of revenues) and other firm characteristics such as firm size, firm size-squared, age of firm, ownership (foreign/local), R&D activity and ICT utilization e.g. computer utilization).

The simplest version utilizes cross-section data from the MKCS (2002, 2006) and WBES datasets. These are implemented via OLS regressions for the average firm-level wage *w* for firm *i* that operates in industry *k*, and location *l*:

$$w_i = \beta_1 EX_i + \beta_2 Protect_k + \beta_3 EX_i * Protect_k + \gamma \mathbf{Z}_i + \alpha_k + \varepsilon_i \qquad (2)$$

where *EX* exporting status, *Protect* a trade liberalization variable, **Z** firm characteristics (such as firm size, firm size-squared, age of firm, ownership (foreign/local), R&D activity and ICT utilization (i.e. computer utilization), α_k industry effects and ε_i error term.

A panel version incorporating real effective exchange rate (*RER*) can be estimated using the balanced-panel data from the MKCS datasets based on the following model:

$$w_{i,t} = \beta_1 EX_{i,t} + \beta_2 Protect_{k,t} + \beta_3 RER_t + \beta_4 EX_{i,t} * Protect_{k,t} + \beta_5 EX_{i,t} * RER_t + \gamma \mathbf{Z}_{i,t} + \alpha_{k,t} + \varepsilon_{i,t} \qquad (3)$$

Given the availability of information on occupational categories in the WBES2006 dataset, it is also possible to test for wage premium across these different occupational categories using the above specification (2). The occupational categories are management, professionals, skilled production, unskilled production and non-production. In addition, the impact of employment of foreign workers on wages can also be estimated.

(c) Wage Inequality Within Firms: Skill Wage Premium

The impact of trade on wage inequality within firm can be analyzed empirically by estimating the skill wage premium across the exporting and non-exporting firms. The dependent variable used in existing studies is essentially the log of the ratio of skilled and unskilled workers' wages (*log*(*ws*/*wu*)). The explanatory variables can be very similar to that used in estimating the exporter wage premium (see Amiti & Davis (2012) and Amiti & Cameron (2012)).

The specification for the skill wage premium can be expressed as follows for firm *i* operating in industry *k*, and location *l*:

$$\frac{w_i^s}{w_i^u} = \beta_1 EX_i + \beta_2 Protect_k + \beta_3 EX_i * Protect_k + \gamma \mathbf{Z}_i + \alpha_k + \alpha_l + \varepsilon_i \qquad (4)$$

where *EX* exporting status or export share of revenues, *Protect* a trade liberalization variable, **Z** firm characteristics (such as firm size, firm size-squared, age of firm, ownership (foreign/local), R&D activity, α_k industry effects, α_l location effects and ε error term. The OLS method is used to estimate the above equation.

The definitions of skilled and unskilled workers used depend very much on what worker classifications are available in the data used. In Verhoogen (2008), the two categories of workers are while-collar and blue-collar workers whilst in Amiti & Cameron (2012) it is nonproduction and production workers. Only the WBES has information on worker categories to estimate the skill wage premium. In the dataset, there are five categories of workers, namely, management (*ma*), professionals (*pr*), skilled production workers (*sp*), unskilled production workers (*up*) and nonproduction workers (*np*). The ratios constructed are based on theoretical considerations in terms of their role in various theories:

1. $\frac{w^{ma}}{w^{sp}}$ and $\frac{w^{ma}}{w^{up}}$: wage ratio of management workers to skilled production workers and unskilled production workers. Management workers may be

considered to be proxies for workers with some entrepreneurial ability to improve productivity and quality (Verhoogen, 2008).

2. $\frac{w^{pr}}{w^{sp}}$ and $\frac{w^{pr}}{w^{up}}$: *wup* : wage ratio of professional workers to skilled production workers and unskilled production workers. Professional workers may be considered to be highly skilled workers crucial for adoption of technology (Yeaple, 2005).

3. $\frac{w^{sp}}{w^{np}}$: wage ratio of skilled production and unskilled production workers. Skilled production workers could be crucial for adoption of technology and achievement of high levels of productivity.

