International Wage Determination and Globalization

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Abstract

This paper analyzes new data on wages and salaries in 3256 companies in 58 countries. Multinational companies pay a wage premium that averages about 14 percent for high-paying occupations in relatively poorer countries. They do not pay a significant premium in OECD countries nor for very low-paying occupations in poorer countries. The data also indicate that larger companies pay higher wages in all occupations. When we look at wages by occupation across countries the data indicate that minimum wage rules have a small effect in raising pay of low-wage occupations. Cross country differences in the extent of democratic rights or in wage-setting institutions or unionization rates appear to have little effect on wages. The size of the immigrant population and the share of workers in agriculture is also not strongly correlated with wages of low-paying occupations. Wages and salaries generally are tightly correlated with the level of GDP, as expected. However,

the association is much weaker for salaries of managers. Empirical tests suggest that this is linked to the fact that executives in certain countries which either speak English as a primary language or have high foreign language attainment can more readily market themselves globally rather than locally. This means that labor markets are global but only for certain high paying professions and for certain internationally-oriented countries.

1. Introduction

This paper examines international wage determination using a new data set of wages for the year 1998 from a sample of medium to large companies in 58 countries[1]. The data were collected to fill in a gap in our knowledge about wage levels in different countries. Good wage data exist for *some* countries, but these are primarily OECD economies, which have similar levels of income and fairly similar institutions. Further, there are problems with comparability even with this data, due to the lack of synchronization of reporting and the lack of common standards on a number of details. In several poorer countries the problem is simply that adequate wage data are not collected. This absence of data from poorer countries

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means that we lack information to use in tests that require extensive variation in national income.

The data will be discussed more extensively below, but briefly, it was collected in early 1999 through identical surveys of managers in large firms in 58 countries. Each company was asked to report monthly take-home-pay in their company for five occupations: Janitors, Drivers, Secretaries with five years experience, mid-level managers and top managers. Companies were also asked to report their sector of operation, number of employes, multinational affiliation and a number of other questions pertaining to the nature of their business and labor market practices in their company and main country of operation. The strategy was to ask relatively simple questions to obtain a high response rate, with full awareness that there would be some cost in terms of precision. The advantage of this data is that it covers a large number of countries, and asks the same questions about wages to executives within each country at the same point in time. The sample sizes average about 56 firms per country. The composition of responding firms was designed to be proportional to the distribution of non-agricultural labor force in each country and was weighted towards medium to large firms. However, we cannot guarantee that this was carried out with the same diligence in every country and ultimately we cannot guarantee complete accuracy in reported wages and salaries. Nevertheless we can calculate wages that adjust for differences in the

composition of the sample ex-post by controlling for firm-specific characteristics such as sector, size and nature of the firm in regressions that also have country-specific dummy variables. We can also run several quality checks on the data. In the course of the paper we hope to convince the reader that the resulting wage information is indeed quite reliable.

The core of the paper includes two kinds of regressions. In the first regressions wages by occupation, company, sector and country are regressed on a vector of company characteristics, sector dummy variables and country-specific dummy variables. In other words, this is a fixed-effects specification with fixed effects for sector and country. We focus on these regressions primarily to learn which characteristics of companies are associated with wages on a world-wide basis. In the second kind of regression mean wages by occupation are regressed on a list of country-specific variables. Our measure of the mean wage is not the unconditional mean but rather the estimated coefficients on the country dummy variables from the first kind of regression. Since these country fixed effects are taken from regressions with size and industry dummy variables, they represent estimates of the mean wage by country after controlling for the composition of company size and industry in the sample.

The paper has five sections. After the introduction, the second section describes the data and the executive survey that generated the wage and salary data.

This section also discusses some additional evidence to corroborate the wage data and evaluate the accuracy of the survey information. The third section presents regressions of wages of the five occupations on company characteristics. These regressions examine the association of wages with the multinational status of the company, public/government nature of the company, size of the company, recent performance of the company, the nature of the competitive pressures facing the company, and the economic sector of the company. The fourth section examines wage determination across countries. The section first discusses how the cross country association between wages and GDP by occupation may be informative about the extent of globalization of labor markets. Then the section presents regressions that estimate the effects of cross country differences in product market competition, foreign language attainment, labor market regulations, perceived unionization and centralized wage setting, and democratic rights. The section also tests whether foreign language attainment by executives serves to de-link their pay from the standard of the domestic labor market. The final section summarizes the findings in the context of a discussion of globalization.

This paper is related to Richard Freeman and Remco Oostendorp (2000), who examine different data on wages across countries. Freeman and Oostendorp examine the determinants of the *standard deviation of log wages* across occupations by country and by year during 1983-1988. We examine the determinants of the

level of log wages conditional on local GDP, so the dependent variables in the two studies are different. Freeman and Oostendorp's findings are that a) skill differentials during the 1980s were larger in poorer countries, b) cross-country differences in pay by occupation increased between 1983 and 1998, and c) that local GDP and wage-setting institutions were the two most important determinants of the standard deviation in log wages. The data source in Freeman and Oostendorp is the October Inquiry of the International Labor Office. The I.L.O. data varies by occupation, time and country. The data here varies by occupation, company and country. Hence the main difference is that our data has company variation but the I.L.O. data offers time variation. The range of occupations in the I.L.O. data is also more detailed than the five occupations considered here.

2. The company survey

The surveys were conducted in 58 countries in January and February of 1999, by local Partner Institutes of the World Economic Forum directly or by professional survey firms hired by the Partners. The Partner Institute's were given tables that reported employment by economic sector and were asked to choose samples in which the distribution of firms was proportional to the distribution of non-agricultural employment across sectors. These employment data were taken from

the Yearbook of Labor Statistics of the International Labor Office.[2] The Partners were also asked to conduct personal interviews with the CEO or top managers in each enterprise. We expect nevertheless that most CEO's delegated this work to a colleague or an assistant. In total 3843 companies filled out all or part of the survey. The list of countries, number of respondents from each country and number of respondents who answered the wage question are listed in table 1.

Each executive was requested to report the typical monthly salary for year 1998 for the following occupations: Office cleaner, Driver, Secretary with five years experience, mid-level manager, senior manager. See appendix 2 for a reproduction of the survey question. The survey requested full time equivalent monthly wages or salaries in local currency. Firms were asked to report salaries that did not include payroll taxes that they paid on behalf of the worker. They were also asked not to deduct income taxes. We show plots of the data on median wages by occupation against GDP per-worker in figures 1-5. In these figures both wages and GDP are measured in logs of US dollars for 1998. One line in the figures is the 45 degree line representing equality between annual wages and per-worker GDP, and the other is the simple least squares regression line.

