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Education: Evidence from Matched Employer-Employee Data in Japan

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Abstract

The effect of imports and exports has long been a topic of special interest to economists in the modern era of expanding globalization, but few studies have examined the effects on the worker by characteristics. This paper studies the effect of imports and exports by worker groups, evaluating diverse types of employment positions, which was not done in previous research. We match employer-employee data from the Basic Survey on Wage Structure and the Basic Survey of Japanese Business Structure and Activities from 1998 to 2008, and estimate the elasticities of labor demand. Our results indicate that trade increases the demand for well-educated workers for an indefinite period, but imports increase the demand for such workers with a limited-term contract for females. We do not find a significant negative effect from the increase in imports from Asia. The effects are related to differences among types of employment, education levels and gender.

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1. Introduction

Interest in the impact of exports and imports on the labor market has remained high over the last few decades. In 2011, in particular, much attention has been paid to this issue in Japan because there are growing concerns about the collapse of domestic industry given that the manufacturing bases of East Japan were struck by an earthquake disaster in March 2011, and Japanese enterprises are facing appreciation of the yen due to the euro crisis.

Much of the research examines the impact of imports on workers by skill level (Feenstra and Hanson, 1999; Ekholm and Hakkala, 2005; Sakurai, 2000b; Ahn, Fukao and Ito, 2008). They report that imports of intermediate goods from low-income countries affect labor composition, shifting the labor requirements to highly skilled workers. Other studies note that offshoring increases the ratio of non-regular workers to whole country worker (Machikita and Sato, 2011; Tomiura, Ito and Wakasugi, 2011). In recent years research has been conducted using employer-employee data with rich information on both companies and workers. These studies mainly explore the impact of exports and whether or not the high wages of exporters are caused by the changing worker-pool composition, an increasing return on highly skilled workers, or growing productivity (Krishna, Poole and Senses, 2011; Frias, Kaplan and Verhoogen, 2009).

Although many previous studies examined the impact of exports and imports on workers as a homogenous group, little is known about the effect of trade on workers by type of employment, by gender or by age. Most theoretical studies considered the model dividing labor by skill, and empirical studies examined the effects on workers according to their education levels or to the division of production/non-production workers. Those studies considering the type of employment discuss the changing *ratio* but not the *quantity* of each type of employment. Due to the recent development of employer-employee data, it is now possible to analyze the effects of trade by each worker type. However, previous papers using employer-employee data focus only on labor composition, and not yet on the effect of imports and exports on workers. Thus, we analyze employer-employee data and examine this effect. Moreover, we try to estimate the data at the company level instead of industry level, in contrast to previous papers,

and extend the previous empirical method. We analyze the effect of other companies' export and import decisions on a target company, including the effects on subcontractors and the attendant change in behavior of the target company. For example: Company A purchases from Company B in its home country, but changes to purchasing from Company C abroad. The effect of this change on Company A appears in the increasing ratio of imports by other companies.

Variety in types of employment arrangements has greatly expanded in recent years. Specifically, the number of workers working for a non-traditional number of hours and for non-traditional contract periods has greatly increased in many developed countries, and at the same time, disparities in treatment and pay among these workers is being recognized. We can assume that the impact of trade also affects such differences among workers. The goal of this study is to clarify the effects of export and import purchases on workers by type of employment, gender, education level, and age.

We have five main findings. First, increasing export levels increases the demand for workers with higher education levels and decreases the demand for workers with lower education levels; but among exporting companies, the demand for female workers falls in the cases of exports to Asia and North America. Second, increasing imports increases the demand for skilled labor and clearly decreases the demand for unskilled male labor, but the increases the demand for all female workers with contracts for a limited time period. Third, increasing export levels increases the demand for subcontractors, but we do not find a significant effect with the increase in imports from Asia. Fourth, we little succeed determining a clear effect comparing the two cases; workers divided by contract base and by designation at the workplace; those groups designated only by contract period consist of a mix of the two different types of worker (regular and non-regular staff). We also find different effects depending on the trade direction and the worker's age. Finally, increasing wages increases the number of working hours for part-time workers and workers with contracts for a limited time period, but decreases the number of workers for a definite period, and substitutes between gender (for example, increasing the wages of female workers with a junior high school education increases the number of male workers with the same education level). When wages increase on an hourly basis for permanent employees with a particular

level of education, this increase correspondingly decreases the demand for workers with other employment arrangements at the same education level. Further, the impact of increasing wages for males is greater on female employees than is the impact of the same wage increase for females on the male employees.

The remainder of the paper is organized as follows. The next section reviews previous studies and proposes our hypotheses and theory. Section 3 describes our empirical approach and explains the data set. Section 4 presents the empirical results and Section 5 concludes.

2. Literature Review and Theoretical Model

Various theories about the effect of imports on workers exist. One of the key theories is presented in a string of studies discussing the Stolper-Samuelson effect. The Stolper-Samuelson effect suggests that increasing the price of goods induces an increase in the price of components or materials (factors) used intensively in such products. However, in practice, price data are often incomplete because the changing mix of goods produced with different factor proportions is not directly linked with factor prices, and price is often determined by factors unrelated to trade (Goldberge and Pavcnik, 2007). To address this issue, the Heckscher-Ohlin-Vanek (HOV) model aggregates the factor contents of trade to the underlying endowments of a specific country. Feenstra and Hanson (1999) and Feenstra (2004) apply the HOV model and make an outsourcing model indicating that a fall in the price of import intermediate inputs, (in other words, the price of outsourcing), decreases the factor price used extensively for those imports, which is often the wages of unskilled labor in developed countries. Specifically, demand for skilled labor increases in developed countries when imports levels increase, and in developing countries when export levels increase. From the perspective of developing countries, the demand for skilled labor increases because the workers contributing to export intermediate inputs for developed countries are relatively high skill, compared to that of workers producing goods for domestic markets. This interdependence of events is

the string theory and it is widely applied by many researchers (e.g., Sakurai, 2004; Sasaki and Sakura, 2004)

The other key theory is skill-biased technological change (SBTC). Trade, both imports and exports, induces increases in research and development (R&D) and promotes the utilization of exciting new technologies. Technological development, as well as offshoring, increases productivity by causing the implementation of new technological skills requiring increases in skilled labor and their headquarter productive activities. Technological development does not, however, affect the productivity of other types of labor. This technological change or augmentation of import intermediate inputs leads to increases in the relative demand for skilled labor versus unskilled labor. Ekholm and Hakkala¹ (2005) and Sakurai (2004) apply this theory. Sasaki and Sakura (2004) compare the effect of this theory with that of the above string theory.

Another line of explanation for the effects of imports and exports on workers focuses on the production activity of a particular company, rather than on the country as a whole. Machikita and Sato (2011) consider permanent and temporary workers, rather than skilled and unskilled workers. They assert that companies incur termination costs when dismissing permanent workers. Thus, the marginal cost of temporary workers stays constant, but that of permanent workers per divided unit of labor increases when total labor increases. Hence, the maximum number or limit of permanent workers is determined by the point at which the marginal cost of temporary workers equals that of permanent workers. The total amount of labor is determined by the point at which the marginal cost of labor equals marginal revenue; stated another way, this marginal cost of labor is the marginal cost of temporary workers, because the marginal cost of permanent workers is higher than that of temporary workers beyond the intersection point of equal numbers of both. Thus, the number of temporary workers can be determined. When outsourcing increases a company's marginal revenue, the number of temporary workers increases, but that of permanent workers is unaffected. Thus, the ratio of temporary workers increases. Hummels et al. (2011) explain this phenomenon another way: they made a production function such that unskilled labor and import inputs are substituted for one another.

¹ Ekholm and Hakkala (2005) argued factor-biased technological change (FTBC).

In light of the previous studies, this paper considers the following issues. Increasing imports negatively affects the competitive labor that produces the same goods in the home or importing country. In contrast, increasing imports positively affects the complementary labor needed for using imported goods. If imported purchases are relatively unskilled-labor-intensive products, the demand for unskilled workers in the importing country decreases and the demand for skilled workers increases. In the same way, increasing export levels increases the relative demand for workers producing those goods. If exported goods are relatively male-labor-intensive products, the demand for male workers increases in the exporting country. Whether or not labor has a competitive (or complementary) relationship with producers of imported goods, and whether labor is intensively employed in producing goods for export depends on skill levels, the working stage of production and costs. Skill is substituted not only by educational attainment, but also by type of employment. Non-regular staff or staff for a definite period can be a proxy for lower-skilled workers than regular staff or staff for an indefinite period, even if their educational level is the same, because their training for human capital development is often minimal. Even if skill levels are the same between them, non-regular staff or staff for a definite period compete with producers of imported goods or intensively work for exporting goods because regular staff or staff for an indefinite period have termination costs. Thus, costs for regular staff or staff for an indefinite period are higher than those for non-regular staff or staff for a definite period.

We can argue the same point about part-time workers. We divide part-time workers by regular or non-regular staff and staff for an indefinite period or a definite period. Additionally, the human development opportunities for part-time workers are less than those for full-time workers, and also their cost are lower than regular staffs or staffs for an indefinite period. The working stage of production is also a point to consider. International specialization has progressed in recent years, and some stages of production are now outsourced to foreign countries, while others are still performed in the home country. Thus, the working stage of production is to a degree observable from the age, gender, or number-of-subcontractors data.

Thus, we hypothesize as follows. Increasing the level of export goods increases the numbers of skilled workers (highly educated workers, regular staff, staff for an

indefinite period), as well as subcontractors, in the exporting country. In contrast, increasing exports decreases unskilled labor, such as workers with low education levels, non-regular staff and staff for a definite period. Increasing imports decreases unskilled labor levels (poorly educated workers, non-regular staff, staff for a definite period) workers, male workers used intensively in the manufacturing industry, and subcontracted workers. Increasing imports increases the demand for skilled labor and for lower cost part-time workers. We examine empirically these hypotheses in this paper.

Regarding empirical previous research, the cost function is used by many researchers to analyze the impact of increasing imported intermediate goods (Feenstra and Hanson, 1999; Feenstra, 2004; Ekholm and Hakkala, 2005; Sakurai, 2000; Sakurai, 2004; Ahn, Fukao and Ito, 2008; Sasaki and Sakura, 2004). Feenstra and Hanson and Feenstra make the short-run cost function defined by unskilled labor, skilled labor and capital, when the levels of capital and output are fixed. They estimate for 447 industries within the U.S. manufacturing sector from 1979 to 1990. Their data are industry level, although they find the changes in relative employment and wages of skilled workers within industries are greater than those between industries. They use nonproduction labor as a proxy for skilled labor. They find a positive effect of outsourcing on nonproduction wage share.

Ekholm and Hakkala (2005) use educational attainment for skill level, rather than using nonproduction or production workers, and they calculate elasticity using Swedish data from 1995 to 2000. They argue that an increase of one percentage point in offshoring by a low-income country reduces the demand for workers with upper secondary education by about 3.5 percent, and increases the demand for workers with tertiary education by 5 to 6 percent in that country.

In the case of Japan, Sakurai (2004) examines the theory of skill-biased technological change, and finds that R&D and investing in computer technology for workers positively affect wages of workers with tertiary education. Sakurai (2000) examines the impact of outsourcing using data from a census of manufacturers and nonproduction labor as a proxy for skilled labor. Sakurai (2000) does not find a clear impact caused by the short data period (1987 to 1990).

A clear impact of outsourcing is found by Ahn, Fukao and Ito (2008). They examine the effect of outsourcing by region and education level attainment at the industry level. They use the Japan Industrial Productivity database (JIP) database that compiled by the Research Institute of Economy, Trade and Industry research project for fiscal year 2004 to 2005. The elasticity they calculated indicates that import intermediated inputs from Asia, Europe and North America are substitutes for workers with lower secondary, upper secondary and tertiary education levels, respectively.

Sasaki and Sakura (2004) conducted their research over a longer period. They analyze data for 1988 to 2003 by industry levels, despite that their data only include male workers and 14 manufacturing industries, and only note workers having attained tertiary education levels. Sasaki and Sakura (2004) find that increasing the ratio of imported goods from East Asia to domestically produced goods and total imported goods, and increasing the ratio of goods produced abroad to goods produced both domestically and abroad, increases the wages of workers with tertiary education.

Other methods besides the cost function analysis are used by Machikita and Sato (2011) and Tomiura, Ito and Wakasugi (2011). Machikita and Sato indicate that the share of imports input has a positive impact on the ratio of temporary workers. Tomiura, Ito and Wakasugi find that offshoring negatively affects the ratio of full-time regular employees to all workers. Both studies argue that outsourcing replaces permanent workers with temporary workers.

In recent years, employer-employee data have been used by many researchers; (Verhoogen,2008; Frias, Kaplan and Verhoogen, 2009; Hummels, Jørgensen, Munch and Xiang ,2011). Frias, Kaplan and Verhoogen find that an increase differential wage premia at the company level within industries by the late 1994 peso devaluation in Mexico is reflected in the differential responses of companies to the currency shock. Both company data and worker data support the hypothesis that sorting by labor ability can explain the phenomenon of companies with high export levels paying higher wages than those with lower levels of exports and those that do not export goods.

Hummel et al. (2011) eliminate the factors *offshoring changed by transport costs* and *exchange rate*, among others, by using instrument variables and include

instead the factor *offshoring changed by productivity*. They find that increasing offshore production increases the wages of skilled labor but decreases that of unskilled labor.

This paper constructs an employer-employee data set, estimates the cost function, and calculates elasticity. We conduct our estimation at the company level, rather than the industry level, because outsourcing changes the composition of factors at the company level. This study captures not only the effects of imports and exports on workers by varying educational levels, but also by type of employment, gender, and age. We also address the effect of imports and exports on subcontracted workers. The next section describes our empirical approach in detail.

3. Empirical Approach

3.1 Empirical Model

We begin by assuming that capital and input goods can be treated as fixed factors when considered for time periods of at least one year, but that labor should be treated as a variable. Assuming that the variable cost function in company i has a translog form, we can write it as

$$\begin{aligned} \ln C_i = & \alpha_i + \sum_j \beta_j \ln w_{ij} + \frac{1}{2} \sum_j \sum_k \gamma_{jk} \ln w_{ij} \ln w_{ik} + \sum_l \delta_l \ln x_{il} \\ & + \sum_j \sum_l \zeta_{jl} \ln w_{ij} \ln x_{il} + \frac{1}{2} \sum_l \sum_m \eta_{lm} \ln x_{il} \ln x_{im} + \sum_n \kappa_n z_{in} \\ & + \sum_n \sum_j \lambda_{nj} z_{in} \ln w_{ij} + \sum_n \sum_l \mu_{nl} z_{in} \ln x_{il} + \frac{1}{2} \sum_n \sum_o \nu_{no} z_{in} z_{io}, \end{aligned} \quad (3-1)$$

where C_i is the total variable cost for company i , w_{ij} is the wages of the optimally chosen workers in labor category j in company i , x_{il} is fixed inputs or outputs l in company i , and z_{in} is the structural variable n in company i , including year dummy, that shifts variable cost.

Differentiating the translog cost function with respect to wage w_{ij} yields the payment to workers in labor category j in company i relative to variable costs, which we denote by the cost shares S_{ij} :

$$S_{ij} = \beta_j + \sum_k \gamma_{jk} \ln w_{ik} + \sum_l \zeta_{jl} \ln x_{il} + \sum_n \lambda_{nj} z_{in}, \quad (3-2)$$

where $S_{ij} = \partial \ln C_i / \partial \ln w_{ij} = (w_{ij}/C_i) / (\partial C_i / \partial w_{ij}) = w_{ij} L_{ij} / \sum_k w_{ik} L_{ik}$. We employ some definitions about labor category depending employment, gender, education level, and age, which are explained in Section 4. As for fixed input and output factor x_{il} , we use three variables: tangible fixed asset, total output, and total input. Structural variable z_{in} includes factors regarding firm's international economic transaction such as overseas affiliates dummy, export and import dummy, ratio of export to and import from four regions (Asia, North America, Europe, and the other region) by each company, ratio of export to and import from four regions by other companies in the same industry, as well as year dummy.

We also calculate elasticities of factor demand using estimation results. The elasticity of labor demand in labor category j with wage for labor categories j and k is

$$\varepsilon_{jj} = \frac{\partial \ln L_{ij}}{\partial \ln w_{ij}} = \frac{\gamma_{jj} + S_{ij}^2}{S_{ij}} - 1 \quad (3-3a)$$

$$\varepsilon_{jk} = \frac{\partial \ln L_{ij}}{\partial \ln w_{ik}} = \frac{\gamma_{jk} + S_{ij} S_{ik}}{S_{ij}} \quad (3-3b)$$

where L_{ij} denotes the demand for labor in labor category j . Homogeneity of degree one in prices and symmetry of underlying translog cost function requires $\sum_k \gamma_{jk} = 0$ and

$\gamma_{ij} = \gamma_{ji}$. These characteristics also make the condition $\sum_k \varepsilon_{jk} = 0$ satisfied. We

estimate share equations using an iteration of Zellner's method for seemingly unrelated regression equations (ISUR). Since the sum of labor cost shares equals one, one equation needs to be dropped, and ISUR can be applied as a method independent of the deleted equation.

The elasticity of labor demand in category j with respect to exporting by own company, exporting by other companies in the same industry, outsourcing by own company, or outsourcing by other companies in the same industry is demonstrated by

$$\varepsilon_{jl} = \frac{\partial \ln L_{ij}}{\partial \ln x_{il}} = \frac{\zeta_{jl}}{S_{ij}} \quad (3-4)$$

We use cost share S_{ij} of sample means to calculate the above elasticities.

3.2 Data

Data including detailed information about both workers and companies, such as the type of employment, trade, sales, and other information, in one survey do not exist in Japan. Therefore, we construct the employer-employee data set ourselves using the Basic Survey on Wage Structure and the Basic Survey of Japanese Business Structure and Activities, with information from 1998 to 2008. The Basic Survey on Wage Structure is conducted by the Ministry of Health, Labor and Welfare on establishments with 10 or more regular employees, and private establishments with five to nine regular employees, as well as on workers selected by a uniform sampling method from among the establishments that were selected for the Basic Survey on Wage Structure, to obtain a clear picture of the wage structure throughout Japan. The Basic Survey on Wage Structure provides rich information about workers, including as to their education level attainment, age, gender, type of employee, and workplace. The Basic Survey of Japanese Business Structure and Activities is conducted by the Minister of Economy, Trade and Industry, and covers enterprises with 50 or more employees, having excess capital or investment funds valued at over 30 million yen. Covered industries are mining, manufacturing, wholesale and retail trade, and the food and drink industry. Because the conducted unit of workers data from the Basic Survey on Wage Structure is work *establishment*, whereas the unit of company data from the Basic Survey of Japanese Business Structure and Activities is *enterprises*, we use the Establishment and Enterprise Census to link both data sets. The Establishment and Enterprise Census is conducted on all establishments in Japan to compile a complete directory as the master sampling framework for various statistical surveys, including the Basic Survey on Wage Structure by the Statistics Bureau.

We link both data sets using the following steps. First, data from the Basic

Survey of Japanese Business Structure and Activities for 2008², the latest survey that we can obtain, is matched with the Establishment and Enterprise Census in 2006 using postal codes and company names. Only the Establishment and Enterprise Census in 2006 has information about which establishment belongs to which enterprise. Hence, we connect this data set to all data from the Basic Survey of Japanese Business Structure and Activities for other years using the number permanently assigned to enterprises in this survey. Second, each Basic Survey on Wage Structure is matched to the Establishment and Enterprise Census in the year corresponding to the master sampling framework using city codes, survey area codes, the number assigned to the establishment, and a code number corresponding to an industrial classification system. We connect all these data sets using city codes, survey area codes, and the number assigned to the establishment in the previous survey in the Establishment and Enterprise Census. (Because only the data set for 2006 has information about which establishment belongs to which enterprise, as stated above, we have to connect all data sets to that information for 2006.) Finally, the data set derived from the first step is matched to that of the second step, and we obtain the full data set, including workers' information, along with their working enterprises data.

Using this data set, we calculate the cost share by using the hourly wage rate as *wage*, and labor hours multiplied by the number of workers as the *demand for labor*. We also estimate Equation 3-2 by using the wage per person as *wage*, and the number of workers as the demand *for labor*.

We explain some independent variables below. First, working groups is divided by regular and non-regular staff or staff for an indefinite and definite period, as well as gender and education level attainment. (In Japan, the share of non-regular staff who are not called *regular* (*Seiki* in Japanese), increases from about 16 percent in the late 1980s to about 34 percent in 2008, although the share of workers employed on a contract basis for less than one year changes slightly from 12 percent to 16 percent during the same period. It seems that the designation in the workplace is more important than the contract period. In particular, 11.64 percent of all employees in the latest Employment Status Survey for 2007 work as non-regular staff for an indefinite

² It was conducted in 2008, but the data were published in 2009.

time period. We next compare the estimation results by both classifications of workers characteristics. However, we can obtain the data collected by regular and non-regular staff only for after 2005.

Second, *part-time workers* in the Basic Survey on Wage Structure means workers whose scheduled working hours per day or per week are less than those of general workers in that establishment, and who are not temporary workers. The Basic Survey on Wage Structure does not cover the data of the education level of these employees. When we do not indicate “part-time workers” and the workers are designated by education level, they are not part-time workers³.

Third, the export dummy is 0 if the amount of exports to Asia, North America, Europe, and other regions equals 0, otherwise 1. In addition, the import dummy is 0 if the amount of imports from Asia, North America, Europe and other regions excluding the Middle East, is 0, otherwise 1.

Fourth, the ratio of exports to Asia (North America, Europe, other regions) by other companies in the same industry is calculated as follows: total exports to Asia (North America, Europe, other regions) in the specific industry minus the amount of exports to Asia (North America, Europe, other regions) by the specific company, divided by the total amount of sales in the specific industry. The ratio of imports from Asia (North America, Europe, other regions) by other companies in the same industry is calculated as follows: total imports from Asia (North America, Europe, other regions) in the specific industry minus the amount of imports from Asia (North America, Europe, other regions) by the specific company, divided by the amount of inputs in the specific industry.

Finally, we assume that the subcontractors and companies which import goods belong to the same industry. For example: Company A in Industry D typically purchased from Company B in Industry D in its home country, but then changes its trading partner and instead begins to import from Company C abroad. Company B recognizes the effect of this change in Company A as the increasing ratio of imports by other companies in the same industry.

³ They are called *regular workers* in the Basic Survey on Wage Structure, but we avoid clear notification in the text because it can be confused with the term *regular*, meaning based designation at the workplace in the text.