4.3. Data

Two different sets of firm-level data are used in this study, namely, the World Bank's *Enterprise Survey* data (WBES) and the Economic Planning Unit's *Malaysian Knowledge Content Survey* (MKCS). The datasets used in this study have a minimum of 10 workers. The WBES data (WBES2006) covers the year 2006 and contains 1,073 firms from the manufacturing sector. The data can be matched to the employee survey which contains 10,615 observations. On average, 10 workers are sampled from each firm in the matched employer-employee data set. The MKCS data covers two years period, namely 2002 and 2006. The MKCS2002 and MKCS2006 contain 1,114 firms and 1,139 firms, respectively.

As the data sets used in this study do not come from manufacturing census or survey, some comments on the sampling methods used in these studies are in order. The respondents in the MKCS surveys were obtained from random sampling. A stratified random sampling is used in collecting the data for the WBES. The stratification is based on sector, region, state and industry. The WBES data contains more details on wages (renumeration) at both the firm-level (total wages earned by various categories of employees such as management, professional, skilled, unskilled and non-production (see **Table 5**). In addition, the WBES dataset contains information on individual wages and worker characteristics (e.g. age, ethnicity, gender, marital

status, foreign/local worker, education level and position). For the MKCS data, only total wage at the firm level is available.

Both the WBES and MKCS datasets contain information on the exporting status. However, only the WBES dataset has information on foreign ownership which is defined in this study as 10% or more the equity owned by foreigners. Both datasets have data on R&D even though they are recorded differently. In the MKCS datasets, firms state whether they undertake R&D activities while in the WBES dataset, firms state the amount of expenditure on R&D. The MKCS dataset has information on percentage of employees using computers at least once a week. The effectively applied tariffs at the two-digit level for year 2001 and 2005 are used as proxies for trade liberalization. This is obtained from World Bank's WITS database available online. Real effective exchange rates were obtained from International Financial Statistics, International Monetary Fund.

5. Results

5.1. Brief Summary Statistics

A brief summary statistics of the data used in this study is presented in **Table 6**. The datasets show some slight variations in firm size (measured in terms of number of full time employees). The mean firm size ranges from 203 to 232 employees in the datasets. Thus, the average firm in the datasets is a large firm (based on the Malaysian official definition of a large firm, namely those exceeding 150 employees).

The percentage of firms exporting in all three datasets is fairly high. There might be some sampling bias as the percentage of firms exporting is lower in census data. In the 2005 manufacturing census, the proportion of firms exporting is much lower, at around 16 percent to 49 percent across the different industries. In the case of foreign ownership, about a third of the firms in the datasets are firms with foreign participation (more accurately, have headquarters located outside Malaysia).

Table 6: Basic Descriptive Statistics

Size (no. employees)	Obs	Mean	Std. Dev.	Min	Max	
MKCS2002	1,114	203	401	10	6,086	
MKCS2006	1,139	232	570	10	9,879	
WBES2006	1,063	211	624	10	14,067	
Exporting Status	**Yes**	**%**	**No**	**%**	**Total**	**%**
MKCS2002	843	75.7	271	24.3	1,114	100.0
MKCS2006	645	56.6	494	43.4	1,139	100.0
WBES2006	651	61.8	403	38.2	1,054	100.0
Foreign Participation*	**Yes**	**%**	**No**	**%**	**Total**	**%**
MKCS2002	191	34.9	357	65.1	548	100.0
MKCS2006	200	31.9	428	68.1	628	100.0
WBES2006	337	31.4	736	68.6	1,073	100.0

**Note*: In MKCS2002 and MKCS2006, foreign participation is defined as firms with headquarters located outside Malaysia while in WBES, foreign participation is defined as firm with 10% of more equity owned by foreigners.

Source: Author's compilation.

5.2. Wage Levels and Globalization

The results from the application of the Kolgomorov-Smirnov (KS) on the datasets confirm that the average wage level in exporting firms are higher than those in non-exporting firms (see **Table 7**).

Table 7: Differences in Average Wage Between Exporters and Non-Exporters

MKCS2002, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1614	0.0000	
Exporters	-0.0025	0.9970	
Combined K-S	0.1614	0.0000	0.0000
MKCS2006, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1709	0.0000	
Exporters	-0.0047	0.9880	
Combined K-S	0.1709	0.0000	0.0000

WBES2006, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1287	0.0000	
Exporters	-0.0028	0.9960	
Combined K-S	0.1287	0.0010	0.0000

Source: Author's compilation.