The occupational categories were chosen to be sufficiently broad so that all companies would be able to respond without too much effort, but at the same

[2] See Yearbook of Labour Statistics, 1998 p. 1287 or p. 1293 for examples.

time sufficiently specific so that the results would be reasonably comparable across countries. Virtually all companies have office cleaners, secretaries and managers. The driver category was included in an attempt to obtain wages for manual labor between Janitors and Secretaries. This reasoning is disputable: it is very common in Eastern Europe, parts of Western Europe and South America for companies to have drivers on hand dedicated to running errands, but this is less common in the United States and some other counties.

Of the 3843 surveys returned, 3256 (84.7 percent) contained at least one answer to the wage questions. More detail on the sample sizes and response rates by country is presented in table 1. Table 2 shows that of these 3256 surveys with at least one response to the wage question, 82.4 percent responded with data on all five wage questions. In total, out of these 3256 surveys there were 15,420 wages or salaries reported. Table 3 shows that out of this number only 241 (1.6 percent) were thrown out because the values were considered implausible. A reported wage was deemed implausible if it was found to be very different from the other wages reported for that country and occupation.

These monthly wages in local currency were then converted to annual rates by multiplying by 12, and to a uniform currency (US Dollars) by using the average annual exchange rate during 1998. In spite of the instructions in the question, some survey respondents nevertheless reported the data in US dollars or in annual

terms or in weekly terms. These were converted where possible on a case-by-case basis. In many cases this change was noted in writing in the survey form so there was little ambiguity. In other cases where the reported wage was in an unusual unit for that country, and there was no further guiding evidence, the case was eliminated.

It is possible that firms with high executive wages would deliberately not respond to the questions about executive salaries. One way to try to assess this is to look at the cases of partial responses. Table 4 shows a matrix to assess this. To read this table, the first row reports that there were 2798 cases that answered the Office Cleaner wage question. Of these, only 91 (3.3 percent) did not fill out the question on the top-manager's salary. For comparison even more (142) did not respond to the question on the Driver's wage. Overall partial responses turn out to be fairly rare in this data. Table 4 also shows that partial responses were actually more likely for the lower-paying occupations. That is, it was more likely that those who responded to the question about the top manager's salary failed to respond to the question about the Janitor's wage than the other way around.

Table 5 shows a break down of these 91 non-respondents. The general pattern, which also tends to be the case for other examples, is that the non-responses are clustered in certain countries. Several Latin American countries were reluctant to fill out the manager's salary, especially Costa Rica , El Salvador, Bolivia and

Venezuela. Judging from the rest of the data, these countries have relatively high salaries for given levels of GDP per worker. If we focus only on these surveys that did not report top-manager's salaries, the table shows that the reported mean salary for the next lowest occupation, mid-managers, tends to be close to the mean for the country, with the exception of Costa Rica. Therefore, except for Costa Rica, this evidence does not suggest that the non-responding firms were especially high-wage firms.

As mentioned above, an effort was made to ensure a similar composition of the samples in different countries by asking that the industry composition of the sample matched the distribution of employment across non-agricultural sectors. In addition, we attempted to deal with this issue by collecting information about the sector, size and other characteristics of the firms. This allows us to both test for and control for the effects of these characteristics on wages in regression analysis. The average wages by country used in later sections of this paper are estimated coefficients from country-dummies in regressions that also control for the size of the firm and the sector of the firm. These estimated country–specific effects turn out to be similar in magnitude to the mean wage by country but are preferable because they control for differences in the composition of the sample across countries.

The overall reliability of the information in this survey is also an issue. One

check on this is simply the reasonableness of the results presented later in this paper. As a further minimum check on accuracy, it should be mentioned that the median wages are highly correlated with average per-capita GDP across countries. Another check on accuracy is to compare the mean responses from the survey questions to outside data on subjects where underlying concepts overlap. In figure 6 we compare the mean response to the survey question on whether wage setting is centralized to independent data on union density and collective bargaining coverage from the OECD Employment Outlook, July 1997, quoted in Freeman (2000, exhibit 6). The response to the survey question is plotted on the horizontal axis, with higher values corresponding to little centralization of wage setting. On the vertical axis, we plot $(union + cbcov)/2$, where *union* is union density and *cbcov* is the percentage coverage of collective bargaining agreements. One can see from the figure that the two are negatively related, as expected, with low perceived centralization being associated with low union density and low coverage ratios. The rankings on centralization from the survey also strongly correlate with the ratings provided in Marshall (1999, table 1) on Latin America and Soskice (1996) for industrialized countries.

3. Results Part I: Company-specific determinants of wages

This section describes the findings from regressions of wages on a list of company specific characteristics, sector-specific intercepts and country-specific intercepts. In other words, the sector and country intercepts are fixed effects that fully control for sector and country-specific determinants of wages so that we focus here on explaining the company-specific part of wage determination. We categorize the variables that may affect wages into four broad groups. The first of these groups is the ownership status of the firm, in which we consider domestic firms, multinational firms and government owned or controlled firms[3]. The second broad group is the size of the firm, in which we consider size in terms of employment and not just size in the local domestic market but also size in all worldwide operations of the company. The third group includes performance variables such a profitability, revenue growth and export growth. And finally the fourth group includes variables on the extent and nature of competition faced by the firm. We also examine, through the sector-specific intercepts, the extent to which the economic sector of the firm is correlated with wage levels on a global basis.

Given that we have five occupations, these questions are of course examined

[3]Our data divides companies into five categories: 1. domestically based firms that sell primarily in the domestic market; 2 domestically based firms that sell in both the domestic market and the foreign market. 3; a unit/subsidiary of a multinational operating in the country; 4. a government or quasi-government enterprise; and 5. a government organization.

separately by occupation. More specifically, the wage data here varies by company (indexed by c), industry (indexed by i), and country (indexed by j). The estimating equation takes the following form for each of the five occupations:

$$\ln(w_{cij}) = \sum_{i=1}^{I} \eta_i d_i + \sum_{j=1}^{J} \theta_j d_j + \alpha' Z_{cij} + e_{cij}.$$

The notation d_i and d_j is used for the industry and country dummy variables; α stands for a vector of coefficients for the additional company characteristics and Z_{cij} is the notation summarizing the corresponding data matrix. It is quite natural to expect errors to be correlated within countries but not across countries (since the sampling is conducted independently in each country). We therefore use a GLS error structure where the error terms will be assumed to be correlated within each country but not across countries. This assumption substantially increases the estimated standard errors relative to the case where each observation is assumed to be and independent draw.

