RIETI Discussion Paper Series 17-E-115

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The Research Institute of Economy, Trade and Industry
http://www.rieti.go.jp/en/

RIETI Discussion Paper Series 17-E-115

October 2017

Wage Premium of Exporting Plants in Japan: Do plant and firm size matter?*

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Abstract

Do the benefits firms obtain through globalization go to their workers? For example, do workers in exporting firms receive higher compensation than those in non-exporting firms? To investigate this, this paper constructs cross-sectional employer-employee data by merging plant and worker data, estimates a Mincer-type wage function in Japan's manufacturing sector, and examines the existence of the part of wages that are purely correlated with exports and that cannot be explained by any other characteristics of the workers and plants.

The results of the estimation indicate that the wages of exporting plants are higher than those at non-exporting plants even after controlling for the characteristics of workers and plants, and the estimation of plant and firm size shows that the wage differential correlated with exports is remarkable for relatively smaller plants or firms. In addition, according to the Blinder-Oaxaca decomposition, the portion of the wage differential correlated with exports constitutes less than 10% of the wage premium of exporters, but for plants on a smaller scale, the export premium constitutes a certain share, i.e., around 30%.

Based on the results, exports and wages clearly are correlated in Japan's manufacturing sector, especially for smaller-scale plants and firms.

Keywords: Wage, Export, Plant, Employer-employee data, Japan

JEL classification: D22, F14, J31, L25

*This study is supported by the Research Institute of Economy, Trade and Industry (RIETI). I acknowledge Professor Kyoji Fukao (Institute of Economic Research, Hitotsubashi University), who suggested many useful comments. Also, I appreciate helpful comments from Makoto Yano (President of RIETI), Masayuki Morikawa (Vice President of RIETI), and other participants at the RIETI DP meeting, and Tomohiko Inui (Gakushuin University) and other participants at the 7th Spring Meeting of the Japan Society of International Economics. This study utilizes micro data from questionnaire information from the Basic Survey on Wage Structure conducted by the Ministry of Health, Labour and Welfare, Census of Manufacture conducted by the Ministry of Economy, Trade and Industry (METI), the Economic Census for Business Activity conducted by the Ministry of Internal Affairs and Communications (MIC) and METI, and the Establishment and Enterprise Census conducted by MIC. I am grateful for the great support from the staff at the Quantitative Analysis and Database Group of RIETI for helping me use data for this research. The errors in this paper are my responsibility alone.

1. Introduction

In Japan, as in other countries, the globalization of the economy began progressing rapidly in the 1990s, and trade and foreign direct investment has also quickly expanded. Overseas production activities are also being actively carried out through the introduction of offshoring and other activities.

Generally, it is thought that firms engaged in globalization benefit in various ways.[2] Many empirical studies of the relationship between globalization of firms and productivity/profit have been conducted since the 2000s, and several have indicated that benefits such as improvements in productivity come from international activities such as exporting.[3]

When firms benefit from globalization, do their workers profit from such benefits? For example, do workers at exporting firms receive higher compensation than those of firms that do not export?

Previous studies focused on a salary, a representative indicator of benefits for workers, and indicated average wages at exporting firms are higher than those at non-exporting firms. The difference between them is called wage premium of exporters, and it has been observed in various countries around the world (Schank et al. 2007).

However, we should not conclude that workers in exporting firms obtain high wages by exporting due to this wage premium because wages are affected by other firm characteristics, e.g., size, and individual workers' characteristics, e.g., academic background, employment pattern, job category, and gender. Only after confirming that the wage premium of exporters exists when these various characteristics are controlled, we can say workers at exporters receive higher wages.

Therefore, to control the characteristics of firms and workers,, more and more studies have been produced in recent years examining the wage premium of exporters by using linked employer–employee data, combining data from firms and their employees.

Working from recent studies, this paper constructs Japan's cross-sectional employer–employee data by merging plants' data from Census of Manufacture implemented by the Ministry of Economy, Trade and Industry (METI); the Economic Census for Business Activity implemented by the Ministry of Internal Affairs and Communications (MIC)

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[2] Firms self-select whether to make efforts to globalize, so there is no need for them to tackle it if they do not expect benefits. For this reason, it is expected that firms engaged in globalization currently benefit or judge that they will benefit in the future even if they are not benefiting now.

[3] Although the results of empirical studies on the causal relationship between firms' international activities (export/FDI) and their productivity vary depending on the country and the period, in Japan Ito (2011) and Kurita (2014) have shown the existence of the causal relationship from starting exportation to productivity improvement.

and METI; and worker data from the Basic Survey on Wage Structure implemented by the Ministry of Health, Labour and Welfare (MHLW). The study estimates a Mincer-type wage function in Japan's manufacturing sector to determine the existence of part of the wage premium that cannot be explained by other characteristics of workers and plants, i.e., a part purely correlated with exports.

2. Previous Studies

(1) Studies on wage gaps between firms

Studies on the wage premium of exporters became common in the 2000s; however, studies on the wage differentials between firms were conducted before that time. In Japan, the existence of a wage differential between large and small enterprises has been recognized for a long time, and theoretical interpretations of the phenomenon have accumulated.[4]

In a normal perfect-competition economy, wages should be equal to labor productivity. Therefore, assuming perfect competition, the wage differential according to firm size is caused by the difference in labor productivity among firm size. This hypothesis regarding the productivity gap is still effective today. For example, Fukao et al. (2014) factorized Japan's wage differential by firm size from 1975 to 2010 into labor share and labor productivity and indicated that the latter is greater. Furthermore, they broke down the latter into three factors, i.e., labor quality, capital–labor ratio, and total factor productivity, and found that the differential of the capital–labor ratio has the largest share, i.e., 65% of the average contribution in their chosen period.

Furthermore, if we investigate the workers' side, it is possible that a difference in workers' inherent capabilities that does not appear in the data brings about the wage differential. Genda (1996) and Okui (2000) examined capability difference hypotheses and focused on this concept. They used data on workers who moved between companies of different sizes and decomposed their change in wages before and after the movement into the effects of the workers' specific skills/capabilities and other effects, showing that the former has a large effect.

(2) Analyses of the wage premium of exporters

Analyses of the exporting wage premium using microdata date back to Bernard and Jensen (1995). At the time their paper was published, the GATT Uruguay Round and the North American Free Trade Agreement (NAFTA) were under negotiation, and the pros and cons of the promotion of free trade were being intensely discussed. However,

[4] For example, see the Small and Medium Enterprise Agency (1963).

there was a lack of information on exporting from a firm perspective. Thus, the authors made various comparisons between exporting and non-exporting plants using plant-level data in the manufacturing sector in the United States to show the significance of exporting. As a part of this, in a comparison of employees' average annual incomes and remunerations, exporting plants have higher wages (prescribed salary) by 14.5% and remuneration (other than the prescribed salary) by 32.7% than do non-exporting plants. Furthermore, a regression was performed using the plants' average annual incomes and remunerations as a dependent variable, indicating that after controlling for plants' attributes, such as size and capital–labor ratio, the coefficient of the export dummy was statistically significantly positive (4.4% for wage, 7.6% for remuneration), i.e., exporting plants paid higher wages than non-exporting plants. In the 2000s, similar studies were conducted in many countries. According to Schank et al. (2007), most of 21 empirical studies covering 22 countries confirmed the existence of a wage premium after controlling for other firms' or plants' variables in the same way Bernard and Jensen (1995) did.

However, the need to control for workers' attributes was noted from the first studies that detected a wage premium, which controlled only the attributes of firms/plants. In a comment on Bernard and Jensen (1995), Lawrence (1995), noting that the wage premium would shrink when the capital–labor ratio and the size of plants were controlled for, wrote, "One suspects, moreover, that the premiums would be even further reduced if the authors were able to control for worker characteristics."

To control workers' characteristics in addition to the characteristics of firms/plants, it is necessary to conduct analyses using matched employer–employee data that connect data on workers and firms/plants. Whereas matched employer–employee data had been used in the field of labor economics, Schank et al. (2007) used them for the first time in an analysis of the wage premium of exporters.[5] They estimated the wage function using plant data for the manufacturing sector in the former West Germany. They first measured the wage premium by controlling only the characteristics of plants and then verified whether the wage premium could be significantly measured by controlling the attributes of workers as well as plants. The results indicated that the coefficients of the export dummy were not statistically significant and that there was no wage gap due to exporting. In addition, they estimated the wage function, including the sales–export ratio instead of the export dummy to check whether the wage differential stems from

[5] Initial studies using matched employer–employee data include Carrington and Troske (1998), which analyzed the wage differential between men and women among establishments, and Troske (1999) which analyzed the relationships between the sizes of workplaces and their wages.

export dependency, and they showed that the coefficient was significantly positive. This result implies that wage disparities exist only between plants with a high dependence on exports and other plants.

Munch and Skaksen (2008) also performed a similar analysis using Denmark's matched employer–employee data. Again, the coefficient of the export dummy in their estimation was not significant, and only the coefficient of the sales–export ratio was significant.[6] Many other similar types of analyses also report that the significance of the export dummy disappears after workers' characteristics are controlled for.[7]

In Japan, Wakasugi et al. (2008) calculated the wage premium of exporters by using firm-level data from METI's Basic Survey of Japanese Business Structure and Activities (1997–2005). They estimated the average wage for exporting firms as 19–25% higher than that of non-exporting firms. Since then, a small number of studies on wages using matched employer–employee data have also been conducted in Japan. Kawaguchi et al. (2006) constructed cross-sectional employer–employee data for each of 1993 to 2003 and estimated the production function and wage function at the establishment level, thereby calculating the gap between labor productivity and wage using workers' characteristics.[8] Tanaka (2015) and Endo (2016) can also be cited as conducting analyses using matched employer–employee data in Japan from the viewpoint of globalization and wages; the former focused on the wage differential between foreign-affiliated firms and domestic firms, and the latter analyzed the wage differential between offshoring firms and others. Both also calculated a wage premium for exporters, but that was not the focus of their analysis, and the numbers of samples used was smaller compared to those in this paper.[9]

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[6] Munch and Skaksen (2008) further estimated the wage function, including the intersection term of the sales–export ratio and the skilled-worker ratio. Here, the coefficients of the cross term became significant, but the coefficient of sales–export ratio became insignificant. In other words, they confirmed that the wage premium observed in export plants is correlated with a dependency on skilled labor within the plant. They ascribe this result to relationships with overseas markets where products manufactured by firms compete. They interpret that firms with low skilled-labor ratios produce homogeneous goods, which compete with goods produced in low-income countries overseas, and as a result their suppressed profits makes it hard for them to raise workers' wages (rent sharing).

[7] See Wagner (2012) for survey of analyses on wage premium of exports using matched employer–employee data.

[8] According to Kawaguchi et al.'s (2006) estimation, the slope of the wage profile is larger than the slope of the productivity profile in Japanese manufacturing industry, meaning that young workers receive rewards below their productivity on the one hand and middle-aged and older workers receive more rewards more than their productivity.

[9] As in this paper, Tanaka (2015) connects the workers' data from the Ministry of Health, Labour and Welfare's (MHLW) Basic Survey on Wage Structure 2012 to the

The data they used were extracted from relatively larger plants or firms, which tend to have better performance and faster growth whether they export or not, and they might show smaller differences between exporters and non-exporters compared to small plants and firms. Thus, in this paper, smaller plants and firms are also analyzed.

(3) Theoretical interpretation of the wage premiums of exporters

In the 2000s, research on trade theory explaining the heterogeneity of trade behavior in firms became more widespread, and the wage premium of exporters became a topic to be theoretically interpreted and a target of empirical analyses.

Early research results include those of Yeaple (2005), who showed a model in which a wage differential between exporting and non-exporting firms would occur under perfect competition, and Helpman et al. (2010), who constructed a model in which a wage difference occurs between exporting and non-exporting firms in scenarios involving monopolistic competition and a search-type labor market.

In Yeaple's (2005) model, the workers' skills are different and their distribution follows a constant probability density function. Because firms are homogeneous, it is possible for a firm to freely select any of three technologies (from low to high): production technology of homogeneous goods, low-level heterogeneous goods, and high-level heterogeneous goods. More-skilled workers are required for high-level technology. In this economy, Yeaple showed that firms with high-level technology employ workers with higher skills and pay higher wages. He also found that under certain assumptions regarding fixed costs associated with the production of heterogeneous goods, only firms that select high-level heterogeneous good production technology come to export in an open economy. Since there is no heterogeneity among firms in the model, the wage

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Ministry of Internal Affairs and Communications (MIC) and Ministry of Economy, Trade and Industry's (METI) Economic Census for Business Activity 2012. In addition, he also connects the data of MIC's Economic Census for Business Frame 2009 to obtain information on ownership situation of foreign companies and information on foreign direct investment. As a result, the number of sample establishments is 6,440 and the number of sample workers is 89,590, which are only 67.6% and 35.2% of the data used in this paper.

Endo (2016) uses METI's Basic Survey of Japanese Business Structure and Activities, which is smaller in sample size than the Economic Census for Business Activity and has samples extracted from larger firms, as data to be connected with Basic Survey on Wage Structure. He also utilizes only data of firms that conduct both export and outsourcing (import). The sample size of the data for 15 years used for connection is about 800,000 workers and 11,000 firms, but the average annual sample number is 53,333 people and 733 firms.

premium of exporters stems from differences in workers' skills.[10]

Meanwhile, Helpman et al. (2010) constructed a model in which wage differentials arise between exporting and non-exporting firms in a monopolistic competition model assuming firm heterogeneity. Firms acquire profits according to their productivity under monopolistic competition. In the labor market, assumed to be a search-type market, firms must pay exploration and examination costs to hire workers. Firms that earn higher profits can pay higher exploration costs and higher wages than firms with lower profits. When exports become possible, only firms with high productivity export, thus expanding profits and increasing wages further. The wage premium in this case is considered to be based on differences in rent sharing among firms.[11]

According to Yeaple (2005), the wage premium can be explained by the difference in worker attributes, whereas the wage differential due to firms' exporting behavior is an attribute of firms in that it exports according to the conclusion of Helpman et al. (2010). Below, we will examine these hypotheses for Japan.