We report detailed descriptive statistics in Table 1. The male log of mean wages by company is higher than that of females, excluding part-time workers. The observation is the number of companies. This number is reduced by the matching process from around 20,000 companies each year in the Basic Survey of Japanese Business Structure and Activities to 3000 companies. Table 1 also presents the percentage of each worker type. It is important to note that this is calculated by individual worker data, but we estimate the cost function by company level. The sample about worker groups divided by designation at the workplace from post 2005 because these data are only included after 2005. Comparing Table 1 and the Basic Survey on Wage Structure in 2008 (which is not matched with company data), the ratios of worker groups are almost the same. The most important groups are junior high school or senior high school and staff for an indefinite period for males: 26.38 percent in the Basic Survey on Wage Structure and 39.95 percent in our sample. The next important group is higher professional school, junior college, university, or graduate school, and staff for an indefinite period for males: 22.26% in the Basic Survey on Wage Structure and 25.78 percent in our sample. Our sample includes more male workers than does the Basic Survey on Wage Structure: 70.13 percent in our sample, compared to 59.3 percent in the Basic Survey on Wage Structure.

4. Results

4.1 The Elasticities of Labor Demand with Trade

Table 2 presents the elasticities of labor demand with the export and import dummies, exporting and outsourcing. The coefficients estimated by Equation 3-2 are shown in the Appendix. Export activities increase the demand for male workers with higher education, regardless of the contract period, but decreases the demand for workers with lower education for both genders. Figure 1 describes the trends of the year dummy (reference 2008 data). The left axis is the coefficient of the year dummy for workers with lower education, and the right axis is that for workers with higher

education. The demand for workers with lower education trends toward declining; the demand for workers with higher education trends upward, and there is a stronger tendency for males than for females.

On the other hand, the impact of import activities is remarkably different between male and female workers. Import activities increase the demand for female workers with junior high school or senior high school diplomas for a definite period, female workers with higher professional school, junior college, university, or graduate school diplomas for a definite period, and part-time female workers for a definite period. We do not find that the elasticity for part-time workers is higher than for the others. This means that even if the cost of part-time workers is lower than for the others in Section 2, the skills differ among them and the part-time worker does not substitute for other workers in some jobs. In contrast, import activities decrease the demand for male workers with less education or part-time workers for an indefinite period, and increases the demand for male workers with more education for an indefinite period.

Among export companies, the impact differs between male and female workers even for the same education attainment level and the same type of employment. The increasing ratio of exports to total output increases the demand in Asia and North America for male workers with higher education levels for an indefinite period, but decreases it for female workers. The reason for this might be the different gender-specific roles performed by workers within the same company— We eliminate differences between industries by using an industry dummy, and include either the non-trade industries in which females work extensively—or unobserved skill bias which appears as a gender difference. Even exporting activities with regard to workers for a definite period, a one-percentage-point increase in the export ratio to Asia is estimated to reduce the demand for male workers with higher education by about 1.3 percent.

Among importing companies, there is a clear contrast in the impact for male workers of various education levels; an increasing ratio of imports has a negative impact on the workers with less education, but a positive impact for workers with higher education levels. The reason for this clear effect for male workers is the exclusive use of male workers in manufacturing. As to the import ratio from Asia, it reduces the demand for male workers with less education, but by contrast, increases the demand for

all female workers for an indefinite period.

Next, we consider the impact from other companies in lower part of Table 2. In contrast to the direct effect of exports from a worker's own company, the effect of exports from other companies in the same industry is positive for the workers with lower education levels and negative for the workers with higher education levels, both male and female. It is possible to say that the workers with less education work for subcontractors of the exporting company; thus, increasing export activities of other companies means growth for the export company and increases the demand for subcontractors. In contrast, increases in export activities of other companies means growth for the competitors and a corresponding decrease in exports for the target company, and thus demand, for the workers with higher education levels. The same situation applies to both male and female part-time workers for a definite period. A one-percentage-point increase in the exporting ratio to North America is estimated to increase the demand for both male and female part-time workers for a definite period by about 4 percent.

Regarding the effect of import activities from other companies, there is no significant impact for Asia. We do not find evidence that increasing import intermediate inputs from Asia decreases the demand for subcontracted workers with less education in the home country. Rather, a one-percentage-point increase in the import ratio from Europe is estimated to increase the demand for workers with lower education levels for a definite period by about 5 and 4 percent in males and females, respectively. As to workers with higher education levels, there is an opposite impact between import activities of their own companies and that of other companies, as well as the export activities: Increasing the import ratio of other companies means growth of competitors, and a corresponding decrease in demand for their products.

We combine junior high school graduates with senior high school graduates into one worker group, and combine higher professional school or junior college graduates with university or graduate school graduates into another group in order to reduce the number of worker groups and simplify the estimation. We then check whether the effects differ greatly among these groups, without regard to the work contract period. Table 3 shows the elasticities by each education-attainment group. We

find the opposite impacts between the demand for workers with junior high school education and for workers with senior high school diplomas in the export activities of other companies to Asia, North America, and Europe, as well as the import ratio of other companies from North America and the other regions, for male workers.

Therefore, we create worker groups of junior high school and senior high school graduates for males. We also divide workers by gender and contract period. Table 4 presents the elasticities for these worker groups. We find significant impacts of exporting ratios to Asia and North America in workers with lower education levels, although we cannot find these impacts in Table 2. Increasing the exporting ratio to Asia and North America decreases the demand for workers with a junior high school education but does not affect the workers with a high school education. Regarding Table 4, we understand that the negative impact on workers with lower education levels for an indefinite period in Table 2 comes from the effect of workers with a senior high school education for an indefinite period. As to the import ratio, it mainly affects the workers with senior high school diplomas. We can thus understand that the negative impact of the workers with low education levels, including junior high school graduates and senior high school graduates, in Table 2 comes from senior high school. The different impacts between male workers with junior high school diplomas and those with senior high school diplomas are shown in the effects from the activities of other companies in Table 3. Then, regarding these effects in Table 4, the export ratio to Asia by other companies increases the demand for workers with a senior high school education for an indefinite period, as well as the effect on workers with lower education levels for an indefinite period in Table 2. In contrast, it decreases the demand for workers with a junior high school education in Table 4. However, the export ratio to North America by other companies increases the demand for workers with a junior high school education. Even for workers in the same category, the role in the production stage differs depending on the export direction of the goods. The effect of the export ratio to Europe by other companies becomes apparent when the worker groups are divided into junior high school education and senior high school education levels. This effect decreases the demand for workers with only a junior high school education, but increases the demand for workers with a senior high school education for an indefinite period. Regarding the

import ratio by other companies, that from North America can be shown in Table 4, although there is no significant effect shown in Table 2. The results indicate that the workers with a senior high school education for an indefinite period are in a complementary relationship with imported goods, but the workers with only a junior high school education and for an indefinite period compete with workers from abroad.

Next, we compare the results between the estimation when a worker group is divided by contract period and when the worker group is divided by designation at the workplace. Table 5 shows the results using the contract period. The same method is used for Table 2 but the estimation period is shorter than for Table 5 due to a comparison of the results of estimation when the worker group is made by designation at the workplace using the data collected after 2005. We find almost the same results in Table 2 as in Table 5, although the number of significant elasticities is reduced in Table 5. Table 6 presents the results using designation at the workplace. Despite having almost the same results as Table 5, the impacts on the non-regular, part-time workers in Table 6 are remarkable. As we already show in previous section, the workers who are non-regular workers but workers for an indefinite period are many in Japan. They are included in part-time workers for an indefinite period group in Table 5, but this category also includes the part-time regular workers, then this category mixes the two different types of workers and cannot demonstrate the effect clearly. In Table 6, non-regular part-time workers catch the effect clearly and the elasticities become significant. The imported goods from Asia increase the demand for non-regular staff in part-time workers. In contrast, increasing the import ratio from Europe decreases the demand for these workers. The effect of imports differs depending on their origination country.

We present some additional estimations. Table 7 presents the result of estimation using the wage per capita, not using hourly wage, as for the above results. We cannot find a great difference in elasticities between Table 7 and Table 2, but the elasticities of wages are quite different between them as shown in 4.2.

Table 8 shows the results by age groups. The exporting activities have a negative effect on male workers under the age of 30, and a positive effect on older male workers aged between 30 and 50, regarding the export dummy and each export ratio according to country of final destination. However, for females, even older workers have

negative elasticities of labor demand with export. Regarding the import ratio, this has a negative impact on male workers under the age of 30 and also the male workers aged between 50 and 60. The effect is mixed in the worker groups aged between 30 and 40; increasing the import ratio from Asia decreases their demand while increasing that of North America increases their demand. This conclusion is consistent with above results. The significant elasticities of labor demand with the import ratio from Asia are negative for males, but for North America and for male workers with higher education levels, they are positive in Tables 2 through 7. By contrast, the demand for female workers aged between 40 and 60 increases with an increase in the ratio of imports from Asia. This is the consistent with above results for part-time workers in Table 6, likely because as many part-time workers resume their work after raising their children, they thus tend to be aged 40 and older.

4.2 The Elasticities of Labor Demand with Wage

Tables 9, 10, 11, 12, 13, 14 and 15 present the elasticities of labor demand with wage that are calculated using the coefficient from the same estimation, Equation 3-2, with Tables 2, 3, 4, 5, 6, 7 and 8, respectively. First, we see the impact of the increasing wage on the demand of the same categorized worker groups. For example, increasing the wage of male workers with less education for a definite period increases the demand for male workers with less education for a definite period, as shown in Table 9. We see the diagonal in Table 9 which shows the positive impact of increasing wages to meet the demand of the same categorized workers when they comprise staff for a definite period or part-time workers. In contrast, the diagonal shows the negative impact of increasing wages to meet the demand of the same categorized workers when they comprise staff for an indefinite period, both in male and female. The same results can be seen in Table 11 which divides worker groups with junior high school and senior high school diplomas in Table 9 and Table 12 (Table 12 estimates a shorter period than Table 9 using the same method). It is important to note that the demand for labor indicates multiple man-hours in these results. Accordingly, this result means that the workers for a definite period increase their number of working hours by augmenting their hourly wage, but the

number of workers for an indefinite period is reduced by an hourly wage increase. In fact, regarding Table 14, which is estimated by Equation 3-2 using wage per person, increasing wages to meet the demand of the same categorized workers decreases the demand for them, excepting workers with higher education and for a definite period. This means that the demand for employees decreases when the cost per employee increases. Table 13 presents the elasticities of labor demand with wage in the case of worker groups divided by designation at the workplace. When we compare the above results and Table 13, the effect of increasing the hourly wage is more important for the workers for a definite period than for the non-regular staff.

Second, we consider the substitution between workers. The hourly wage increases the demand for workers of the opposite gender with the same educational attainment and the same type of employment, first of all, and the workers with the same type of employment and of the same gender, but with the other educational levels, next. For example, in Table 9, when the wages of male workers with less education for an indefinite period increases, the largest elasticity is female workers with less education for an indefinite period, and the second largest elasticity is male workers with more education for an indefinite period. However, an increase in the hourly wage decreases the demand for the other type of workers with the same education level attainment and the same gender. In the above case, the elasticity of the male workers with lower education levels for a definite period is negative. We can find the same results in Table 11 and Table 14. But this final point is not indicated by Table 14; an increase in wage per worker for unlimited (limited) time periods does not reduce the number of the other workers with the same education level attainment and the same gender, with limited (unlimited) work contracts. This change can be seen only on an hourly basis.

Third, regarding Table 14, we can find the substitution among the same gender in the workers for a definite period. The workers with lower education levels for a definite period are strong substitutes for the workers with higher education levels for a definite period; the elasticity is about 0.087 and 0.089 for males and females, respectively. In contrast, the elasticity of the workers with the same category but the opposite gender is smaller, about 0.070 and 0.069, respectively. This is observed for the

lower education levels.

Finally, the impact of labor demand on the other worker groups for males is larger than that for females. For example, the elasticity of the wage for male workers with higher education levels for an indefinite period with the female workers with higher education levels for an indefinite period is about 0.371, but it is less than one sixth of that number (0.059) in the case of the elasticity of the wages for female workers with higher education completion for an indefinite period with the male workers with higher education for an indefinite period.

5. Conclusion and Discussion

This study analyzes the effects of export and import purchases on workers by type of employment, gender, educational level and age using employer-employee data sets that we constructed. The initial hypotheses indicated that an increase in goods exports increases demand for skilled labor (such as highly educated workers, regular staff, and staff for an indefinite period) and subcontracted workers. In contrast, an increase in exports decreases demand for workers with low education attainment non-regular staff, and staff for a definite period, whereas increasing imports decreases the demand for unskilled laborers (such as for poorly educated workers, non-regular staff, and staff for a definite period), as well as male workers and subcontracted workers, while increasing demand for skilled labor and part-time workers.

Our hypotheses as to the effects of exports as related to worker education levels and type of employment are supported as to males, but not supported as to females. The hypothesis concerning subcontractors is supported as to both genders. However, the effect of exports from of other companies on the evaluated company depended on the exporting direction. Concerning the effect of imports, our hypotheses concerning educational levels and type of employment are supported for male workers, but not totally supported for female workers; the demand for female workers with less education for a definite period increased with the increase in imports levels. Our

hypotheses concerning subcontractors are partially supported; we did not find that an increase in imports from Asia reduces the business of subcontractors, but did find imports from North America reduce the demand of subcontracted workers with only a junior high school education. We found the difference in effect depends on the export and import direction. Our hypotheses concerning part-time workers is unsupported; there is no evidence that the number of part-time workers increases more than the other type of workers when imports increase.

We also obtained results concerning elasticities of labor demand with wage. An increase in the hourly wage increased the number of working hours for staff for a definite period, but decreased the number of workers for an indefinite period. The substitution occurred between the opposite gender having the same education level attainment and the same type of employment, but the workers with lower education levels for a definite period were substituted between the same gender workers with higher education attainment.

As to the different effects of export and import trade on male and female workers, we might think there are unobserved skill biases between genders, or the different genders take different jobs in the same company. For example, male workers might get a job in production line work, whereas female workers might instead obtain clerical positions. Even when male and female workers both obtain positions on the production line, the female workers would perhaps perform inspection tasks, for instance, while a male worker might have very different responsibilities. Depending on which stage of production a company outsources, the affected gender changes. It is not certain whether or not these different effects of trade on males and females is typically found in Japan. The majority of the existing studies for other countries do not evaluate the workers by gender.

We suspect that outsourcing to Asia reduces the demand for workers with lower education levels, as well as staff for a definite period or non-regular staff, but we could find no evidence to support this hypothesis. It may be caused by mixed effects. For example, some companies outsource the production of intermediate inputs, and the demand for workers who produce the intermediate inputs is reduced by increasing the import ratio in this case. In contrast, other companies outsource the final stage of

production, specifically, the assemblage, and the demand for workers that produce the intermediate input is increased by increasing the import ratio in this case. Thus, the total effect of imported goods get balanced out.

Like all studies, ours contains some limitations. First, the companies in our sample have 50 or more employees and have excess capital or investment funds exceeding 30 million yen. In other words, small companies are not included in our sample. Moreover, our sample covers only those companies which can be linked between the Basic Survey on Wage Structure and the Basic Survey of Japanese Business Structure and Activities, and the matching ratio is unfortunately not particularly high. Only data for 2008 can be used to connect above two surveys. Therefore, we cannot evaluate those companies existing prior to 2008. Second, we use individual worker information, such as the type of employment, gender, designation at the workplace, and educational level attainment, but when we estimate the cost function, we reduce the information to level of firm by calculating the average wage by company using each individual worker's wage information. Finally, our empirical method is the cost function. Therefore, we cannot obtain the effect of trade to wage. By contrast, we can obtain the comprehensive effect of trade due to using the cost function. Despite these limitations, our findings will contribute to a better understanding of the effects on trade by various worker groups in Japan.

Thus, we recommend that future research be conducted addressing the change in employment demand and wages from a trade perspective, focusing on the activities of overseas affiliated companies and foreign exchange fluctuations. In recent years, the emphasis is not only on trade, but also on increasing local sales with local production, as well as the returns of local companies. Further, appreciation in the value of the local currency advances the local production, rather than supporting outsourcing.

Our analysis has implications for policy concerning the direction of human capital investment, as well as legislative support for promoting employment and appropriate training of worker groups in accordance with their skill, gender, and type of employment. There is no simple solution, such as increasing goods to decrease the demand of labor. Rather, the effect depends on a worker's skill, gender, and type of employment, as well as on the direction of trade. In conclusion, our study addresses the

importance of understanding the individual effects of trade on workers.

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Table 1 Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max
ln(mean wage by company)					
Male	Junior high school or senior high school Staff for a definite period	0.45	0.98	0.00	4.17
	Junior high school or senior high school Staff for an indefinite period	2.78	0.72	0.00	4.60
	Higher professional school, junior college, university or graduate school Staff for a definite period	0.23	0.77	0.00	5.02
	Higher professional school, junior college, university or graduate school Staff for an indefinite period	2.78	0.80	0.00	4.41
	Part-time workers Staff for a definite period	0.25	0.73	0.00	4.61
	Part-time workers Staff for an indefinite period	0.26	0.74	0.00	5.52
Female	Junior high school or senior high school Staff for a definite period	0.35	0.83	0.00	4.01
	Junior high school or senior high school Staff for an indefinite period	2.11	0.99	0.00	4.27
	Higher professional school, junior college, university or graduate school Staff for a definite period	0.20	0.66	0.00	4.23
	Higher professional school, junior college, university or graduate school Staff for an indefinite period	1.74	1.23	0.00	4.04
	Part-time workers Staff for a definite period	0.42	0.86	0.00	4.91
	Part-time workers Staff for an indefinite period	0.62	0.98	0.00	4.60
ln(tangible fixed asset)		7.96	1.92	0.00	16.31
ln(total output)		9.42	1.65	5.27	16.31
ln(total input)		8.53	2.06	0.00	16.23
Ratio of export to					
	Asia	0.02	0.06	0.00	1.00
	North America	0.01	0.04	0.00	1.00
	Europe	0.01	0.03	0.00	0.90
	Other region	0.00	0.03	0.00	1.00
Ratio of import from					
	Asia	0.02	0.09	0.00	1.00
	North America	0.01	0.04	0.00	1.00
	Europe	0.00	0.04	0.00	1.00
	Other region	0.00	0.02	0.00	0.99
Ratio of export by other firms to					
	Asia	0.04	0.04	0.00	0.35
	North America	0.04	0.06	0.00	0.34
	Europe	0.02	0.03	0.00	0.16
	Other region	0.01	0.03	0.00	0.34
Ratio of import by other firms from					
	Asia	0.03	0.05	0.00	0.46
	North America	0.01	0.02	0.00	0.99
	Europe	0.01	0.01	0.00	0.65
	Other region	0.01	0.02	0.00	0.31
Overseas affiliates dummy (=1, %)			26.35		
Export dummy (=1, %)			27.54		
Import dummy (=1, %)			26.34		
Observation			34430		
Year			1998-2008		

Note: Statistics based by company

Table 1 Descriptive Statistics (Continue)

%

Year:1998-2008		Male	Female
Junior high school or senior high school	Staff for a definite period	1.23	1.43
	Staff for an indefinite period	39.95	10.94
Higher professional school, junior college, university or graduate school	Staff for a definite period	0.43	0.57
	Staff for an indefinite period	25.78	5.66
Part-time workers	Staff for a definite period	1.70	6.04
	Staff for an indefinite period	1.05	5.22
Total		70.13	29.87
Total in Male and Female			100.00

Year:2005-2008		Male	Female
Junior high school or senior high school	Non-regular staffs	3.04	4.13
	Regular staffs	30.81	7.52
Higher professional school, junior college, university or graduate school	Non-regular staffs	0.96	1.46
	Regular staffs	24.44	5.54
Part-time workers	Non-regular staffs	5.06	16.85
	Regular staffs	0.05	0.13
Total		64.36	35.64
Total in Male and Female			100.00

Year:1998-2008		Male	Female
Junior high school		6.85	7.86
Senior high school		54.27	58.63
Higher professional school and junior university or graduate school		7.73	19.91
University or graduate school		31.16	13.61
Total		100.00	100.00

Year:1998-2008		Male	Female
15-Under 20		1.51	1.35
20-30		15.64	8.25
30-40		19.77	6.49
40-50		16.74	6.48
50-60		14.93	6.44
Over 60		1.55	0.86
Total		70.13	29.87
Total in Male and Female			100.00

Note: Statistics based by individual workers, but the estimation in this study conducted by company level.