When the KS tests are carried out for different occupational categories using the WBES2006 dataset, differences between average wage paid by exporters and non-exporters continue to be observed (**Table 8**). It is interesting to note that, comparing across the different occupational categories, average wage gap between the exporters and non-exporters are largest in the management and non-production categories. Managers in exporting firms are essentially paid more than their counterparts in non-exporting firms. This perhaps indirectly confirms the assumptions made in many of the exiting theories about the emphasis on entrepreneurial/managerial abilities in exporting firms e.g. Yeaple (2005). However, it can also be observed that the large gap is also observed in the non-production category of workers. This could be due to the possibility that the depressive effect of low-skilled foreign workers on wages is more significant in non-exporting firms.

Results from the application of the KS test using the WBES2006 dataset also suggest that the average wage levels in firms with foreign participation are higher than in their local counterpart (**Table 9**). The wage gap is found to be particularly large in the management and non-production categories (**Table 10**). This is very similar to the pattern observed between exporters and non-exporters.

Table 8: Differences in Average Wage Between Exporters and Non-Exporters, by Occupational Categories

Management, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1409	0.0000	
Exporters	-0.0077	0.9720	
Combined K-S	0.1287	0.0010	0.0000
Professional, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.0541	0.5150	
Exporters	-0.0351	0.7570	
Combined K-S	0.0541	0.8940	0.8720
Skilled Production, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.0805	0.0670	
Exporters	-0.0194	0.8550	
Combined K-S	0.0805	0.1340	0.1160
Unskilled Production, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.0785	0.0660	
Exporters	-0.0026	0.9970	
Combined K-S	0.0785	0.1320	0.1150
Non-Production, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1126	0.0060	
Exporters	-0.0030	0.9960	
Combined K-S	0.1126	0.0130	0.0100

Source: Author's compilation.

Table 9: Differences in Average Wage Between Local and Foreign Firms

MKCS2002, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1630	0.0000	
Exporters	-0.0183	0.9210	
Combined K-S	0.1630	0.0030	0.0020
MKCS2006, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1808	0.0000	
Exporters	-0.0077	0.9840	
Combined K-S	0.1808	0.0000	0.0000
WBES2006, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.2313	0.0000	
Exporters	-0.0148	0.9080	
Combined K-S	0.2313	0.0000	0.0000

Source: Author's compilation.

Table 10: Differences in Average Wage Between Local and Foreign Firms, by Occupational Categories

Management, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1621	0.0000	
Exporters	0.0000	1.0000	
Combined K-S	0.1621	0.0000	0.0000
Professional, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1009	0.0580	
Exporters	-0.0411	0.6230	
Combined K-S	0.1009	0.1160	0.0970
Skilled Production, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.0715	0.1190	
Exporters	-0.0048	0.9900	
Combined K-S	0.0072	0.2380	0.2120

Unskilled Production, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1231	0.0020	
Exporters	-0.0393	0.5380	
Combined K-S	0.1231	0.0050	0.0040

Non-Production, Average Wage per Worker			
Smaller Group	D	P-Value	
Non-Exporters	0.1732	0.0000	
Exporters	-0.0143	0.9220	
Combined K-S	0.1732	0.0000	0.0000

Source: Author's compilation.

5.3. Wage Inequality Between Firms: Exporter Wage Premium

The export dummy variable has a positive sign and is statistically significant in the OLS regression using the MKCS2002 dataset (**Table 11**). This is consistent with findings from studies in the literature such as Amiti & Cameron (2012) and Frias, *et al.* (2012). However, the variable is statistically insignificant in regressions using other datasets (MKCS2006 and WBES2006) even though the signs of the coefficients are also positive.

In the fixed-effects panel regression, the export variable has a positive sign and is statistically insignificant.[4] Overall, there is some evidence of an exporter wage premium albeit this evidence is a weak one.

The proxy variable for trade liberalization (protect variable) has a positive sign in the OLS regressions involving both the MKCS2006 and WBES2006 datasets (**Table 11**). In contrast, the variable is statistically insignificant and has a negative coefficient signs for both the WKCS2002 dataset and the panel regression (MKCS2002 and MKCS2006). The negative sign for interacting variable involving exporting and trade liberalization is more consistent across the different datasets and panel regression. However, the variable is only statistically significant for the MKCS2002 dataset. It can be concluded that whilst there is some evidence of a positive impact of trade liberalization on wage levels, this evidence is a weak one.