3. Data

The data used in the analysis used in this paper are as follows.

(1) MHLW's Basic Survey on Wage Structure

The Basic Survey on Wage Structure (hereafter the Wage Survey) is intended to identify the actual situation of employees' wages in major industries according to categories such as type of employment, type of labor, occupation, gender, age, level of education, length of service, and occupational career.

In the Wage Survey, a Japanese survey implemented annually in July, samples of private establishments employing five regular employees or more [12]and public establishments employing 10 regular employees or more in major industries[13] are required to report

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[10] Verhoogen (2008) and Kugler and Verhoogen (2012) are also examples of studies that regard differences in workers' skills as a cause of the wage export premium.

[11] Other studies like Helpman et al. (2010), showing that differences in rent sharing among exporters and non-exporters will bring wage export premiere, include Cosar et al. (2016), Macis and Schvardi (2016).

[12] Among establishments with five to nine employees, only establishments whose size of enterprise is five to nine employees are included in the sample of the Wage Survey.

[13] The industries to be surveyed are the following 16 major industries based on the Japan Standard Industrial Classification (November 2007 Revision, hereafter JSIC): mining and quarrying of stone and gravel; construction; manufacturing; electricity, gas, heat supply and water; information and communications; transport and postal activities; wholesale and retail trade; finance and insurance; real estate and goods rental and leasing; scientific research, professional and technical services;

information on the establishment and employed workers, including attributes of the establishment, workers' genders, types of employment, types of labor, levels of education, ages, lengths of service, types of employee, classes of position, types of occupation, years of experience, days worked, scheduled hours worked, overtime hours worked, contractual cash earnings, cash earnings for overtime work, annual bonuses, and special cash earnings such as term-end allowances.

The extraction of samples is conducted every two or three years. In principle, the replacement of the surveyed establishments is not carried out until the next extraction, and the establishments surveyed are asked to answer each year. However, each year different identification numbers are assigned to the employee information provided by each establishment. For this reason, it is impossible to find a given employee's data for constructing panel data. Thus, in this paper, the individual data for each year of the Wage Survey are joined to the individual data from the Census of Manufacture or the MIC and METI's Economic Census for Business Activity, using information on plants in the method described below, and cross-sectional data were created for the analysis. In this paper, the individual data for employees who worked at the sampled manufacturing plants in 2002 and 2012 were used.

(2) METI's Census of Manufacture

The Census of Manufacture, which is conducted to clarify the actual conditions of the nation's manufacturing sector, is an annual survey of all plants with four or more employees in the manufacturing sector.[14] The response date is December 31 of each year.[15] The information collected from plants includes the amount of capital or investment; number of employees; value of total cash wages and salaries; costs of raw materials, fuel, and electricity consumed; and value of manufactured goods shipments.

To identify exporting or non-exporting establishments, plants that responded to the item "Ratio of direct export value to amount of shipment of manufactured goods" with no answer or zero are regarded as non-exporters, and other plants were regarded as exporters.[16]

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accommodation, eating and drinking services; living-related and personal services and amusement services; education and learning support; medical, health care and welfare; compound services; services not elsewhere classified.

[14] Census of Manufacture is not conducted in the previous year of MIC and METI Economic Census for Business Activity.

[15] The survey date was changed from December 31st to June 1st in 2016.

[16] The item "Ratio of direct export value to the amount of shipment of manufactured goods (year)" has been part of the questionnaire since 2001.

In this paper, individual plant data from 2000 to 2010 are used. Individual plant data for 2001 were connected with data from the Wage Survey in 2002. In addition, the individual data from the Census of Manufacture for all years and individual plant data from MIC and METI's Economic Census for Business Activity were connected to construct panel data.[17,18]

(3) MIC and METI's Economic Census for Business Activity

The objectives of the Economic Census for Business Activity (hereafter Economic Census) are to identify the structure of establishments and enterprises in all industries on the national and regional levels and to obtain basic information for conducting various statistical surveys by investigating the economic activity of establishments and enterprises. The Economic Census has been conducted since 2012, and the subjects are all establishments and enterprises, excluding some establishments.[19]

The Economic Census in 2012 was to replace the Census of Manufacture in Heisei 23 (in 2011, and the survey questions on the manufacturing industry in the Economic Census cover all the survey questions Census of Manufacture.

In this paper, data from all manufacturing establishments with four or more employees are used. These data are linked with the data from the Wage Survey in 2012 and are used as panel data after integration with data from the Census of Manufacture.

(4) MIC's Establishment and Enterprise Census

The Wage Survey in 2002 and the Census of manufacture of 2001 have different identification numbers for plants; thus, they cannot be directly compared. To integrate the data, data from MIC's Establishment and Enterprise Census of 1999 were used.

The establishment list for the Establishment and Enterprise Census is the population

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17 For the method of making panel data, please refer to Appendix.

18 The survey form of the Census of Manufacture is different between establishments with more than 30 employees and those with 4 employees or more and 29 employees or less, and the form for the latter (Otsu form) in comparison with that for the former (Kou form) has limited investigation items. In this paper, all establishments from both categories are covered.

19 The Economic Census does not cover the following: establishments of national and local public entities, establishments of individual proprietorships that fall under Division A "agriculture and forestry" of JSIC, establishments of individual proprietorships that fall under Division B "fisheries" of JSIC, establishments that fall under Group 792 "domestic services" in Division N "living-related and personal services, and amusement services" of JSIC, and establishments that fall under Major Group 96 "foreign governments and international agencies in Japan" in Division R "services, n.e.c." of JSIC.

for the Wage Survey, and a survey form for plants of the Wage Survey includes the establishment numbers for the Establishment and Enterprise Census, which makes it possible to connect the surveys. After the surveys were connected, the individual data from the Establishment and Enterprise Census and the Census of Manufacture were merged using information on address, firm name, address, and telephone number.

4. Methodology

(1) Estimation of a Mincer-type wage function

In this paper, the following equation is estimated; it adds a dummy variable showing the presence or absence of exporting activity of plant or sales–export ratio to the standard Mincer-type wage function:[20]

$$\begin{aligned}\log\_W_{ij} = {} & \alpha_0 + \alpha_1 \mathrm{d\_export}_j + \alpha_2\, \mathrm{d\_DOL}_j + \alpha_3 \log\_\mathrm{emp}_j \\ & + \alpha_4\, \mathrm{d\_Firm\_size}_j + \alpha_5\, \mathrm{d\_School}_{ij} \\ & + \alpha_6 \mathrm{Potential\_Experience}_{ij} + \alpha_7\, (\mathrm{Potential\_Experience}_{ij})^2 \\ & + \alpha_8\, \mathrm{d\_Age60}_{ij} + \alpha_9\, \mathrm{d\_Line\_Product}_{ij} \\ & + \alpha_{10}\, \mathrm{d\_Emp\_style}_{ij} + \alpha_{11}\, \mathrm{d\_Gender}_{ij} \qquad (1)\end{aligned}$$

i and j are indexes of workers and plants, respectively. W_{ij} is the salary of a worker, and the hourly wage is used as in many previous studies on wage function estimation. W_{ij} is calculated in two ways. The first defines a wage as the value of regular salary divided by regular working hours. The other calculates a wage by dividing the sum of the regular salary plus 1/12 of special allowances, such as bonuses by real (regular and excess) working hours. Since exports fluctuate, the performance gained from exports might be reflected in special allowances rather than regular salaries. Therefore, wages calculated in the second way might have a greater correlation between exports.

[20] Kawaguchi (2011) is the source for the estimation of the Mincer-type wage function. Kawaguchi (2011) recommends that the analysis target be limited to workers under 59 years old, based on the fact that the wage profile becomes discontinuous before and after the retirement age of 60 in Japan. However, in this paper the issue was dealt with by introducing age dummy variables.

The explanatory variable consists of variables indicating the characteristics of plants and firms in which the worker works and a variable indicating the characteristics of the workers themselves (see Table 1 for details on the variables). The variables indicating the characteristics of plants and firms are the export dummy $\mathrm{d\_export}_j$ indicating the presence or absence of exporting behavior, the multi-establishment dummy $\mathrm{d\_DOL}_j$ indicating that the establishment/enterprises in which the worker works owns multiple business establishments, and the number of employees (logarithmic value) at the plant $\mathrm{log\_emp}_j$ to control the size of the plant and the firm size dummy $\mathrm{d\_Firm\_size}_j$.

On the other hand, the variables indicating the attributes of the workers are the academic dummy $\mathrm{d\_School}_{ij}$ and $\mathrm{Potential\_Experience}_{ij}$ indicating the latent experience years (= age − years of education), dummy of 60 year old or older $\mathrm{d\_Age60}_{ij}$, $\mathrm{d\_Line\_Product}_{ij}$ indicating working section (management or production) and position (line or staff), the employment style dummy $\mathrm{d\_Emp\_style}_{ij}$ indicating type of employment (regular/irregular and permanent/fixed-term employment), and a gender dummy $\mathrm{d\_Gender}_{ij}$.

Export dummy is indispensable for analyzing the wage differential between exporting and non-exporting plants; however, it is possible that wages may differ depending on export dependence even among the same exporting plants. Therefore, equation (2) is also estimated using the sales–export ratio $\mathrm{Sales\_export\_ratio}_j$ instead of the export dummy:

$$\begin{aligned}\mathrm{log\_}W_{ij} = {} & \alpha_0 + \alpha_1\ \mathrm{Sales\_export\_ratio}_j + \alpha_2\ \mathrm{d\_DOL}_j + \alpha_3 \mathrm{log\_emp}_j \\ & + \alpha_4\ \mathrm{d\_Firm\_size}_j + \alpha_5\ \mathrm{d\_School}_{ij} \\ & + \alpha_6 \mathrm{Potential\_Experience}_{ij} + \alpha_7\ (\mathrm{Potential\_Experience}_{ij})^2 \\ & + \alpha_8\ \mathrm{d\_Age60}_{ij} + \alpha_9\ \mathrm{d\_Line\_Product}_{ij} \\ & + \alpha_{10}\ \mathrm{d\_Emp\_style}_{ij} + \alpha_{11}\ \mathrm{d\_Gender}_{ij} \qquad (2)\end{aligned}$$

This paper mainly shows results of the estimation using 2012 data; however, it also shows an analysis of results using 2002 data as a comparison target.

(2) Blinder = Oaxaca Decomposition

The existence of a wage premium for exporters purely correlated with exporting behavior could be found by estimating the wage function explained above; however, Blinder =

Oaxaca decomposition is performed to grasp the relative importance of exporting relative to parts attributable to the characteristics of workers and plants/firms.[21]
Specifically, the sample was divided into two groups: a group of workers at exporting plants and a group of workers at non-exporting plants. The wage function for each group was then estimated separately, and the differences of the logarithmic average wage between the two groups were decomposed as follows:

$$\overline{\ln w_i^{ex}} - \overline{\ln w_i^{nx}} = \sum_i \alpha^*(\overline{x_i^{ex}} - \overline{x_i^{nx}}) + \sum_i \overline{x_i^{ex}}(\alpha^{ex} - \alpha^*) + \sum_i \overline{x_i^{nx}}(\alpha^* - \alpha^{nx}) \qquad (3)$$

Here, subscripts *ex* and *nx* stand for export plants and non-exporters, respectively. α_i^{ex}, α_i^{nx}, and α^* are coefficients of the wage function (1), estimated for the workers at exporting plants, for the workers at non-exporting plants, and for all workers in our data, respectively.[22]
On the right-hand side, the first term $(\sum_i \alpha_i^*(\overline{x_i^{ex}} - \overline{x_i^{nx}}))$ is based on the difference in the attributes of the plants. On the other hand, the other two terms form a part that

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[21] Blinder = Oaxaca decomposition is a wage factorization method proposed by Blinder (1973) and Oaxaca (1973). To quantify the part based on racial discrimination among the race-based wage disparities among companies in the United States, both decomposed wage differences among racial diversity into a part based on workers' characteristics such as academic background and years of experience and a part that cannot be explained by difference in workers' characteristics, that is, part by discrimination). This method is explained in detail by Ogawa (2006).
This method is also applied to analysis of wage disparities between men and women, and recently, Yasui et al. (2016a, 2016b) applies it to the analysis analyzed of the wage differential between unlimited regular employees and limited regular employees as well as the wage gap between regular employees and fixed-term employees.

[22] Oaxaca (1973) shows the Blinder=Oaxaca decomposition utilizes one of the two coefficients calculated from two different group as a standard and, as a result, can be implemented in two methods. Based on the notation in this paper, $\overline{\ln w_i^{ex}} - \overline{\ln w_i^{nx}}$ can be expressed in two alternative ways; that is,

$$\overline{\ln w_i^{ex}} - \overline{\ln w_i^{nx}} = \sum_i \alpha_i^{ex}(\overline{x_i^{ex}} - \overline{x_i^{nx}}) + \sum_i \overline{x_i^{nx}}(\alpha_i^{ex} - \alpha_i^{nx})$$

and

$$\overline{\ln w_i^{ex}} - \overline{\ln w_i^{nx}} = \sum_i \alpha_i^{nx}(\overline{x_i^{ex}} - \overline{x_i^{nx}}) + \sum_i \overline{x_i^{ex}}(\alpha_i^{ex} - \alpha_i^{nx})$$

Of course, the value of the first and second term on the left-hand side in the second equations is different from that of the same term in the first equation.
Regarding the choice of the two expressions, Neumark (1988) suggested to a new expression, equation (3), which uses a coefficient calculated from the whole sample, which indicates a situation without difference/discrimination between two groups. This paper follows the new method.

cannot be explained by the difference between those attributes, stemming from the criteria dividing the two groups (in this case, the presence or absence of exporting).