The list of regressors, summarized by the Z matrix above, is large. If a variable is found to be significantly correlated with wages the question inevitably arises whether the result still holds with other possible subsets of the Z matrix included in the regression. To deal with this issue we compare estimates in regressions with both large and small sets of regressors. The regression with the largest

set of regressors is shown in table 7. For comparison, tables 1-4 in appendix 1 reports four additional regressions, one for each group of dummy variable. Each of these regressions includes only the set of variables in the four groups plus the industry and country dummies. For example, in order to test for the effect of ownership status on wages we examine two regressions. One, a large regression (table 7) that has the ownership status variables and all the other variables. Two, a simpler regression (appendix 1, table 1) that has the ownership status variables alone with the country and industry dummies. In table 8 we report our preferred regression that was estimated after eliminating the variables that were found to be insignificant or not robust across specifications.

The main results contained in table 8 can be summarized as follows.

1. There is fairly strong evidence for a multinational premium. Defenders of multinationals claim that multinationals pay more than local firms. If multinationals try to strike a balance between maintaining uniform pay norms in the firm across the world and paying the going wage in the domestic labor market, the multinational wage should be an average of high wages in rich countries and the local wage. If this explains multinational behavior, we would expect to observe that the multinational wage premium would be higher in low wage countries that are farther than international pay norms. On the other hand it is sometimes alleged that multinational firms

pay less for unskilled labor than the local labor market because they have monopsony power or other compensating advantages to offer such as greater job security. The empirical specification allows the multinational wage effect to differ between industrialized and developing countries. That is, we enter the multinational variable alone and also interact it with the OECD dummy variable. This means that the estimated multinational premium in non-OECD countries is simply the estimated coefficient on the multinational dummy variable, but for OECD countries it is the sum of the multinational coefficient and the estimated coefficient on the interaction term. In the results in table 7, 8 and appendix 1 table 1, the multinational premium for non-OECD countries is in the range of 7-27 percent. Our preferred specification in table 8 shows the estimated premium to be between 7 and 14 percent. It is not significant for the lower two occupations, but is significant for secretaries and managers. The estimated premium in OECD countries (given by the sum of the second and third estimated coefficients) is rarely large or statistically significant. The only regression in which it appears significant is in the regression in appendix 2 table 1, but that regression does not control for size. For example, for top managers the estimates in appendix 1 table 1 suggest a 15 percent premium. The p-value given below this estimate suggests that it is highly significant. Yet after controlling

for size as in the regression in table 8, the estimated premium drops to 7 percent and the p-value of 0.2 shows that this would only be significant at the relatively high 20 percent level. These estimates suggest, reasonably, that the multinational premium is zero in OECD countries after controlling for size of firm.

2. Government organizations tend to pay lower wages. Note that the estimated coefficients in table 7 represent the premium in government organizations relative to purely domestic private firms since that is the excluded dummy variable. For example, the estimated coefficient of -0.11 for the government organization dummy in regression number 1 in table 7 indicates that Janitor's wages are on average 0.11 log points lower in government organizations than in solely domestic companies. The t-ratio, calculated with robust standard errors is 2.14, indicating significance at the 5 percent level. To asses robustness, compare this with the same estimated coefficient in appendix 1 table 1. In the case of the government organization coefficient, the estimated effect in appendix 2 is -0.05 (t-ratio 1.26). Therefore the significance of this estimated effect is sensitive to the precise set of regressors included in the regression.

3. The estimates in table 8 also suggest that managers are paid higher salaries

in outwardly-oriented domestic companies than in domestically-oriented domestic companies. However, the estimated effect is small, on the order of 7-9 percent.

4. There is also evidence that larger firms pay higher wages, but only when size is measured by worldwide employment, not domestic employment. The estimates are shown in table 7. The excluded dummy variable in the regression is that for the smallest category of firm (0-500 employees). Relative to these firms, companies with worldwide employment in the range 1,000-10,000 pay a wage premium that ranges between 6 and 21 percent, and the premium is larger for higher paying occupations. Table 7 and table 2 in appendix 1 shows that wages are positively correlated with worldwide employment of the company and not domestic employment.

5. There is evidence for performance bonuses in wages, but only for managerial salaries. Table 8 shows that salaries for mid-managers and top-managers are about three percent higher in companies that report high revenue growth over the past three years. Given the coding of this variable the estimates imply approximately that each additional 10 percent of revenue growth is associated with a 3 percent wage premium for managers. There is also modest evidence that top managers in firms that show strong export growth

receive higher wages, on the order of about 4 or 5 percent. However, this effect is sometimes not significantly different from zero. It is also worth noting the results in table 3 of appendix 1 that if anything, wages are sensitive to revenue growth and not profitability of the firm. In the final preferred specification in table 8, the profit variable is dropped due to insignificance.

6. Table 7 and 8 show that more intense E-mail by companies also correlates with higher wages, and this is true for all occupations. Office cleaners get an extra 2 percent in E-mail literate companies, secretaries get an extra 3 percent, and managers get an extra 4 percent. This estimated effect is probably not causal. Rather, E-mail usage is probably a proxy for other unobservables such as the quality of the capital in the company, or the skill level of the employees, and these in turn account for higher wages.

7. Of the industry intercepts, the textile and apparel sectors report that wages are between 15 and 27 percent lower than food processing (the excluded category). The financial services sector reports 12 percent higher salaries for managers. The petroleum and chemical sector reports higher salaries for the top four occupations and the computer sector reports higher salaries for the managerial occupations. These are the only industry-specific premia that appear significant in these data.

8. It is also worth summarizing what *does not* correlate with wages. As already mentioned, companies with growing profits do not seem to pay higher wages (at least after controlling for revenue growth). And the nature of the competition that a company faces does not seem to have a significant effect on wages. We tested whether companies in rich countries that report that their prime competition is from imports paid lower wages and found no supporting evidence.