Figure 1 Trends of year dummy (2008=base)

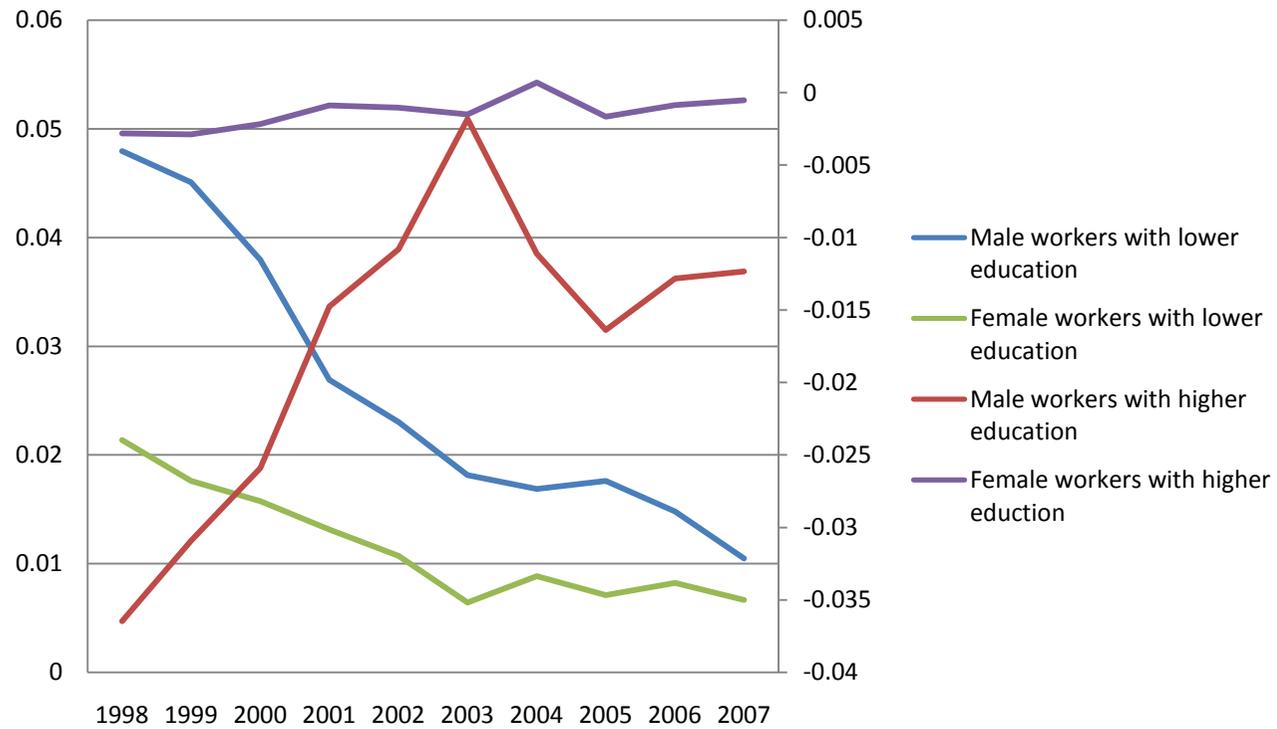


Table 2 Elasticities of labor demand with trade by education, type of employment and gender

	Male						Female					
	Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Export dummy	-0.026	-0.048	0.196	0.083	0.016	-0.116	-0.008	-0.030	0.008	0.030	-0.018	-0.075
Import dummy	0.029	-0.038	0.002	0.050	-0.056	-0.153	0.145	-0.014	0.182	0.009	0.081	-0.029
Ratio of export to												
Asia	-0.406	-0.013	-1.271	0.148	-0.293	0.224	-0.007	-0.102	-0.614	-0.302	-0.276	0.173
North America	-0.421	-0.021	0.111	0.181	-0.157	1.202	-0.168	-0.104	0.344	-0.562	-0.157	-0.225
Europe	0.807	-0.376	2.622	0.375	0.087	-0.545	0.679	0.308	0.358	0.107	0.135	-0.617
Other region	-1.146	0.010	-1.782	0.168	-0.440	-0.324	0.045	-0.157	-0.608	-0.270	-0.130	0.157
Ratio of import from												
Asia	0.166	-0.086	-0.248	-0.028	0.005	0.106	-0.780	0.285	-0.428	0.224	0.135	0.366
North America	-0.146	-0.102	-0.254	0.250	-0.775	0.105	-0.325	-0.110	-0.854	0.069	0.052	-0.383
Europe	-0.380	-0.182	-0.782	0.171	-0.357	-0.172	-0.406	0.006	-0.500	1.562	-0.700	-0.510
Other region	-0.140	0.284	-0.303	-0.478	-0.787	0.084	0.537	0.509	0.067	-0.336	-0.220	-0.182
Ratio of export by other companies to												
Asia	0.059	0.412	-2.500	-0.717	-1.947	-1.382	-0.499	1.253	-2.045	-0.807	-1.383	1.015
North America	0.091	-0.137	0.951	0.083	4.116	2.278	4.556	-0.496	1.067	-0.953	3.709	-2.027
Europe	-0.534	0.394	3.462	-1.375	-1.028	-3.935	-0.326	3.555	-0.390	-1.100	-1.329	0.040
Other region	1.324	0.037	-5.229	0.319	-4.740	1.484	-12.358	-0.564	-5.022	2.459	-5.974	5.087
Ratio of import by other companies from												
Asia	-0.023	-0.022	-0.005	0.084	0.855	0.713	-0.161	-0.249	-1.304	-0.041	0.097	0.186
North America	1.609	0.169	1.164	-0.474	0.293	-2.546	2.276	0.541	0.530	-0.834	3.107	-1.721
Europe	5.077	0.584	3.866	-1.345	2.134	2.745	4.166	-0.976	3.872	0.785	1.385	0.579
Other region	-3.004	0.070	-4.482	0.005	-2.508	-0.479	-4.922	0.987	-2.608	0.330	-3.725	2.593

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 3 Elasticities of labor demand with trade by education and gender

	Male					Female				
	Junior high school	Senior high school	Higher professional school and junior college	University or graduate school	Part-time workers	Junior high school	Senior high school	Higher professional school and junior college	University or graduate school	Part-time workers
Export dummy	-0.032	-0.043	0.020	0.094	-0.095	-0.005	-0.008	0.035	-0.026	-0.076
Import dummy	0.027	-0.041	-0.011	0.061	-0.122	-0.023	0.014	0.007	0.024	0.007
Ratio of export to										
Asia	-0.578	0.055	0.076	0.108	0.018	0.014	-0.091	-0.085	-0.454	-0.004
North America	0.229	-0.012	0.196	0.133	0.593	-0.356	-0.088	-0.447	-0.823	-0.292
Europe	-0.109	-0.375	0.213	0.489	-0.071	0.052	0.253	-0.097	0.170	-0.125
Other region	0.160	-0.092	-0.424	0.250	-0.280	0.778	-0.032	-0.052	-0.533	0.084
Ratio of import from										
Asia	0.059	-0.095	-0.049	-0.003	0.108	-0.084	0.153	0.103	0.204	0.273
North America	-0.273	-0.031	-0.108	0.274	-0.380	0.481	-0.132	-0.414	0.205	-0.221
Europe	-0.061	-0.149	-0.067	0.218	-0.379	-0.122	-0.086	0.500	2.275	-0.659
Other region	-0.205	0.402	0.027	-0.730	-0.242	0.888	0.470	-0.441	-0.055	-0.221
Ratio of export by other companies to										
Asia	-1.838	0.768	0.005	-1.026	-1.333	-0.167	1.211	0.162	-2.472	-0.051
North America	1.435	-0.502	0.043	0.187	3.712	-0.824	0.070	-0.479	-0.345	0.837
Europe	-3.921	1.166	0.906	-2.118	-2.781	1.509	3.066	-0.001	-1.605	-0.831
Other region	1.342	0.113	-0.527	0.311	-2.838	1.861	-1.931	1.626	0.989	-0.424
Ratio of import by other companies from										
Asia	-0.054	0.017	-0.092	0.025	0.914	0.189	-0.229	-0.543	0.401	0.223
North America	-2.785	0.628	-1.420	-0.101	-1.332	-1.027	0.765	-0.330	-0.944	0.302
Europe	-0.579	0.852	-4.148	-0.741	2.654	-1.506	0.373	0.795	1.212	1.132
Other region	-2.963	0.522	0.809	-0.212	-1.421	1.309	-0.181	0.498	-1.114	-0.354

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 4 Elasticities of labor demand with trade by education divided by junior and senior high school, type of employment and gender

	Male								Female					
	Junior high school		Senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Export dummy	0.163	-0.037	-0.037	-0.047	0.177	0.081	0.005	-0.129	-0.016	-0.030	-0.018	0.026	-0.022	-0.080
Import dummy	0.276	0.015	0.021	-0.045	0.013	0.049	-0.056	-0.154	0.150	-0.016	0.180	0.008	0.078	-0.032
Ratio of export to														
Asia	-0.947	-0.586	-0.275	0.060	-1.248	0.149	-0.277	0.240	0.013	-0.098	-0.595	-0.297	-0.276	0.183
North America	-1.558	0.093	-0.588	-0.062	0.236	0.197	-0.054	1.316	-0.095	-0.095	0.569	-0.529	-0.124	-0.175
Europe	0.190	-0.165	1.034	-0.397	2.582	0.371	0.055	-0.590	0.642	0.303	0.289	0.101	0.138	-0.637
Other region	-2.174	0.196	-1.068	-0.056	-1.623	0.186	-0.327	-0.204	0.150	-0.142	-0.404	-0.225	-0.096	0.223
Ratio of import from														
Asia	-0.530	0.083	0.135	-0.101	-0.266	-0.030	0.005	0.103	-0.805	0.283	-0.407	0.219	0.138	0.357
North America	-0.301	-0.259	-0.203	-0.027	-0.357	0.225	-0.857	0.013	-0.434	-0.132	-0.951	0.017	0.013	-0.461
Europe	-0.483	-0.010	-0.396	-0.150	-0.897	0.144	-0.451	-0.280	-0.519	-0.017	-0.621	1.505	-0.743	-0.595
Other region	-1.826	-0.189	-0.259	0.416	-0.454	-0.511	-0.850	0.009	0.409	0.499	0.007	-0.403	-0.255	-0.261
Ratio of export by other companies to														
Asia	-3.014	-1.935	0.534	0.751	-2.194	-0.733	-1.823	-1.267	-0.403	1.244	-1.775	-0.841	-1.430	0.989
North America	6.548	1.489	-0.314	-0.434	0.885	0.117	4.068	2.236	4.613	-0.473	0.835	-0.881	3.756	-1.944
Europe	-11.440	-3.832	1.000	1.155	3.029	-1.448	-1.311	-4.256	-0.722	3.488	-0.733	-1.273	-1.437	-0.220
Other region	3.963	0.792	-0.322	-0.028	-4.776	0.290	-4.478	1.783	-12.187	-0.567	-4.392	2.394	-6.054	5.077
Ratio of import by other companies from														
Asia	0.111	-0.165	-0.336	0.010	-0.029	0.080	0.863	0.725	-0.178	-0.244	-1.273	-0.056	0.087	0.181
North America	1.173	-2.983	1.173	0.621	1.115	-0.474	0.296	-2.545	2.248	0.538	0.602	-0.842	3.096	-1.735
Europe	1.607	-0.658	5.226	0.715	3.988	-1.320	2.264	2.911	4.237	-0.971	4.166	0.844	1.491	0.668
Other region	-5.003	-3.060	-3.346	0.530	-4.273	-0.012	-2.367	-0.335	-4.863	0.983	-2.273	0.294	-3.731	2.573

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 5 Elasticities of labor demand with trade by education, type of employment and gender : 2005-2008

	Male						Female					
	Junior high school or senior high school		Higher professional school, junior college, university or graduate		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate		Part-time workers	
	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Export dummy	-0.095	-0.019	0.140	0.051	-0.069	0.023	-0.138	0.001	-0.130	0.062	-0.102	-0.051
Import dummy	0.012	-0.059	0.020	0.043	-0.008	-0.104	0.120	-0.033	0.217	-0.003	0.072	0.111
Ratio of export to												
Asia	-0.291	-0.116	-0.625	0.258	-0.033	0.727	0.448	-0.316	0.018	-0.383	-0.049	0.400
North America	-0.315	0.142	-0.745	0.269	-0.758	0.368	-0.584	-0.216	-0.903	-0.458	-1.239	0.606
Europe	0.742	-0.389	0.171	0.305	0.114	-0.027	0.632	0.042	0.168	0.022	0.153	-0.259
Other region	-1.479	0.026	-0.831	0.144	-0.100	-0.856	0.467	-0.064	0.127	-0.289	0.179	-0.057
Ratio of import from												
Asia	0.255	-0.085	0.011	0.018	0.024	-0.193	-0.613	0.123	-0.257	0.241	0.196	0.183
North America	-0.386	-0.041	-0.251	0.329	-0.567	0.987	-0.284	-0.012	-1.174	-0.272	-0.283	-1.175
Europe	-0.110	-0.245	-0.350	0.277	0.060	-0.106	-0.402	-0.211	-0.584	1.582	-0.591	-0.569
Other region	0.180	0.244	0.196	-0.352	-1.384	0.258	0.590	0.820	0.399	-0.126	-0.706	-0.816
Ratio of export by other companies to												
Asia	-0.048	0.458	-1.928	-0.954	-0.090	-1.373	1.754	1.609	0.724	-1.205	0.860	-0.319
North America	-0.925	-0.411	-2.925	0.524	3.432	2.399	0.026	-0.402	-2.262	0.059	-0.287	1.662
Europe	1.830	1.059	4.736	-2.336	-1.676	-6.919	1.300	5.417	0.945	-2.493	0.493	-3.713
Other region	-2.395	0.106	-3.820	0.470	-1.321	4.886	-2.173	-2.024	1.464	0.896	0.133	2.678
Ratio of import by other companies from												
Asia	-0.703	0.455	1.780	-0.266	-0.357	1.724	-0.958	-0.377	-1.854	0.176	-0.549	0.091
North America	0.608	0.230	-1.157	-0.469	-2.549	-0.491	-0.213	1.554	-1.067	-0.782	0.235	0.240
Europe	4.224	0.062	2.352	-0.501	-0.884	0.432	0.218	-0.079	0.172	-0.948	1.292	0.034
Other region	-0.188	-0.256	-1.397	0.042	0.785	0.369	0.750	0.566	-0.126	-0.356	-0.122	1.745

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 6 Elasticities of labor demand with trade by education, designation at the workplace and gender : 2005-2008

	Male						Female					
	Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs
Export dummy	-0.040	-0.020	0.109	0.053	-0.035	-0.661	-0.098	-0.001	-0.013	0.037	-0.092	0.080
Import dummy	-0.033	-0.051	0.139	0.038	-0.067	0.550	0.074	-0.021	0.171	-0.004	0.071	-0.515
Ratio of export to												
Asia	-0.437	-0.119	-0.429	0.257	0.147	1.422	0.150	-0.199	-0.003	-0.308	0.036	-0.759
North America	0.049	0.136	-1.125	0.293	0.013	-15.320	-0.955	-0.162	-1.264	-0.247	-0.721	0.186
Europe	0.480	-0.382	-0.166	0.271	-0.402	8.419	0.658	0.205	0.579	-0.010	-0.018	-0.575
Other region	-0.710	-0.034	-0.486	0.126	-0.109	-0.074	0.339	-0.136	-0.106	-0.268	0.216	-0.781
Ratio of import from												
Asia	0.221	-0.087	0.098	0.019	-0.043	0.247	-0.189	0.002	-0.150	0.221	0.215	-0.235
North America	-0.453	-0.040	-0.568	0.311	-0.633	36.237	-0.120	-0.040	-1.267	-0.332	-0.415	-0.448
Europe	-0.152	-0.257	-1.342	0.301	0.098	-7.624	-0.136	-0.272	-0.572	1.742	-0.591	-1.190
Other region	0.612	0.294	-0.155	-0.375	-0.840	-2.708	0.092	1.073	-0.316	-0.155	-0.945	5.257
Ratio of export by other companies to												
Asia	-0.746	0.530	-0.778	-0.990	-0.362	-6.146	1.299	1.778	0.206	-1.142	0.448	-0.181
North America	0.327	-0.501	-1.439	0.493	-1.034	179.796	-0.794	-0.041	-2.707	0.277	0.215	-4.162
Europe	0.198	1.155	3.790	-2.250	0.967	-175.391	2.005	5.035	2.228	-2.877	-0.410	-0.894
Other region	-0.112	-0.019	-0.869	0.451	0.414	-9.471	-2.188	-1.998	0.266	1.156	0.539	8.700
Ratio of import by other companies from												
Asia	-0.151	0.420	0.256	-0.212	0.461	0.575	-0.438	-0.675	-1.642	0.203	-0.194	-3.137
North America	-0.302	0.295	-1.206	-0.442	-1.572	-34.262	-0.323	1.949	-1.458	-0.645	0.120	1.179
Europe	3.293	0.027	1.657	-0.531	-0.262	-1.533	0.164	0.199	0.832	-1.025	0.970	3.411
Other region	-0.002	-0.240	-1.108	-0.021	0.832	6.225	0.434	0.567	-0.026	-0.386	0.622	-1.183

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 7 Elasticities of labor demand with trade by education, type of employment and gender : wage per person

	Male						Female					
	Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Export dummy	-0.056	-0.045	0.150	0.087	-0.021	-0.148	-0.042	-0.026	-0.049	0.029	-0.048	-0.096
Import dummy	0.020	-0.036	-0.015	0.049	-0.068	-0.162	0.133	-0.011	0.163	0.007	0.068	-0.033
Ratio of export to												
Asia	-0.370	-0.021	-1.198	0.153	-0.270	0.189	0.050	-0.107	-0.531	-0.289	-0.262	0.158
North America	-0.410	-0.026	0.045	0.183	-0.108	1.192	-0.083	-0.122	0.408	-0.546	-0.124	-0.203
Europe	0.776	-0.365	2.642	0.358	0.000	-0.414	0.592	0.327	0.276	0.109	0.026	-0.552
Other region	-1.007	-0.004	-1.573	0.174	-0.395	-0.247	0.114	-0.185	-0.458	-0.272	-0.098	0.209
Ratio of import from												
Asia	0.248	-0.094	-0.095	-0.031	0.076	0.188	-0.704	0.262	-0.284	0.226	0.201	0.395
North America	-0.282	-0.108	-0.439	0.284	-0.910	-0.022	-0.481	-0.117	-1.081	0.140	-0.042	-0.424
Europe	-0.613	-0.172	-1.125	0.200	-0.631	-0.436	-0.610	0.019	-0.672	1.635	-0.865	-0.615
Other region	-0.103	0.263	-0.321	-0.440	-0.810	0.108	0.566	0.472	0.102	-0.323	-0.240	-0.173
Ratio of export by other companies to												
Asia	0.526	0.352	-1.643	-0.731	-1.443	-0.682	-0.018	1.168	-1.246	-0.860	-1.151	1.345
North America	-0.314	-0.109	0.423	0.101	3.707	2.096	4.189	-0.454	0.594	-0.914	3.464	-2.044
Europe	0.744	0.235	5.776	-1.434	0.546	-2.305	1.174	3.312	2.169	-1.221	-0.080	0.507
Other region	1.487	0.092	-5.344	0.320	-5.133	0.576	-12.675	-0.458	-5.980	2.470	-6.422	4.756
Ratio of import by other companies from												
Asia	-0.132	-0.017	-0.148	0.096	0.808	0.597	-0.327	-0.242	-1.511	-0.020	0.021	0.175
North America	1.837	0.105	1.682	-0.479	0.948	-1.753	2.647	0.455	1.203	-0.847	3.492	-1.466
Europe	5.034	0.609	4.070	-1.381	2.029	2.510	4.131	-0.917	4.061	0.721	1.386	0.542
Other region	-2.819	0.050	-4.164	-0.029	-2.054	-0.467	-4.478	0.975	-2.168	0.326	-3.407	2.569

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 8 Elasticities of labor demand with trade by age and gender

	Male							Female						
	15-Under 20	20-30	30-40	40-50	50-60	Over 60	15-Under 20	20-30	30-40	40-50	50-60	Over 60		
Export dummy	0.069	-0.027	0.003	-0.012	0.039	0.009	0.154	0.003	-0.001	-0.051	-0.033	0.025		
Import dummy	-0.087	-0.029	0.022	0.003	-0.009	-0.041	-0.082	0.042	0.017	-0.001	-0.008	-0.078		
Ratio of export to														
Asia	0.002	0.049	0.198	0.081	-0.249	0.054	-0.136	-0.258	-0.066	-0.054	0.052	0.602		
North America	-0.781	0.113	0.212	0.176	-0.071	0.371	-0.664	-0.311	-0.481	-0.505	-0.295	0.707		
Europe	-0.222	-0.259	0.251	0.137	-0.348	-0.161	0.373	0.292	-0.080	0.042	0.092	0.845		
Other region	-0.744	-0.229	-0.641	-0.141	1.021	-0.128	-0.040	-0.168	-0.130	0.142	0.176	-0.031		
Ratio of import from														
Asia	0.245	0.028	-0.116	0.003	-0.080	0.306	0.243	0.023	0.042	0.214	0.246	0.008		
North America	0.333	-0.044	0.161	0.094	-0.197	-0.061	-0.200	-0.052	-0.060	-0.071	0.000	0.236		
Europe	0.402	-0.157	-0.002	0.016	-0.088	-0.080	0.285	0.380	0.461	0.042	-0.319	0.174		
Other region	-1.068	-0.297	-0.508	0.143	0.696	-0.666	0.212	0.000	-0.168	0.254	-0.052	-0.413		
Ratio of export by other														
companies to														
Asia	-0.556	0.280	0.512	-0.071	-0.955	-0.520	-0.448	0.581	0.170	0.815	0.061	-1.407		
North America	-0.666	-0.157	0.170	-0.347	0.455	0.825	-0.531	-1.340	0.155	-0.247	0.431	3.630		
Europe	0.958	1.232	0.282	1.555	-3.526	-3.000	-0.583	1.230	0.290	2.036	0.897	-3.624		
Other region	1.170	0.119	-0.076	-1.633	1.403	3.178	2.511	1.613	-0.281	-0.332	-1.431	-3.942		
Ratio of import by other														
companies from														
Asia	-0.444	0.065	0.225	-0.285	0.087	0.680	-0.246	-0.410	-0.145	-0.517	0.560	0.884		
North America	0.398	0.421	0.345	-0.063	-0.827	-0.759	-0.144	0.246	0.230	0.305	0.213	1.186		
Europe	1.115	1.152	-0.295	-0.470	-0.627	-0.069	0.076	0.822	1.248	-0.682	0.600	1.102		
Other region	-0.725	0.510	0.854	-0.758	-0.634	1.202	1.101	1.123	-0.824	0.292	-0.384	-1.911		

Note: Blue cells indicate the elasticities are calculated by significant coefficient, and bold letters are referred in the paper.

Table 9 Elasticities of labor demand with wage by education, type of employment and gender

			Male						Female					
			Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
			Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Male	Junior high school or senior high school	Staff for a definite period	1.154	-0.001	0.246	-0.011	-0.118	-0.104	0.169	-0.022	-0.406	-0.040	-0.141	-0.056
		Staff for an indefinite period	-0.043	-0.336	-0.778	0.313	-0.116	-0.160	-0.108	0.503	-0.775	0.104	-0.063	0.128
	Higher professional school, junior college, university or graduate school	Staff for a definite period	0.090	-0.008	3.049	-0.006	-0.200	-0.166	-0.146	-0.015	0.191	-0.017	-0.070	-0.038
		Staff for an indefinite period	-0.299	0.222	-0.471	-0.392	-0.039	-0.135	-0.255	0.104	-0.368	0.461	0.004	0.063
	Part-time workers	Staff for a definite period	-0.069	-0.002	-0.320	-0.001	1.386	-0.299	-0.214	-0.023	-0.528	-0.019	0.260	-0.083
		Staff for an indefinite period	-0.062	-0.003	-0.271	-0.003	-0.306	1.543	-0.130	-0.011	-0.432	-0.023	-0.097	0.099
Female	Junior high school or senior high school	Staff for a definite period	0.166	-0.003	-0.395	-0.010	-0.362	-0.215	1.350	-0.015	0.213	-0.032	-0.067	-0.124
		Staff for an indefinite period	-0.196	0.120	-0.370	0.035	-0.344	-0.160	-0.132	-0.531	-0.355	0.045	-0.128	0.102
	Higher professional school, junior college, university or graduate school	Staff for a definite period	-0.137	-0.007	0.177	-0.005	-0.306	-0.245	0.073	-0.014	3.184	-0.006	-0.040	-0.052
		Staff for an indefinite period	-0.166	0.012	-0.196	0.073	-0.134	-0.164	-0.134	0.021	-0.072	-0.441	-0.048	-0.014
	Part-time workers	Staff for a definite period	-0.289	-0.003	-0.393	0.000	0.918	-0.335	-0.140	-0.030	-0.245	-0.023	0.809	-0.323
		Staff for an indefinite period	-0.149	0.009	-0.280	0.006	-0.379	0.440	-0.333	0.031	-0.408	-0.009	-0.418	0.298

Note: Bold letters and purple cells are referred in the paper.