5. Descriptive Statistics

In this section, descriptive statistics for the sample used in this paper are outlined.

(1) Workers

The workers' characteristics are shown in Tables 2 and 3. In addition to the attributes of the entire sample, the characteristics of exporting and non-exporting establishments are also shown.

Since the differences between the characteristics of exporting and non-exporting plants are similar in 2002 and 2012, we survey the latest 2012 data here. The average number of years of education, which is relevant to the quality of workers, is 13.183 for exporting plants, 0.437 more than that for non-exporting plants, and the ratio of college and university graduates is 26.6% for exporting plants, 10 percentage points higher than the percentage for non-exporting plants (16.2%). These findings imply that the quality of workers is higher on average at exporting plants. For non-exporting plants, the average number of years of service for workers is longer because they have fewer years of education.

There is not a significant difference between exporting and non-exporting plants in the placement of workers with managerial posts. On the other hand, as for the staff (workers without managerial posts), more staff members are located in the non-production departments at exporting plants than at non-exporting plants, and more staff members are located in the production departments in non-exporting plants than at exporting plants.

The percentage of regular employees (full-time employees without fixed employment terms) is 77.2%. Exporting plants surpassed this with a rate of 84.4%, nearly 10 percentage points higher than the 75.7% for non-exporting plants. For non-exporting plants, the proportion of unlimited irregular employees (workers who are not regular employees and who do not have fixed employment terms) is relatively high (8.3%).

Most of those who work at exporting plants (51.1%) work in firms with more than 1,000 regular employees, and 72.5% work for companies with more than 300 regular workers, meaning that more than 70% of the workers work for large firms. In contrast, among i.e., regular employees or fewer is 64.5%, i.e., nearly two-thirds of the workers work for small and medium-sized enterprises.

Thus, there are various differences in the attributes of workers between exporting and

non-exporting plants, and it is necessary to control these differences to compare wages between these plants.

(2) Plants

Table 4 summarizes the characteristics of the plants where workers are working. The average number of employees at exporting plants is four to five times greater or more than that of non-exporting plants, and the average amounts of shipments of manufactured goods is also seven to 10 times greater than that of non-exporting plants, meaning that there is a scale differential between them. Tables 5 and 6 show composition ratios according to the plants' characteristics.

(3) Wage premium of exporters

Finally, let us confirm the wage premium for exporting plants. In Tables 7 through 9, the average logarithm of wages (scheduled cash earnings per scheduled hours worked) are compared between exporting and non-exporting plants. The average wage of exporting plants in 2012 is 10.5% higher logarithmically than in the non-export business plants (32.8% higher when converted to real numbers).[23] Even in 2002, the average wage at the export plants was 11.0% higher logarithmically (32.3% higher on a real-number basis), and the wage premium was at almost the same level as in 2012.

Table 8 shows the results of calculating wage premiums by plant size. In both 2002 and 2012, wage premises at plants with more than 300 employees are equal to or slightly lower than those of other classes. Even looking at the results of comparing export premiers by firm size (Table 9), relatively small wage disparities are observed in subcategories with a large company size.

6. Result of Estimation of Mincer-type Wage Function

(1) Baseline estimation

Tables 10 and 11 indicate the results of estimating a Mincer-type wage function in 2002 and 2012, respectively. Although the results are omitted in the tables, estimates are made including prefectural dummies and industry classification dummies for all estimates. In addition, in 2012, estimates are made for cases in which the same firm dummy for identifying business establishments belonging to the same firm is added or not added.

[23] This figure is larger than the wage export premium (19–25%) found by Wakasugi et al. (2008). Although the survey year of this paper differs from that of Wakasugi et al. (2008), it is natural that a larger differential is confirmed since this paper uses the survey form of Census of Manufacture, including smaller establishments.

In Table 10, the first two rows show the effect of not adding a bonus to wages and the remaining two rows show the estimation result when the bonus is added to wages. Among the first two rows, both the coefficients of the export dummy and the sales–export ratio are negative, while in the last two rows, the coefficient of the export dummy is significantly positive, indicating positive effects of exports on wage.

In the estimation results for 2012, the effects of exports on wages are clearer. By using export dummies, I made four estimates for two types of wages, one with and without the same company dummy; however, the coefficient was positive and statistically significantly positive in every case (Table 11[1]). The largest coefficient was 0.0258 for estimations without the same firm dummy for wages including bonuses, meaning that 2.6% (= exp (0.0258) − 1) of the wage premium of 32.8% for the exporting plants is a part not attributable to the characteristics of workers and other characteristics of the plants and firms, i.e., purely correlated with export behavior. In comparison with the many previous studies with export dummy coefficients that are not statistically significant, including the case of Japan, as studied by Tanaka (2015) and Endoh (2016), this result is quite distinctive.

As for the estimate based on the sales–export ratio, as in the case of using the export dummy, four estimations were implemented, and all the coefficients were statistically significant and positive (Table 11[2]). However, this is extremely low compared with previous studies, and even when the coefficient is the largest (when it is estimated without including the same firm dummy for wages including bonus), if the proportion of the sales–export increases by 10 percentage points, wages rise only by 0.35%.

In general, wage disparities correlated with exports are observed between exporting and non-exporting plants in Japan's manufacturing industry, whereas even if the dependence on exports rises, wages rarely rise in relation to exports, and the wage gap between exporting plants does not expand.

The coefficients of the other variables show the same signs as those in previous studies, and they are strongly statistically significant, except for multiple establishment dummies in the estimate for 2012. Wages increase as the number of employees at the establishment and the company size increase. Regarding the form of employment, full-time employees who do not have employment periods receive the highest wages, and wages decrease in the order of regular employees with fixed employment periods and non-regular employees. As workers' academic careers and years of latent experience become longer, the wages they receive become higher. Women's wages are lower than men's. By category and occupation, the wages of workers with managerial posts in administrative departments are the highest, and wages decrease in the following order:

workers with managerial positions in production departments, professionals in management departments, and professionals in production departments. The wage differential between workers with managerial positions in management departments and other workers as well as the wage differential between workers at firms of different sizes is greater in 2012 than in 2002.

The coefficient is larger when bonuses are added to salaries. This suggests that export performance is reflected in the bonus, as predicted.[24] Therefore, in the following, I analyze using salaries, including bonuses.

(2) Estimation by plant size

The baseline estimation confirmed the effects of exporting on wages. These effects are quite different from those found in prior research conducted abroad. Discrepancies in the data are conceivable. Whereas prior research from abroad uses panel data for workers, this paper does not use panel data due to restrictions on data. Thus, I cannot exclude the possibility that differences in the unobservable characteristics of workers and plants affect the results. However, it is thought that such differences are small among plants and firms with similar scales.

Tanaka (2015) and Endoh (2016), who had similar data constraints, did not find a wage premium for exports, and the results of this paper are also different from prior studies conducted in Japan. The data in this paper include relatively smaller establishments, which may have created differences from the previous studies. Therefore, I estimate the wage function by plant and firm size using 2012 data.

Tables 12 and 13 show the results of estimating the wage function by plant size using an export dummy and a sales–export ratio, respectively. It is understood that the influence of the export dummy is remarkable in plants with 300 or fewer employees. In particular, the coefficients for exporting plants with 50 or fewer employees are larger than those for plants at larger scales, revealing particularly strong relationships with exporting. For example, in plants with 20 or fewer employees in 2012, 3.8% (= exp (0.0371) − 1) of 11.7% of the wage premium of export, which is more than 30%, can be regarded as a part purely correlated with exporting.

In contrast, in the estimation for large-scale plants with more than 301 employees, neither the statistically positive coefficient for the export dummy nor that of the sales–export ratio can be confirmed, showing that there is no correlation for exporting and

[24] Even if we look at explanatory variables other than export dummies and sales export ratios, the absolute value of the coefficient is larger in the case of adding bonus, except for gender and the over 60 years old dummy, the meaning and the influence of explanatory variable on wage is more remarkable.

wage increases.
Regarding the sales–export ratio, the coefficients of all firm size categories with 300 or fewer employees apart from plants with 51–100 employees have a significantly positive coefficient. In particular, in plants with 20 or fewer employees and those with 201 to 300 employees, wages increase considerably by 1.9% and 2.9%, respectively, when the sales–export ratio rises by 10 percentage points.

(3) Estimation by firm size
The result of estimating by firm size is also contrasted with small and medium-sized enterprises (with 299 or fewer employees) and large firms (with more than 300 employees).
Table 14 shows the results of estimating the wage function by firm size using export dummies. In small and medium-sized enterprises, the export dummy coefficient is positive in all subgroups. In contrast, in a subgroup of large firms, the coefficient of the export dummy is either significantly negative or not significant.
Table 15 indicates estimation results using the sales–export ratio. In small and medium-sized enterprises, the coefficients were significantly positive in all subgroups, except for firms with 30 to 99 employees, but no significant positive coefficient was observed in subgroups of large companies.

(4) Estimation using export experience
As predicted above, a wage differential purely correlated with exports could be confirmed at small-scale plants and firms. By what mechanism did export bring a wage differential only to small-scale plants and firms?
Two mechanisms are conceivable. One is the rent sharing pointed out in previous studies. In general, plants at a small scale do not have good performance. Among such plants, exporting startups will greatly improve their performance compared with others, which may also be reflected in wages. On the other hand, large-scale non-exporting plants have certain achievements of their own, and in consequence, even if performance improvement by exporting is reflected in wages of exporting startups, the wage gap between exporting startup and non-exporters may not be clear.
The other would be a mechanism that raises wages because of training and recruitment for beginning exporting. Generally, in smaller-scale plants, efforts to foster human resources, such as in-house training, are scarce compared to those at large-scale plants. When a plant attempts to begin exporting, the training and recruitment of personnel conducting the exporting business are urgent, and a wage differential from non-

exporting plants becomes remarkable. On the other hand, in case of large-scale plants, many plants actively engage in human resource development regardless of whether they export, and exporting plants also have no need to hire or train additional special human resources for exporting due to their extensive experience in exporting. As a result, the wage differential between exporting and non-exporting plants may not widen as much. Whichever mechanism is at work, as the export experience of a plant deepens, wages are expected to rise accordingly. To confirm this point, we used 2012 data to estimate the wage function by replacing the export dummy with the export experience value (number of exports during the investigation period) $\text{export\_experience}_j$. According to the above forecasts, the wage gap widens as export experience grows at small-scale plants, and it does not expand much at large-scale plants. As Table 16 shows, the coefficients in many hierarchies of small-scale plants exceed the coefficients of large-scale plants with 300 or more employees, as expected.

(5) Summary

Based on the results of estimation from a Mincer-type wage function, the following points were clarified:

(i) In the manufacturing sector as a whole, wage disparities due to the presence or absence of exportation at plants existed clearly for wages, including bonuses.

(ii) In particular, the influence on the wage disparity of exports is remarkable in small plants/firms, and it became clear that the wage differential expands as plants' export experience increases. This is expected to be related to rent sharing at exporting plants or human resource development/recruitment that exporting operations carry out (or both).

7. Blinder = Oaxaca decomposition

Through our estimation of a Mincer-type wage function, we could confirm the existence of pure export premium in wages; however, to compare the degree of relative impact with other factors, a Blinder = Oaxaca Degradation was conducted.[25] Table 17 shows the results.

In the entire sample, the average wage deviates by 0.345 (logarithmic term) and 41.2%

[25] For the data of 2002, I also performed the Blinder = Oaxaca decomposition, but since the features are similar to the results using the data of 2012, this result is omitted here.

(real term) between exporting and non-exporting plants.[26] The part that can be explained by the difference in characteristics between the two groups accounts for most of the premium, and the other part, i.e., the difference in wages correlated with exports, accounts for only 3.3%, consisting of 8.1% (= 0.033/0.412) of the wage premium, meaning that the impact of exports is extremely limited.[27]

However, in small-scale plants and firms, exportation may have a larger influence than other factors since the impact on wages of exports at small-scale plants and firms is large. To examine this point, a decomposition was implemented according to plant size.

As expected, the influence of exports on wages is remarkable in small plants. At plants with 100 or fewer employees, the share of wages correlated with exports in the export premium exceeds 30% (32.3% at plants with 20 or fewer employees, 32.9% at plants with 21 to 50 employees, 36.3% at plants with 51 to 100 employees), and the proportion of plants with 101 to 200 employees, 22.8%, also exceeds 20% (Table 17[8]). However, at plants with more than 201 to 300 people, this figure drops to 7.7%, and at plants with more than 301 people, it comes to −1.0%.

8. Conclusion

From the foregoing analysis, the following points were clarified:

(1) For the manufacturing industry in Japan, I estimated a Mincer-type wage function in 2002 and 2012. For 2012, estimated wages at exporting plants were higher than those at non-exporting plants even after the characteristics of workers and plants were controlled for, and a wage differential was found to be correlated with exports, whereas in 2002, wages at the exporting plants were lower than at the non-exporters. In other words, the positive correlation between exports and wages is not stable.

(2) The estimation of the Mincer-type wage function according to plant size indicates that wage differential correlated with exports is remarkable in relatively small plants with fewer than 300 employees.

(3) From the estimation result of the Mincer-type wage function by industry, the impact of exporting on wages varies depending on the type of industry.