4. Results Part II: Country-specific determinants of wages

4.1. Basic Framework

In this section we follow Rodrik (1999) and others by examining regressions of wages on per-capita GDP and other variables to explain the variation in wage levels across countries. Rodrik (1999) motivates the GDP variable as a proxy for average labor productivity. Another simple way to understand these regressions is to think of them as estimating first order conditions from a straightforward production function. To illustrate, consider an economy with two kinds of labor: basic labor (L) and skilled labor (S). Production takes place according to the function $Y_j = A_j(\theta_j S_j + L_j)^{\alpha_j}$, with the subscript indicating country. With this technology, the first order conditions can be rearranged to yield

$$w_1 = \left[\frac{\alpha}{s_L + \theta s_S}\right] \frac{PY}{N}$$

and

$$w_2 = \left[\frac{\alpha\theta}{s_L + \theta s_S}\right] \frac{PY}{N}$$

Multiplying both sides by the local currency /US Dollar exchange rate and taking logs, one has a simple estimating equation where dollar wages should vary one for one with dollar GDP per-capita with an elasticity of 1. Wages of different occupations will differ by a constant amount θ_j. This framework indicates that graphs of log wages against log GDP per-capita should resemble straight parallel lines with slopes of one and intercepts that differ according to the magnitude of the terms in square brackets (s_S is the share of skilled labor in the population, N is population, and PY is nominal GDP).

The discussion above is appropriate when wage-setting is entirely domestic. To introduce global considerations, suppose now that we examine a poor country in which some workers have skills that make them perfect substitutes for higher paid workers in other countries. International companies are willing to pay these workers the global wage $\bar{w}$ rather than the domestic wage, and because of immi-

gration barriers these workers stay in the country. They therefore continue to be counted in that country's GDP. To see how this would affect the observed relation between wages and GDP, we once again focus on the case above where there are two occupations. The low-paying occupation pays w_1 and the high-paying occupation pays w_2. Suppose further that a fraction β of the high-wage workers have skills that make them marketable to international companies, so that they can earn $\bar{w}$ (higher than w_2). In this economy the GDP identity would be

$$gdp = s_1 w_1 + (1 - \beta) s_2 w_2 + \beta \bar{w} s_2.$$

If once again $w_2 = \theta w_1$, the solution for the second wage would be the following

$$w_2 = \frac{\theta}{s_1 + (1 - \beta)\theta s_2}(gdp - \beta \bar{w} s_2).$$

But of course this wage would be earned only by $(1-\beta)$ of those in the higher-paid occupation. Workers who earn the international wage would still be listed in same occupation as the domestic workers that earn w_2, so the observed average wage of this occupation would be a weighted average of the international wage and w_2. This means that the observed wage for the second occupation would be

w_2^* below rather than w_2 given in the earlier expression above:

$$w_2^* = \beta\bar{w} + \frac{(1-\beta)\theta(gdp - \beta\bar{w}s_2)}{s_1 + (1-\beta)\theta s_2}.$$

This may be simplified to :

$$w_2^* = \frac{\beta\bar{w}s_1 + (1-\beta)\theta gdp}{s_1 + (1-\beta)\theta s_2}.$$

Let us now compute what we would expect to observe in terms of the elasticity of this wage with respect to gdp. The elasticity would now be:

$$\varepsilon = \frac{(1-\beta)\theta gdp}{\beta\bar{w}(1-s_2) + (1-\beta)\theta gdp}.$$

Note the relation between this elasticity and the fraction of workers with international skills - β. As β approaches zero, the elasticity approaches one; but as β approaches one, the elasticity approaches zero. In other words, with increased globalization (defined as rising β), wage-GDP elasticities for given occupations should approach zero. Therefore, a low elasticity with gdp for a particular occupation may be interpreted as a sign of greater globalization of labor markets for that occupation.

These equations help sort out a potentially confusing issue. How is it possible

for example, for wages not to correlate with GDP, given that GDP is the sum of all wages and profits? The answer is that such a result is possible for certain occupations but not all occupations. This can be seen from the fact that the elasticity above depends on both β AND s_2 the share of that occupation in the labor force. Mathematically, If the occupation in question is a large share of the labor force, s_2 would be close to 1 and the $\beta\bar{w}(1-s_2)$ term would be close to zero regardless of the size of β. In other words, if the occupation is a large share of the economy, the wage of that occupation will correlate closely with GDP no matter the size of β. But when the occupation is a small part of the economy, $(1-s_2)$ will be a positive number and the full term $\beta\bar{w}(1-s_2)$ can be significant, making the wage-GDP slope close to zero. More generally, the observed cross-section correlation between wages and GDP for a given occupation should be positive but should fall as β rises for a given value of s_2 or as s_2 falls for a given value of β.

4.2. Empirical Specification

The essential point in the previous discussion about globalization is that a low estimated wage-gdp relationship can indicate a high degree of globalization of the labor market for a particular occupation. In the discussion above the degree of globalization was closely connected to the parameter β, which stood for the

fraction of workers with skills that are marketable in an international context. When we turn to the evidence however, we want to go a little further than this. We want an econometric specification that allows us to see if the degree of globalization varies according to occupation and also to try to determine what specific variables play the role of β. For this purpose we will estimate simple mixture models in which wage setting for each occupation is potentially a mix of domestic wage-setting and international wage-setting. The observed mean wage would be a weighted average between the domestic wage setting equation and the global wage setting equation, with the weights given by $\beta : \ln(w) = (1-\beta)(\theta+\ln(gdp/L))+\beta\bar{w}$.

The specific regression equation we estimate is, for each occupation:

$$\ln(\hat{w}_{.j}) = \alpha_0 + \alpha_1 \ln(gdp/L_j) + \alpha_2 \ln(gdp/L_j) * \beta_j + \alpha_3 Z_j + u_j$$

This equation has an interaction term between GDP per capita and β and the vector Z stands for additional regressors.

4.3. Results

We start by noting the graphical relationship between log wages and gdp in figures 1 through 5. As expected, there is a strong simple association between wages and GDP per worker. The figures also show that post-socialist countries and Latin

American countries tend to have lower and higher wages respectively than the cross-country norm. The empirical association with GDP is strong enough that, as we go through the five occupations from Office Cleaners to Managers, it is possible to explain respectively 90, 92, 82, 70 and 62 percent of the cross country variation by regressing wages on GDP alone. The task for the remaining analysis is to explain the variation left over after controlling for GDP. How much of the additional variation can be explained by other country-specific variables?

We can identify five broad categories of variables that may have explanatory power over wages after conditioning on GDP. First are variables that explain the aggregate labor or profit share, variables that explain cross-country differences in occupational premia (the θ_i terms), variables that explain cross country differences in the shares of labor across occupations (the s_i terms), variables that explain cross country differences in globalization (the β term) and variables that explain differing degrees of policy interventions the labor market such as different degrees of centralized wage setting or minimum wage laws.