Table 10 Elasticities of labor demand with wage by education and gender

		Male					Female				
		Junior high school	Senior high school	Higher professional school and junior college	University or graduate school	Part-time workers	Junior high school	Senior high school	Higher professional school and junior college	University or graduate school	Part-time workers
Male	Junior high school	-0.339	0.048	-0.018	0.014	-0.029	0.074	-0.001	-0.044	-0.047	-0.010
	Senior high school	0.345	-0.367	0.213	0.261	-0.062	0.079	0.410	0.088	-0.154	0.105
	Higher professional school and junior college	-0.022	0.038	-0.447	0.063	-0.008	-0.059	-0.001	0.079	-0.017	0.020
	University or graduate school	0.060	0.162	0.221	-0.445	0.029	-0.178	0.074	0.218	0.406	0.100
	Part-time workers	-0.007	-0.002	-0.002	0.002	0.270	-0.111	-0.030	-0.043	-0.044	0.076
Female	Junior high school	0.020	0.003	-0.012	-0.011	-0.118	0.257	0.028	-0.033	-0.047	-0.030
	Senior high school	-0.002	0.105	-0.001	0.030	-0.220	0.192	-0.517	0.050	-0.007	0.042
	Higher professional school and junior college	-0.025	0.007	0.036	0.028	-0.098	-0.071	0.016	-0.320	0.030	-0.009
	University or graduate school	-0.019	-0.009	-0.005	0.036	-0.069	-0.070	-0.001	0.021	-0.125	0.002
	Part-time workers	-0.011	0.015	0.016	0.022	0.304	-0.114	0.023	-0.016	0.005	-0.295

Note: Bold letters and purple cells are referred in the paper.

Table 11 Elasticities of labor demand with wage by education divided by junior and senior high school, type of employment and gender

			Male								Female					
			Junior high school	Junior high school	Senior high school	Senior high school	Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
			Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Male	Junior high school	Staff for a definite period	5.191	-0.005	0.072	-0.002	-0.209	-0.004	-0.194	-0.188	-0.038	-0.007	-0.509	-0.011	-0.031	-0.030
	Junior high school	Staff for an indefinite period	-0.120	-0.329	-0.091	0.047	-0.085	0.013	-0.050	-0.065	-0.098	0.030	-0.083	-0.036	-0.018	-0.059
	Senior high school	Staff for a definite period	0.342	-0.017	1.364	-0.003	0.241	-0.010	-0.108	-0.108	0.134	-0.019	-0.374	-0.034	-0.129	-0.053
	Senior high school	Staff for an indefinite period	-0.426	0.342	-0.122	-0.378	-0.769	0.279	-0.134	-0.168	-0.099	0.443	-0.717	0.092	-0.089	0.109
	Higher professional school, junior college, university or graduate school	Staff for a definite period	-0.437	-0.007	0.106	-0.009	3.081	-0.006	-0.176	-0.146	-0.129	-0.014	0.239	-0.016	-0.067	-0.036
	Higher professional school, junior college, university or graduate school	Staff for an indefinite period	-0.616	0.074	-0.316	0.226	-0.451	-0.380	-0.014	-0.099	-0.243	0.113	-0.328	0.477	0.015	0.091
	Part-time workers	Staff for a definite period	-0.647	-0.006	-0.076	-0.002	-0.281	0.000	1.415	-0.273	-0.195	-0.021	-0.465	-0.017	0.265	-0.078
Part-time workers	Staff for an indefinite period	-0.644	-0.009	-0.078	-0.003	-0.239	-0.002	-0.280	1.567	-0.112	-0.009	-0.372	-0.021	-0.091	0.104	
Female	Junior high school or senior high school	Staff for a definite period	-0.216	-0.021	0.160	-0.003	-0.348	-0.009	-0.330	-0.185	1.377	-0.012	0.281	-0.029	-0.064	-0.120
	Junior high school or senior high school	Staff for an indefinite period	-0.343	0.060	-0.206	0.120	-0.342	0.038	-0.318	-0.130	-0.113	-0.527	-0.310	0.055	-0.119	0.120
	Higher professional school, junior college, university or graduate school	Staff for a definite period	-0.987	-0.006	-0.153	-0.007	0.222	-0.004	-0.270	-0.211	0.096	-0.012	3.257	-0.004	-0.035	-0.046
	Higher professional school, junior college, university or graduate school	Staff for an indefinite period	-0.273	-0.033	-0.170	0.012	-0.181	0.076	-0.119	-0.146	-0.124	0.026	-0.047	-0.435	-0.041	-0.002
	Part-time workers	Staff for a definite period	-0.360	-0.008	-0.320	-0.006	-0.377	0.001	0.933	-0.313	-0.133	-0.028	-0.210	-0.020	0.810	-0.314
Part-time workers	Staff for an indefinite period	-0.464	-0.035	-0.171	0.009	-0.262	0.009	-0.355	0.465	-0.323	0.036	-0.362	-0.001	-0.406	0.313	

Note: Bold letters and purple cells are referred in the paper.

Table 12 Elasticities of labor demand with wage by education, type of employment and gender : 2005-2008

			Male						Female					
			Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
			Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Male	Junior high school or senior high school	Staff for a definite period	0.111	0.008	0.243	-0.008	-0.018	-0.003	0.153	-0.034	-0.122	-0.045	-0.034	-0.039
		Staff for an indefinite period	0.115	-0.378	-0.279	0.270	0.111	-0.142	0.087	0.447	-0.260	0.108	0.096	0.083
	Higher professional school, junior college, university or graduate school	Staff for a definite period	0.096	-0.008	0.909	-0.004	-0.060	-0.122	-0.043	-0.022	0.119	-0.018	-0.030	-0.055
		Staff for an indefinite period	-0.105	0.233	-0.137	-0.386	0.170	-0.134	-0.045	0.123	-0.059	0.426	0.145	-0.010
	Part-time workers	Staff for a definite period	-0.010	0.004	-0.083	0.008	0.250	-0.347	-0.079	-0.031	-0.164	-0.026	0.170	-0.174
Staff for an indefinite period		-0.001	-0.003	-0.091	-0.003	-0.189	1.390	-0.063	-0.013	-0.202	-0.028	-0.074	0.204	
Female	Junior high school or senior high school	Staff for a definite period	0.154	0.006	-0.110	-0.004	-0.147	-0.212	0.205	-0.008	0.181	-0.029	-0.007	-0.192
		Staff for an indefinite period	-0.119	0.110	-0.193	0.035	-0.197	-0.155	-0.029	-0.493	-0.167	0.048	-0.038	0.149
	Higher professional school, junior college, university or graduate school	Staff for a definite period	-0.045	-0.007	0.110	-0.002	-0.110	-0.249	0.066	-0.017	0.985	0.003	-0.018	-0.093
		Staff for an indefinite period	-0.095	0.016	-0.097	0.073	-0.102	-0.199	-0.061	0.029	0.019	-0.417	-0.002	-0.043
	Part-time workers	Staff for a definite period	-0.065	0.013	-0.143	0.022	0.591	-0.468	-0.013	-0.020	-0.092	-0.002	0.035	-0.495
Staff for an indefinite period		-0.036	0.005	-0.128	-0.001	-0.297	0.639	-0.178	0.040	-0.238	-0.019	-0.244	0.665	

Note: Bold letters and purple cells are referred in the paper.

Table 13 Elasticities of labor demand with wage by education, designation at the workplace and gender : 2005-2008

			Male						Female					
			Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
			Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs	Non-regular staffs	Regular staffs
Male	Junior high school or senior high school	Non-regular staffs	-0.073	0.020	0.111	-0.001	0.002	-0.257	0.114	-0.040	-0.136	-0.054	-0.029	-0.223
		Regular staffs	0.239	-0.394	-0.109	0.261	0.147	-2.595	0.136	0.421	-0.246	0.102	0.156	-0.915
	Higher professional school, junior college, university or graduate school	Non-regular staffs	0.035	-0.003	0.735	0.002	-0.066	-1.520	-0.031	-0.019	0.031	-0.018	-0.021	-0.801
		Regular staffs	-0.015	0.228	0.055	-0.393	0.185	-2.813	-0.045	0.116	-0.106	0.412	0.161	-0.917
	Part-time workers	Non-regular staffs	0.002	0.009	-0.146	0.012	-0.136	-0.861	-0.082	-0.032	-0.146	-0.035	0.100	-0.797
		Regular staffs	-0.004	-0.003	-0.075	-0.004	-0.019	18.587	-0.008	-0.003	-0.066	-0.003	-0.006	-3.562
Female	Junior high school or senior high school	Non-regular staffs	0.137	0.014	-0.118	-0.005	-0.141	-0.614	-0.047	0.006	0.174	-0.033	-0.021	-0.539
		Regular staffs	-0.105	0.093	-0.159	0.029	-0.119	-0.546	0.014	-0.491	-0.145	0.034	0.047	-0.346
	Higher professional school, junior college, university or graduate school	Non-regular staffs	-0.047	-0.007	0.034	-0.004	-0.072	-1.460	0.050	-0.019	0.766	0.001	-0.012	-0.620
		Regular staffs	-0.095	0.015	-0.099	0.069	-0.087	-0.298	-0.048	0.022	0.006	-0.423	0.015	-0.200
	Part-time workers	Non-regular staffs	-0.067	0.031	-0.154	0.036	0.339	-0.918	-0.041	0.042	-0.081	0.020	-0.384	-0.590
		Regular staffs	-0.007	-0.002	-0.074	-0.003	-0.033	-6.705	-0.013	-0.004	-0.053	-0.003	-0.007	9.510

Note: Bold letters and purple cells are referred in the paper.

Table 14 Elasticities of labor demand with wage by education, type of employment and gender : wage per person

			Male						Female					
			Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers		Junior high school or senior high school		Higher professional school, junior college, university or graduate school		Part-time workers	
			Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period	Staff for a definite period	Staff for an indefinite period
Male	Junior high school or senior high school	Staff for a definite period	-0.274	0.007	0.087	0.004	-0.026	-0.022	0.070	0.000	-0.125	-0.004	-0.035	-0.006
		Staff for an indefinite period	0.256	-0.477	-0.049	0.389	0.221	0.191	0.225	0.462	-0.040	0.312	0.253	0.319
	Higher professional school, junior college, university or graduate school	Staff for a definite period	0.032	0.000	0.382	0.000	-0.063	-0.047	-0.042	-0.002	0.079	-0.002	-0.017	-0.006
		Staff for an indefinite period	0.094	0.276	0.019	-0.583	0.188	0.148	0.113	0.235	0.061	0.371	0.215	0.230
	Part-time workers	Staff for a definite period	-0.015	0.003	-0.100	0.004	-0.177	-0.091	-0.059	-0.004	-0.156	-0.001	0.084	-0.018
		Staff for an indefinite period	-0.013	0.003	-0.078	0.003	-0.093	-0.126	-0.029	0.000	-0.115	-0.003	-0.021	0.035
Female	Junior high school or senior high school	Staff for a definite period	0.069	0.006	-0.113	0.004	-0.100	-0.048	-0.236	0.003	0.089	-0.002	-0.010	-0.025
		Staff for an indefinite period	-0.003	0.110	-0.057	0.079	-0.059	0.000	0.023	-0.765	-0.046	0.084	0.022	0.096
	Higher professional school, junior college, university or graduate school	Staff for a definite period	-0.042	0.000	0.073	0.001	-0.091	-0.065	0.031	-0.002	0.363	0.001	-0.008	-0.010
		Staff for an indefinite period	-0.018	0.035	-0.026	0.059	-0.011	-0.021	-0.007	0.040	0.015	-0.783	0.019	0.029
	Part-time workers	Staff for a definite period	-0.071	0.014	-0.094	0.017	0.295	-0.073	-0.022	0.005	-0.048	0.009	-0.400	-0.078
		Staff for an indefinite period	-0.015	0.023	-0.044	0.023	-0.084	0.154	-0.068	0.029	-0.078	0.018	-0.101	-0.565

Note: Bold letters and purple cells are referred in the paper.

Table 15 Elasticities of labor demand with wage by age and gender

		Male						Female					
		15-Under 20	20-30	30-40	40-50	50-60	Over 60	15-Under 20	20-30	30-40	40-50	50-60	Over 60
Male	15-Under 20	0.398	0.015	-0.005	-0.006	0.001	-0.022	-0.025	-0.005	-0.013	-0.006	-0.010	-0.152
	20-30	0.245	-0.446	0.148	0.056	0.036	-0.050	0.153	0.215	-0.012	-0.028	-0.019	-0.195
	30-40	-0.115	0.227	-0.476	0.164	0.123	-0.066	-0.308	0.150	0.122	0.055	-0.006	-0.464
	40-50	-0.149	0.084	0.161	-0.488	0.205	-0.031	-0.299	0.023	0.105	0.116	0.120	-0.087
	50-60	0.018	0.053	0.117	0.200	-0.478	0.251	-0.043	0.001	0.059	0.089	0.192	0.128
	Over 60	-0.049	-0.007	-0.006	-0.003	0.024	0.033	-0.076	-0.019	-0.015	-0.014	0.014	0.024
Female	15-Under 20	-0.019	0.007	-0.009	-0.009	-0.001	-0.025	0.808	0.008	-0.005	0.000	-0.005	-0.192
	20-30	-0.035	0.098	0.045	0.007	0.000	-0.062	0.080	-0.483	0.107	0.043	0.008	-0.129
	30-40	-0.075	-0.004	0.029	0.025	0.014	-0.039	-0.042	0.084	-0.497	0.102	0.054	-0.075
	40-50	-0.034	-0.010	0.013	0.027	0.022	-0.035	0.003	0.033	0.101	-0.497	0.131	-0.024
	50-60	-0.062	-0.007	-0.001	0.031	0.050	0.038	-0.043	0.006	0.058	0.143	-0.497	0.147
	Over 60	-0.123	-0.010	-0.015	-0.003	0.004	0.008	-0.208	-0.014	-0.010	-0.003	0.019	1.020

Note: Bold letters and purple cells are referred in the paper.

Appendix1 Regression results for calculating elasticities of Table2 and 9

Dependent variable is cost share			(1)		(2)		(3)		(4)		(5)						
			Male workers with														
			Junior or senior high school diplomas for				Higher professional school, junior college, university or				Part-time workers						
			a definite period		an indefinite period		a definite period		an indefinite period		a definite period						
			Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.			
In wage of	male workers with	Junior or senior high school diplomas for a definite period	0.0252	***	0.0002	-0.0056	***	0.0003	0.0010	***	0.0001	-0.0072	***	0.0002	-0.0009	***	0.0001
		Junior or senior high school diplomas for an indefinite period	-0.0056	***	0.0003	0.0991	***	0.0012	-0.0052	***	0.0002	-0.0382	***	0.0009	-0.0038	***	0.0002
		Higher professional school, junior college, university or graduate school diplomas for a definite period	0.0010	***	0.0001	-0.0052	***	0.0002	0.0173	***	0.0001	-0.0033	***	0.0001	-0.0014	***	0.0001
		Higher professional school, junior college, university or graduate school diplomas for an indefinite period	-0.0072	***	0.0002	-0.0382	***	0.0009	-0.0033	***	0.0001	0.0924	***	0.0010	-0.0024	***	0.0002
		Part-time workers a definite period	-0.0009	***	0.0001	-0.0038	***	0.0002	-0.0014	***	0.0001	-0.0024	***	0.0002	0.0162	***	0.0002
		Part-time workers an indefinite period	-0.0008	***	0.0001	-0.0042	***	0.0002	-0.0012	***	0.0001	-0.0031	***	0.0002	-0.0021	***	0.0001
	female workers with	Junior or senior high school diplomas for a definite period	0.0018	***	0.0002	-0.0063	***	0.0003	-0.0017	***	0.0001	-0.0065	***	0.0003	-0.0026	***	0.0002
		Junior or senior high school diplomas for an indefinite period	-0.0035	***	0.0002	0.0069	***	0.0006	-0.0020	***	0.0001	-0.0214	***	0.0005	-0.0031	***	0.0001
		Higher professional school, junior college, university or graduate school diplomas for a definite period	-0.0017	***	0.0001	-0.0048	***	0.0001	0.0007	***	0.0001	-0.0027	***	0.0001	-0.0021	***	0.0001
		Higher professional school, junior college, university or graduate school diplomas for an indefinite period	-0.0025	***	0.0001	-0.0164	***	0.0004	-0.0010	***	0.0001	0.0074	***	0.0003	-0.0013	***	0.0001
		Part-time workers a definite period	-0.0037	***	0.0002	-0.0120	***	0.0004	-0.0018	***	0.0001	-0.0074	***	0.0004	0.0061	***	0.0002
		Part-time workers an indefinite period	-0.0021	***	0.0002	-0.0096	***	0.0005	-0.0013	***	0.0001	-0.0077	***	0.0004	-0.0028	***	0.0001
ln(tangible fixed asset)			-0.0004	**	0.0002	0.0063	***	0.0010	-0.0002	0.0001	0.0003	0.0009	-0.0007	***	0.0001		
ln(total output)			0.0016	***	0.0004	-0.0114	***	0.0018	0.0012	***	0.0002	0.0143	***	0.0016	0.0023	***	0.0003
ln(total input)			-0.0007	***	0.0002	0.0027	**	0.0012	-0.0005	***	0.0001	0.0004	0.0011	-0.0003	0.0002		
Overseas affiliates dummy			-0.0006	0.0006	-0.0151	***	0.0030	0.0004	0.0003	0.0116	***	0.0027	-0.0005	0.0005			
Export dummy			-0.0003	0.0007	-0.0211	***	0.0032	0.0008	**	0.0004	0.0258	***	0.0030	0.0001	0.0005		
Import dummy			0.0003	0.0006	-0.0166	***	0.0031	0.0000	0.0004	0.0154	***	0.0028	-0.0004	0.0005			
Ratio of export to																	
		Asia	-0.0048	0.0038	-0.0058	0.0189	-0.0054	**	0.0022	0.0457	***	0.0173	-0.0020	0.0029			
		North America	-0.0050	0.0064	-0.0089	0.0319	0.0005	0.0038	0.0560	*	0.0293	-0.0011	0.0049				
		Europe	0.0095	0.0079	-0.1641	***	0.0394	0.0112	**	0.0046	0.1160	***	0.0362	0.0006	0.0061		
		Other region	-0.0135	**	0.0062	0.0042	0.0309	-0.0076	**	0.0036	0.0519	*	0.0284	-0.0030	0.0048		
Ratio of import from																	
		Asia	0.0020	0.0023	-0.0377	***	0.0113	-0.0011	0.0013	-0.0085	0.0104	0.0000	0.0017				
		North America	-0.0017	0.0048	-0.0443	*	0.0240	-0.0011	0.0028	0.0775	***	0.0221	-0.0053	0.0037			
		Europe	-0.0045	0.0048	-0.0795	***	0.0239	-0.0033	0.0028	0.0530	**	0.0220	-0.0024	0.0037			
		Other region	-0.0016	0.0087	0.1239	***	0.0436	-0.0013	0.0051	-0.1482	***	0.0401	-0.0054	0.0067			
Ratio of export by other companies to																	
		Asia	0.0007	0.0094	0.1798	***	0.0468	-0.0107	*	0.0055	-0.2221	***	0.0430	-0.0133	*	0.0072	
		North America	0.0011	0.0118	-0.0596	0.0592	0.0041	0.0070	0.0258	0.0544	0.0281	***	0.0091				
		Europe	-0.0063	0.0227	0.1721	0.1134	0.0148	0.0134	-0.4259	***	0.1042	-0.0070	0.0175				
		Other region	0.0156	0.0181	0.0160	0.0906	-0.0224	**	0.0107	0.0987	0.0832	-0.0324	**	0.0140			
Ratio of import by other companies from																	
		Asia	-0.0003	0.0076	-0.0096	0.0380	0.0000	0.0045	0.0259	0.0349	0.0058	0.0059					
		North America	0.0189	0.0147	0.0738	0.0735	0.0050	0.0087	-0.1467	**	0.0675	0.0020	0.0113				
		Europe	0.0597	**	0.0238	0.2548	**	0.1188	0.0165	0.0140	-0.4167	***	0.1091	0.0146	0.0183		
		Other region	-0.0353	**	0.0149	0.0305	0.0742	-0.0192	**	0.0087	0.0016	0.0682	-0.0171	0.0114			
Cons.			0.0478	***	0.0020	0.3006	0.0098	0.0278	***	0.0012	0.1460	***	0.0090	0.0149	***	0.0016	

Notes: A full set of industry dummies and year dummies is included.