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[26] The part explained by the difference of characteristics of workers, plants/firms is 36.6% (=exp (0.312)) in real term. Among them, 28.8% can be explained by differences of characteristics of plants/firms, which greatly exceeds the part based on the difference of workers' characteristics. Among the characteristics of plants and firms, the impact on firm size is the largest, 17.6%, that is, almost half of the total export premium can be interpreted as being due to the difference in firm size.

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(4) According to Blinder = Oaxaca decomposition, in the manufacturing sector as a whole, the portion of the wage differential correlated with exports constitutes less than 10% of the wage premium of exporters, but for plants at a smaller scale, it becomes larger, i.e., over 30%.

We should interpret this study to show that the wage premium of exporting cannot be explained by the difference of the characteristics of workers, as was found by Yeaple (2005), and some part is correlated with exporting. However, this is not necessarily the result of rent sharing, as found by Helpman et al. (2010), but it may be the result of training and recruitment to begin exporting. Although this point can be clarified by verifying the causal relation between plants' export behaviors and wages, accurate verification is impossible unless panel data for workers in Japan are made available.[28] In addition, the possibility raised in this article that the part of the wage premium that appears to be purely affected by exports may be affected by the unobserved attributes of workers and plants cannot be denied.[29] The lack of panel data for workers caused us to control for unobserved attributes by estimating the fixed-effect models of workers and plants. In other countries, such panel data is well developed; I would like to expect such a development in Japan.

In addition, as is clear from the Blinder = Oaxaca decomposition, the characteristics of plants and firms have a relatively large effect on wages beyond the presence or absence of exports. After the mechanisms by which firms affect wages are clarified, it is expected that effective policies will be created to raise wages, especially for small and medium-sized enterprises. Such work remains a task for the future. When doing this task, it is important to control the characteristics of workers by using employer–employee data, as used in this paper (see annotation 27).

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[28] By using panel data constructed from individual data from the Census of Manufacture, it is possible to verify the causal relation between the average wage at establishments and their exporting. However, the attributes of the workers cannot be controlled.

[29] The characteristics of unobserved workers may have a direct impact on wages and may indirectly affect them through company productivity. Regarding the influence of unobserved attributes of workers, Fukao (2016) also noted that "The wage rate of exporters is high. The high TFP of exporters can be mostly explained by a difference in the quality of labor that is not observed."

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Appendix: Creating panel data from the individual data of the Census of Manufacture and the Economic Census

In this paper, the individual data from the Census of Manufacture (Heisei 12-22 (2000–10) and the Economic Census (Heisei 24 (2012) were combined to make panel data using the following method, implemented in Yukimoto (2015).

(1) The Census of Manufacture

Individual data from the Census of Manufacture consists of roster data, including roster information, such as plant number, plant name, address, telephone number, other data, and response data. Since the roster data also includes information on plants not covered by the survey, such as plants with three or fewer employees, the number of plants included in the roster data greatly exceeds the number of plants included in the response data.

I made individual data into a panel using roster information. Plant numbers are not immutable, but METI has created a converter showing the correspondence relationship between plant numbers in two consecutive business years. Using this converter, I connected individual data.

However, the converter cannot connect individual data from the same plants that have responded at intervals of at least one year. For this reason, on the assumption that some plants do not answer in a given year, we confirmed and corrected data using information on the names, addresses, and telephone numbers of plants.

As described above, after using the roster data to make plant-level data into a panel, the response data for each plant was connected using plant data.

(2) The Economic Census

The Economic Census of 2012 was intended to replace the Census of Manufacture in 2011. The data used are only the response data for business establishments; these data do not include roster da.

Since the plant number of the 2010 Census of Manufacture are included in the response data for the Economic Census, this information was used to link to the panel data created in (1).

Table 1　Variables used in the estimation of the wage function

$\log\_W_{ij}$	: log of salary of worker (= regular salary/regular working hours)
d_export_j	: export dummy (0: non-exporting, 1: exporting)
$\text{Sales\_export\_ratio}_j$	: sales–export ratio (ratio of direct export value to the amount of shipment of manufactured goods)
$\text{export\_experience}_j$	: export experience (number of exports during the investigation period, 2001–2010)
d_DOL_j	: division of labor dummy (0: single plant, 1: independent headquarter or multiple plants)
$\log\_\text{emp}_j$	: log of workers at plant
d_Firm_size_j	: firm size dummy (1: 5,000 or more regular employees, 2: 1,000–4,999 regular employees, 3: 500–999 regular employees, 4: 300–499 regular employees, 5: 100–299 regular employees, 6: 30–99 regular employees, 7: 10–29 regular employees, 8: 5–9 regular employees)
d_School_i	: education dummy (1: junior high school, 2: high school, 3: junior college, 4: university/graduate school)
$\text{Potential\_Experience}_{ij}$	: latent experience year (= age–education year)
d_Age60_{ij}	: dummy of 60 years old or older (0: 59 years old or younger, 1:60 years old or older)
$\text{d\_Line\_Product}_{ij}$	: dummy of working section (1: management section and line, 2: management section and staff, 3: production section and line, 4: production section and staff)
$\text{d\_Emp\_styleKoyo}_{ij}$	: employment type dummy (1: regular and permanent, 2: regular and fixed term, 3: irregular and permanent, 4: irregular and fixed term in 2012), (1: regular, 2: temporary in 2002)
d_Gender_{ij}	: gender dummy (0: male, 1: female)

Table 2 Descriptive data for workers (2002)

	Whole sample			Non-exporting plants			Exporting plants		
	mean	std error	sample	mean	std error	sample	mean	std error	sample
Age	42.190	12.650	159,339	42.380	12.715	147,295	39.866	11.570	12,044
Years of education	12.299	1.977	140,702	12.236	1.946	129,218	13.011	2.179	11,484
Years of service	29.160	13.239	140,702	29.394	13.302	129,218	26.528	12.195	11,484
Share									
Graduate from Univ/Grad School	12.9%	0.335	159,339	11.8%	0.322	147,295	27.0%	0.444	12,044
Management & line	14.2%	0.349	159,339	14.1%	0.348	147,295	15.4%	0.361	12,044
Management & staff	24.8%	0.432	159,339	23.9%	0.427	147,295	35.8%	0.479	12,044
Production & line	2.4%	0.154	159,339	2.3%	0.148	147,295	4.4%	0.206	12,044
Production & staff	58.5%	0.493	159,339	59.7%	0.491	147,295	44.4%	0.497	12,044
60 years or older workers	7.4%	0.262	159,339	7.8%	0.268	147,295	2.6%	0.160	12,044
Female	34.8%	0.476	159,339	35.7%	0.479	147,295	23.4%	0.423	12,044
Regular	97.8%	0.147	159,339	97.7%	0.149	147,295	98.5%	0.120	12,044
Nonregular	2.2%	0.147	159,339	2.3%	0.149	147,295	1.5%	0.120	12,044
Firm size									
5～ 9 workers	8.9%	0.284	159,339	9.5%	0.294	147,295	0.7%	0.086	12,044
10～ 29 workers	25.6%	0.436	159,339	27.1%	0.445	147,295	6.3%	0.243	12,044
30～ 99 workers	30.2%	0.459	159,339	31.7%	0.465	147,295	11.5%	0.319	12,044
100～299 workers	16.4%	0.371	159,339	16.3%	0.369	147,295	18.1%	0.385	12,044
300～499 workers	7.6%	0.265	159,339	6.7%	0.251	147,295	18.4%	0.387	12,044
500～999 workers	6.3%	0.244	159,339	4.8%	0.214	147,295	25.0%	0.433	12,044
1,000～4,999 workers	3.8%	0.192	159,339	2.8%	0.166	147,295	16.0%	0.366	12,044
5,000 or more workers	1.1%	0.105	159,339	0.9%	0.093	147,295	4.1%	0.198	12,044

Note 1 Author's calculations from employer–employee data constructed from MHLW's Wage Survey 2002 and METI's Census of Manufacture 2001.

2 Years of education is calculated based on the response to terminal stage of education; junior high school = 9, high school = 12, junior college = 14, university/graduate school = 16.

Table 3 Descriptive data for workers (2012)

	Whole sample			Non-exporting plants			Exporting plants		
	mean	std error	sample	mean	std error	sample	mean	std error	sample
Age	42.137	12.429	255,351	42.328	12.516	213,572	41.164	11.923	41,779
Years of education	12.822	1.839	228,785	12.746	1.810	188,915	13.183	1.930	39,870
Years of service	28.528	12.478	228,785	28.730	12.544	188,915	27.567	12.113	39,870
Share									
Graduate from Univ/Grad School	17.9%	0.384	255,351	16.2%	0.369	213,572	26.6%	0.442	41,779
Management & line	13.9%	0.346	255,351	13.9%	0.346	213,572	14.0%	0.347	41,779
Management & staff	24.6%	0.431	255,351	23.4%	0.423	213,572	31.1%	0.463	41,779
Production & line	4.0%	0.197	255,351	3.7%	0.189	213,572	5.6%	0.231	41,779
Production & staff	57.4%	0.495	255,351	59.0%	0.492	213,572	49.2%	0.500	41,779
60 years or older workers	9.2%	0.289	255,351	9.7%	0.296	213,572	6.4%	0.245	41,779
Female	29.2%	0.455	255,351	31.2%	0.463	213,572	18.9%	0.391	41,779
Regular & permanent	77.2%	0.420	255,351	75.7%	0.429	213,572	84.4%	0.363	41,779
Regular & fixed term	1.9%	0.135	255,351	1.9%	0.138	213,572	1.4%	0.118	41,779
Nonregular & permanent	7.3%	0.260	255,351	8.3%	0.276	213,572	2.3%	0.151	41,779
Nonregular & fixrd term	12.8%	0.334	255,351	13.1%	0.337	213,572	11.5%	0.319	41,779
Temporary	0.9%	0.093	255,351	1.0%	0.099	213,572	0.3%	0.053	41,779
Firm size									
5～ 9 workers	4.8%	0.214	255,351	5.6%	0.230	213,572	0.6%	0.076	41,779
10～ 29 workers	12.3%	0.328	255,351	14.2%	0.349	213,572	2.2%	0.147	41,779
30～ 99 workers	20.3%	0.402	255,351	22.6%	0.418	213,572	8.4%	0.278	41,779
100～299 workers	21.2%	0.408	255,351	22.1%	0.415	213,572	16.3%	0.370	41,779
300～499 workers	8.6%	0.280	255,351	8.2%	0.275	213,572	10.1%	0.302	41,779
500～999 workers	8.5%	0.278	255,351	7.9%	0.270	213,572	11.3%	0.316	41,779
1,000～4,999 workers	14.3%	0.350	255,351	12.6%	0.331	213,572	23.2%	0.422	41,779
5,000 or more workers	10.2%	0.302	255,351	6.7%	0.250	213,572	27.9%	0.448	41,779

Note 1 Author's calculation from employer–employee data constructed from MHLW's Wage Survey 2012 and MIC/METI's Economic Census 2012.

2 Years of education is calculated based on the response to terminal stage of education: junior high school = 9, high school = 12, junior college = 14, university/graduate school = 16.

Table 4 Descriptive data for plants

2002

	Whole sample			Non-exporting plants			Exporting plants		
	mean	std error	sample	mean	std error	sample	mean	std error	sample
Number of employees	85.873	236.964	7,933	71.977	202.667	7,596	399.089	542.580	337
Shipment of manufactured goods (10 thousand yen)	273,589	1,471,560	7,933	219,474	1,351,242	7,596	1,493,334	2,879,347	337
Sales Export Ratio	0.007	0.055	7,933	—	—	—	0.162	0.213	337

2012

	Whole sample			Non-exporting plants			Exporting plants		
	mean	std error	sample	mean	std error	sample	mean	std error	sample
Number of employees	174.705	516.822	9,952	129.877	421.917	8,909	557.615	930.079	1,043
Shipment of manufactured goods (10 thousand yen)	829,169	4212264	9,952	443,974	2501516	8,909	4,119,397	10200000	1,043
Sales Export Ratio	0.024	0.110	9,952	—	—	—	0.233	0.258	1,043

Note Author's calculation from employer–employee data constructed from MHLW's Wage Survey 2002 and 2012, METI's Census of Manufacture 2001, and MIC/METI's Economic Census 2012.

Table 5 Structure of plants according to characteristics (2002)

	Whole sample		Non-exporting plants		Exporting plants	
	Samples	Share	Samples	Share	Samples	Share
Number of plants						
single plant	6,001	75.6%	5,837	76.8%	164	48.7%
multiple plants	1,932	24.4%	1,759	23.2%	173	51.3%
total	7,933	100.0%	7,596	100.0%	337	100.0%
Size of plant						
～20 workers	3,626	45.7%	3,596	47.3%	30	8.9%
21～50 workers	2,009	25.3%	1,960	25.8%	49	14.5%
51～100 workers	928	11.7%	895	11.8%	33	9.8%
101～200 workers	673	8.5%	624	8.2%	49	14.5%
201～300 workers	175	2.2%	151	2.0%	24	7.1%
301～ workers	522	6.6%	370	4.9%	152	45.1%
total	7,933	100.0%	7,596	100.0%	337	100.0%
Size of firm						
5～ 9 workers	2,078	26.2%	2,065	27.2%	13	3.9%
10～ 29 workers	2,460	31.0%	2,420	31.9%	40	11.9%
30～ 99 workers	1,904	24.0%	1,855	24.4%	49	14.5%
100～299 workers	862	10.9%	794	10.5%	68	20.2%
300～499 workers	224	2.8%	183	2.4%	41	12.2%
500～999 workers	249	3.1%	172	2.3%	77	22.8%
1,000～4,999 workers	126	1.6%	82	1.1%	44	13.1%
5,000 or more workers	30	0.4%	25	0.3%	5	1.5%
total	7,933	100.0%	7,596	100.0%	337	100.0%
Industry						
food and beverage	836	10.5%	824	10.8%	12	3.6%
textile	620	7.8%	609	8.0%	11	3.3%
wood, furniture, pulp	1,513	19.1%	1,502	19.8%	11	3.3%
chemical	1,108	14.0%	1,057	13.9%	51	15.1%
leather, ceramic, other	866	10.9%	834	11.0%	32	9.5%
steel	319	4.0%	306	4.0%	13	3.9%
nonferrous metals	768	9.7%	747	9.8%	21	6.2%
general machinery	918	11.6%	833	11.0%	85	25.2%
electric machinery	581	7.3%	517	6.8%	64	19.0%
transport machinery	404	5.1%	367	4.8%	37	11.0%
total	7,933	100.0%	7,596	100.0%	337	100.0%

Note Author's calculations from employer–employee data constructed from MHLW's Wage Survey 2002 and METI's Census of Manufacture 2001.