The dependent variable in each of the five regressions is the regression coefficient on the country-specific dummy variable from the regression in table 8. It turns out that the results are very similar using instead the simple median or mean wages by country as the dependent variable. However, the use of coefficients on the country dummies is slightly preferable because these control for

differences in the composition of the sample of firms in each country with respect to company size and industry mix. For gdp we use the log of GDP in dollars per worker in 1998, converted at market exchange rates. GDP in purchasing power parity is not the correct variable here because wages are measured in real dollars, not purchasing power parities.

To proxy β we test a variable we call *Foreign Language (FL).* This variable is constructed to measure the extent to which managers in each country speak a major foreign language. The reasoning is that this is likely to be a crucial determinant for whether managers are useful to foreign companies. Whether or not managers actually work in a foreign company, managers that speak one of the major foreign languages should have different reservation wages than managers that speak only the domestic language. For example, if managers in Russia speak English they may receive offers from international companies or companies in other countries that have higher pay standards than Russia; but if they speak only Russian this is less likely. These higher outside offers may be expected to increase the domestic salary of such managers relative to their counterparts that speak only Russian. *Foreign Language* is measured differently for English and non-English speaking countries. For non-English speaking countries, this is the subjective rating of the extent to which managers in the country speak a foreign language, English or other. This is rated on a 1-7 scale where the higher value

indicates maximum language attainment. For English-speaking counties, since the managers already speak the international common language, this is set equal to 6 (a value close to the maximum of 7). The *FL* variable is entered alone and also interacted with *per-capita GDP.* There are two empirical implications of this equation. Managerial wages would rise with GDP, but wages would be *less* sensitive to GDP in countries in which a high share of managers spoke a foreign language. In addition, the return on speaking a foreign language would be positive, but would be *less* positive in richer countries where the domestic wage was already close to the global standard $\bar{w}$. The implication is that attendance at an English language school would yield a higher return for a Brazilian child's future income than a French child's income, since the domestic wage for French-speaking managers is closer to the international wage than the domestic wage for managers in Brazil.

As determinants of the labor share we considered proxies for the extent of product-market competition, on the reasoning that competition may erode the share of national income for profits. We also considered proxies for direct labor market intervention such as the extent to which minimum wage laws are binding, or the extent of centralized wage-setting. *Competition* is a subjective rating of the intensity of competition in local product markets by corporate executives (rated on a scale of 1-7 where the higher value means more intense competition). A

positive sign would mean that wages are higher in countries with more product market competition. *Minimum Wage* is a subjective rating of whether minimum wage legislation is binding (rated on a scale of 1-7 where the higher value means not binding). A negative sign on the estimated coefficient would mean that wages are higher in countries where minimum wage rules are binding, holding other things constant.

We will also discuss at the end of this section additional variables that we tested and found to be insignificant in wage equations. The best fitting wage equation was found to be the following. For each occupation j:

$$\begin{aligned} \ln(\hat{w}_{.j}) &= \alpha_0 + \alpha_1 \ln(gdp/L_j) + \alpha_2 \ln(gdp/L_j) * FL_j \\ &\quad + \alpha_3 \min w + \alpha_4 comp_j + \alpha_5 FL_j + u_j \end{aligned}$$

The results from the regressions in table 9 may be summarized as follows.

1. Countries that are perceived to have binding minimum wage rules are estimated to have 13 percent higher wages for Janitors, holding constant their level of GDP. Minimum wage regulations have no apparent effect on wages of higher-paying occupations, as we would expect. Much of the cross-country variance for estimating an effect such as this comes from the comparison of

European countries, with relatively strong minimum wage laws, and East Asian countries, with little or no minimum wage laws. Of all the European countries in our sample, France is perceived to have the strictest and most binding regulations[4]. If we compare France with Singapore, we can better understand the estimated magnitude of this effect. The median wage for Office Cleaners in France was around 14 thousand dollars per year and in Singapore around 5 thousand dollars. In log units this difference is 1.02. France's GDP in 1998 was only about 7 percent higher than Singapore's. Given the estimated GDP elasticity of 1.04, this difference in GDP can account for only 0.07 log units (approximately 7 percent) of the total wage difference of 1.02. The difference between France and Singapore in the rating on the minimum wage question is 2.95 points. Multiplied by the estimated coefficient of 0.14, this can account for 0.41 of the wage difference. Therefore, the estimated minimum wage effect can account for about 41 percent of the wage difference between France and Singapore. In other pairs of countries the estimated minimum wage coefficient can account for much more of the difference in Office Cleaner's wages. If we compare the United States with France, based on the fact that GDP is 26 percent higher

[4]This perception that France has strong minimum wage laws is supported the evidence in Abowd, Kamar and Margolis (1999). They estimate the effect on employment rather than wages.

in the United States we would expect Office Cleaners wages to be about 26 percent higher. However, they are in fact only 8 percent higher. The difference in minimum wage regulations can account for a 28 percent difference in wages. Therefore, from the perspective of the regression in table 9, minimum wage regulations not GDP accounts for most of the wage differential for Office Cleaners between France and the United States.

2. Counties with more intense (product market) competition are estimated to have higher wages. The estimated effect is in the range of 30 percent and is borderline significant for all five occupations. The fact that the magnitude of this effect is similar across the five occupations supports the idea that competition squeezes profits and thus raises the wage bill. The effect does however appear less significant for top-managers than the other four occupations. The magnitude of the coefficient estimates suggests that a unit standard deviation change in competition is associated with approximately a 16 percent change in wages (0.33*0.48). Two countries that are interesting in this regard are Greece and the United Kingdom. The U.K. is perceived to have very competitive product markets, with a rating of 5.74, while Greece is perceived to have less competitive markets, with a rating of 4.51. Wages for Secretaries are 0.94 log points higher in the U.K. than in Greece. Income differences can account for 0.77 of this gap, but greater

competition helps pick up the remainder. In fact in this case it overexplains the gap since it can account for a further 0.36 log points of the 0.94 point difference.

3. There is little evidence that democracies have higher wages after controlling for these regressors. In table 10, we show results when six additional regressors were added to these regressions. The first of these six is the index of political rights and civil liberties used by Rodrik (1999) to measure democratic rights. The results show that none of the estimated effects are significant.

4. Our data also show little impact of centralized wage setting on overall wage levels after controlling for the variables in table 9. Centralized wage setting is measured as the mean response to the survey question on whether wage setting is centralized or decentralized. The estimated coefficients in table 10 are not significant.

5. Table 10 also shows that there is little evidence that the percent of the population employed in agriculture or the percent of the population that is foreign born is strongly correlated with wages. These variables were added one by one to the regression reported in table 9. There is also little evidence that survey ratings on the strength of unions (collective bargaining power)

correlates with wages. We also created a variable that added together union density (percent of workforce unionized) and collective bargaining coverage (percent of contracts covered by collective bargaining agreements) and found that wages were not correlated with this variable.