[4] A Hausman specification test was undertaken to select the appropriate panel regression method i.e. random or fixed effects GLS.

Table 11: Exporter Wage Premium - Cross Section Estimates

	(1)	(2)	(3)	(4)
	MKCS2002 Cross-Section	MKCS2006 Cross-Section	WBES2006 Cross-Section	MKCS2002 & MKCS2006 Panel
	OLS	OLS	OLS	GLS FE
Variables	lnAveWage	lnAveWage	lnAveWage	lnAveWage
Size	-0.00442	0.303*	0.111	1.062**
	(0.154)	(0.159)	(0.0905)	(0.458)
Size-squared	0.00421	-0.0310**	-0.0123	-0.137***
	(0.0145)	(0.0148)	(0.00969)	(0.0439)
Foreign	0.0722	0.0999	0.164***	0.0249
	(0.0525)	(0.0651)	(0.0458)	(0.143)
R&D	-0.186***	-0.0844	0.109*	-0.0272
	(0.0501)	(0.0609)	(0.0584)	(0.0680)
Computer Use	0.112***	0.0895***		-0.0629*
	(0.0204)	(0.0282)		(0.0347)
Export	0.310***	0.164	0.00297	0.129
	(0.105)	(0.113)	(0.0716)	(1.761)
Protect	-0.00759	0.0469***	0.00401	-0.0481
	(0.00999)	(0.0111)	(0.00623)	(0.0521)
Export*Protect	-0.0239***	-0.0121	0.00595	-0.00964
	(0.00817)	(0.00971)	(0.00544)	(0.0101)
RER				-0.00965
				(0.0212)
Export*RER				-0.000993
				(0.0166)
Constant	9.751***	8.437***	9.058***	9.708***
	(0.429)	(0.432)	(0.218)	(2.259)
Industry Dummies	Yes	Yes	Yes	Yes
Observations	520	614	1,041	1,134
R-squared	0.299	0.156	0.134	0.135

Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Source: Author's compilation.

As for the foreign ownership variable, it has a positive coefficient in all cases but the variable is only statistically significant in the WBES2006 dataset. Larger firms are likely to be associated with higher wages up to a point (due to the negative sign of the size-squared variable).

The role of technology is a bit more complex. The R&D variable has a negative sign in the regressions involving the MKCS2002 and MKCS2006 datasets (cross-section and panel). However, the variable is only statistically significant for the MKCS2002 dataset. The explanation for the negative coefficient sign is that Malaysian firms could be involved in non-cutting edge type of innovation activities.

Interestingly, the computer use variable is statistically significant and has a positive sign in the cross-section results. Computer usage could be associated with higher skills. For example, Autor, *et al.* (2003) associates computerization with an increase in labor input of non-routine cognitive task. This result is thus consistent with emphasis on the importance of skills in both the theoretical and empirical literature.

In terms of wages by occupational categories, the exporter wage premium is statistically insignificant (**Table 12**). However, the proxy variable for trade liberalization has a negative sign and is significant for skilled production workers' wages. The sign and significance of the interactive exporting and trade liberalization variable for this occupation category also implies that trade liberalization are likely to be associated with higher wages for skilled production workers in exporting firms.

The inclusion of foreign employment share provides additional insights on the impact of foreign employment on wages. Overall, higher share of foreign employment is associated with lower average wages (**Table 12**). This is particularly true in the case of skilled production workers based on the negative sign and statistical significance of the variable for share of foreign employment of skilled workers.

5.4. Wage Inequality Within Firms: Skill Wage Premium

Most existing theories assume that exporting entails the hiring of high-skill workers which are associated with higher ability that enhances firm productivity and/or its product quality. One key problem with testing such theories empirically is that existing classification of workers may not correspond perfectly with the high skilled / low skilled dichotomy in the theoretical literature.