Table 6 Structure of plants according to characteristics (2012)

	Whole sample		Non-exporting plants		Exporting plants	
	Samples	Share	Samples	Share	Samples	Share
Number of plants						
single plant	4,761	53.6%	4,566	58.2%	195	18.7%
multiple plants	4,126	46.4%	3,278	41.8%	848	81.3%
total	8,887	100.0%	7,844	100.0%	1,043	100.0%
Size of plant						
～20 workers	3,282	33.0%	3,205	36.0%	77	7.4%
21～50 workers	2,290	23.0%	2,186	24.5%	104	10.0%
51～100 workers	1,367	13.7%	1,244	14.0%	123	11.8%
101～200 workers	1,374	13.8%	1,161	13.0%	213	20.4%
201～300 workers	428	4.3%	337	3.8%	91	8.7%
301～ workers	1,211	12.2%	776	8.7%	435	41.7%
total	9,952	100.0%	8,909	100.0%	1,043	100.0%
Size of firm						
5～ 9 workers	1,776	17.8%	1,743	19.6%	33	3.2%
10～ 29 workers	1,898	19.1%	1,843	20.7%	55	5.3%
30～ 99 workers	2,089	21.0%	1,962	22.0%	127	12.2%
100～299 workers	1,815	18.2%	1,596	17.9%	219	21.0%
300～499 workers	508	5.1%	422	4.7%	86	8.2%
500～999 workers	564	5.7%	445	5.0%	119	11.4%
1,000～4,999 workers	846	8.5%	634	7.1%	212	20.3%
5,000 or more workers	456	4.6%	264	3.0%	192	18.4%
total	9,952	100.0%	8,909	100.0%	1,043	100.0%
Industry						
food and beverage	1,068	10.7%	1,013	11.4%	55	5.3%
textile	445	4.5%	424	4.8%	21	2.0%
wood, furniture, pulp	1,505	15.1%	1,475	16.6%	30	2.9%
chemical	1,293	13.0%	1,107	12.4%	186	17.8%
leather, ceramic, other	947	9.5%	836	9.4%	111	10.6%
steel	384	3.9%	338	3.8%	46	4.4%
nonferrous metals	921	9.3%	840	9.4%	81	7.8%
general machinery	1,384	13.9%	1,157	13.0%	227	21.8%
electric machinery	1,367	13.7%	1,180	13.2%	187	17.9%
transport machinery	635	6.4%	536	6.0%	99	9.5%
total	9,949	100.0%	8,906	100.0%	1,043	100.0%
Year of establishment						
before 1984	5,643	59.3%	4,897	57.7%	746	72.0%
1985～1994	1,940	20.4%	1,801	21.2%	139	13.4%
1995～2004	1,315	13.8%	1,206	14.2%	109	10.5%
after 2005	622	6.5%	580	6.8%	42	4.1%
total	9,520	100.0%	8,484	100.0%	1,036	100.0%

Note Author's calculation from employer–employee data constructed from MHLW's Wage Survey 2012 and MIC/METI's Economic Census 2012.

Table 7 Logarithmic wages for exporting and non-exporting plants

2002

[1] Wages without bonus

Whole sample			Non-exporting plants			Exporting plants			Wage premium of Exporters (real term)
mean	std error	samples	mean	std error	samples	mean	std error	samples	
2.662	0.453	158,879	2.641	0.449	146,865	2.921	0.410	12,014	1.324

[2] Wages with bonus

Whole sample			Non-exporting plants			Exporting plants			Wage premium of Exporters (real term)
mean	std error	samples	mean	std error	samples	mean	std error	samples	
2.746	0.496	158,880	2.719	0.490	146,866	3.073	0.456	12,014	1.425

2012

[1] Wages without bonus

Whole sample			Non-exporting plants			Exporting plants			Wage premium of Exporters (real term)
mean	std error	samples	mean	std error	samples	mean	std error	samples	
2.755	0.459	254,822	2.708	0.450	213,121	2.992	0.432	41,701	1.328

[2] Wages with bonus

Whole sample			Non-exporting plants			Exporting plants			Wage premium of Exporters (real term)
mean	std error	samples	mean	std error	samples	mean	std error	samples	
2.833	0.524	254,822	2.775	0.510	213,121	3.128	0.493	41,701	1.423

Note 1 Author's calculation from employer-employee data constructed from MHLW's Wage Survey 2002 and 2012, METI's Census of Manufacture 2001 and MIC/METI's Economic Census 2012.

2 Mean in this table is calculated by averaging logarithmic transformation of regular salary/regular working hour.

3 Wage premium of exporters (real term) is a ratio of realized mean of logarithm of wages of exporters and non-exporters.

Table 8 Logarithmic of wages for exporting and non-exporting plants by plant size

2002

[1] Wages without bonus

	Plant size (number of workers)					
	～20	21～50	51～100	101～200	201～300	301～
Non-exporters	2.492	2.574	2.632	2.701	2.769	2.959
	0.430	0.415	0.406	0.429	0.410	0.466
	34,984	39,941	27,740	18,266	6,642	19,292
Exporters	2.675	2.774	2.811	2.832	2.824	3.005
	0.426	0.448	0.412	0.411	0.418	0.378
	337	1,077	1,130	1,425	1,018	7,027
Wage premium of exporters (real term)	1.201	1.222	1.196	1.140	1.056	1.047

[2] Wages with bonus

	Plant size (number of workers)					
	～20	21～50	51～100	101～200	201～300	301～
Non-exporters	2.546	2.635	2.711	2.797	2.884	3.086
	0.455	0.443	0.440	0.470	0.462	0.515
	34,985	39,941	27,740	18,266	6,642	19,292
Exporters	2.731	2.873	2.931	2.966	2.956	3.182
	0.435	0.484	0.465	0.453	0.463	0.414
	337	1,077	1,130	1,425	1,018	7,027
Wage premium of exporters (real term)	1.204	1.269	1.246	1.183	1.075	1.101

2012

[1] Wages without bonus

	Plant size (number of workers)					
	～20	21～50	51～100	101～200	201～300	301～
Non-exporters	2.511	2.567	2.657	2.740	2.828	3.009
	0.397	0.400	0.415	0.413	0.440	0.445
	32,874	46,538	41,198	35,722	16,866	39,923
Exporters	2.621	2.707	2.759	2.849	2.992	3.112
	0.413	0.388	0.403	0.417	0.413	0.399
	882	2,218	4,144	6,343	4,615	23,499
Wage premium of exporter (real term)	1.117	1.151	1.107	1.115	1.179	1.108

[2] Wages with bonus

	Plant size (number of workers)					
	～20	21～50	51～100	101～200	201～300	301～
Non-exporters	2.540	2.605	2.717	2.816	2.926	3.127
	0.425	0.438	0.466	0.469	0.510	0.516
	32,874	46,538	41,198	35,722	16,866	39,923
Exporters	2.676	2.798	2.857	2.967	3.130	3.267
	0.449	0.435	0.459	0.475	0.470	0.456
	882	2,218	4,144	6,343	4,615	23,499
Wage premium of exporters (real term)	1.145	1.213	1.150	1.162	1.227	1.150

Note 1 Author's calculation from employer–employee data constructed from MHLW's Wage Survey 2002 and 2012, METI's Census of Manufacture 2001, and MIC/METI's Economic Census 2012.
2 Upper row: mean, middle row: standard error, lower row: sample numbers
3 Wage premiums of exporters (real term) are ratios of the realized means of logarithms of wages of exporters and non-exporters.

Table 9 Logarithmic wages for exporting and non-exporting plants by firm size

2002

[1] Wages without bonus

	Firm size (number of workers)							
	5～9	10～29	30～99	100～299	300～499	500～999	1000～4999	5000～
Non-exporters	2.457	2.529	2.610	2.709	2.860	2.939	3.066	3.237
	0.428	0.423	0.407	0.419	0.454	0.442	0.473	0.434
	13,991	39,796	46,679	23,963	9,911	7,066	4,171	1,288
Exporters	2.751	2.701	2.766	2.799	2.894	2.996	3.080	3.310
	0.497	0.422	0.397	0.429	0.377	0.357	0.364	0.312
	88	753	1,383	2,174	2,206	3,004	1,917	489
Wage premium of exporters (real term)	1.342	1.188	1.169	1.094	1.034	1.058	1.015	1.075

[2] Wages with bonus

	Firm size (number of workers)							
	5～9	10～29	30～99	100～299	300～499	500～999	1000～4999	5000～
Non-exporters	2.511	2.583	2.682	2.806	2.981	3.072	3.195	3.401
	0.451	0.448	0.439	0.459	0.513	0.481	0.522	0.488
	13,992	39,796	46,679	23,963	9,911	7,066	4,171	1,288
Exporters	2.836	2.763	2.871	2.926	3.066	3.162	3.277	3.510
	0.465	0.415	0.440	0.468	0.422	0.383	0.413	0.358
	88	753	1,383	2,174	2,206	3,004	1,917	489
Wage premium of exporters (real term)	1.384	1.198	1.208	1.127	1.089	1.094	1.085	1.115

2012

[1] Wages without bonus

	Firm size (number of workers)							
	5～9	10～29	30～99	100～299	300～499	500～999	1000～4999	5000～
Non-exporters	2.484	2.494	2.562	2.691	2.796	2.867	2.964	3.125
	0.394	0.389	0.384	0.398	0.423	0.425	0.443	0.452
	11,943	30,255	48,277	47,176	17,574	16,837	26,810	14,249
Exporters	2.567	2.651	2.682	2.809	2.898	2.944	3.108	3.185
	0.372	0.395	0.399	0.401	0.384	0.381	0.410	0.381
	240	926	3,511	6,810	4,228	4,705	9,664	11,617
Wage premium of exporters (real term)	1.087	1.171	1.127	1.124	1.108	1.080	1.155	1.063

[2] Wages with bonus

	Firm size (number of workers)							
	5～9	10～29	30～99	100～299	300～499	500～999	1000～4999	5000～
Non-exporters	2.508	2.511	2.601	2.758	2.886	2.977	3.077	3.264
	0.412	0.409	0.420	0.447	0.485	0.488	0.509	0.537
	11,943	30,255	48,277	47,176	17,574	16,837	26810	14249
Exporters	2.626	2.700	2.757	2.912	3.030	3.087	3.274	3.343
	0.413	0.426	0.441	0.448	0.448	0.431	0.468	0.438
	240	926	3,511	6,810	4,228	4,705	9664	11617
Wage premium of exporters (real term)	1.126	1.208	1.168	1.166	1.155	1.117	1.217	1.082

Note 1 Author's calculation from employer–employee data constructed from MHLW's Wage Survey 2002 and 2012, METI's Census of Manufacture 2001, and MIC/METI's Economic Census 2012.

2 Upper row: mean, middle row: standard error, lower row: sample numbers

3 Wage premiums of exporters (real term) are a ratio of the realized means of the logarithms of wages of exporters and non-exporters.