6. There is evidence for a foreign language premium for the managerial professions. Countries in which managers have high foreign language attainment tend to show exhibit higher salaries for managers. The estimated coefficients are positive and significant for the top three occupations, and not consistently so for the bottom two occupations (compare the results in table 9 and 12).

7. There is also strong statistical evidence for an interaction between foreign language attainment and GDP per-worker. According to the interpretation given above, this provides evidence for two parallel effects: wage setting for managers tends to be global rather than domestic in countries where a high fraction of managers speak English or a foreign language; and the additional return from speaking a foreign language is higher in poorer countries.

We checked the robustness of these regression estimates by examining the residuals and the leverage of particular countries in the sample. We followed the rule suggested by Belsley, Kuh and Welsch (1980, p 24) that if the influence of

a particular country was above a critical value[5] then the observation should be excluded. In table 12 we show regressions that were re-estimated after applying this rule and at the bottom the list of excluded countries. The main point to notice from table 12 is that the foreign language and interaction variables are no longer significant for the two lower-wage occupations.

We now turn to a discussion of the estimated interaction between executive salaries foreign language attainment and GDP. One metric for the extent to which wage setting is local rather than global is the whether the estimated slope in cross-country data between wages of that occupation and GDP per-worker is close to unity. A one-for-one relation with GDP per worker as in the equation $\ln(w) = \theta + \ln(gdp/L)$ may be interpreted as the extreme case of local wage setting. A slope of zero would be the extreme case of global wage setting. We have already seen that empirically the wage-GDP elasticities are close to one for the lower paying occupations. For the higher-paying occupations, there is evidence that the slopes depend on the extent of foreign language attainment. Using the notation in the regression equation above, if the estimate of α_2 is significant, the estimated slope between wages and GDP depends on the level

[5]Details are in STATA 7 reference manual volume 3, p. 107. The procedure calculates DFITS, which is an aggregation of the residuals and the leverages: $(DFITS = r_i(\frac{h_i}{1-h_i})^{1/2})$ where $r_i = e_i/(s_i(1-h_i)^{1/2}$ is a standardatioin of the residuals and h_i is the leverage. The procedure then excludes observations for which $abs(DFITS) > 2(k/n)^{1/2}$.

of FL: $\frac{dw}{dGDP} = \alpha_1 + \alpha_2 FL_j$. According to the estimates in table 9, by how much does foreign language attainment alter the slopes? The evidence on this is presented in table 11. This table shows the estimated wage-GDP elasticities for two extremes: high and low foreign language attainment. The bottom row of this table shows the point estimates for the wage-GDP elasticity evaluated at the minimum value of foreign language attainment of $FL = 2.6$. These are not different from one statistically for any of the occupations, supporting the idea that wage-setting is entirely domestic in countries with low foreign language skills. The top row of Table 11 reports the wage-GDP slopes for a relatively high level of foreign language attainment of $FL = 6.3$ (this is not the maximum possible value but rather the highest mean score of all the countries). The estimated slopes in this case are 0.28 (mid-level managers) and 0.19 (top-managers). These are close to zero, but are still statistically different from zero. One can see from the p-values given below the point estimates that the hypothesis of equality with 0 would be rejected.

We may summarize this by saying that there is a high degree of globalization of labor markets for managers, and that the extent depends on the degree of foreign language attainment in the country. Nevertheless, even for countries in which foreign language attainment is very high, average salaries for managers still depend somewhat on the local level of GDP.

Figure 9 shows the same evidence graphically. One can see from the slope of the lower line in the figure that the interaction with foreign language attainment goes a long way in accounting for lower salaries of managers in formerly closed post-communist countries. It also may be part of the explanation for higher than normal salaries for managers in Latin American countries, since elites in these countries tend to be educated in bilingual or non-Spanish speaking schools.

Another way to put the globalization hypothesis is that language attainment acts as a wedge driving apart executive wages of those with and without language skills. This wedge tends to boost average executive wages relative to the domestic executive wage in countries where executives can speak an international language. Therefore, a further test is to see if there is indeed lower dispersion of executive wages in post socialist countries with relatively poor language skills. In our data this tends to be confirmed. The six countries with the lowest standard deviation of executive wages are Russia, Ukraine, Vietnam, Bulgaria, China, Hungary and the Slovak Republic, in that order: all countries where managers were not highly trained in foreign language skills until very recently.

5. Conclusion

This paper has examined what variables are reliably associated with wages based on new data from over 3000 firms in 58 countries. The evidence in this paper is

that the following characteristics of companies are associated with higher wages and salaries: multinational status (but only in non-OECD countries), high recent revenue growth and size of the company as measured by global rather than domestic employment. Companies in the financial services sector pay higher executive salaries and companies in the petroleum chemicals sector pay higher wages and salaries for several occupations. Textile companies and government organizations pay lower wages and salaries. While some of these findings are unsurprising and corroborate what previous studies of wages in single countries have found, they nevertheless provide evidence for these associations across a global sample of companies. Given that multinational companies tend also to be companies with high levels of global employment, the evidence overall confirms that there is a significant wage premium in multinational companies. This wage premium is only present in non-OECD countries and is largest in percentage terms for the higher-paying occupations.

At the country level, holding constant GDP per-capita, wage levels correlate positively with minimum wage rules and the intensity of competition in product markets. Wages and salaries tend not to correlate with the extent of democratic rights, the percentage of the labor force in agriculture, the percentage of foreign born persons in the population, the extent of centralized wage setting, union power, union density, or the percentage of wage contracts covered by collective

bargaining agreements.

This paper advances the additional argument that the magnitude of the association between wages and GDP per-capita can be a metric of the extent to which the labor market for a particular occupation is influenced by the local or global labor market for that occupation. The empirical results suggest that wage-setting for the lower paying occupations is almost entirely local since wages vary one for one with GDP per-worker. However, the data suggests that wage setting for higher paying occupations such as managers is subject to more global influences since these salaries correlate less strongly with local GDP per worker. One factor that appears to be important in determining whether global or local forces affect domestic salaries is the extent of foreign language attainment or the extent to which English is spoken in the country. The regressions suggest that this variable can fully account for the finding that executive wages vary less than one for one with local GDP per capita.

One implication of this result is that wage inequality within companies will automatically be higher the poorer and the more globalized the country. That is because in such countries executive salaries will be an average of the local salary and the world salary, but wages for lower paying occupations will just be the local wage. Another implication is that wages of lower paying occupations will be more sensitive to variations in the local economy that will salaries of the higher

paying occupations. The higher paying occupations are more insulated from local economic shocks.