*** significant at the 1 percent level, **significant at the 5 percent level, * significant at the 10 percent level.

Appendix1 Regression results for calculating elasticities of Table2 and 9(Continue)

(6)			(7)			(8)			(9)			(10)			(11)			(12)		
Male workers with			Female workers with																	
Part-time workers			Junior or senior high school diplomas for			Higher professional school, junior college, university or						Part-time workers								
an indefinite period			a definite period			an indefinite period			a definite period			an indefinite period			a definite period			an indefinite period		
Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
-0.0008 ***	0.0001		0.0018 ***	0.0002		-0.0035 ***	0.0002		-0.0017 ***	0.0001		-0.0025 ***	0.0001		-0.0037 ***	0.0002		-0.0021 ***	0.0002	
-0.0042 ***	0.0002		-0.0063 ***	0.0003		0.0069 ***	0.0006		-0.0048 ***	0.0001		-0.0164 ***	0.0004		-0.0120 ***	0.0004		-0.0096 ***	0.0005	
-0.0012 ***	0.0001		-0.0017 ***	0.0001		-0.0020 ***	0.0001		0.0007 ***	0.0001		-0.0010 ***	0.0001		-0.0018 ***	0.0001		-0.0013 ***	0.0001	
-0.0031 ***	0.0002		-0.0065 ***	0.0003		-0.0214 ***	0.0005		-0.0027 ***	0.0001		0.0074 ***	0.0003		-0.0074 ***	0.0004		-0.0077 ***	0.0004	
-0.0021 ***	0.0001		-0.0026 ***	0.0002		-0.0031 ***	0.0001		-0.0021 ***	0.0001		-0.0013 ***	0.0001		0.0061 ***	0.0002		-0.0028 ***	0.0001	
0.0177 ***	0.0002		-0.0016 ***	0.0002		-0.0018 ***	0.0002		-0.0017 ***	0.0001		-0.0015 ***	0.0001		-0.0025 ***	0.0002		0.0029 ***	0.0002	
-0.0016 ***	0.0002		0.0270 ***	0.0003		-0.0027 ***	0.0002		0.0008 ***	0.0001		-0.0021 ***	0.0002		-0.0019 ***	0.0002		-0.0042 ***	0.0002	
-0.0018 ***	0.0002		-0.0027 ***	0.0002		0.0380 ***	0.0006		-0.0018 ***	0.0001		-0.0029 ***	0.0003		-0.0056 ***	0.0003		-0.0001	0.0003	
-0.0017 ***	0.0001		0.0008 ***	0.0001		-0.0018 ***	0.0001		0.0166 ***	0.0002		-0.0005 ***	0.0001		-0.0011 ***	0.0001		-0.0017 ***	0.0001	
-0.0015 ***	0.0001		-0.0021 ***	0.0002		-0.0029 ***	0.0003		-0.0005 ***	0.0001		0.0251 ***	0.0002		-0.0023 ***	0.0002		-0.0020 ***	0.0002	
-0.0025 ***	0.0002		-0.0019 ***	0.0002		-0.0056 ***	0.0003		-0.0011 ***	0.0001		-0.0023 ***	0.0002		0.0430 ***	0.0004		-0.0108 ***	0.0003	
0.0029 ***	0.0002		-0.0042 ***	0.0002		-0.0001	0.0003		-0.0017 ***	0.0001		-0.0020 ***	0.0002		-0.0108 ***	0.0003		0.0395 ***	0.0004	
-0.0007 ***	0.0002		-0.0010 ***	0.0002		-0.0007	0.0005		-0.0006 ***	0.0001		-0.0015 ***	0.0003		-0.0011 ***	0.0004		0.0002	0.0004	
0.0019 ***	0.0003		0.0003	0.0004		-0.0148 ***	0.0010		0.0010 ***	0.0002		-0.0017 ***	0.0005		0.0041 ***	0.0006		0.0011	0.0007	
0.0001	0.0002		0.0001	0.0003		-0.0009	0.0007		0.0000	0.0001		-0.0009 **	0.0004		-0.0002	0.0004		0.0002	0.0005	
0.0004	0.0005		0.0009	0.0006		0.0040 **	0.0017		0.0005 *	0.0003		0.0033 ***	0.0009		-0.0039 ***	0.0011		-0.0010	0.0012	
-0.0008	0.0005		-0.0001	0.0007		-0.0031 *	0.0018		0.0000	0.0004		0.0015	0.0010		-0.0004	0.0012		-0.0023 *	0.0013	
-0.0011 **	0.0005		0.0017 **	0.0007		-0.0015	0.0018		0.0007 **	0.0003		0.0004	0.0010		0.0019 *	0.0011		-0.0009	0.0013	
0.0016	0.0030		-0.0001	0.0041		-0.0106	0.0107		-0.0024	0.0021		-0.0148 **	0.0058		-0.0067	0.0069		0.0054	0.0077	
0.0084 *	0.0051		-0.0019	0.0069		-0.0109	0.0181		0.0014	0.0035		-0.0276 ***	0.0099		-0.0038	0.0117		-0.0070	0.0130	
-0.0038	0.0063		0.0078	0.0086		0.0320	0.0223		0.0014	0.0043		0.0053	0.0122		0.0033	0.0144		-0.0192	0.0161	
-0.0023	0.0049		0.0005	0.0067		-0.0163	0.0175		-0.0024	0.0034		-0.0133	0.0095		-0.0031	0.0113		0.0049	0.0126	
0.0007	0.0018		-0.0090 ***	0.0025		0.0296 ***	0.0064		-0.0017	0.0012		0.0110 ***	0.0035		0.0032	0.0041		0.0114 **	0.0046	
0.0007	0.0038		-0.0038	0.0052		-0.0114	0.0136		-0.0034	0.0026		0.0034	0.0074		0.0013	0.0088		-0.0119	0.0098	
-0.0012	0.0038		-0.0047	0.0052		0.0007	0.0136		-0.0020	0.0026		0.0768 ***	0.0074		-0.0169 *	0.0087		-0.0159	0.0098	
0.0006	0.0069		0.0062	0.0095		0.0530 **	0.0248		0.0003	0.0048		-0.0165	0.0135		-0.0053	0.0159		-0.0057	0.0178	
-0.0097	0.0074		-0.0058	0.0102		0.1305 ***	0.0265		-0.0081	0.0052		-0.0397 ***	0.0144		-0.0333 *	0.0171		0.0316 *	0.0191	
0.0159 *	0.0094		0.0526 ***	0.0129		-0.0516	0.0336		0.0042	0.0065		-0.0469 ***	0.0183		0.0893 ***	0.0216		-0.0631 ***	0.0242	
-0.0275	0.0180		-0.0038	0.0247		0.3700 ***	0.0644		-0.0015	0.0125		-0.0541	0.0350		-0.0320	0.0414		0.0012	0.0463	
0.0104	0.0144		-0.1427 ***	0.0197		-0.0587	0.0514		-0.0199 **	0.0100		0.1210 ***	0.0280		-0.1439 ***	0.0331		0.1584 ***	0.0370	
0.0050	0.0060		-0.0019	0.0083		-0.0259	0.0215		-0.0052	0.0042		-0.0020	0.0117		0.0023	0.0139		0.0058	0.0155	
-0.0178	0.0117		0.0263 *	0.0160		0.0563	0.0417		0.0021	0.0081		-0.0410 *	0.0227		0.0748 ***	0.0268		-0.0536 *	0.0300	
0.0192	0.0189		0.0481 **	0.0259		-0.1016	0.0674		0.0153	0.0131		0.0386	0.0367		0.0333	0.0434		0.0180	0.0485	
-0.0033	0.0118		-0.0568 ***	0.0162		0.1028 **	0.0421		-0.0103	0.0082		0.0162	0.0229		-0.0897 ***	0.0271		0.0807 ***	0.0303	
0.0203 ***	0.0016		0.0528 ***	0.0022		0.1900 ***	0.0056		0.0249 ***	0.0011		0.0805 ***	0.0031		0.0506 ***	0.0036		0.0439 ***	0.0040	

Appendix2 Regression results for calculating elasticities of Table3 and 10

Dependent variable is cost share		(1)		(2)		(3)		(4)		(5)	
		Male workers with									
		Junior high school diplomas		Senior high school diplomas		Higher professional school and junior		University or graduate school diplomas		Part-time workers	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
In wage of male workers with	Junior high school	0.0333 ***	0.0003	-0.0027 ***	0.0004	-0.0050 ***	0.0002	-0.0101 ***	0.0003	-0.0012 ***	0.0001
	Senior high school	-0.0027 ***	0.0004	0.0942 ***	0.0012	-0.0125 ***	0.0004	-0.0324 ***	0.0008	-0.0063 ***	0.0003
	Higher professional school and junior college diplomas	-0.0050 ***	0.0002	-0.0125 ***	0.0004	0.0335 ***	0.0003	-0.0016 ***	0.0003	-0.0011 ***	0.0001
	University or graduate school diplomas	-0.0101 ***	0.0003	-0.0324 ***	0.0008	-0.0016 ***	0.0003	0.0759 ***	0.0008	-0.0030 ***	0.0002
	Part-time workers	-0.0012 ***	0.0001	-0.0063 ***	0.0003	-0.0011 ***	0.0001	-0.0030 ***	0.0002	0.0174 ***	0.0002
	female workers with	Junior high school	0.0003 **	0.0001	-0.0046 ***	0.0002	-0.0019 ***	0.0001	-0.0062 ***	0.0002	-0.0018 ***
Senior high school	-0.0056 ***	0.0003	0.0017 ***	0.0006	-0.0071 ***	0.0003	-0.0172 ***	0.0005	-0.0044 ***	0.0002	
Higher professional school and junior college diplomas	-0.0031 ***	0.0001	-0.0096 ***	0.0003	0.0003 **	0.0001	-0.0008 ***	0.0002	-0.0018 ***	0.0001	
University or graduate school diplomas	-0.0022 ***	0.0001	-0.0120 ***	0.0002	-0.0019 ***	0.0001	0.0035 ***	0.0002	-0.0013 ***	0.0001	
Part-time workers	-0.0036 ***	0.0002	-0.0159 ***	0.0005	-0.0027 ***	0.0002	-0.0080 ***	0.0004	0.0034 ***	0.0002	
ln(tangible fixed asset)		-0.0002	0.0004	0.0065 ***	0.0009	-0.0004	0.0004	-0.0003	0.0008	-0.0014 ***	0.0002
ln(total output)		-0.0044 ***	0.0007	-0.0026	0.0017	-0.0073 ***	0.0007	0.0200 ***	0.0015	0.0039 ***	0.0004
ln(total input)		0.0013 ***	0.0004	0.0002	0.0011	0.0011 **	0.0005	-0.0006	0.0010	-0.0002	0.0002
Overseas affiliates dummy		-0.0007	0.0011	-0.0158 ***	0.0028	-0.0011	0.0012	0.0153 ***	0.0024	0.0004	0.0006
Export dummy		-0.0018	0.0012	-0.0169 ***	0.0031	0.0014	0.0014	0.0230 ***	0.0027	-0.0013 *	0.0007
Import dummy		0.0015	0.0012	-0.0162 ***	0.0029	-0.0008	0.0013	0.0149 ***	0.0025	-0.0017 ***	0.0006
Ratio of export to		-0.0317 ***	0.0071	0.0215	0.0179	0.0053	0.0079	0.0265 *	0.0154	0.0002	0.0039
	North America	0.0126	0.0120	-0.0047	0.0302	0.0136	0.0134	0.0325	0.0261	0.0082	0.0066
	Europe	-0.0060	0.0148	-0.1475 ***	0.0373	0.0148	0.0165	0.1196 ***	0.0322	-0.0010	0.0082
	Other region	0.0088	0.0116	-0.0362	0.0293	-0.0294 **	0.0129	0.0612 **	0.0253	-0.0039	0.0064
Ratio of import from		0.0032	0.0043	-0.0374 ***	0.0107	-0.0034	0.0047	-0.0008	0.0093	0.0015	0.0023
	North America	-0.0150 *	0.0091	-0.0123	0.0228	-0.0075	0.0101	0.0669 ***	0.0197	-0.0052	0.0050
	Europe	-0.0033	0.0090	-0.0586 ***	0.0227	-0.0046	0.0100	0.0533 ***	0.0196	-0.0052	0.0050
	Other region	-0.0112	0.0164	0.1580 ***	0.0414	0.0019	0.0183	-0.1786 ***	0.0357	-0.0033	0.0091
Ratio of export by other companies to		-0.1009 ***	0.0176	0.3021 ***	0.0443	0.0003	0.0196	-0.2510 ***	0.0383	-0.0184 *	0.0097
	North America	0.0788 ***	0.0223	-0.1976 ***	0.0561	0.0030	0.0248	0.0458	0.0484	0.0513 ***	0.0123
	Europe	-0.2153 ***	0.0427	0.4584 ***	0.1075	0.0629	0.0475	-0.5182 ***	0.0928	-0.0384	0.0235
	Other region	0.0737 **	0.0341	0.0444	0.0858	-0.0366	0.0379	0.0761	0.0741	-0.0392 **	0.0188
Ratio of import by other companies from		-0.0030	0.0143	0.0068	0.0360	-0.0064	0.0159	0.0062	0.0311	0.0126	0.0079
	North America	-0.1529 ***	0.0277	0.2470 ***	0.0697	-0.0986 ***	0.0308	-0.0248	0.0602	-0.0184	0.0152
	Europe	-0.0318	0.0448	0.3350 ***	0.1126	-0.2879 ***	0.0498	-0.1813 *	0.0972	0.0367	0.0246
	Other region	-0.1627 ***	0.0280	0.2053 ***	0.0703	0.0561 *	0.0311	-0.0518	0.0607	-0.0196	0.0154
Cons.		0.1267 ***	0.0037	0.2230 ***	0.0093	0.1268 ***	0.0041	0.0975 ***	0.0080	0.0185 ***	0.0021

Notes: A full set of industry dummies and year dummies is included.

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*** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

Appendix2 Regression results for calculating elasticities of Table3 and 10(Continue)

(6)			(7)			(8)			(9)			(10)		
Female workers with														
Junior high school diplomas			Senior high school diplomas			Higher professional school and junior			University or graduate school diplomas			Part-time workers		
Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
0.0003	**	0.0001	-0.0056	***	0.0003	-0.0031	***	0.0001	-0.0022	***	0.0001	-0.0036	***	0.0002
-0.0046	***	0.0002	0.0017	***	0.0006	-0.0096	***	0.0003	-0.0120	***	0.0002	-0.0159	***	0.0005
-0.0019	***	0.0001	-0.0071	***	0.0003	0.0003	**	0.0001	-0.0019	***	0.0001	-0.0027	***	0.0002
-0.0062	***	0.0002	-0.0172	***	0.0005	-0.0008	***	0.0002	0.0035	***	0.0002	-0.0080	***	0.0004
-0.0018	***	0.0001	-0.0044	***	0.0002	-0.0018	***	0.0001	-0.0013	***	0.0001	0.0034	***	0.0002
0.0183	***	0.0002	0.0013	***	0.0002	-0.0015	***	0.0001	-0.0013	***	0.0001	-0.0025	***	0.0002
0.0013	***	0.0002	0.0386	***	0.0005	-0.0016	***	0.0002	-0.0024	***	0.0002	-0.0033	***	0.0003
-0.0015	***	0.0001	-0.0016	***	0.0002	0.0203	***	0.0002	0.0000		0.0001	-0.0022	***	0.0002
-0.0013	***	0.0001	-0.0024	***	0.0002	0.0000		0.0001	0.0187	***	0.0002	-0.0011	***	0.0002
-0.0025	***	0.0002	-0.0033	***	0.0003	-0.0022	***	0.0002	-0.0011	***	0.0002	0.0359	***	0.0004
-0.0003		0.0002	-0.0006		0.0005	-0.0010	***	0.0002	-0.0012	***	0.0002	-0.0011	**	0.0005
-0.0015	***	0.0003	-0.0110	***	0.0009	-0.0022	***	0.0004	-0.0001		0.0003	0.0053	***	0.0008
0.0004	*	0.0002	-0.0016	***	0.0006	0.0000		0.0003	-0.0004	*	0.0002	-0.0002		0.0006
-0.0002		0.0006	0.0032	**	0.0015	0.0018	***	0.0007	0.0007		0.0006	-0.0035	**	0.0014
-0.0001		0.0006	-0.0008		0.0017	0.0011		0.0007	-0.0006		0.0006	-0.0042	***	0.0015
-0.0003		0.0006	0.0014		0.0016	0.0002		0.0007	0.0005		0.0006	0.0004		0.0015
0.0002		0.0036	-0.0092		0.0098	-0.0026		0.0043	-0.0099	***	0.0037	-0.0002		0.0089
-0.0052		0.0060	-0.0089		0.0165	-0.0140	*	0.0072	-0.0180	***	0.0062	-0.0161		0.0150
0.0008		0.0074	0.0256		0.0204	-0.0030		0.0089	0.0037		0.0077	-0.0069		0.0185
0.0115	**	0.0058	-0.0033		0.0160	-0.0016		0.0070	-0.0117	*	0.0060	0.0046		0.0145
-0.0012		0.0021	0.0154	***	0.0059	0.0032		0.0026	0.0045	**	0.0022	0.0150	***	0.0053
0.0071		0.0045	-0.0133		0.0125	-0.0130	**	0.0054	0.0045		0.0047	-0.0122		0.0113
-0.0018		0.0045	-0.0087		0.0124	0.0156	***	0.0054	0.0497	***	0.0047	-0.0364	***	0.0113
0.0131		0.0082	0.0474	**	0.0226	-0.0138		0.0099	-0.0012		0.0085	-0.0122		0.0205
-0.0025		0.0088	0.1222	***	0.0242	0.0051		0.0106	-0.0541	***	0.0091	-0.0028		0.0220
-0.0121		0.0112	0.0071		0.0307	-0.0150		0.0134	-0.0075		0.0115	0.0462	*	0.0279
0.0222		0.0214	0.3094	***	0.0588	0.0000		0.0256	-0.0351		0.0221	-0.0459		0.0534
0.0274		0.0171	-0.1949	***	0.0469	0.0509	**	0.0205	0.0216		0.0176	-0.0234		0.0426
0.0028		0.0072	-0.0231		0.0197	-0.0170	**	0.0086	0.0088		0.0074	0.0123		0.0179
-0.0151		0.0139	0.0772	**	0.0381	-0.0103		0.0166	-0.0206		0.0143	0.0167		0.0346
-0.0222		0.0224	0.0376		0.0616	0.0249		0.0269	0.0265		0.0232	0.0625		0.0559
0.0193		0.0140	-0.0182		0.0385	0.0156		0.0168	-0.0243	*	0.0145	-0.0195		0.0349
0.0482	***	0.0019	0.1867	***	0.0051	0.0624	***	0.0022	0.0629	***	0.0019	0.0473	***	0.0046

Appendix3 Regression results for calculating elasticities of Table4 and 11

Dependent variable is cost share			(1)		(2)		(3)		(4)		(5)		(6)							
			Male workers with																	
			Junior high school diplomas for				Senior high school diplomas for				Higher professional school, junior college, university or graduate school diplomas for									
			a definite period		an indefinite period		a definite period		an indefinite period		a definite period		an indefinite period							
			Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.						
In wage of	male workers with	Junior high school diplomas for a definite period	0.0127	***	0.0001	-0.0004	***	0.0000	0.0007	***	0.0001	-0.0017	***	0.0001	-0.0009	***	0.0001	-0.0019	***	0.0001
		Junior high school diplomas for an indefinite period	-0.0004	***	0.0000	0.0327	***	0.0003	-0.0014	***	0.0001	-0.0022	***	0.0004	-0.0006	***	0.0001	-0.0125	***	0.0004
		Senior high school diplomas for a definite period	0.0007	***	0.0001	-0.0014	***	0.0001	0.0229	***	0.0002	-0.0049	***	0.0002	0.0010	***	0.0001	-0.0061	***	0.0002
		Senior high school diplomas for an indefinite period	-0.0017	***	0.0001	-0.0022	***	0.0004	-0.0049	***	0.0002	0.0914	***	0.0012	-0.0049	***	0.0002	-0.0323	***	0.0009
		Higher professional school, junior college, university or graduate school diplomas for a definite period	-0.0009	***	0.0001	-0.0006	***	0.0001	0.0010	***	0.0001	-0.0049	***	0.0002	0.0174	***	0.0001	-0.0033	***	0.0001
	Higher professional school, junior college, university or graduate school diplomas for an indefinite period	-0.0019	***	0.0001	-0.0125	***	0.0004	-0.0061	***	0.0002	-0.0323	***	0.0009	-0.0033	***	0.0001	0.0961	***	0.0010	
	female workers with	Part-time workers a definite period	-0.0013	***	0.0001	-0.0007	***	0.0001	-0.0008	***	0.0001	-0.0035	***	0.0002	-0.0012	***	0.0001	-0.0022	***	0.0002
		Part-time workers an indefinite period	-0.0013	***	0.0001	-0.0008	***	0.0001	-0.0008	***	0.0001	-0.0039	***	0.0002	-0.0011	***	0.0001	-0.0029	***	0.0002
		Junior or senior high school diplomas for a definite period	-0.0005	***	0.0001	-0.0017	***	0.0001	0.0014	***	0.0002	-0.0056	***	0.0003	-0.0015	***	0.0001	-0.0064	***	0.0003
		Junior or senior high school diplomas for an indefinite period	-0.0009	***	0.0001	-0.0023	***	0.0003	-0.0030	***	0.0002	0.0062	***	0.0006	-0.0019	***	0.0001	-0.0205	***	0.0005
Higher professional school, junior college, university or graduate school diplomas for a definite period		-0.0020	***	0.0001	-0.0005	***	0.0001	-0.0015	***	0.0001	-0.0044	***	0.0001	0.0009	***	0.0001	-0.0025	***	0.0001	
Higher professional school, junior college, university or graduate school diplomas for an indefinite period	-0.0007	***	0.0000	-0.0044	***	0.0002	-0.0021	***	0.0001	-0.0143	***	0.0004	-0.0010	***	0.0001	0.0082	***	0.0003		
Part-time workers a definite period	-0.0008	***	0.0001	-0.0017	***	0.0002	-0.0033	***	0.0002	-0.0114	***	0.0004	-0.0017	***	0.0001	-0.0071	***	0.0004		
Part-time workers an indefinite period	-0.0010	***	0.0001	-0.0035	***	0.0002	-0.0020	***	0.0002	-0.0086	***	0.0004	-0.0013	***	0.0001	-0.0068	***	0.0004		
ln(tangible fixed asset)			-0.0001		0.0001	-0.0001		0.0004	-0.0003		0.0002	0.0060	***	0.0009	-0.0001		0.0001	0.0004		0.0009
ln(total output)			0.0005	***	0.0001	-0.0054	***	0.0007	0.0015	***	0.0003	-0.0062	***	0.0017	0.0011	***	0.0002	0.0143	***	0.0016
ln(total input)			-0.0001		0.0001	0.0015	***	0.0004	-0.0007	***	0.0002	0.0012		0.0011	-0.0005	***	0.0001	0.0004		0.0011
Overseas affiliates dummy			-0.0001		0.0002	-0.0007		0.0011	-0.0001		0.0005	-0.0164	***	0.0028	0.0004		0.0003	0.0125	***	0.0027
Export dummy			0.0003	*	0.0002	-0.0020		0.0012	-0.0004		0.0006	-0.0179	***	0.0031	0.0008	**	0.0004	0.0251	***	0.0029
Import dummy			0.0006	***	0.0002	0.0008		0.0011	0.0002		0.0005	-0.0174	***	0.0030	0.0001		0.0004	0.0151	***	0.0028
Ratio of export to	Asia	-0.0019	*	0.0011	-0.0310	***	0.0070	-0.0027		0.0032	0.0229		0.0181	-0.0053	**	0.0022	0.0461	***	0.0171	
	North America	-0.0032	*	0.0019	0.0049		0.0118	-0.0057		0.0055	-0.0237		0.0307	0.0010		0.0038	0.0610	**	0.0289	
	Europe	0.0004		0.0023	-0.0087		0.0146	0.0100		0.0068	-0.1524	***	0.0378	0.0111	**	0.0046	0.1149	***	0.0357	
	Other region	-0.0044	**	0.0018	0.0103		0.0115	-0.0104	**	0.0053	-0.0215		0.0297	-0.0069	*	0.0036	0.0576	**	0.0280	
Ratio of import from	Asia	-0.0011		0.0007	0.0044		0.0042	0.0013		0.0019	-0.0386	***	0.0109	-0.0011		0.0013	-0.0094		0.0102	
	North America	-0.0006		0.0014	-0.0137		0.0089	-0.0020		0.0041	-0.0105		0.0231	-0.0015		0.0028	0.0698	***	0.0218	
	Europe	-0.0010		0.0014	-0.0005		0.0089	-0.0038		0.0041	-0.0577	**	0.0230	-0.0038		0.0028	0.0445	**	0.0217	
	Other region	-0.0037		0.0026	-0.0100		0.0162	-0.0025		0.0075	0.1596	***	0.0419	-0.0019		0.0051	-0.1583	***	0.0395	
Ratio of export by other companies to	Asia	-0.0062	**	0.0028	-0.1023	***	0.0174	0.0052		0.0080	0.2882	***	0.0449	-0.0094	*	0.0055	-0.2270	***	0.0423	
	North America	0.0134	***	0.0035	0.0787	***	0.0220	-0.0031		0.0102	-0.1665	***	0.0569	0.0038		0.0070	0.0363		0.0536	
	Europe	-0.0234	***	0.0067	-0.2025	***	0.0421	0.0097		0.0195	0.4429	***	0.1090	0.0130		0.0133	-0.4487	***	0.1027	
	Other region	0.0081		0.0053	0.0418		0.0336	-0.0031		0.0155	-0.0109		0.0870	-0.0204	*	0.0106	0.0897		0.0820	
Ratio of import by other companies from	Asia	0.0002		0.0022	-0.0087		0.0141	-0.0033		0.0065	0.0038		0.0365	-0.0001		0.0045	0.0246		0.0344	
	North America	0.0024		0.0043	-0.1577	***	0.0273	0.0114		0.0126	0.2382	***	0.0706	0.0048		0.0086	-0.1468	**	0.0665	
	Europe	0.0033		0.0070	-0.0348		0.0441	0.0507	**	0.0204	0.2742	**	0.1142	0.0171		0.0140	-0.4089	***	0.1076	
	Other region	-0.0102	**	0.0044	-0.1617	***	0.0275	-0.0325	**	0.0127	0.2031	***	0.0713	-0.0183	**	0.0087	-0.0038		0.0672	
Cons.			0.0140	***	0.0006	0.1247	***	0.0037	0.0413	***	0.0017	0.2068	***	0.0094	0.0268	***	0.0012	0.1276	***	0.0089

Notes: A full set of industry dummies and year dummies is included.