Table 10 Wage function: Baseline estimation (2002)

	Wage without bonus		Wage with bonus	
d_export	-0.0081***		0.0083**	
	[-2.61]		[2.50]	
Sales_export_ratio		-0.0535***		-0.0437***
		[-4.93]		[-3.75]
d_DoL	-0.0079***	-0.0079***	-0.0143***	-0.0139***
	[-4.55]	[-4.55]	[-7.65]	[-7.46]
log_emp	0.0478***	0.0477***	0.0586***	0.0591***
	[31.32]	[31.33]	[35.81]	[36.19]
d Firm size 2	-0.0878***	-0.0868***	-0.1194***	-0.1189***
	[-10.81]	[-10.69]	[-13.71]	[-13.64]
d Firm size 3	-0.0963***	-0.0958***	-0.1324***	-0.1322***
	[-12.10]	[-12.04]	[-15.50]	[-15.48]
d Firm size 4	-0.1259***	-0.1258***	-0.1659***	-0.1674***
	[-15.41]	[-15.41]	[-18.93]	[-19.12]
d Firm size 5	-0.1880***	-0.1879***	-0.2450***	-0.2476***
	[-22.57]	[-22.60]	[-27.41]	[-27.76]
d Firm size 6	-0.1969***	-0.1970***	-0.2663***	-0.2693***
	[-21.93]	[-21.97]	[-27.63]	[-27.99]
d Firm size 7	-0.2269***	-0.2269***	-0.3077***	-0.3102***
	[-22.87]	[-22.90]	[-28.91]	[-29.18]
d Firm size 8	-0.4417***	-0.4418***	-0.6104***	-0.6129***
	[-39.38]	[-39.41]	[-50.73]	[-50.97]
d School 2	0.0526***	0.0527***	0.0541***	0.0540***
	[22.62]	[22.64]	[21.66]	[21.63]
d School 3	0.1020***	0.1021***	0.1115***	0.1116***
	[29.05]	[29.08]	[29.60]	[29.62]
d School 4	0.1295***	0.1297***	0.1467***	0.1471***
	[39.82]	[39.89]	[42.06]	[42.16]
Potential_experience	0.0311***	0.0311***	0.0360***	0.0360***
	[103.78]	[103.75]	[111.92]	[111.93]
(Potential_experience)^2	-0.0004***	-0.0004***	-0.0004***	-0.0004***
	[-67.69]	[-67.65]	[-72.64]	[-72.64]
d_Age60	-0.1624***	-0.1625***	-0.1540***	-0.1541***
	[-39.06]	[-39.08]	[-34.54]	[-34.55]
d_Line_Product_2	-0.1250***	-0.1250***	-0.1854***	-0.1853***
	[-36.45]	[-36.44]	[-50.38]	[-50.36]
d_Line_Product_3	-0.0665***	-0.0665***	-0.1561***	-0.1567***
	[-12.78]	[-12.80]	[-27.97]	[-28.09]
d_Line_Product_4	-0.2265***	-0.2266***	-0.3308***	-0.3311***
	[-65.95]	[-65.96]	[-89.77]	[-89.84]
d_Emp_styl_2	-0.1769***	-0.1768***	-0.2685***	-0.2686***
	[-23.17]	[-23.16]	[-32.77]	[-32.78]
d_Gender_2	-0.4016***	-0.4016***	-0.3746***	-0.3747***
	[-234.15]	[-234.18]	[-203.60]	[-203.64]
State dummy	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes
N	140,293	140,293	140,294	140,294
R-squared	0.625	0.625	0.6404	0.6404
Adj--R-squared	0.623	0.623	0.639	0.639

* p<0.1, ** p<0.05, *** p<0.01

Table 11 Wage function: Baseline estimation (2012)
[1] using export dummy

	Wage without bonus		Wage with bonus	
d_export	0.0119***	0.0102***	0.0258***	0.0227***
	[7.20]	[5.54]	[14.53]	[11.52]
d_DoL	0.0024	0.0025	0.0090***	0.0102***
	[1.55]	[1.62]	[5.43]	[6.24]
log_emp	0.0332***	0.0342***	0.0372***	0.0383***
	[40.23]	[37.58]	[42.00]	[39.34]
d_Firm_size_2	-0.0374***	-0.0382***	-0.0482***	-0.0377***
	[-14.26]	[-7.62]	[-17.10]	[-7.03]
d_Firm_size_3	-0.1077***	-0.0893***	-0.1220***	-0.0893***
	[-35.47]	[-16.37]	[-37.38]	[-15.30]
d_Firm_size_4	-0.1250***	-0.1086***	-0.1573***	-0.1196***
	[-39.29]	[-19.75]	[-45.98]	[-20.32]
d_Firm_size_5	-0.2102***	-0.1990***	-0.2606***	-0.2273***
	[-67.98]	[-36.80]	[-78.41]	[-39.29]
d_Firm_size_6	-0.2354***	-0.2224***	-0.3024***	-0.2698***
	[-64.12]	[-38.64]	[-76.64]	[-43.80]
d_Firm_size_7	-0.2707***	-0.2567***	-0.3598***	-0.3257***
	[-59.78]	[-40.45]	[-73.91]	[-47.95]
d_Firm_size_8	-0.5063***	-0.4905***	-0.6821***	-0.6468***
	[-86.02]	[-66.30]	[-107.80]	[-81.70]
d_School_2	0.0242***	0.0241***	0.0320***	0.0311***
	[9.13]	[9.32]	[11.26]	[11.22]
d_School_3	0.0604***	0.0605***	0.0752***	0.0741***
	[18.45]	[18.89]	[21.36]	[21.63]
d_School_4	0.1231***	0.1215***	0.1476***	0.1441***
	[39.73]	[40.07]	[44.30]	[44.43]
Potential_experience	0.0303***	0.0301***	0.0357***	0.0356***
	[124.84]	[126.64]	[137.10]	[140.32]
(Potential_experience)^2	-0.0004***	-0.0004***	-0.0004***	-0.0004***
	[-81.92]	[-83.23]	[-88.24]	[-90.81]
d_Age60	-0.1204***	-0.1189***	-0.0893***	-0.0863***
	[-36.63]	[-37.00]	[-25.27]	[-25.10]
d_Line_Product_2	-0.1819***	-0.1827***	-0.2450***	-0.2463***
	[-77.27]	[-78.53]	[-96.81]	[-98.91]
d_Line_Product_3	-0.0873***	-0.0816***	-0.1720***	-0.1688***
	[-26.30]	[-24.92]	[-48.20]	[-48.14]
d_Line_Product_4	-0.2575***	-0.2545***	-0.3580***	-0.3555***
	[-110.69]	[-110.48]	[-143.13]	[-144.21]
d_Emp_style_2	-0.1332***	-0.1398***	-0.1812***	-0.1892***
	[-31.74]	[-33.88]	[-40.16]	[-42.83]
d_Emp_style_3	-0.2724***	-0.2729***	-0.3540***	-0.3519***
	[-84.04]	[-85.43]	[-101.60]	[-102.92]
d_Emp_style_4	-0.2767***	-0.2773***	-0.3831***	-0.3809***
	[-130.87]	[-132.22]	[-168.57]	[-169.65]
d_Gender_2	-0.3064***	-0.3025***	-0.2736***	-0.2697***
	[-208.08]	[-209.45]	[-172.87]	[-174.50]
State dummy	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes
Same firm dummy	No	yes	No	yes
N	201,869	201,869	201,869	201,869
R-squared	0.6572	0.6754	0.6974	0.7159
Adj--R-squared	0.6568	0.6743	0.6971	0.715

* p<0.1, ** p<0.05, *** p<0.01

Table 11 Wage function: Baseline estimation (2012)
[2] using sales–export ratio

	Wage without bonus		Wage with bonus	
Sales export ratio	0.0139***	0.0094*	0.0348***	0.0261***
	[3.35]	[1.89]	[7.79]	[4.90]
d DoL	0.0029*	0.0030*	0.0100***	0.0112***
	[1.89]	[1.94]	[6.04]	[6.85]
log emp	0.0336***	0.0346***	0.0381***	0.0391***
	[40.77]	[38.05]	[42.93]	[40.18]
d Firm size 2	-0.0381***	-0.0381***	-0.0494***	-0.0369***
	[-14.48]	[-7.56]	[-17.45]	[-6.84]
d Firm size 3	-0.1084***	-0.0890***	-0.1229***	-0.0881***
	[-35.44]	[-16.24]	[-37.39]	[-15.01]
d Firm size 4	-0.1258***	-0.1083***	-0.1583***	-0.1184***
	[-39.30]	[-19.60]	[-46.03]	[-20.01]
d Firm size 5	-0.2113***	-0.1991***	-0.2624***	-0.2269***
	[-67.99]	[-36.62]	[-78.53]	[-39.00]
d Firm size 6	-0.2365***	-0.2226***	-0.3045***	-0.2697***
	[-64.33]	[-38.51]	[-77.01]	[-43.58]
d Firm size 7	-0.2717***	-0.2567***	-0.3616***	-0.3253***
	[-59.98]	[-40.36]	[-74.24]	[-47.77]
d Firm size 8	-0.5070***	-0.4903***	-0.6833***	-0.6461***
	[-86.12]	[-66.21]	[-107.95]	[-81.50]
d School 2	0.0241***	0.0241***	0.0320***	0.0310***
	[9.11]	[9.31]	[11.23]	[11.20]
d School 3	0.0604***	0.0605***	0.0752***	0.0741***
	[18.45]	[18.89]	[21.35]	[21.62]
d School 4	0.1234***	0.1216***	0.1481***	0.1445***
	[39.80]	[40.13]	[44.43]	[44.54]
Potential experience	0.0303***	0.0301***	0.0357***	0.0356***
	[124.85]	[126.63]	[137.10]	[140.30]
(Potential experience)^2	-0.0004***	-0.0004***	-0.0004***	-0.0004***
	[-81.91]	[-83.22]	[-88.21]	[-90.77]
d Age60	-0.1204***	-0.1189***	-0.0894***	-0.0864***
	[-36.63]	[-37.01]	[-25.28]	[-25.11]
d Line Product 2	-0.1817***	-0.1826***	-0.2445***	-0.2461***
	[-77.18]	[-78.48]	[-96.60]	[-98.80]
d Line Product 3	-0.0873***	-0.0817***	-0.1720***	-0.1690***
	[-26.30]	[-24.95]	[-48.16]	[-48.19]
d Line Product 4	-0.2576***	-0.2546***	-0.3580***	-0.3558***
	[-110.69]	[-110.51]	[-143.09]	[-144.27]
d Emp style 2	-0.1330***	-0.1397***	-0.1808***	-0.1890***
	[-31.69]	[-33.86]	[-40.05]	[-42.78]
d Emp style 3	-0.2725***	-0.2730***	-0.3541***	-0.3521***
	[-84.06]	[-85.45]	[-101.61]	[-102.95]
d Emp style 4	-0.2770***	-0.2775***	-0.3837***	-0.3812***
	[-131.01]	[-132.29]	[-168.78]	[-169.76]
d Gender 2	-0.3064***	-0.3025***	-0.2737***	-0.2698***
	[-208.08]	[-209.46]	[-172.86]	[-174.50]
State dummy	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes
Same firm dummy	No	yes	No	yes
N	201,869	201,869	201,869	201,869
R-squared	0.6572	0.6754	0.6972	0.7158
Adj--R-squared	0.6568	0.6742	0.6968	0.7148

* p<0.1, ** p<0.05, *** p<0.01

Table 12　Wage function by plant size (using export dummy for 2012)

	～20 workers	21～50 workers	51～100workers	101～200 workers	201～300 workers	301～ workers
d_export	0.0371***	0.0634***	0.0481***	0.0364***	-0.001	-0.0059*
	[3.09]	[8.96]	[8.79]	[8.21]	[-0.13]	[-1.91]
d_DoL	0.0123*	0.0310***	0.0298***	-0.0108***	0.0751***	0.0038
	[1.85]	[8.94]	[7.82]	[-3.00]	[10.42]	[0.83]
log_emp	0.0167**	0.0555***	0.0532***	0.0920***	0.0769***	0.0252***
	[2.26]	[9.80]	[9.32]	[14.08]	[6.31]	[10.08]
d_Firm_size_2	0	-0.4098***	0.0169	-0.1518***	0.4240***	-0.0389***
	[.]	[-6.21]	[0.33]	[-4.69]	[8.09]	[-7.20]
d_Firm_size_3	0.0930**	-0.5183***	-0.0792	-0.1631***	0.3982***	-0.1216***
	[2.40]	[-8.01]	[-1.53]	[-4.81]	[7.33]	[-19.10]
d_Firm_size_4	-0.1378***	-0.5210***	-0.2116***	-0.2930***	0.3898***	-0.1228***
	[-3.38]	[-8.19]	[-4.14]	[-8.75]	[7.26]	[-17.07]
d_Firm_size_5	-0.2646***	-0.6558***	-0.3044***	-0.3570***	0.3870***	-0.1775***
	[-8.07]	[-10.37]	[-5.97]	[-10.75]	[7.24]	[-10.98]
d_Firm_size_6	-0.2859***	-0.7035***	-0.2963***	-0.3369***		
	[-8.97]	[-11.13]	[-5.82]	[-9.92]		
d_Firm_size_7	-0.3420***	-0.7273***	-0.6133***	0.2074***		
	[-11.01]	[-11.48]	[-10.05]	[2.98]		
d_Firm_size_8	-0.6528***	-0.8688***				
	[-18.03]	[-12.01]				
d_School_2	0.0245***	0.0296***	0.0316***	0.0336***	0.0389***	0.0426***
	[3.70]	[5.14]	[4.86]	[4.82]	[3.90]	[7.28]
d_School_3	0.1109***	0.0838***	0.0568***	0.0631***	0.0720***	0.0839***
	[12.10]	[11.32]	[7.17]	[7.64]	[6.13]	[12.13]
d_School_4	0.1421***	0.1338***	0.1316***	0.1214***	0.1751***	0.1981***
	[15.64]	[18.83]	[17.33]	[15.29]	[15.61]	[30.58]
Potential_experience	0.0316***	0.0298***	0.0313***	0.0312***	0.0374***	0.0437***
	[39.97]	[49.49]	[52.70]	[53.09]	[47.23]	[99.40]
(Potential_experience)^2	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0004***	-0.0005***
	[-28.76]	[-32.31]	[-33.63]	[-32.46]	[-29.53]	[-60.62]
d_Age60	-0.0454***	-0.0737***	-0.0780***	-0.0839***	-0.0734***	-0.1257***
	[-4.97]	[-9.83]	[-9.77]	[-9.85]	[-6.40]	[-18.87]
d_Line_Product_2	-0.1890***	-0.2271***	-0.2179***	-0.2498***	-0.2755***	-0.2621***
	[-8.25]	[-21.60]	[-32.60]	[-50.12]	[-42.24]	[-77.01]
d_Line_Product_3	-0.1503***	-0.1882***	-0.1431***	-0.1587***	-0.1761***	-0.1597***
	[-4.33]	[-12.37]	[-15.80]	[-25.64]	[-20.82]	[-32.06]
d_Line_Product_4	-0.3395***	-0.3871***	-0.3535***	-0.3455***	-0.3404***	-0.3090***
	[-14.97]	[-37.20]	[-54.00]	[-74.52]	[-53.00]	[-86.82]
d_Emp_style_2	-0.1134***	-0.1951***	-0.2195***	-0.1999***	-0.3480***	-0.2627***
	[-11.00]	[-22.84]	[-20.70]	[-16.74]	[-18.70]	[-24.14]
d_Emp_style_3	-0.2748***	-0.3176***	-0.3408***	-0.3811***	-0.3620***	-0.4281***
	[-30.48]	[-46.06]	[-45.78]	[-45.96]	[-26.42]	[-53.29]
d_Emp_style_4	-0.2523***	-0.3074***	-0.3391***	-0.3744***	-0.4256***	-0.4740***
	[-22.30]	[-49.30]	[-64.98]	[-78.60]	[-66.13]	[-131.43]
d_Gender_2	-0.3183***	-0.3098***	-0.2859***	-0.2362***	-0.2081***	-0.2017***
	[-65.92]	[-89.31]	[-83.52]	[-67.84]	[-42.78]	[-70.66]
State dummy	yes	yes	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes	yes	yes
Same firm dummy	yes	yes	yes	yes	yes	yes
N	24147	37445	36566	34188	17403	52120
R-squared	0.4788	0.5656	0.6216	0.6514	0.6844	0.6654
Adj--R-squared	0.4743	0.5631	0.6194	0.6493	0.6814	0.6642