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Appendix 1.

Appendix Table 1.	Additional wage regressions: effect of company ownership status.
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Appendix Table 3.	Additional wage regressions: effect of company performance.
Appendix Table 4.	Additional wage regressions: effect of the nature of competition.

Table 1. Sample Sizes and Percent with a Response.

	Number of Surveys Returned (1)	Number of Surveys with a Response to the Wage Questions (2)	Percent with a Response (2)/(1)
Argentina	121	97	80.2
Australia	58	49	84.5
Austria	53	44	83.0
Belgium	30	21	70.0
Bolivia	101	95	94.1
Brazil	85	74	87.1
Bulgaria	83	62	74.7
Canada	85	70	82.4
Chile	150	138	92.0
China	121	108	89.3
Colombia	76	56	73.7
Costa Rica	100	93	93.0
Czech Republic	70	62	88.6
Denmark	31	26	83.9
Egypt	40	39	97.5
El Salvador	100	95	95.0
Finland	19	18	94.7
France	24	18	75.0
Germany	56	45	80.4
Greece	47	41	87.2
Hong Kong	54	47	87.0
Hungary	82	69	84.1
Iceland	39	33	84.6
India	98	86	87.8
Indonesia	33	30	90.9
Ireland	59	45	76.3
Israel	38	30	78.9
Italy	66	53	80.3
Japan	75	54	72.0
Jordan	51	49	96.1
Korea,Republic of	41	36	87.8
Luxembourg	9	8	88.9
Malaysia	38	36	94.7
Mauritius	38	34	89.5
Mexico	29	23	79.3
Netherlands	36	30	83.3
New Zealand	88	80	90.9
Norway	50	42	84.0
Peru	76	64	84.2
Philippines	42	37	88.1
Poland	56	49	87.5
Portugal	123	92	74.8
Russian Federation	147	128	87.1
Singapore	67	62	92.5
Slovak Republic	17	14	82.4
South Africa	160	142	88.8
Spain	76	49	64.5
Sweden	26	23	88.5
Switzerland	54	40	74.1
Taiwan	50	43	86.0
Thailand	66	63	95.5
Turkey	36	31	86.1
Ukraine	67	39	58.2
United Kingdom	54	44	81.5
United States	132	109	82.6
Venezuela	117	94	80.3
Vietnam	62	59	95.2
Zimbabwe	41	38	92.7
All Countries	3843	3256	84.7

Table 2. Number of Partial Responses.

	One (of five) wage questions answered	Two	Three	Four	All Five	Percent with Complete Response
Argentina	0	0	8	21	68	70.1
Australia	0	1	6	3	39	79.6
Austria	0	0	5	3	36	81.8
Belgium	0	0	0	1	20	95.2
Bolivia	3	2	13	27	50	52.6
Brazil	0	0	0	2	72	97.3
Bulgaria	1	0	2	5	54	87.1
Canada	0	1	12	7	50	71.4
Chile	1	0	12	19	106	76.8
China	1	1	2	4	100	92.6
Colombia	0	2	5	10	39	69.6
Costa Rica	1	7	6	37	42	45.2
Czech Republic	1	0	3	2	56	90.3
Denmark	0	0	1	0	25	96.2
Egypt	0	1	0	0	38	97.4
El Salvador	0	1	3	14	77	81.1
Finland	0	0	0	1	17	94.4
France	0	0	0	1	17	94.4
Germany	0	0	1	3	41	91.1
Greece	0	1	0	4	36	87.8
Hong Kong	0	0	1	4	42	89.4
Hungary	0	1	4	8	56	81.2
Iceland	0	0	3	4	26	78.8
India	0	0	0	4	82	95.3
Indonesia	0	0	1	0	29	96.7
Ireland	0	0	6	10	29	64.4
Israel	0	1	3	1	25	83.3
Italy	0	0	5	6	42	79.2
Japan	0	1	14	2	37	68.5
Jordan	0	0	0	0	49	100.0
Korea,Republic o	0	0	1	4	31	86.1
Luxembourg	0	0	1	1	6	75.0
Malaysia	0	0	0	1	35	97.2
Mauritius	0	0	0	2	32	94.1
Mexico	0	0	0	1	22	95.7
Netherlands	0	0	1	3	26	86.7
New Zealand	0	2	14	18	46	57.5
Norway	0	0	4	4	34	81.0
Peru	0	0	2	8	54	84.4
Philippines	0	0	0	3	34	91.9
Poland	0	1	2	4	42	85.7
Portugal	1	1	1	4	85	92.4
Russian Federati	0	0	8	10	110	85.9
Singapore	0	0	8	5	49	79.0
Slovak Republic	0	0	0	3	11	78.6
South Africa	0	0	3	6	133	93.7
Spain	0	1	2	6	40	81.6
Sweden	0	0	3	0	20	87.0
Switzerland	0	1	3	5	31	77.5
Taiwan	0	0	0	4	39	90.7
Thailand	0	0	0	0	63	100.0
Turkey	0	0	0	1	30	96.8
Ukraine	0	1	0	2	36	92.3
United Kingdom	0	0	6	4	34	77.3
United States	0	0	17	18	74	67.9
Venezuela	1	3	2	13	75	79.8
Vietnam	0	1	0	4	54	91.5
Zimbabwe	0	0	0	2	36	94.7
All Countries	10	31	194	339	2682	82.4

Table 3. Further Information on the Sample.