*** significant at the 1 percent level, **significant at the 5 percent level, * significant at the 10 percent level.

Appendix3 Regression results for calculating elasticities of Table4 and 11(Continue)

(7)		(8)		(9)		(10)		(11)		(12)		(13)		(14)	
Male workers with				Female workers with											
Part-time workers				Junior or senior high school diplomas for				Higher professional school, junior college, university or graduate school diplomas for				Part-time workers			
a definite period		an indefinite period		a definite period		an indefinite period		a definite period		an indefinite period		a definite period		an indefinite period	
Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
-0.0013 ***	0.0001	-0.0013 ***	0.0001	-0.0005 ***	0.0001	-0.0009 ***	0.0001	-0.0020 ***	0.0001	-0.0007 ***	0.0000	-0.0008 ***	0.0001	-0.0010 ***	0.0001
-0.0007 ***	0.0001	-0.0008 ***	0.0001	-0.0017 ***	0.0001	-0.0023 ***	0.0003	-0.0005 ***	0.0001	-0.0044 ***	0.0002	-0.0017 ***	0.0002	-0.0035 ***	0.0002
-0.0008 ***	0.0001	-0.0008 ***	0.0001	0.0014 ***	0.0002	-0.0030 ***	0.0002	-0.0015 ***	0.0001	-0.0021 ***	0.0001	-0.0033 ***	0.0002	-0.0020 ***	0.0002
-0.0035 ***	0.0002	-0.0039 ***	0.0002	-0.0056 ***	0.0003	0.0062 ***	0.0006	-0.0044 ***	0.0001	-0.0143 ***	0.0004	-0.0114 ***	0.0004	-0.0086 ***	0.0004
-0.0012 ***	0.0001	-0.0011 ***	0.0001	-0.0015 ***	0.0001	-0.0019 ***	0.0001	0.0009 ***	0.0001	-0.0010 ***	0.0001	-0.0017 ***	0.0001	-0.0013 ***	0.0001
-0.0022 ***	0.0002	-0.0029 ***	0.0002	-0.0064 ***	0.0003	-0.0205 ***	0.0005	-0.0025 ***	0.0001	0.0082 ***	0.0003	-0.0071 ***	0.0004	-0.0068 ***	0.0004
0.0164 ***	0.0002	-0.0020 ***	0.0001	-0.0023 ***	0.0002	-0.0029 ***	0.0001	-0.0019 ***	0.0001	-0.0011 ***	0.0001	0.0062 ***	0.0002	-0.0026 ***	0.0001
-0.0020 ***	0.0001	0.0179 ***	0.0002	-0.0014 ***	0.0002	-0.0016 ***	0.0002	-0.0015 ***	0.0001	-0.0014 ***	0.0001	-0.0024 ***	0.0002	0.0030 ***	0.0002
-0.0023 ***	0.0002	-0.0014 ***	0.0002	0.0273 ***	0.0003	-0.0025 ***	0.0002	0.0011 ***	0.0001	-0.0020 ***	0.0002	-0.0018 ***	0.0002	-0.0041 ***	0.0002
-0.0029 ***	0.0001	-0.0016 ***	0.0002	-0.0025 ***	0.0002	0.0384 ***	0.0006	-0.0016 ***	0.0001	-0.0024 ***	0.0003	-0.0054 ***	0.0003	0.0005	0.0003
-0.0019 ***	0.0001	-0.0015 ***	0.0001	0.0011 ***	0.0001	-0.0016 ***	0.0001	0.0169 ***	0.0002	-0.0004 ***	0.0001	-0.0009 ***	0.0001	-0.0016 ***	0.0001
-0.0011 ***	0.0001	-0.0014 ***	0.0001	-0.0020 ***	0.0002	-0.0024 ***	0.0003	-0.0004 ***	0.0001	0.0254 ***	0.0002	-0.0022 ***	0.0002	-0.0016 ***	0.0002
0.0062 ***	0.0002	-0.0024 ***	0.0002	-0.0018 ***	0.0002	-0.0054 ***	0.0003	-0.0009 ***	0.0001	-0.0022 ***	0.0002	0.0430 ***	0.0004	-0.0105 ***	0.0003
-0.0026 ***	0.0001	0.0030 ***	0.0002	-0.0041 ***	0.0002	0.0005	0.0003	-0.0016 ***	0.0001	-0.0016 ***	0.0002	-0.0105 ***	0.0003	0.0399 ***	0.0004
-0.0007 ***	0.0001	-0.0007 ***	0.0002	-0.0009 ***	0.0002	-0.0007	0.0005	-0.0005 ***	0.0001	-0.0015 ***	0.0003	-0.0011 ***	0.0004	0.0002	0.0004
0.0022 ***	0.0003	0.0019 ***	0.0003	0.0003	0.0004	-0.0149 ***	0.0010	0.0009 ***	0.0002	-0.0016 ***	0.0005	0.0041 ***	0.0006	0.0011	0.0007
-0.0003	0.0002	0.0001	0.0002	0.0001	0.0003	-0.0008	0.0007	0.0000	0.0001	-0.0009 **	0.0004	-0.0002	0.0004	0.0002	0.0005
-0.0005	0.0005	0.0004	0.0005	0.0010	0.0006	0.0041 **	0.0017	0.0005	0.0003	0.0036 ***	0.0009	-0.0039 ***	0.0011	-0.0009	0.0012
0.0000	0.0005	-0.0009 *	0.0005	-0.0002	0.0007	-0.0031 *	0.0018	-0.0001	0.0004	0.0013	0.0010	-0.0005	0.0012	-0.0025 *	0.0013
-0.0004	0.0005	-0.0011 **	0.0005	0.0017 ***	0.0007	-0.0016	0.0017	0.0007 **	0.0003	0.0004	0.0009	0.0019 *	0.0011	-0.0010	0.0013
-0.0019	0.0029	0.0017	0.0030	0.0001	0.0041	-0.0102	0.0107	-0.0024	0.0021	-0.0146 **	0.0058	-0.0066	0.0069	0.0057	0.0077
-0.0004	0.0049	0.0092 *	0.0051	-0.0011	0.0069	-0.0099	0.0181	0.0023	0.0035	-0.0260 ***	0.0098	-0.0030	0.0117	-0.0055	0.0130
0.0004	0.0061	-0.0041	0.0063	0.0074	0.0086	0.0315	0.0223	0.0011	0.0043	0.0050	0.0121	0.0033	0.0144	-0.0198	0.0161
-0.0022	0.0048	-0.0014	0.0049	0.0017	0.0067	-0.0147	0.0175	-0.0016	0.0034	-0.0111	0.0095	-0.0023	0.0113	0.0069	0.0126
0.0000	0.0017	0.0007	0.0018	-0.0093 ***	0.0025	0.0294 ***	0.0064	-0.0016	0.0012	0.0108 ***	0.0035	0.0033	0.0041	0.0111 **	0.0046
-0.0059	0.0037	0.0001	0.0038	-0.0050	0.0052	-0.0138	0.0136	-0.0038	0.0026	0.0008	0.0074	0.0003	0.0088	-0.0143	0.0098
-0.0031	0.0037	-0.0020	0.0038	-0.0060	0.0052	-0.0018	0.0136	-0.0025	0.0026	0.0740 ***	0.0074	-0.0179 **	0.0087	-0.0185 *	0.0098
-0.0058	0.0067	0.0001	0.0069	0.0047	0.0095	0.0519 **	0.0247	0.0000	0.0048	-0.0198	0.0134	-0.0061	0.0159	-0.0081	0.0178
-0.0124 *	0.0072	-0.0089	0.0074	-0.0047	0.0102	0.1295 ***	0.0265	-0.0070	0.0051	-0.0414 ***	0.0144	-0.0344 **	0.0171	0.0308	0.0191
0.0278 ***	0.0091	0.0156 *	0.0094	0.0533 ***	0.0129	-0.0492	0.0336	0.0033	0.0065	-0.0433 **	0.0182	0.0904 ***	0.0216	-0.0605 **	0.0241
-0.0090	0.0175	-0.0298 *	0.0180	-0.0083	0.0247	0.3631 ***	0.0643	-0.0029	0.0124	-0.0626 *	0.0348	-0.0346	0.0414	-0.0069	0.0462
-0.0306 **	0.0139	0.0125	0.0144	-0.1408 ***	0.0197	-0.0590	0.0514	-0.0174 *	0.0099	0.1177 ***	0.0278	-0.1458 ***	0.0331	0.1581 ***	0.0369
0.0059	0.0058	0.0051	0.0060	-0.0021	0.0083	-0.0254	0.0215	-0.0050	0.0042	-0.0028	0.0117	0.0021	0.0139	0.0056	0.0155
0.0020	0.0113	-0.0178	0.0117	0.0260	0.0160	0.0560	0.0417	0.0024	0.0081	-0.0414 *	0.0226	0.0745 ***	0.0269	-0.0540 *	0.0300
0.0155	0.0183	0.0203	0.0189	0.0489 *	0.0258	-0.1011	0.0674	0.0165	0.0130	0.0415	0.0365	0.0359	0.0434	0.0208	0.0484
-0.0162	0.0114	-0.0023	0.0118	-0.0562 ***	0.0161	0.1024 **	0.0421	-0.0090	0.0081	0.0145	0.0228	-0.0899 ***	0.0271	0.0801 ***	0.0303
0.0137 ***	0.0016	0.0188 ***	0.0016	0.0511 ***	0.0022	0.1896 ***	0.0056	0.0231 ***	0.0011	0.0746 ***	0.0030	0.0483 ***	0.0036	0.0397 ***	0.0040

Appendix4 Regression results for calculating elasticities of Table5 and 12

Dependent variable is cost share			(1)		(2)		(3)		(4)		(5)			
			Male workers with											
			Junior or senior high school diplomas for				Higher professional school, junior college, university or				Part-time workers			
			a definite period		an indefinite period		a definite period		an indefinite period		a definite period			
			Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.		
ln wage of	male worker s with	Junior or senior high school diplomas for a definite period	0.0280 ***	0.0004	-0.0066 ***	0.0005	0.0022 ***	0.0002	-0.0109 ***	0.0005	-0.0006 **	0.0002		
		Junior or senior high school diplomas for an indefinite period	-0.0066 ***	0.0005	0.0934 ***	0.0017	-0.0067 ***	0.0003	-0.0316 ***	0.0013	-0.0036 ***	0.0004		
	Higher professional school, junior college, university or graduate school diplomas for	a definite period	0.0022 ***	0.0002	-0.0067 ***	0.0003	0.0195 ***	0.0003	-0.0047 ***	0.0003	-0.0010 ***	0.0002		
		an indefinite period	-0.0109 ***	0.0005	-0.0316 ***	0.0013	-0.0047 ***	0.0003	0.0942 ***	0.0016	-0.0021 ***	0.0004		
	Part-time workers	a definite period	-0.0006 **	0.0002	-0.0036 ***	0.0004	-0.0010 ***	0.0002	-0.0021 ***	0.0004	0.0174 ***	0.0004		
		an indefinite period	-0.0002	0.0002	-0.0039 ***	0.0003	-0.0010 ***	0.0002	-0.0035 ***	0.0003	-0.0028 ***	0.0003		
	Junior or senior high school diplomas for	a definite period	0.0033 ***	0.0003	-0.0074 ***	0.0005	-0.0014 ***	0.0002	-0.0095 ***	0.0005	-0.0024 ***	0.0003		
		an indefinite period	-0.0054 ***	0.0004	0.0071 ***	0.0008	-0.0029 ***	0.0002	-0.0178 ***	0.0008	-0.0041 ***	0.0003		
	female worker s with	Higher professional school, junior college, university or graduate school diplomas for	a definite period	-0.0014 ***	0.0002	-0.0060 ***	0.0003	0.0010 ***	0.0002	-0.0036 ***	0.0003	-0.0017 ***	0.0002	
		an indefinite period	-0.0039 ***	0.0003	-0.0143 ***	0.0006	-0.0016 ***	0.0002	0.0059 ***	0.0006	-0.0022 ***	0.0002		
Part-time workers	a definite period	-0.0029 ***	0.0004	-0.0134 ***	0.0007	-0.0020 ***	0.0003	-0.0085 ***	0.0007	0.0076 ***	0.0003			
	an indefinite period	-0.0016 ***	0.0003	-0.0069 ***	0.0006	-0.0016 ***	0.0002	-0.0079 ***	0.0006	-0.0045 ***	0.0003			
ln(tangible fixed asset)			-0.0007 *	0.0004	0.0057 ***	0.0013	-0.0002	0.0002	0.0007	0.0013	-0.0011 ***	0.0003		
ln(total output)			0.0015 *	0.0008	-0.0184 ***	0.0026	0.0009 *	0.0005	0.0199 ***	0.0024	0.0030 ***	0.0006		
ln(total input)			-0.0009 *	0.0005	0.0047 ***	0.0018	-0.0008 ***	0.0003	-0.0016	0.0016	0.0000	0.0004		
Overseas affiliates dummy			-0.0021	0.0014	-0.0080	0.0049	-0.0005	0.0009	0.0133 ***	0.0046	-0.0015	0.0011		
Export dummy			-0.0024	0.0016	-0.0069	0.0056	0.0014	0.0010	0.0163 ***	0.0053	-0.0010	0.0012		
Import dummy			0.0003	0.0015	-0.0217 ***	0.0053	0.0002	0.0009	0.0138 ***	0.0050	-0.0001	0.0012		
Ratio of export to	Asia	-0.0075	0.0088	-0.0427	0.0304	-0.0064	0.0054	0.0821 ***	0.0285	-0.0005	0.0066			
	North America	-0.0081	0.0183	0.0525	0.0629	-0.0077	0.0112	0.0857	0.0590	-0.0107	0.0137			
	Europe	0.0192	0.0184	-0.1437 **	0.0631	0.0018	0.0112	0.0970	0.0592	0.0016	0.0138			
	Other region	-0.0382 **	0.0150	0.0097	0.0516	-0.0085	0.0092	0.0459	0.0485	-0.0014	0.0113			
Ratio of import from	Asia	0.0066	0.0050	-0.0313 *	0.0170	0.0001	0.0030	0.0058	0.0160	0.0003	0.0037			
	North America	-0.0100	0.0132	-0.0152	0.0454	-0.0026	0.0081	0.1049 **	0.0426	-0.0080	0.0099			
	Europe	-0.0028	0.0113	-0.0904 **	0.0388	-0.0036	0.0069	0.0881 **	0.0364	0.0009	0.0085			
	Other region	0.0047	0.0240	0.0903	0.0825	0.0020	0.0147	-0.1120	0.0774	-0.0195	0.0180			
Ratio of export by other companies to	Asia	-0.0012	0.0204	0.1692 **	0.0701	-0.0198	0.0125	-0.3037 ***	0.0658	-0.0013	0.0153			
	North America	-0.0239	0.0420	-0.1517	0.1442	-0.0300	0.0257	0.1668	0.1353	0.0484	0.0315			
	Europe	0.0473	0.0582	0.3912 **	0.1999	0.0487	0.0356	-0.7436 ***	0.1876	-0.0236	0.0437			
	Other region	-0.0619	0.0434	0.0392	0.1490	-0.0392	0.0266	0.1496	0.1399	-0.0186	0.0326			
Ratio of import by other companies from	Asia	-0.0182	0.0203	0.1682 **	0.0699	0.0183	0.0125	-0.0846	0.0656	-0.0050	0.0153			
	North America	0.0157	0.0424	0.0850	0.1457	-0.0119	0.0260	-0.1492	0.1367	-0.0360	0.0318			
	Europe	0.1092 **	0.0527	0.0230	0.1812	0.0242	0.0323	-0.1596	0.1701	-0.0125	0.0396			
	Other region	-0.0049	0.0371	-0.0945	0.1273	-0.0143	0.0227	0.0133	0.1195	0.0111	0.0278			
Cons.			0.0685 ***	0.0041	0.3127 ***	0.0139	0.0412 ***	0.0025	0.1243 ***	0.0130	0.0093 ***	0.0031		

Notes: A full set of industry dummies and year dummies is included.

*** significant at the 1 percent level, **significant at the 5 percent level, * significant at the 10 percent level.

Appendix4 Regression results for calculating elasticities of Table5 and 12(Continue)

(6)		(7)		(8)		(9)		(10)		(11)		(12)	
Male workers with		Female workers with											
Part-time workers		Junior or senior high school diplomas for				Higher professional school, junior college, university or				Part-time workers			
an indefinite period		a definite period		an indefinite period		a definite period		an indefinite period		a definite period		an indefinite period	
Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
-0.0002	0.0002	0.0033 ***	0.0003	-0.0054 ***	0.0004	-0.0014 ***	0.0002	-0.0039 ***	0.0003	-0.0029 ***	0.0004	-0.0016 ***	0.0003
-0.0039 ***	0.0003	-0.0074 ***	0.0005	0.0071 ***	0.0008	-0.0060 ***	0.0003	-0.0143 ***	0.0006	-0.0134 ***	0.0007	-0.0069 ***	0.0006
-0.0010 ***	0.0002	-0.0014 ***	0.0002	-0.0029 ***	0.0002	0.0010 ***	0.0002	-0.0016 ***	0.0002	-0.0020 ***	0.0003	-0.0016 ***	0.0002
-0.0035 ***	0.0003	-0.0095 ***	0.0005	-0.0178 ***	0.0008	-0.0036 ***	0.0003	0.0059 ***	0.0006	-0.0085 ***	0.0007	-0.0079 ***	0.0006
-0.0028 ***	0.0003	-0.0024 ***	0.0003	-0.0041 ***	0.0003	-0.0017 ***	0.0002	-0.0022 ***	0.0002	0.0076 ***	0.0003	-0.0045 ***	0.0003
0.0183 ***	0.0004	-0.0018 ***	0.0003	-0.0019 ***	0.0003	-0.0020 ***	0.0002	-0.0020 ***	0.0002	-0.0040 ***	0.0003	0.0047 ***	0.0003
-0.0018 ***	0.0003	0.0308 ***	0.0005	-0.0031 ***	0.0004	0.0015 ***	0.0002	-0.0030 ***	0.0003	-0.0016 ***	0.0004	-0.0053 ***	0.0004
-0.0019 ***	0.0003	-0.0031 ***	0.0004	0.0378 ***	0.0008	-0.0024 ***	0.0002	-0.0023 ***	0.0004	-0.0063 ***	0.0005	0.0014 ***	0.0004
-0.0020 ***	0.0002	0.0015 ***	0.0002	-0.0024 ***	0.0002	0.0187 ***	0.0003	-0.0003 *	0.0002	-0.0013 ***	0.0003	-0.0025 ***	0.0003
-0.0020 ***	0.0002	-0.0030 ***	0.0003	-0.0023 ***	0.0004	-0.0003 *	0.0002	0.0289 ***	0.0004	-0.0028 ***	0.0004	-0.0024 ***	0.0004
-0.0040 ***	0.0003	-0.0016 ***	0.0004	-0.0063 ***	0.0005	-0.0013 ***	0.0003	-0.0028 ***	0.0004	0.0483 ***	0.0007	-0.0131 ***	0.0004
0.0047 ***	0.0003	-0.0053 ***	0.0004	0.0014 ***	0.0004	-0.0025 ***	0.0003	-0.0024 ***	0.0004	-0.0131 ***	0.0004	0.0396 ***	0.0006
-0.0002	0.0003	-0.0015 ***	0.0004	0.0006	0.0007	-0.0010 ***	0.0002	-0.0020 ***	0.0005	-0.0018 ***	0.0007	0.0013 **	0.0005
0.0019 ***	0.0005	-0.0018 **	0.0009	-0.0136 ***	0.0014	0.0004	0.0004	-0.0008	0.0009	0.0073 ***	0.0013	-0.0001	0.0010
-0.0002	0.0003	0.0010 *	0.0006	-0.0014	0.0010	0.0005	0.0003	-0.0010 *	0.0006	0.0001	0.0009	-0.0003	0.0007
-0.0003	0.0009	0.0006	0.0016	0.0049 *	0.0027	0.0003	0.0008	0.0053 ***	0.0017	-0.0102 ***	0.0024	-0.0017	0.0018
0.0002	0.0011	-0.0036 **	0.0018	0.0001	0.0031	-0.0012	0.0010	0.0034 *	0.0020	-0.0050 *	0.0028	-0.0012	0.0021
-0.0008	0.0010	0.0031 *	0.0017	-0.0030	0.0029	0.0021 **	0.0009	-0.0001	0.0018	0.0035	0.0026	0.0027	0.0020
0.0056	0.0058	0.0117	0.0099	-0.0288 *	0.0167	0.0002	0.0052	-0.0209 **	0.0106	-0.0024	0.0151	0.0097	0.0115
0.0028	0.0119	-0.0153	0.0205	-0.0196	0.0345	-0.0086	0.0108	-0.0251	0.0220	-0.0606 *	0.0313	0.0146	0.0238
-0.0002	0.0120	0.0165	0.0206	0.0038	0.0347	0.0016	0.0108	0.0012	0.0221	0.0075	0.0314	-0.0063	0.0238
-0.0066	0.0098	0.0122	0.0169	-0.0058	0.0284	0.0012	0.0089	-0.0158	0.0181	0.0087	0.0257	-0.0014	0.0195
-0.0015	0.0032	-0.0160 ***	0.0056	0.0112	0.0093	-0.0024	0.0029	0.0132 **	0.0059	0.0096	0.0085	0.0044	0.0064
0.0076	0.0086	-0.0074	0.0148	-0.0011	0.0250	-0.0111	0.0078	-0.0149	0.0159	-0.0139	0.0226	-0.0284 *	0.0172
-0.0008	0.0074	-0.0105	0.0127	-0.0192	0.0213	-0.0055	0.0067	0.0865 ***	0.0136	-0.0289	0.0193	-0.0137	0.0147
0.0020	0.0157	0.0154	0.0270	0.0745 *	0.0453	0.0038	0.0141	-0.0069	0.0288	-0.0346	0.0411	-0.0197	0.0312
-0.0106	0.0133	0.0458 **	0.0229	0.1462 ***	0.0385	0.0069	0.0120	-0.0659 ***	0.0245	0.0421	0.0349	-0.0077	0.0265
0.0185	0.0274	0.0007	0.0471	-0.0365	0.0792	-0.0215	0.0247	0.0032	0.0504	-0.0140	0.0718	0.0401	0.0545
-0.0533	0.0379	0.0339	0.0653	0.4923 ***	0.1098	0.0090	0.0343	-0.1363 *	0.0699	0.0241	0.0996	-0.0897	0.0755
0.0376	0.0283	-0.0567	0.0487	-0.1840 **	0.0819	0.0139	0.0255	0.0490	0.0521	0.0065	0.0742	0.0647	0.0563
0.0133	0.0133	-0.0250	0.0228	-0.0343	0.0384	-0.0176	0.0120	0.0096	0.0244	-0.0269	0.0348	0.0022	0.0264
-0.0038	0.0276	-0.0056	0.0476	0.1412 *	0.0800	-0.0101	0.0250	-0.0427	0.0509	0.0115	0.0726	0.0058	0.0550
0.0033	0.0344	0.0057	0.0592	-0.0072	0.0995	0.0016	0.0310	-0.0518	0.0634	0.0633	0.0903	0.0008	0.0685
0.0028	0.0242	0.0196	0.0416	0.0514	0.0699	-0.0012	0.0218	-0.0195	0.0445	-0.0060	0.0634	0.0421	0.0481
0.0227 ***	0.0027	0.0733 ***	0.0046	0.1620 ***	0.0077	0.0340 ***	0.0025	0.0759 ***	0.0049	0.0239 ***	0.0070	0.0523 ***	0.0053