* p<0.1, ** p<0.05, *** p<0.01

Table 13　Wage function by plant size (using sales–export ratio for 2012)

	～20 workers	21～50 workers	51～100workers	101～200 workers	201～300 workers	301～ workers
Sales export ratio	0.1749***	0.0884***	0.0233	0.1179***	0.2555***	-0.0144**
	[4.86]	[2.69]	[1.25]	[7.09]	[8.13]	[-2.19]
d DoL	0.0121*	0.0323***	0.0321***	-0.0097***	0.0645***	0.0043
	[1.82]	[9.31]	[8.43]	[-2.72]	[8.94]	[0.93]
log emp	0.0168**	0.0552***	0.0536***	0.0914***	0.0765***	0.0257***
	[2.27]	[9.74]	[9.39]	[13.96]	[6.30]	[10.17]
d Firm size 2	0	-0.4714***	-0.0228	-0.1541***	0.4147***	-0.0398***
	[.]	[-7.17]	[-0.44]	[-4.76]	[8.03]	[-7.31]
d Firm size 3	0.1048***	-0.5730***	-0.1219**	-0.1686***	0.3893***	-0.1223***
	[2.70]	[-8.89]	[-2.36]	[-4.97]	[7.26]	[-19.18]
d Firm size 4	-0.1258***	-0.5815***	-0.2524***	-0.2977***	0.3684***	-0.1235***
	[-3.08]	[-9.18]	[-4.94]	[-8.88]	[6.96]	[-17.14]
d Firm size 5	-0.2510***	-0.7142***	-0.3478***	-0.3599***	0.3781***	-0.1768***
	[-7.62]	[-11.34]	[-6.81]	[-10.83]	[7.16]	[-10.94]
d Firm size 6	-0.2726***	-0.7613***	-0.3387***	-0.3399***		
	[-8.51]	[-12.10]	[-6.64]	[-10.01]		
d Firm size 7	-0.3290***	-0.7869***	-0.6555***	0.1996***		
	[-10.54]	[-12.48]	[-10.72]	[2.87]		
d Firm size 8	-0.6402***	-0.9296***				
	[-17.63]	[-12.90]				
d School 2	0.0247***	0.0298***	0.0314***	0.0332***	0.0373***	0.0426***
	[3.73]	[5.17]	[4.81]	[4.76]	[3.75]	[7.29]
d School 3	0.1107***	0.0837***	0.0568***	0.0627***	0.0703***	0.0838***
	[12.09]	[11.29]	[7.16]	[7.59]	[6.00]	[12.11]
d School 4	0.1426***	0.1347***	0.1326***	0.1213***	0.1731***	0.1980***
	[15.72]	[18.94]	[17.45]	[15.28]	[15.45]	[30.57]
Potential experience	0.0316***	0.0298***	0.0313***	0.0312***	0.0373***	0.0437***
	[39.96]	[49.42]	[52.67]	[53.01]	[47.18]	[99.40]
(Potential experienc	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0004***	-0.0005***
	[-28.74]	[-32.27]	[-33.63]	[-32.39]	[-29.48]	[-60.63]
d Age60	-0.0460***	-0.0739***	-0.0777***	-0.0839***	-0.0746***	-0.1257***
	[-5.04]	[-9.85]	[-9.73]	[-9.84]	[-6.51]	[-18.87]
d Line Product 2	-0.1890***	-0.2257***	-0.2172***	-0.2500***	-0.2766***	-0.2621***
	[-8.25]	[-21.44]	[-32.47]	[-50.15]	[-42.49]	[-77.01]
d Line Product 3	-0.1501***	-0.1873***	-0.1435***	-0.1587***	-0.1756***	-0.1597***
	[-4.32]	[-12.30]	[-15.82]	[-25.64]	[-20.80]	[-32.06]
d Line Product 4	-0.3397***	-0.3864***	-0.3537***	-0.3460***	-0.3413***	-0.3090***
	[-14.98]	[-37.09]	[-53.98]	[-74.63]	[-53.26]	[-86.82]
d Emp style 2	-0.1122***	-0.1961***	-0.2211***	-0.1988***	-0.3455***	-0.2634***
	[-10.89]	[-22.91]	[-20.83]	[-16.64]	[-18.60]	[-24.19]
d Emp style 3	-0.2750***	-0.3180***	-0.3395***	-0.3819***	-0.3625***	-0.4279***
	[-30.52]	[-46.07]	[-45.56]	[-46.05]	[-26.51]	[-53.27]
d Emp style 4	-0.2521***	-0.3079***	-0.3391***	-0.3744***	-0.4240***	-0.4738***
	[-22.29]	[-49.33]	[-64.91]	[-78.58]	[-66.13]	[-131.43]
d Gender 2	-0.3180***	-0.3098***	-0.2864***	-0.2362***	-0.2072***	-0.2017***
	[-65.86]	[-89.23]	[-83.60]	[-67.82]	[-42.67]	[-70.65]
State dummy	yes	yes	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes	yes	yes
Same firm dummy	yes	yes	yes	yes	yes	yes
N	24,147	37,445	36,566	34,188	17,403	52120
R-squared	0.4927	0.5889	0.6689	0.7112	0.766	0.775
Adj--R-squared	0.4877	0.5856	0.666	0.7082	0.7627	0.7732

* p<0.1, ** p<0.05, *** p<0.01

Table 14　Wage function by firm size (using export dummy, 2012)

	5～9 workers	10～29 workers	30～99 workers	100～299 workers	300～499 workers	500～999 workers	1000～4999 workers	5000～ workers
Sales_export_ratio	0.0759***	0.0605***	0.0364***	0.0317***	-0.0076	-0.0274***	0.0304***	-0.0089
	[3.02]	[5.15]	[6.51]	[8.06]	[-1.18]	[-4.69]	[5.40]	[-1.56]
d_DoL	0.0319	0.0092*	0.0437***	-0.0018	-0.0536***	-0.0330***	-0.0384***	
	[1.51]	[1.66]	[14.61]	[-0.59]	[-8.05]	[-4.55]	[-4.80]	
log_emp	0.0220*	0.0095*	0.0715***	0.0648***	0.0523***	0.0095***	0.0202***	-0.0087***
	[1.69]	[1.77]	[24.77]	[30.47]	[15.76]	[3.27]	[9.00]	[-2.65]
d_School_2	0.0468***	0.0208***	0.0273***	0.0328***	0.0468***	0.0346***	0.0371***	0.0439***
	[4.30]	[3.11]	[4.72]	[5.51]	[4.71]	[3.49]	[4.62]	[5.00]
d_School_3	0.1582***	0.0939***	0.0689***	0.0535***	0.0740***	0.0455***	0.0793***	0.1140***
	[10.21]	[10.23]	[9.42]	[7.52]	[6.29]	[3.97]	[8.56]	[10.64]
d_School_4	0.1767***	0.1283***	0.1307***	0.1209***	0.1536***	0.1406***	0.1889***	0.2394***
	[11.45]	[14.24]	[18.61]	[17.72]	[13.72]	[12.87]	[21.38]	[24.36]
Potential_experience	0.0311***	0.0292***	0.0312***	0.0292***	0.0344***	0.0366***	0.0447***	0.0489***
	[22.29]	[37.46]	[53.70]	[55.77]	[43.67]	[48.40]	[77.62]	[71.30]
(Potential_experienc	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0004***	-0.0004***	-0.0005***	-0.0006***
	[-16.94]	[-25.71]	[-35.39]	[-33.86]	[-26.33]	[-29.09]	[-48.53]	[-44.06]
d_Age60	-0.0404***	-0.0566***	-0.0710***	-0.0885***	-0.0749***	-0.0569***	-0.1280***	-0.1486***
	[-2.66]	[-6.10]	[-9.65]	[-11.96]	[-6.51]	[-5.12]	[-14.78]	[-14.22]
d_Line_Product_2		0.1569***	0.1688***	-0.2384***	-0.2664***	-0.2545***	-0.2753***	-0.2721***
		[33.70]	[53.14]	[-54.00]	[-41.43]	[-42.58]	[-60.08]	[-49.91]
d_Line_Product_3				-0.1617***	-0.1626***	-0.1549***	-0.1585***	-0.1533***
				[-30.12]	[-19.42]	[-18.57]	[-24.56]	[-19.52]
d_Line_Product_4				-0.3473***	-0.3407***	-0.3022***	-0.3113***	-0.3062***
				[-86.38]	[-55.07]	[-49.85]	[-64.75]	[-53.60]
d_Emp_style_2	-0.0569***	-0.1762***	-0.1647***	-0.2671***	-0.2276***	-0.2370***	-0.3112***	-0.3083***
	[-3.02]	[-18.09]	[-18.10]	[-26.85]	[-13.74]	[-13.21]	[-23.04]	[-14.14]
d_Emp_style_3	-0.2750***	-0.2870***	-0.3187***	-0.3451***	-0.3554***	-0.4654***	-0.4602***	-0.4372***
	[-17.38]	[-32.83]	[-49.32]	[-48.07]	[-30.79]	[-36.62]	[-40.24]	[-29.75]
d_Emp_style_4	-0.1995***	-0.2288***	-0.2664***	-0.3416***	-0.4399***	-0.5103***	-0.4921***	-0.4839***
	[-7.75]	[-20.66]	[-47.48]	[-79.65]	[-70.34]	[-86.44]	[-101.27]	[-82.80]
d_Gender_2	-0.2896***	-0.3227***	-0.3140***	-0.2485***	-0.2123***	-0.2105***	-0.1982***	-0.1963***
	[-34.55]	[-68.73]	[-96.16]	[-80.95]	[-46.05]	[-45.99]	[-52.26]	[-39.60]
State dummy	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes	yes	yes	yes	yes
Same firm dummy	yes	yes	yes	yes	yes	yes	yes	yes
N	8,668	23,258	41,612	45,343	17,802	17,420	28,346	19,420
R-squared	0.4192	0.4917	0.5599	0.6668	0.7388	0.7731	0.7895	0.7861
Adj--R-squared	0.4063	0.4875	0.5576	0.6647	0.7355	0.77	0.7867	0.7837

* p<0.1, ** p<0.05, *** p<0.01

Table 15　Wage function by firm size (using sales–export ratio, 2012)

	5～9 workers	10～29 workers	30～99 workers	100～299 workers	300～499 workers	500～999 workers	1000～4999 workers	5000～ workers
Sales_export_ratio	0.1928***	0.2127***	-0.0241	0.0931***	0.023	0.0095	0.0175	-0.0242**
	[3.01]	[5.84]	[-1.00]	[6.48]	[1.24]	[0.56]	[1.28]	[-2.31]
d_DoL	0.0327	0.0093*	0.0457***	-0.0019	-0.0550***	-0.0349***	-0.0343***	
	[1.54]	[1.69]	[15.34]	[-0.63]	[-8.25]	[-4.82]	[-4.30]	
log_emp	0.021	0.0096*	0.0732***	0.0656***	0.0512***	0.0074**	0.0211***	-0.0073**
	[1.61]	[1.80]	[25.36]	[30.95]	[15.52]	[2.54]	[9.41]	[-2.21]
d_School_2	0.0471***	0.0213***	0.0269***	0.0326***	0.0465***	0.0344***	0.0372***	0.0440***
	[4.33]	[3.18]	[4.65]	[5.47]	[4.68]	[3.47]	[4.63]	[5.01]
d_School_3	0.1587***	0.0937***	0.0685***	0.0533***	0.0730***	0.0452***	0.0796***	0.1140***
	[10.24]	[10.21]	[9.36]	[7.49]	[6.21]	[3.94]	[8.58]	[10.64]
d_School_4	0.1777***	0.1294***	0.1312***	0.1212***	0.1528***	0.1398***	0.1895***	0.2394***
	[11.53]	[14.37]	[18.68]	[17.75]	[13.65]	[12.78]	[21.43]	[24.36]
Potential_experience	0.0310***	0.0292***	0.0312***	0.0292***	0.0344***	0.0366***	0.0447***	0.0489***
	[22.24]	[37.46]	[53.72]	[55.76]	[43.67]	[48.37]	[77.57]	[71.28]
(Potential_experienc	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0004***	-0.0004***	-0.0005***	-0.0006***
	[-16.88]	[-25.71]	[-35.41]	[-33.83]	[-26.33]	[-29.11]	[-48.47]	[-44.05]
d_Age60	-0.0411***	-0.0566***	-0.0712***	-0.0885***	-0.0750***	-0.0557***	-0.1283***	-0.1487***
	[-2.70]	[-6.10]	[-9.67]	[-11.95]	[-6.52]	[-5.01]	[-14.80]	[-14.23]
d_Line_Product_2		0.1574***	0.1694***	-0.2380***	-0.2667***	-0.2549***	-0.2748***	-0.2721***
		[33.82]	[53.32]	[-53.91]	[-41.48]	[-42.60]	[-59.95]	[-49.91]
d_Line_Product_3				-0.1615***	-0.1625***	-0.1550***	-0.1587***	-0.1535***
				[-30.07]	[-19.41]	[-18.57]	[-24.57]	[-19.55]
d_Line_Product_4				-0.3473***	-0.3410***	-0.3017***	-0.3114***	-0.3063***
				[-86.35]	[-55.10]	[-49.74]	[-64.74]	[-53.66]
d_Emp_style_2	-0.0559***	-0.1748***	-0.1647***	-0.2669***	-0.2276***	-0.2415***	-0.3115***	-0.3101***
	[-2.97]	[-17.95]	[-18.08]	[-26.81]	[-13.73]	[-13.46]	[-23.02]	[-14.21]
d_Emp_style_3	-0.2755***	-0.2868***	-0.3176***	-0.3459***	-0.3543***	-0.4658***	-0.4600***	-0.4374***
	[-17.42]	[-32.80]	[-49.12]	[-48.19]	[-30.71]	[-36.63]	[-40.19]	[-29.77]
d_Emp_style_4	-0.1980***	-0.2286***	-0.2657***	-0.3422***	-0.4396***	-0.5103***	-0.4919***	-0.4836***
	[-7.69]	[-20.65]	[-47.35]	[-79.82]	[-70.31]	[-86.38]	[-101.19]	[-82.77]
d_Gender_2	-0.2899***	-0.3225***	-0.3141***	-0.2485***	-0.2123***	-0.2109***	-0.1983***	-0.1964***
	[-34.60]	[-68.69]	[-96.17]	[-80.94]	[-46.03]	[-46.06]	[-52.27]	[-39.62]
State dummy	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes	yes	yes	yes	yes
Same firm dummy	yes	yes	yes	yes	yes	yes	yes	yes
N	8,668	23,258	41,612	45,343	17,802	17,420	28,346	19,420
R-squared	0.4192	0.4919	0.5595	0.6667	0.7388	0.7728	0.7893	0.7862
Adj--R-squared	0.4063	0.4877	0.5571	0.6645	0.7355	0.7697	0.7865	0.7838