Table 12: Exporter Wage Premium by Occupational Categories

Variables	(1) WBES2006 All	(2) WBES2006 Management	(3) WBES2006 Professional	(4) WBES2006 Skilled Prod	(5) WBES2006 Unskilled Prod	(6) WBES2006 Non Prod
Size	0.118	0.659***	0.393**	0.158	0.112	0.501***
	(0.0893)	(0.130)	(0.182)	(0.125)	(0.128)	(0.149)
Size-squared	-0.0121	-0.0542***	-0.0240	-0.0136	-0.00728	-0.0488***
	(0.00955)	(0.0139)	(0.0183)	(0.0131)	(0.0137)	(0.0154)
Foreign	0.148***	0.123*	0.0732	0.0637	0.0662	0.124*
	(0.0451)	(0.0667)	(0.0769)	(0.0601)	(0.0635)	(0.0710)
R&D	0.0925	-0.0539	-0.0218	0.00630	0.00697	-0.185**
	(0.0575)	(0.0822)	(0.0902)	(0.0746)	(0.0818)	(0.0885)
Export	0.101	-0.125	-0.151	-0.101	-0.0190	0.0398
	(0.0762)	(0.103)	(0.130)	(0.0999)	(0.107)	(0.115)
Protect	-0.00363	0.00792	-0.00874	-0.0188**	-0.0119	0.00519
	(0.00626)	(0.00906)	(0.0134)	(0.00853)	(0.00870)	(0.0106)
Export*Protect	0.00926*	0.00750	0.0111	0.0155**	0.0129*	0.00239
	(0.00540)	(0.00780)	(0.0103)	(0.00740)	(0.00762)	(0.00879)
PerForeignEmp	-0.0915					
	(0.117)					
Export*PerForeignEmp	-0.478***					
	(0.147)					
PerForeignEmpMgt		-0.491				
		(0.315)				
Export*PerForeignEmpMgt		0.618*				
		(0.355)				
PerForeignEmpPro			0.294			
			(0.393)			
Export*PerForeignEmpPro			-0.355			
			(0.427)			
PerForeignEmpSki				-0.412**		
				(0.185)		
Export*PerForeignEmpSki				-0.193		
				(0.220)		
PerForeignEmpUns					-0.0419	
					(0.120)	
Export*PerForeignEmpUns					-0.243	
					(0.154)	
PerForeignEmpNon						-0.106
						(0.235)
Export*PerForeignEmpNon						-0.192
						(0.282)
Constant	9.204***	8.726***	9.311***	9.483***	8.845***	8.127***
	(0.216)	(0.316)	(0.479)	(0.305)	(0.307)	(0.373)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,041	995	562	913	920	840
R-squared	0.164	0.114	0.089	0.076	0.047	0.063

Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Source: Author's compilation.

Existing common classifications include production/non-production workers (Amiti & Cameron, 2012) and white collar/blue collar (Verhoogen, 2008). In this study, the worker classification method available is that of occupation categories.

In so far as the various wage ratios used capture wage difference between high-skill and low-skill workers, there is no evidence of any systematic skill wage premium associated with exporting (**Table 13**). However, the proxy variable for trade liberalization is significant and has a positive sign for the wage ratio between management and skilled production workers as well as between management and unskilled production workers.

These results are broadly consistent with the results from existing studies such as Verhoogen (2008) and Amiti & Cameron (2012).

Only the firm size variable (measure by total number of employees) is statistically significant which is consistent with the findings from existing studies such as Verhoogen (2008) and Amiti & Cameron (2012). However, the results also suggest that there is an inverse-U relationship between firm size and skill wage premium. The differences between the average wage of high skill and low skill workers increase with size until a particular point after which the relationship is reversed.

However, there might a number of explanations consistent with this finding. One possible explanation could be that high skill workers in the largest firms receive a larger proportion of the compensation in non-wage benefits such as share options and bonus. This would certainly be consistent with the entrepreneurial-type abilities associated with high-skill workers in the theoretical literature (Yeaple, 2005).