Appendix5 Regression results for calculating elasticities of Table6 and 13

Dependent variable is cost share			(1)		(2)			(3)			(4)			(5)			
			Male workers with														
			Junior or senior high school diplomas for						Higher professional school, junior college, university or						Part-time workers		
			Non-regular			Regular			Non-regular			Regular			Non-regular		
			Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	
In wage of	male workers with	Junior or senior high school diplomas for Non-regular	0.0275 ***	0.0004	-0.0039 ***	0.0005	0.0008 ***	0.0002	-0.0102 ***	0.0005	-0.0006 **	0.0003					
		Regular	-0.0039 ***	0.0005	0.0882 ***	0.0016	-0.0046 ***	0.0002	-0.0331 ***	0.0013	-0.0046 ***	0.0004					
		Higher professional school, junior college, university or Part-time workers Non-regular	0.0008 ***	0.0002	-0.0046 ***	0.0002	0.0167 ***	0.0002	-0.0025 ***	0.0002	-0.0016 ***	0.0002					
		Regular	-0.0102 ***	0.0005	-0.0331 ***	0.0013	-0.0025 ***	0.0002	0.0918 ***	0.0015	-0.0029 ***	0.0004					
		Non-regular	-0.0006 **	0.0003	-0.0046 ***	0.0004	-0.0016 ***	0.0002	-0.0029 ***	0.0004	0.0180 ***	0.0004					
	Regular	-0.0001	0.0001	-0.0014 ***	0.0001	-0.0007 ***	0.0001	-0.0015 ***	0.0001	-0.0004 ***	0.0001						
	female workers with	Junior or senior high school diplomas for Non-regular	0.0031 ***	0.0003	-0.0084 ***	0.0006	-0.0015 ***	0.0002	-0.0134 ***	0.0006	-0.0038 ***	0.0003					
		Regular	-0.0057 ***	0.0003	0.0045 ***	0.0007	-0.0023 ***	0.0002	-0.0163 ***	0.0007	-0.0042 ***	0.0003					
		Higher professional school, junior college, university or Part-time workers Non-regular	-0.0018 ***	0.0002	-0.0064 ***	0.0003	0.0002	0.0002	-0.0045 ***	0.0003	-0.0018 ***	0.0002					
		Regular	-0.0046 ***	0.0003	-0.0141 ***	0.0005	-0.0015 ***	0.0002	0.0050 ***	0.0005	-0.0030 ***	0.0003					
Non-regular		-0.0043 ***	0.0004	-0.0150 ***	0.0008	-0.0022 ***	0.0002	-0.0114 ***	0.0007	0.0057 ***	0.0004						
Regular	-0.0002 ***	0.0001	-0.0011 ***	0.0001	-0.0007 ***	0.0001	-0.0011 ***	0.0001	-0.0007 ***	0.0001							
ln(tangible fixed asset)			-0.0004	0.0004	0.0060 ***	0.0013	-0.0010 ***	0.0002	0.0009	0.0012	-0.0014 ***	0.0003					
ln(total output)			0.0002	0.0008	-0.0179 ***	0.0026	0.0006 *	0.0004	0.0194 ***	0.0024	0.0043 ***	0.0007					
ln(total input)			-0.0007	0.0005	0.0044 **	0.0017	-0.0002	0.0002	-0.0015	0.0016	-0.0003	0.0004					
Overseas affiliates dummy			-0.0015	0.0014	-0.0092 *	0.0048	0.0000	0.0007	0.0145 ***	0.0046	-0.0012	0.0013					
Export dummy			-0.0012	0.0016	-0.0073	0.0055	0.0010	0.0008	0.0169 ***	0.0052	-0.0007	0.0014					
Import dummy			-0.0010	0.0015	-0.0188 ***	0.0052	0.0013 **	0.0007	0.0122 **	0.0049	-0.0014	0.0014					
Ratio of export to			-0.0134	0.0089	-0.0433	0.0300	-0.0041	0.0041	0.0821 ***	0.0284	0.0031	0.0078					
	North America	0.0015	0.0183	0.0495	0.0621	-0.0109	0.0085	0.0934	0.0588	0.0003	0.0161						
	Europe	0.0147	0.0184	-0.1394 **	0.0623	-0.0016	0.0085	0.0865	0.0590	-0.0086	0.0162						
	Other region	-0.0217	0.0150	-0.0123	0.0510	-0.0047	0.0069	0.0402	0.0483	-0.0023	0.0133						
Ratio of import from			0.0068	0.0050	-0.0317 **	0.0168	0.0010	0.0023	0.0060	0.0159	-0.0009	0.0044					
	North America	-0.0139	0.0132	-0.0146	0.0448	-0.0055	0.0061	0.0993 **	0.0425	-0.0135	0.0117						
	Europe	-0.0046	0.0113	-0.0938 **	0.0383	-0.0130 **	0.0052	0.0961 ***	0.0363	0.0021	0.0100						
	Other region	0.0187	0.0240	0.1072	0.0814	-0.0015	0.0111	-0.1195	0.0771	-0.0179	0.0212						
Ratio of export by other companies to			-0.0228	0.0204	0.1933 ***	0.0692	-0.0075	0.0094	-0.3158 ***	0.0655	-0.0077	0.0180					
	North America	0.0100	0.0420	-0.1826	0.1423	-0.0139	0.0194	0.1573	0.1348	-0.0220	0.0370						
	Europe	0.0061	0.0582	0.4213 **	0.1972	0.0366	0.0269	-0.7175 ***	0.1868	0.0206	0.0513						
	Other region	-0.0034	0.0434	-0.0071	0.1470	-0.0084	0.0200	0.1438	0.1393	0.0088	0.0382						
Ratio of import by other companies from			-0.0046	0.0203	0.1531 **	0.0689	0.0025	0.0094	-0.0675	0.0653	0.0098	0.0179					
	North America	-0.0092	0.0424	0.1076	0.1437	-0.0116	0.0196	-0.1411	0.1361	-0.0335	0.0374						
	Europe	0.1009 *	0.0528	0.0099	0.1788	0.0160	0.0244	-0.1694	0.1694	-0.0056	0.0465						
	Other region	-0.0001	0.0371	-0.0875	0.1256	-0.0107	0.0171	-0.0067	0.1190	0.0177	0.0327						
Cons.			0.0717 ***	0.0041	0.3269 ***	0.0137	0.0322 ***	0.0019	0.1411 ***	0.0129	0.0105 ***	0.0036					

Notes: A full set of industry dummies and year dummies is included.

*** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

Appendix5 Regression results for calculating elasticities of Table6 and 13(Continue)

(6)		(7)		(8)		(9)		(10)		(11)		(12)								
Male workers with		Female workers with																		
Part-time workers		Junior or senior high school diplomas for				Higher professional school, junior college, university or				Part-time workers										
Regular		Non-regular		Regular		Non-regular		Regular		Non-regular		Regular								
Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.							
-0.0001	0.0001	0.0031	***	0.0003	-0.0057	***	0.0003	-0.0018	***	0.0002	-0.0046	***	0.0003	-0.0043	***	0.0004	-0.0002	***	0.0001	
-0.0014	***	0.0001	-0.0084	***	0.0006	0.0045	***	0.0007	-0.0064	***	0.0003	-0.0141	***	0.0005	-0.0150	***	0.0008	-0.0011	***	0.0001
-0.0007	***	0.0001	-0.0015	***	0.0002	-0.0023	***	0.0002	0.0002	0.0002	-0.0015	***	0.0002	-0.0022	***	0.0002	-0.0007	***	0.0001	
-0.0015	***	0.0001	-0.0134	***	0.0006	-0.0163	***	0.0007	-0.0045	***	0.0003	0.0050	***	0.0005	-0.0114	***	0.0007	-0.0011	***	0.0001
-0.0004	***	0.0001	-0.0038	***	0.0003	-0.0042	***	0.0003	-0.0018	***	0.0002	-0.0030	***	0.0003	0.0057	***	0.0004	-0.0007	***	0.0001
0.0093	***	0.0002	-0.0003	***	0.0001	-0.0003	***	0.0001	-0.0007	***	0.0001	-0.0002	*	0.0001	-0.0005	***	0.0001	-0.0032	***	0.0002
-0.0003	***	0.0001	0.0337	***	0.0005	-0.0024	***	0.0004	0.0014	***	0.0002	-0.0037	***	0.0003	-0.0042	***	0.0004	-0.0005	***	0.0001
-0.0003	***	0.0001	-0.0024	***	0.0004	0.0344	***	0.0007	-0.0024	***	0.0002	-0.0025	***	0.0004	-0.0024	***	0.0005	-0.0004	***	0.0001
-0.0007	***	0.0001	0.0014	***	0.0002	-0.0024	***	0.0002	0.0185	***	0.0003	-0.0005	**	0.0002	-0.0016	***	0.0003	-0.0006	***	0.0001
-0.0002	*	0.0001	-0.0037	***	0.0003	-0.0025	***	0.0004	-0.0005	**	0.0002	0.0281	***	0.0004	-0.0028	***	0.0004	-0.0002	***	0.0001
-0.0005	***	0.0001	-0.0042	***	0.0004	-0.0024	***	0.0005	-0.0016	***	0.0003	-0.0028	***	0.0004	0.0393	***	0.0007	-0.0006	***	0.0001
-0.0032	***	0.0002	-0.0005	***	0.0001	-0.0004	***	0.0001	-0.0006	***	0.0001	-0.0002	***	0.0001	-0.0006	***	0.0001	0.0094	***	0.0002
0.0000	0.0001	-0.0010	**	0.0005	0.0008	0.0007	-0.0008	***	0.0002	-0.0021	***	0.0005	-0.0010	0.0007	0.0000	0.0001	0.0001	0.0001	0.0001	
0.0006	***	0.0002	-0.0033	***	0.0010	-0.0110	***	0.0013	0.0002	0.0005	-0.0007	0.0009	0.0073	***	0.0014	0.0001	0.0002	0.0001	0.0002	
-0.0001	0.0001	0.0012	*	0.0007	-0.0023	***	0.0009	0.0006	**	0.0003	-0.0010	0.0006	-0.0004	0.0009	0.0001	0.0001	0.0001	0.0001	0.0001	
-0.0004	0.0003	0.0011	0.0019	0.0028	0.0028	0.0024	-0.0001	0.0009	0.0053	***	0.0017	-0.0107	***	0.0026	-0.0004	0.0003	0.0001	0.0004	0.0004	
-0.0003	0.0004	-0.0036	*	0.0021	-0.0001	0.0028	-0.0001	0.0010	0.0020	0.0020	-0.0067	**	0.0030	0.0001	0.0004	0.0001	0.0004	0.0003	0.0003	
0.0003	0.0004	0.0027	0.0020	-0.0016	0.0016	0.0026	0.0018	**	0.0009	-0.0002	0.0018	0.0051	*	0.0028	-0.0005	0.0003	0.0019	0.0019	0.0019	
0.0007	0.0022	0.0055	0.0115	-0.0160	0.0151	0.0151	0.0000	0.0053	-0.0165	0.0106	0.0026	0.0162	-0.0007	0.0019	0.0002	0.0040	0.0040	0.0040	0.0040	
-0.0073	0.0045	-0.0351	0.0238	-0.0130	0.0312	0.0312	-0.0133	0.0110	-0.0132	0.0219	-0.0520	0.0335	0.0002	0.0040	-0.0005	0.0040	0.0033	0.0033	0.0033	
0.0040	0.0045	0.0242	0.0239	0.0164	0.0313	0.0313	0.0061	0.0110	-0.0005	0.0220	-0.0013	0.0336	-0.0005	0.0040	0.0156	0.0275	-0.0007	0.0033	0.0033	
0.0000	0.0037	0.0125	0.0196	-0.0109	0.0256	0.0256	-0.0011	0.0090	-0.0144	0.0180	0.0156	0.0275	-0.0007	0.0033	0.0155	*	0.0091	-0.0002	0.0011	
0.0001	0.0012	-0.0070	0.0065	0.0002	0.0084	0.0084	-0.0016	0.0030	0.0118	**	0.0059	0.0155	*	0.0091	-0.0002	0.0011	0.0029	0.0029	0.0029	
0.0173	***	0.0032	-0.0044	0.0172	-0.0032	0.0225	-0.0134	*	0.0079	-0.0178	0.0158	-0.0300	**	0.0242	-0.0004	0.0029	0.0029	0.0029	0.0029	
-0.0036	0.0028	-0.0050	0.0147	-0.0218	0.0192	0.0192	-0.0060	0.0068	0.0934	***	0.0135	-0.0427	**	0.0206	-0.0011	0.0024	0.0024	0.0024	0.0024	
-0.0013	0.0059	0.0034	0.0313	0.0861	**	0.0409	-0.0033	0.0144	-0.0083	0.0287	-0.0683	0.0439	0.0047	0.0052	0.0047	0.0052	0.0052	0.0052	0.0052	
-0.0029	0.0050	0.0478	*	0.0266	0.1427	***	0.0348	0.0022	0.0612	**	0.0244	0.0323	0.0373	-0.0002	0.0044	0.0044	0.0044	0.0044	0.0044	
0.0856	***	0.0103	-0.0292	0.0547	-0.0033	0.0715	-0.0286	0.0252	0.0148	0.0502	0.0155	0.0767	-0.0037	0.0091	-0.0037	0.0091	0.0091	0.0091	0.0091	
-0.0835	***	0.0143	0.0737	0.0758	0.4039	***	0.0992	0.0235	0.0349	-0.1542	**	0.0696	-0.0296	0.1063	-0.0008	0.0126	0.0126	0.0126	0.0126	
-0.0045	0.0106	-0.0804	0.0565	-0.1603	**	0.0739	0.0028	0.0260	0.0620	0.0519	0.0389	0.0793	0.0078	0.0094	0.0078	0.0094	0.0094	0.0094	0.0094	
0.0003	0.0050	-0.0161	0.0265	-0.0542	0.0347	0.0347	-0.0173	0.0122	0.0109	0.0243	-0.0140	0.0372	-0.0028	0.0044	-0.0028	0.0044	0.0044	0.0044	0.0044	
-0.0163	0.0104	-0.0119	0.0552	0.1563	**	0.0722	-0.0154	0.0254	-0.0346	0.0507	0.0087	0.0775	0.0011	0.0092	0.0011	0.0092	0.0092	0.0092	0.0092	
-0.0007	0.0129	0.0060	0.0687	0.0160	0.0899	0.0899	0.0088	0.0316	-0.0549	0.0631	0.0701	0.0964	0.0031	0.0114	0.0031	0.0114	0.0114	0.0114	0.0114	
0.0030	0.0091	0.0160	0.0483	0.0455	0.0632	0.0632	-0.0003	0.0222	-0.0207	0.0443	0.0449	0.0677	-0.0011	0.0080	-0.0011	0.0080	0.0080	0.0080	0.0080	
0.0074	***	0.0011	0.0954	***	0.0053	0.1535	***	0.0069	0.0371	***	0.0025	0.0826	***	0.0049	0.0332	***	0.0074	0.0084	***	0.0009

Appendix6 Regression results for calculating elasticities of Table7 and 14

Dependent variable is cost share			(1)		(2)			(3)			(4)			(5)			
			Male workers with														
			Junior or senior high school diplomas for			Higher professional school, junior college, university or						Part-time workers					
			a definite period			an indefinite period			a definite period			an indefinite period			a definite period		
			Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	
ln wage of	male workers with	Junior or senior high school diplomas for a definite period	0.0084	***	0.0001	-0.0021	***	0.0001	0.0003	***	0.0000	-0.0025	***	0.0001	-0.0003	***	0.0000
		Junior or senior high school diplomas for an indefinite period	-0.0021	***	0.0001	0.0379	***	0.0005	-0.0021	***	0.0001	-0.0147	***	0.0003	-0.0015	***	0.0001
		Higher professional school, junior college, university or graduate school diplomas for a definite period	0.0003	***	0.0000	-0.0021	***	0.0001	0.0059	***	0.0001	-0.0012	***	0.0001	-0.0005	***	0.0000
		Higher professional school, junior college, university or graduate school diplomas for an indefinite period	-0.0025	***	0.0001	-0.0147	***	0.0003	-0.0012	***	0.0001	0.0332	***	0.0004	-0.0008	***	0.0001
		Part-time workers a definite period	-0.0003	***	0.0000	-0.0015	***	0.0001	-0.0005	***	0.0000	-0.0008	***	0.0001	0.0056	***	0.0001
		Part-time workers an indefinite period	-0.0002	***	0.0000	-0.0017	***	0.0001	-0.0004	***	0.0000	-0.0011	***	0.0001	-0.0007	***	0.0000
	female workers with	Junior or senior high school diplomas for a definite period	0.0007	***	0.0001	-0.0024	***	0.0001	-0.0005	***	0.0000	-0.0023	***	0.0001	-0.0008	***	0.0001
		Junior or senior high school diplomas for an indefinite period	-0.0013	***	0.0001	0.0027	***	0.0002	-0.0007	***	0.0000	-0.0078	***	0.0002	-0.0011	***	0.0001
		Higher professional school, junior college, university or graduate school diplomas for a definite period	-0.0005	***	0.0000	-0.0019	***	0.0001	0.0003	***	0.0000	-0.0010	***	0.0000	-0.0006	***	0.0000
		Higher professional school, junior college, university or graduate school diplomas for an indefinite period	-0.0008	***	0.0000	-0.0061	***	0.0001	-0.0003	***	0.0000	0.0030	***	0.0001	-0.0004	***	0.0000
		Part-time workers a definite period	-0.0011	***	0.0001	-0.0044	***	0.0002	-0.0005	***	0.0000	-0.0023	***	0.0001	0.0018	***	0.0001
		Part-time workers an indefinite period	-0.0005	***	0.0001	-0.0037	***	0.0002	-0.0003	***	0.0000	-0.0025	***	0.0001	-0.0008	***	0.0000
ln(tangible fixed asset)			-0.0004	**	0.0002	0.0061	***	0.0009	-0.0001		0.0001	0.0003		0.0009	-0.0007	***	0.0001
ln(total output)			0.0006		0.0004	-0.0075	***	0.0018	0.0005	**	0.0002	0.0163	***	0.0016	0.0017	***	0.0003
ln(total input)			-0.0005	**	0.0002	0.0020	*	0.0012	-0.0004	***	0.0001	0.0002		0.0011	-0.0002		0.0002
Overseas affiliates dummy			-0.0008		0.0006	-0.0143	***	0.0029	0.0004		0.0003	0.0116	***	0.0027	-0.0005		0.0005
Export dummy			-0.0007		0.0006	-0.0195	***	0.0032	0.0006	*	0.0004	0.0268	***	0.0030	-0.0001		0.0005
Import dummy			0.0002		0.0006	-0.0158	***	0.0030	-0.0001		0.0004	0.0153	***	0.0028	-0.0005		0.0005
Ratio of export to	Asia		-0.0043		0.0038	-0.0090		0.0186	-0.0051	**	0.0022	0.0473	***	0.0174	-0.0018		0.0029
	North America		-0.0048		0.0064	-0.0115		0.0315	0.0002		0.0038	0.0566	*	0.0294	-0.0007		0.0049
	Europe		0.0091		0.0079	-0.1591	***	0.0389	0.0113	**	0.0047	0.1108	***	0.0363	0.0000		0.0061
	Other region		-0.0118	*	0.0062	-0.0019		0.0305	-0.0067	*	0.0036	0.0539	*	0.0284	-0.0027		0.0047
	Ratio of import from			0.0029		0.0023	-0.0409	***	0.0112	-0.0004		0.0013	-0.0097		0.0104	0.0005	
Ratio of export by other companies to	Asia		-0.0033		0.0048	-0.0472	**	0.0238	-0.0019		0.0028	0.0881	***	0.0221	-0.0062	*	0.0037
	North America		-0.0072		0.0048	-0.0752	***	0.0237	-0.0048	*	0.0028	0.0618	***	0.0220	-0.0043		0.0037
	Europe		-0.0012		0.0087	0.1146	***	0.0431	-0.0014		0.0052	-0.1363	***	0.0402	-0.0055		0.0067
	Other region		0.0062		0.0094	0.1536	***	0.0462	-0.0070		0.0055	-0.2265	***	0.0431	-0.0099		0.0072
	Ratio of import by other companies from			-0.0037		0.0118	-0.0475		0.0585	0.0018		0.0070	0.0311		0.0545	0.0253	***
Ratio of import by other companies from	Asia		0.0087		0.0227	0.1023		0.1121	0.0247	*	0.0134	-0.4442	***	0.1044	0.0037		0.0174
	North America		0.0175		0.0181	0.0402		0.0895	-0.0229	**	0.0107	0.0991		0.0834	-0.0350	**	0.0139
	Europe		-0.0016		0.0076	-0.0073		0.0375	-0.0006		0.0045	0.0298		0.0350	0.0055		0.0058
	Other region		0.0216		0.0147	0.0460		0.0726	0.0072		0.0087	-0.1485	**	0.0677	0.0065		0.0113
Cons.	Asia		0.0592	**	0.0238	0.2659	**	0.1174	0.0174		0.0140	-0.4279	***	0.1094	0.0139		0.0183
	North America		-0.0331	**	0.0148	0.0220		0.0734	-0.0178	**	0.0088	-0.0089		0.0683	-0.0140		0.0114
	Other region		0.0528	***	0.0020	0.2733	***	0.0097	0.0326	***	0.0012	0.1479	***	0.0090	0.0189	***	0.0016

Notes: A full set of industry dummies and year dummies is included.

*** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

Appendix6 Regression results for calculating elasticities of Table7 and 14(Continue)

(6)			(7)			(8)			(9)			(10)			(11)			(12)		
Male workers with			Female workers with																	
Part-time workers			Junior or senior high school diplomas for						Higher professional school, junior college, university or						Part-time workers					
an indefinite period			a definite period			an indefinite period			a definite period			an indefinite period			a definite period			an indefinite period		
Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
-0.0002	***	0.0000	0.0007	***	0.0001	-0.0013	***	0.0001	-0.0005	***	0.0000	-0.0008	***	0.0000	-0.0011	***	0.0001	-0.0005	***	0.0001
-0.0017	***	0.0001	-0.0024	***	0.0001	0.0027	***	0.0002	-0.0019	***	0.0001	-0.0061	***	0.0001	-0.0044	***	0.0002	-0.0037	***	0.0002
-0.0004	***	0.0000	-0.0005	***	0.0000	-0.0007	***	0.0000	0.0003	***	0.0000	-0.0003	***	0.0000	-0.0005	***	0.0000	-0.0003	***	0.0000
-0.0011	***	0.0001	-0.0023	***	0.0001	-0.0078	***	0.0002	-0.0010	***	0.0000	0.0030	***	0.0001	-0.0023	***	0.0001	-0.0025	***	0.0001
-0.0007	***	0.0000	-0.0008	***	0.0001	-0.0011	***	0.0001	-0.0006	***	0.0000	-0.0004	***	0.0000	0.0018	***	0.0001	-0.0008	***	0.0000
0.0061	***	0.0001	-0.0004	***	0.0001	-0.0007	***	0.0001	-0.0005	***	0.0000	-0.0005	***	0.0000	-0.0007	***	0.0001	0.0009	***	0.0000
-0.0004	***	0.0001	0.0087	***	0.0001	-0.0009	***	0.0001	0.0003	***	0.0000	-0.0006	***	0.0001	-0.0005	***	0.0001	-0.0011	***	0.0001
-0.0007	***	0.0001	-0.0009	***	0.0001	0.0136	***	0.0002	-0.0006	***	0.0000	-0.0010	***	0.0001	-0.0020	***	0.0001	-0.0003	***	0.0001
-0.0005	***	0.0000	0.0003	***	0.0000	-0.0006	***	0.0000	0.0054	***	0.0001	-0.0001	***	0.0000	-0.0003	***	0.0000	-0.0004	***	0.0000
-0.0005	***	0.0000	-0.0006	***	0.0001	-0.0010	***	0.0001	-0.0001	***	0.0000	0.0082	***	0.0001	-0.0007	***	0.0001	-0.0006	***	0.0001
-0.0007	***	0.0001	-0.0005	***	0.0001	-0.0020	***	0.0001	-0.0003	***	0.0000	-0.0007	***	0.0001	0.0139	***	0.0001	-0.0032	***	0.0001
0.0009	***	0.0000	-0.0011	***	0.0001	-0.0003	**	0.0001	-0.0004	***	0.0000	-0.0006	***	0.0001	-0.0032	***	0.0001	0.0126	***	0.0001
-0.0006	***	0.0002	-0.0009	***	0.0002	-0.0009	*	0.0005	-0.0005	***	0.0001	-0.0015	***	0.0003	-0.0010	***	0.0004	0.0003		0.0004
0.0012	***	0.0003	-0.0008	**	0.0004	-0.0136	***	0.0010	0.0004	**	0.0002	-0.0014	**	0.0005	0.0026	***	0.0006	-0.0001		0.0007
0.0002		0.0002	0.0002		0.0003	-0.0012	*	0.0007	0.0001		0.0001	-0.0009	***	0.0004	0.0001		0.0004	0.0004		0.0005
0.0003		0.0005	0.0008		0.0006	0.0040	**	0.0017	0.0004		0.0003	0.0034	***	0.0009	-0.0041	***	0.0011	-0.0012		0.0012
-0.0010	**	0.0005	-0.0005		0.0007	-0.0027		0.0018	-0.0002		0.0004	0.0014		0.0010	-0.0012		0.0012	-0.0030	**	0.0013
-0.0011	**	0.0005	0.0015	**	0.0007	-0.0012		0.0017	0.0006	*	0.0003	0.0003		0.0010	0.0016		0.0011	-0.0010		0.0013
0.0013		0.0030	0.0006		0.0041	-0.0111		0.0106	-0.0021		0.0021	-0.0142	**	0.0058	-0.0063		0.0069	0.0049		0.0077
0.0083	*	0.0050	-0.0010		0.0069	-0.0126		0.0179	0.0016		0.0035	-0.0268	***	0.0099	-0.0030		0.0117	-0.0063		0.0130
-0.0029		0.0062	0.0068		0.0085	0.0341		0.0221	0.0011		0.0043	0.0053		0.0122	0.0006		0.0144	-0.0172		0.0161
-0.0017		0.0049	0.0013		0.0066	-0.0192		0.0173	-0.0018		0.0034	-0.0134		0.0095	-0.0024		0.0113	0.0065		0.0126
0.0013		0.0018	-0.0081	***	0.0024	0.0273	***	0.0063	-0.0011		0.0012	0.0111	***	0.0035	0.0048		0.0041	0.0123	***	0.0046
-0.0002		0.0038	-0.0056		0.0052	-0.0122		0.0135	-0.0043		0.0026	0.0069		0.0074	-0.0010		0.0088	-0.0132		0.0098
-0.0030		0.0038	-0.0070		0.0052	0.0020		0.0134	-0.0027		0.0026	0.0804	***	0.0074	-0.0208	**	0.0087	-0.0191		0.0098
0.0008		0.0069	0.0065		0.0094	0.0492	**	0.0245	0.0004		0.0048	-0.0159		0.0135	-0.0058		0.0160	-0.0054		0.0178
-0.0048		0.0074	-0.0002		0.0101	0.1215	***	0.0262	-0.0049		0.0051	-0.0423	***	0.0145	-0.0277		0.0171	0.0419	**	0.0191
0.0147		0.0094	0.0484	***	0.0127	-0.0473		0.0332	0.0024		0.0065	-0.0450	**	0.0183	0.0834	***	0.0216	-0.0636	***	0.0242
-0.0161		0.0179	0.0136		0.0244	0.3448	***	0.0636	0.0086		0.0124	-0.0600	*	0.0351	-0.0019		0.0415	0.0158		0.0463
0.0040		0.0143	-0.1464	***	0.0195	-0.0477		0.0508	-0.0237	**	0.0099	0.1215	***	0.0280	-0.1546	***	0.0331	0.1481	***	0.0370
0.0042		0.0060	-0.0038		0.0082	-0.0252		0.0213	-0.0060		0.0042	-0.0010		0.0117	0.0005		0.0139	0.0054		0.0155
-0.0123		0.0116	0.0306	*	0.0158	0.0474		0.0412	0.0048		0.0081	-0.0416	*	0.0227	0.0841	***	0.0269	-0.0456		0.0300
0.0175		0.0188	0.0477	*	0.0256	-0.0955		0.0667	0.0161		0.0130	0.0355		0.0367	0.0334		0.0434	0.0169		0.0485
-0.0033		0.0117	-0.0517	***	0.0160	0.1015	**	0.0416	-0.0086		0.0081	0.0160		0.0230	-0.0820	***	0.0271	0.0800	***	0.0303
0.0251	***	0.0016	0.0570	***	0.0022	0.1785	***	0.0055	0.0284	***	0.0011	0.0807	***	0.0031	0.0562	***	0.0036	0.0485	***	0.0040

Appendix7 Regression results for calculating elasticities of Table8 and 15

Dependent variable is cost share		(1)		(2)		(3)		(4)		(5)		
		Male workers aged										
		15-Under 20		20-30		30-40		40-50		50-60		
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	
ln wage of male workers aged	15-Under 20	0.0116 ***	0.0001	0.0009 ***	0.0001	-0.0027 ***	0.0001	-0.0029 ***	0.0001	-0.0015 ***	0.0001	
	20-30	0.0009 ***	0.0001	0.0568 ***	0.0006	0.0025 ***	0.0005	-0.0165 ***	0.0005	-0.0199 ***	0.0004	
	30-40	-0.0027 ***	0.0001	0.0025 ***	0.0005	0.0659 ***	0.0008	-0.0092 ***	0.0006	-0.0172 ***	0.0005	
	40-50	-0.0029 ***	0.0001	-0.0165 ***	0.0005	-0.0092 ***	0.0006	0.0629 ***	0.0007	0.0000	0.0005	
	50-60	-0.0015 ***	0.0001	-0.0199 ***	0.0004	-0.0172 ***	0.0005	0.0000	0.0005	0.0644 ***	0.0006	
	Over 60	-0.0006 ***	0.0001	-0.0035 ***	0.0002	-0.0051 ***	0.0002	-0.0044 ***	0.0002	0.0010 ***	0.0002	
	female workers aged	15-Under 20	-0.0002 ***	0.0001	0.0001	0.0001	-0.0032 ***	0.0001	-0.0031 ***	0.0001	-0.0015 ***	0.0001
		20-30	-0.0008 ***	0.0001	0.0049 ***	0.0003	-0.0036 ***	0.0004	-0.0113 ***	0.0003	-0.0123 ***	0.0003
		30-40	-0.0010 ***	0.0001	-0.0072 ***	0.0003	-0.0042 ***	0.0003	-0.0049 ***	0.0003	-0.0068 ***	0.0002
		40-50	-0.0007 ***	0.0001	-0.0079 ***	0.0003	-0.0074 ***	0.0003	-0.0043 ***	0.0003	-0.0053 ***	0.0002
50-60		-0.0010 ***	0.0001	-0.0081 ***	0.0003	-0.0112 ***	0.0003	-0.0044 ***	0.0003	-0.0004	0.0003	
Over 60	-0.0011 ***	0.0001	-0.0022 ***	0.0001	-0.0045 ***	0.0002	-0.0020 ***	0.0001	-0.0005 ***	0.0001		
ln(tangible fixed asset)		-0.0001	0.0001	0.0018 ***	0.0005	0.0019 ***	0.0005	0.0012 **	0.0005	-0.0001	0.0006	
ln(total output)		-0.0004 ***	0.0002	-0.0005	0.0009	0.0035 ***	0.0010	0.0057 ***	0.0010	0.0051 ***	0.0012	
ln(total input)		0.0002	0.0001	-0.0011 **	0.0006	0.0018 ***	0.0007	0.0003	0.0007	-0.0003	0.0008	
Overseas affiliates dummy		-0.0004 *	0.0003	-0.0019	0.0014	0.0009	0.0017	0.0005	0.0017	-0.0003	0.0019	
Export dummy		0.0006 **	0.0003	-0.0037 **	0.0016	0.0006	0.0018	-0.0025	0.0018	0.0077 ***	0.0021	
Import dummy		-0.0007 ***	0.0003	-0.0039 ***	0.0015	0.0046 ***	0.0017	0.0007	0.0017	-0.0018	0.0020	
Ratio of export to												
	Asia	0.0000	0.0016	0.0066	0.0091	0.0413 ***	0.0106	0.0165	0.0106	-0.0496 ***	0.0123	
	North America	-0.0065 **	0.0027	0.0154	0.0153	0.0442 **	0.0179	0.0360 **	0.0180	-0.0142	0.0209	
	Europe	-0.0018	0.0033	-0.0352 *	0.0189	0.0524 **	0.0221	0.0280	0.0222	-0.0693 ***	0.0258	
	Other region	-0.0062 **	0.0026	-0.0311 **	0.0148	-0.1338 ***	0.0173	-0.0289 *	0.0174	0.2036 ***	0.0202	
Ratio of import from												
	Asia	0.0020 **	0.0010	0.0037	0.0054	-0.0243 ***	0.0063	0.0006	0.0064	-0.0160 **	0.0074	
	North America	0.0028	0.0020	-0.0060	0.0116	0.0337 **	0.0135	0.0191	0.0135	-0.0392 **	0.0157	
	Europe	0.0034 *	0.0020	-0.0213 *	0.0115	-0.0004	0.0134	0.0032	0.0135	-0.0176	0.0157	
	Other region	-0.0089 **	0.0037	-0.0404 *	0.0210	-0.1061 ***	0.0245	0.0292	0.0246	0.1388 ***	0.0285	
Ratio of export by other companies to												
	Asia	-0.0046	0.0040	0.0381 *	0.0225	0.1069 ***	0.0262	-0.0145	0.0263	-0.1906 ***	0.0306	
	North America	-0.0055	0.0050	-0.0213	0.0285	0.0355	0.0332	-0.0710 **	0.0333	0.0909 **	0.0387	
	Europe	0.0080	0.0096	0.1676 ***	0.0545	0.0588	0.0636	0.3181 ***	0.0638	-0.7036 ***	0.0742	
	Other region	0.0098	0.0077	0.0162	0.0436	-0.0160	0.0508	-0.3342 ***	0.0510	0.2799 ***	0.0593	
Ratio of import by other companies from												
	Asia	-0.0037	0.0032	0.0088	0.0183	0.0469 **	0.0213	-0.0583 ***	0.0214	0.0173	0.0248	
	North America	0.0033	0.0062	0.0573	0.0353	0.0721 *	0.0412	-0.0128	0.0414	-0.1650 ***	0.0481	
	Europe	0.0093	0.0101	0.1567 ***	0.0571	-0.0615	0.0666	-0.0962	0.0669	-0.1251	0.0777	
	Other region	-0.0060	0.0063	0.0693 *	0.0357	0.1783 ***	0.0416	-0.1551 ***	0.0418	-0.1265 ***	0.0485	
Cons.		0.0302 ***	0.0008	0.0956 ***	0.0047	0.1001 ***	0.0055	0.0968 ***	0.0055	0.1635 ***	0.0063	

Notes: A full set of industry dummies and year dummies is included.

*** significant at the 1 percent level, ** significant at the 5 percent level, * significant at the 10 percent level.

Appendix7 Regression results for calculating elasticities of Table8 and 15(Continue)

(6)			(7)			(8)			(9)			(10)			(11)			(12)		
Male workers aged			Female workers aged																	
Over 60			15-Under 20			20-30			30-40			40-50			50-60			Over 60		
Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.		Coef.	Std. Err.	
-0.0006	***	0.0001	-0.0002	***	0.0001	-0.0008	***	0.0001	-0.0010	***	0.0001	-0.0007	***	0.0001	-0.0010	***	0.0001	-0.0011	***	0.0001
-0.0035	***	0.0002	0.0001		0.0001	0.0049	***	0.0003	-0.0072	***	0.0003	-0.0079	***	0.0003	-0.0081	***	0.0003	-0.0022	***	0.0001
-0.0051	***	0.0002	-0.0032	***	0.0001	-0.0036	***	0.0004	-0.0042	***	0.0003	-0.0074	***	0.0003	-0.0112	***	0.0003	-0.0045	***	0.0002
-0.0044	***	0.0002	-0.0031	***	0.0001	-0.0113	***	0.0003	-0.0049	***	0.0003	-0.0043	***	0.0003	-0.0044	***	0.0003	-0.0020	***	0.0001
0.0010	***	0.0002	-0.0015	***	0.0001	-0.0123	***	0.0003	-0.0068	***	0.0002	-0.0053	***	0.0002	-0.0004		0.0003	-0.0005	***	0.0001
0.0190	***	0.0001	-0.0006	***	0.0001	-0.0023	***	0.0001	-0.0016	***	0.0001	-0.0016	***	0.0001	-0.0003	**	0.0001	0.0000		0.0001
-0.0006	***	0.0001	0.0112	***	0.0001	0.0001		0.0001	-0.0006	***	0.0001	-0.0003	***	0.0001	-0.0006	***	0.0001	-0.0013	***	0.0001
-0.0023	***	0.0001	0.0001		0.0001	0.0282	***	0.0003	0.0022	***	0.0002	-0.0009	***	0.0002	-0.0028	***	0.0002	-0.0013	***	0.0001
-0.0016	***	0.0001	-0.0006	***	0.0001	0.0022	***	0.0002	0.0221	***	0.0002	0.0026	***	0.0002	0.0003	*	0.0002	-0.0008	***	0.0001
-0.0016	***	0.0001	-0.0003	***	0.0001	-0.0009	***	0.0002	0.0026	***	0.0002	0.0219	***	0.0002	0.0043	***	0.0002	-0.0005	***	0.0001
-0.0003	**	0.0001	-0.0006	***	0.0001	-0.0028	***	0.0002	0.0003	*	0.0002	0.0043	***	0.0002	0.0235	***	0.0002	0.0006	***	0.0001
0.0000		0.0001	-0.0013	***	0.0001	-0.0013	***	0.0001	-0.0008	***	0.0001	-0.0005	***	0.0001	0.0006	***	0.0001	0.0135	***	0.0001
-0.0009	***	0.0002	0.0001		0.0001	-0.0013	***	0.0003	-0.0014	***	0.0002	-0.0010	***	0.0003	-0.0005		0.0003	0.0001		0.0001
-0.0015	***	0.0003	-0.0001		0.0001	-0.0008		0.0006	-0.0008	*	0.0004	-0.0031	***	0.0005	-0.0068	***	0.0006	-0.0004	**	0.0002
0.0001		0.0002	0.0000		0.0001	-0.0012	***	0.0004	-0.0007	**	0.0003	-0.0003		0.0003	0.0011	***	0.0004	0.0003	**	0.0001
-0.0013	**	0.0005	-0.0001		0.0002	0.0010		0.0010	0.0017	**	0.0007	0.0002		0.0008	-0.0003		0.0009	0.0000		0.0003
0.0002		0.0006	0.0010	***	0.0003	0.0002		0.0011	-0.0001		0.0008	-0.0024	***	0.0009	-0.0017	*	0.0010	0.0002		0.0003
-0.0008		0.0006	-0.0005	**	0.0003	0.0026	***	0.0010	0.0009		0.0008	0.0000		0.0009	-0.0004		0.0010	-0.0005		0.0003
0.0010		0.0034	-0.0008		0.0016	-0.0160	***	0.0062	-0.0032		0.0047	-0.0026		0.0053	0.0027		0.0061	0.0040	**	0.0020
0.0069		0.0058	-0.0041		0.0026	-0.0193	*	0.0105	-0.0234	***	0.0080	-0.0243	***	0.0089	-0.0154		0.0102	0.0048		0.0034
-0.0030		0.0072	0.0023		0.0032	0.0181		0.0130	-0.0039		0.0098	0.0020		0.0110	0.0048		0.0126	0.0057		0.0042
-0.0024		0.0056	-0.0002		0.0025	-0.0104		0.0102	-0.0063		0.0077	0.0069		0.0086	0.0092		0.0099	-0.0002		0.0033
0.0057	***	0.0021	0.0015		0.0009	0.0014		0.0037	0.0021		0.0028	0.0103	***	0.0032	0.0128	***	0.0036	0.0001		0.0012
-0.0011		0.0044	-0.0012		0.0020	-0.0032		0.0079	-0.0029		0.0060	-0.0034		0.0067	0.0000		0.0077	0.0016		0.0026
-0.0015		0.0043	0.0018		0.0020	0.0236	***	0.0079	0.0224	***	0.0060	0.0020		0.0067	-0.0167	**	0.0077	0.0012		0.0025
-0.0125		0.0079	0.0013		0.0036	0.0000		0.0144	-0.0082		0.0109	0.0122		0.0122	-0.0027		0.0140	-0.0028		0.0046
-0.0097		0.0085	-0.0028		0.0039	0.0360	**	0.0154	0.0083		0.0117	0.0392	***	0.0130	0.0032		0.0150	-0.0095	*	0.0050
0.0154		0.0108	-0.0033		0.0049	-0.0831	***	0.0195	0.0075		0.0148	-0.0119		0.0165	0.0225		0.0190	0.0244	***	0.0063
-0.0561	***	0.0206	-0.0036		0.0094	0.0763	**	0.0374	0.0141		0.0283	0.0980	***	0.0316	0.0468		0.0364	-0.0244	**	0.0121
0.0595	***	0.0165	0.0156	**	0.0075	0.1001	***	0.0299	-0.0137		0.0226	-0.0160		0.0253	-0.0747	***	0.0291	-0.0265	***	0.0096
0.0127	*	0.0069	-0.0015		0.0031	-0.0254	**	0.0125	-0.0070		0.0095	-0.0249	**	0.0106	0.0293	**	0.0122	0.0059		0.0040
-0.0142		0.0134	-0.0009		0.0061	0.0152		0.0242	0.0112		0.0184	0.0147		0.0205	0.0111		0.0236	0.0080		0.0078
-0.0013		0.0216	0.0005		0.0098	0.0510		0.0391	0.0608	**	0.0297	-0.0328		0.0331	0.0313		0.0381	0.0074		0.0126
0.0225	*	0.0135	0.0068		0.0061	0.0697	***	0.0245	-0.0401	**	0.0185	0.0140		0.0207	-0.0200		0.0238	-0.0128		0.0079
0.0689	***	0.0018	0.0264	***	0.0008	0.0874	***	0.0032	0.0905	***	0.0024	0.0969	***	0.0027	0.1113	***	0.0031	0.0325	***	0.0011