* p<0.1, ** p<0.05, *** p<0.01

Table 16　Wage function by plant size (using export experience, 2012)

	Whole sample	～20 workers	21～50 workers	51～100workers	101～200 workers	201～300 workers	301～ workers
export_experience	0.0027***	0.0119***	0.0084***	0.0021***	0.0097***	0.0054***	0.0003
	[11.09]	[5.81]	[7.83]	[2.89]	[16.49]	[5.83]	[0.89]
d_DoL	0.0103***	0.0136**	0.0319***	0.0317***	-0.0140***	0.0714***	0.0025
	[6.30]	[2.05]	[9.22]	[8.32]	[-3.92]	[10.00]	[0.53]
log_emp	0.0381***	0.0179**	0.0530***	0.0527***	0.0881***	0.0825***	0.0247***
	[39.12]	[2.42]	[9.35]	[9.22]	[13.52]	[6.77]	[9.93]
d_Firm_size_2	-0.0418***		-0.4007***	-0.0317	-0.1608***	0.3691***	-0.0387***
	[-7.79]		[-6.04]	[-0.61]	[-4.98]	[7.03]	[-7.15]
d_Firm_size_3	-0.0939***	0.1034***	-0.4936***	-0.1290**	-0.1641***	0.3377***	-0.1219***
	[-16.08]	[2.67]	[-7.57]	[-2.51]	[-4.86]	[6.19]	[-19.07]
d_Firm_size_4	-0.1230***	-0.1274***	-0.4996***	-0.2617***	-0.2985***	0.3309***	-0.1229***
	[-20.90]	[-3.13]	[-7.79]	[-5.15]	[-8.94]	[6.15]	[-17.07]
d_Firm_size_5	-0.2305***	-0.2581***	-0.6340***	-0.3553***	-0.3577***	0.3349***	-0.1781***
	[-39.88]	[-7.88]	[-9.94]	[-7.01]	[-10.80]	[6.25]	[-11.00]
d_Firm_size_6	-0.2730***	-0.2743***	-0.6798***	-0.3460***	-0.3359***		
	[-44.34]	[-8.59]	[-10.66]	[-6.83]	[-9.92]		
d_Firm_size_7	-0.3291***	-0.3302***	-0.7054***	-0.6626***	0.1885***		
	[-48.47]	[-10.61]	[-11.04]	[-10.90]	[2.72]		
d_Firm_size_8	-0.6501***	-0.6414***	-0.8481***				
	[-82.09]	[-17.69]	[-11.65]				
d_School_2	0.0311***	0.0248***	0.0295***	0.0313***	0.0332***	0.0389***	0.0426***
	[11.24]	[3.75]	[5.12]	[4.80]	[4.78]	[3.91]	[7.28]
d_School_3	0.0741***	0.1106***	0.0829***	0.0566***	0.0627***	0.0716***	0.0838***
	[21.64]	[12.07]	[11.19]	[7.14]	[7.62]	[6.10]	[12.11]
d_School_4	0.1442***	0.1419***	0.1332***	0.1323***	0.1197***	0.1754***	0.1979***
	[44.45]	[15.63]	[18.74]	[17.40]	[15.13]	[15.65]	[30.55]
Potential_experience	0.0356***	0.0316***	0.0298***	0.0313***	0.0313***	0.0374***	0.0437***
	[140.31]	[39.94]	[49.45]	[52.67]	[53.30]	[47.22]	[99.39]
(Potential_experience)^2	-0.0004***	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0004***	-0.0005***
	[-90.79]	[-28.73]	[-32.29]	[-33.62]	[-32.63]	[-29.52]	[-60.63]
d_Age60	-0.0865***	-0.0456***	-0.0740***	-0.0777***	-0.0840***	-0.0740***	-0.1258***
	[-25.15]	[-4.99]	[-9.86]	[-9.73]	[-9.90]	[-6.46]	[-18.88]
d_Line_Product_2	-0.2461***	-0.1901***	-0.2268***	-0.2173***	-0.2500***	-0.2759***	-0.2623***
	[-98.85]	[-8.30]	[-21.57]	[-32.47]	[-50.32]	[-42.36]	[-77.09]
d_Line_Product_3	-0.1686***	-0.1495***	-0.1871***	-0.1431***	-0.1580***	-0.1759***	-0.1597***
	[-48.08]	[-4.31]	[-12.29]	[-15.78]	[-25.61]	[-20.82]	[-32.05]
d_Line_Product_4	-0.3553***	-0.3407***	-0.3871***	-0.3534***	-0.3452***	-0.3407***	-0.3090***
	[-144.08]	[-15.03]	[-37.19]	[-53.93]	[-74.68]	[-53.13]	[-86.81]
d_Emp_style_2	-0.1886***	-0.1123***	-0.1942***	-0.2215***	-0.1956***	-0.3454***	-0.2622***
	[-42.70]	[-10.90]	[-22.73]	[-20.88]	[-16.43]	[-18.57]	[-24.10]
d_Emp_style_3	-0.3519***	-0.2748***	-0.3185***	-0.3396***	-0.3793***	-0.3616***	-0.4278***
	[-102.92]	[-30.50]	[-46.17]	[-45.59]	[-45.87]	[-26.42]	[-53.25]
d_Emp_style_4	-0.3809***	-0.2523***	-0.3075***	-0.3387***	-0.3739***	-0.4243***	-0.4737***
	[-169.64]	[-22.32]	[-49.30]	[-64.83]	[-78.74]	[-66.09]	[-131.41]
d_Gender_2	-0.2697***	-0.3181***	-0.3094***	-0.2864***	-0.2361***	-0.2079***	-0.2017***
	[-174.50]	[-65.89]	[-89.17]	[-83.58]	[-68.03]	[-42.78]	[-70.66]
State dummy	yes	yes	yes	yes	yes	yes	yes
Industry dummy	yes	yes	yes	yes	yes	yes	yes
Same firm dummy	yes	yes	yes	yes	yes	yes	
N	201,869	24,147	37,445	36,566	34,188	17,403	52,120
R-squared	0.7159	0.4929	0.5895	0.669	0.7131	0.7656	0.775
Adj--R-squared	0.715	0.4879	0.5862	0.6661	0.7101	0.7622	0.7732

Table 17 Blinder = Oaxaca Decomposition (2012)

[1] All plants

	Wage	Std error	Z value	samples
Whole sample				202,043
Exporting plants (a)	3.163	0.0021	1541.610	39,801
Non-exporting plants (b)	2.818	0.0010	2914.490	162,242
Wage premium of eporters (a) - (b)	0.345	0.0023	151.970	
Part from difference of characteristics (c)	0.312	0.0022	143.930	
Other part (correlated with exports) (d)	0.033	0.0004	75.830	
Breakdown of (c)				
difference of workers' characteristics (e)	0.059			
difference of plants/firms' characteristics (f)	0.253			
difference from firm size (within (f))	0.162			

[2] Plants with 20 or fewer workers

	Wage	Std error	Z value	samples
Whole sample				24,207
Exporting plants (a)	2.741	0.0158	173.350	759
Non-exporting plants (b)	2.616	0.0027	982.600	23,448
Wage premium of eporters (a) - (b)	0.125	0.0160	7.810	
Part from difference of characteristics (c)	0.083	0.0114	7.300	
Other part (correlated with exports) (d)	0.042	0.0135	3.130	
Breakdown of (c)				
difference of workers' characteristics (e)	-0.003			
difference of plants/firms' characteristics (f)	0.086			
difference from firm size (within (f))	0.033			

[3] Plants with 21–50 workers

	Wage	Std error	Z value	samples
Whole sample				37,521
Exporting plants (a)	2.852	0.0092	311.270	2,023
Non-exporting plants (b)	2.666	0.0022	1217.940	35,498
Wage premium of eporters (a) - (b)	0.187	0.0094	19.810	
Part from difference of characteristics (c)	0.121	0.0082	14.790	
Other part (correlated with exports) (d)	0.065	0.0072	9.020	
Breakdown of (c)				
difference of workers' characteristics (e)	0.035			
difference of plants/firms' characteristics (f)	0.086			
difference from firm size (within (f))	0.020			

[4] Plants with 51–100 workers

	Wage	Std error	Z value	samples
Whole sample				36,566
Exporting plants (a)	2.895	0.0071	409.260	3,893
Non-exporting plants (b)	2.759	0.0024	1148.640	32,673
Wage premium of eporters (a) - (b)	0.136	0.0075	18.180	
Part from difference of characteristics (c)	0.084	0.0069	12.190	
Other part (correlated with exports) (d)	0.052	0.0054	9.510	
Breakdown of (c)				
difference of workers' characteristics (e)	0.043			
difference of plants/firms' characteristics (f)	0.042			
difference from firm size (within (f))	0.020			

[5] Plants with 101–200 workers

	Wage	Std error	Z value	samples
Whole sample				34,199
Exporting plants (a)	3.009	0.0059	513.790	5,897
Non-exporting plants (b)	2.849	0.0026	1083.060	28,302
Wage premium of eporters (a) - (b)	0.161	0.0064	25.020	
Part from difference of characteristics (c)	0.122	0.0058	21.120	
Other part (correlated with exports) (d)	0.039	0.0045	8.740	
Breakdown of (c)				
difference of workers' characteristics (e)	0.047			
difference of plants/firms' characteristics (f)	0.074			
difference from firm size (within (f))	0.010			

[6] Plants with 201–300 workers

	Wage	Std error	Z value	samples
Whole sample				17,403
Exporting plants (a)	3.154	0.0068	464.420	4,467
Non-exporting plants (b)	2.971	0.0041	718.630	12,936
Wage premium of eporters (a) - (b)	0.183	0.0080	23.070	
Part from difference of characteristics (c)	0.169	0.0094	18.060	
Other part (correlated with exports) (d)	0.014	0.0077	1.840	
Breakdown of (c)				
difference of workers' characteristics (e)	0.075			
difference of plants/firms' characteristics (f)	0.094			
difference from firm size (within (f))	-0.023			

[7] Plants with 301 or more workers

	Wage	Std error	Z value	samples
Whole sample				52,147
Exporting plants (a)	3.292	0.0029	1138.340	22,762
Non-exporting plants (b)	3.134	0.0027	1155.510	29,385
Wage premium of eporters (a) - (b)	0.158	0.0040	39.860	
Part from difference of characteristics (c)	0.161	0.0042	38.710	
Other part (correlated with exports) (d)	-0.003	0.0030	-1.070	
Breakdown of (c)				
difference of workers' characteristics (e)	0.061			
difference of plants/firms' characteristics (f)	0.100			
difference from firm size (within (f))	0.026			

[8] Effect of exports on wage premiums

	wage premium of eporters (log)	Correlation with exports (log)	wage premium of eporters (real)	Correlation with exports (real)	Correlation with exports/premium
	(a)	(b)	(c)=exp^(a)	(d)=exp^(b)	(e)=((d)-1)/((c)-1)
Whole sample	0.345	0.033	1.412	1.033	**8.1%**
Size of plant					
～20 workers	0.125	0.042	1.134	1.043	**32.3%**
21～50 workers	0.187	0.065	1.205	1.067	**32.9%**
51～100 workers	0.136	0.052	1.145	1.053	**36.4%**
101～200 workers	0.161	0.039	1.174	1.040	**22.8%**
201～300 workers	0.183	0.014	1.201	1.014	**7.1%**
301～ workers	0.158	-0.003	1.171	0.997	**-1.9%**