Table 13: Skill Wage Premium

Variables	(1) WBES2006 Wage Ratio: Mgt/Skilled	(2) WBES2006 Wage Ratio: Mgt/Unskilled	(3) WBES2006 Wage Ratio: Prof/Skilled	(4) WBES2006 Wage Ratio: Prof/Unskilled	(5) WBES2006 Wage Ratio: Skilled/Unskilled
Size	0.428***	0.469***	0.367*	0.0842	0.164
	(0.150)	(0.175)	(0.196)	(0.242)	(0.155)
Size-squared	-0.0331**	-0.0382**	-0.0255	0.00255	-0.0204
	(0.0157)	(0.0185)	(0.0194)	(0.0242)	(0.0162)
Foreign	0.0439	0.0177	-0.0193	-0.0132	-0.0158
	(0.0732)	(0.0869)	(0.0795)	(0.0967)	(0.0719)
R&D	-0.0897	-0.0385	0.00592	0.0571	0.0532
	(0.0878)	(0.108)	(0.0922)	(0.113)	(0.0902)
Export	-0.0246	-0.0137	0.0270	0.223	-0.0637
	(0.120)	(0.145)	(0.140)	(0.184)	(0.128)
Protect	0.0291***	0.0200*	0.0191	0.0105	0.00187
	(0.0103)	(0.0119)	(0.0141)	(0.0171)	(0.0104)
Export*Protect	-0.00314	-0.0110	-0.00950	-0.0179	-0.000772
	(0.00886)	(0.0103)	(0.0108)	(0.0133)	(0.00902)
PerForeignEmpMgt	-0.207	-0.781*			
	(0.391)	(0.455)			
Export*PerForeignEmpMgt	0.204	1.002**			
	(0.428)	(0.506)			
PerForeignEmpPro			0.145	0.585	
			(0.428)	(0.507)	
Export*PerForeignEmpPro			-0.262	-0.459	
			(0.464)	(0.549)	
PerForeignEmpSki	0.337		0.422		-0.423*
	(0.220)		(0.293)		(0.256)
Export*PerForeignEmpSki	-0.0183		0.0750		0.0909
	(0.261)		(0.339)		(0.302)
PerForeignEmpUns		-0.0244		0.398	0.0546
		(0.166)		(0.252)	(0.152)
Export*PerForeignEmpUns		0.0752		-0.376	0.0968
		(0.210)		(0.293)	(0.189)
Constant	-0.632*	0.142	-0.509	0.781	0.362
	(0.371)	(0.422)	(0.528)	(0.634)	(0.378)
Observations	878	879	534	493	798
R-squared	0.060	0.042	0.068	0.052	0.028

Notes: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Source: Author's compilation.

6. Policy Implcations

Overall, findings from this study suggest that the relationship between exporting average wage levels (exporter wage premium) is relatively weak. The evidence on the positive relationship between wage inequality and trade liberalization is slightly stronger especially on the wages of skilled workers. Interestingly, the wages of this category of workers are likely to be lower when firms higher a higher proportion of skilled foreign workers. Trade liberalization is also likely to be associated with a widening of average wage levels between management and skilled production workers.

What are the policy implications from these findings? The key policy objective in Malaysia continues to be sustained growth via continued reliance on export-oriented manufacturing (given the small size of the economy). A key element of Melitz (2003) and the post-Melitz literature on trade and wage inequality is the importance of productivity (for exporting) and resource reallocation across and within industries. The latter includes reallocation within labor markets. There is clearly a need for further reforms to increase productivity in the economy. In this regard, the evidence in this study suggests that trade liberalization is likely to be an important policy.

The Malaysian government has been very interested in undertaking reforms in the labour market to upgrading the skill profile of the labour force. The implementation of minimum wage - which changes the incentives to use high skill workers - is one such policy. Evidence from this study suggests that this will only work if the country reduces the employment of foreign workers especially those in the skilled production category. Thus, the key policy challenge involves enhancing exporting via trade liberalization without dependence on foreign workers.

7. Conclusions

The relationship between globalization and wage inequality has been an important topic of interest both to policy makers, academics and the general public. The impact on globalization on economic growth, income equality and poverty eradication

development has been extensively researched. A recent development in this area has been the increasing emphasis on micro-level studies incorporating heterogeneous firms and workers, both theoretically and empirically. These studies have emphasized on the importance of the resource allocation and re-allocation process in open economies. This study attempts to extend the empirical literature in this area by studying the Malaysian experience using firm-level data from the country's manufacturing sector.

The results obtained in this study provide some evidence on the relationship between globalization and wage inequality. There is some evidence, albeit relatively weak, that wage levels in exporting firms are higher than those observed in non-exporting firms. The evidence on trade liberalization is stronger especially on wages of skilled production workers. Whilst trade liberalization is associated with higher wages, the employment of foreign workers can have the opposite effect. Therefore, the key policy challenge involves enhancing exporting via trade liberalization without dependence on foreign workers.

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