	Total reponses to the wage questions	Number reporting non-local currency	Number reporting in US Dollars	Number eliminated for implausible values	Percent eliminated for implausible values
					(4)/(1)
Argentina	448	25	5	7	1.6
Australia	227	20	5	5	2.2
Austria	207	5	5	3	1.4
Belgium	104	0	0	1	1.0
Bolivia	404	0	0	1	0.2
Brazil	368	15	10	3	0.8
Bulgaria	297	0	0	2	0.7
Canada	316	5	0	4	1.3
Chile	643	15	15	3	0.5
China	525	40	5	7	1.3
Colombia	254	20	10	6	2.4
Costa Rica	391	0	0	4	1.0
Czech Republic	298	10	10	4	1.3
Denmark	128	0	0	2	1.6
Egypt	192	5	5	0	0.0
El Salvador	452	0	0	2	0.4
Finland	89	5	0	2	2.2
France	89	10	5	2	2.2
Germany	220	5	0	2	0.9
Greece	198	15	10	3	1.5
Hong Kong	229	25	5	11	4.8
Hungary	326	0	0	4	1.2
Iceland	155	0	0	3	1.9
India	426	20	5	6	1.4
Indonesia	148	5	5	3	2.0
Ireland	203	15	5	8	3.9
Israel	140	5	5	0	0.0
Italy	249	15	5	7	2.8
Japan	237	5	0	3	1.3
Jordan	245	0	0	1	0.4
Korea,Republic of	174	0	0	3	1.7
Luxembourg	37	0	0	1	2.7
Malaysia	179	10	0	2	1.1
Mauritius	168	0	0	0	0.0
Mexico	114	20	20	4	3.5
Netherlands	145	10	0	6	4.1
New Zealand	348	10	10	4	1.1
Norway	198	5	5	1	0.5
Peru	308	15	10	2	0.6
Philippines	182	10	5	4	2.2
Poland	234	15	10	3	1.3
Portugal	447	65	10	17	3.8
Russian Federatior	614	5	5	5	0.8
Singapore	289	40	30	7	2.4
Slovak Republic	67	0	0	2	3.0
South Africa	698	20	10	10	1.4
Spain	232	15	0	10	4.3
Sweden	109	5	5	1	0.9
Switzerland	186	10	0	3	1.6
Taiwan	211	0	0	2	0.9
Thailand	315	15	15	5	1.6
Turkey	154	15	15	4	2.6
Ukraine	190	15	0	4	2.1
United Kingdom	204	10	0	7	3.4
United States	493	10	0	6	1.2
Venezuela	440	15	10	5	1.1
Vietnam	288	60	55	12	4.2
Zimbabwe	188	0	0	2	1.1
All Countries	15420	680	330	241	1.6

Table 4. Non-response matrix

	Total Sample	Of which: non-response to: Janitor	Driver	Secretary	Mid-manager	Top-manager
Janitor	2798	0	142	32	33	91
Driver	2777	121	0	32	29	85
Secretary	3042	276	297	0	38	104
Mid-manager	3046	281	298	42	0	85
Top-manager	2975	268	283	37	14	0

Table 5. Possible Under-reporting of Manager's Salaries.

	Number of surveys that report Janitors wage but not top-managers salary	Mean wage of mid-managers for the surveys listed in column 2 (when reported)	Mean wage of mid-managers across all surveys
Argentina	0	.	56502.8
Australia	0	.	55255.8
Austria	1	.	34850.5
Belgium	0	.	38385.6
Bolivia	10	14842.5	15799.1
Brazil	0	.	31033.3
Bulgaria	0	.	2348.8
Canada	0	.	47210
Chile	5	34587.2	35527.8
China	1	.	2474.2
Colombia	5	24801.9	24996.1
Costa Rica	28	23729.7	19453.6
Czech Republic	2	17513.1	9858.4
Denmark	0	.	55819.2
Egypt	1	.	12001.6
El Salvador	9	15946.4	16615.8
Finland	0	.	42822.3
France	0	.	53629.8
Germany	0	.	61724.1
Greece	0	.	23654.5
Hong Kong	0	.	67552
Hungary	1		9169.4
Iceland	0	.	35018
India	0	.	6596.9
Indonesia	0	.	4929.5
Ireland	0	.	37389.2
Israel	0	.	31060
Italy	1	.	35032.6
Japan	0	.	61832
Jordan	0	.	7786.1
Korea	0	.	26060.5
Luxembourg	0	.	57871.6
Malaysia	0	.	14516.7
Mauritius	1		12197
Mexico	0	.	34370
Netherlands	0	.	52474
New Zealand	0	.	30556
Norway	0	.	44625.8
Peru	2	.	22619.7
Philippines	1		14624.8
Poland	2	16742.8	16780.6
Portugal	1	.	23273.3
Russia	10	719.6	1223.9
Singapore	1	.	36928.3
Slovak Republic	0	.	7335
South Africa	0	.	25271.5
Spain	0	.	39070
Sweden	0	.	38528.1
Switzerland	0	.	75311.7
Taiwan	0	.	28373.1
Thailand	0	.	14117.8
Turkey	0	.	21595.6
Ukraine	0	.	1406.1
United Kingdom	0	.	68003.1
United States	1		79845.9
Venezuela	7	26516.5	26887.6
Vietnam	1	.	1149.5
Zimbabwe	0	.	7801.6

Table 6. Descriptive statistics of variables in regressions.

Variable	Observations	Mean	Std. Dev.	Min	Max
Country Regressions					
log median wage - Janitor	58	8.28	1.27	5.57	10.12
log median wage - Driver	58	8.71	1.17	6.29	10.51
log median wage - Secretary	58	9.03	1.11	6.16	10.64
log median wage - Mid-manager	58	9.85	1.11	6.54	11.22
log median wage - Top-manager	58	10.48	1.12	6.94	11.79
log GDP per worker in US$	58	9.55	1.33	6.73	11.30
Minimum wage question	58	4.57	0.76	2.87	6.06
Competition question	58	5.01	0.48	3.83	5.96
Foreign language attainment of managers	58	5.26	0.98	2.75	7.00
log(GDP)* FL	58	51.01	14.48	20.61	79.08
Firm regressions					
log wage in US $- Janitor	2798	8.02	1.25	3.96	10.60
log wage in US $- Driver	2777	8.48	1.18	5.45	11.34
log wage in US $- Secretary	3042	8.87	1.16	4.88	11.29
log wage in US $- Mid-manager	3046	9.72	1.26	5.57	12.39
log wage in US $- Top-manager	2975	10.36	1.32	5.75	13.71
domestic firm sells domestically	3625	0.25	0.43	0.00	1.00
domestic firm sells both home and abroad	3625	0.43	0.49	0.00	1.00
Subsidiary of multinational	3625	0.25	0.43	0.00	1.00
Subs. Of mnational * OECD	3625	0.07	0.25	0.00	1.00
government enterprise	3625	0.04	0.20	0.00	1.00
government organization	3625	0.03	0.16	0.00	1.00
Employment worldwide 0-500 persons	3698	0.26	0.44	0.00	1.00
Employment worldwide 500-1000 persons	3698	0.11	0.31	0.00	1.00
Employment worldwide 1,000-10,000 persons	3698	0.29	0.46	0.00	1.00
Employment worldwide 10,000-100,000 persons	3698	0.21	0.41	0.00	1.00
Employment worldwide 100,000+ persons	3698	0.06	0.24	0.00	1.00
Revenue growth	3462	3.39	1.09	1.00	5.00
Profit trend	3505	2.32	0.79	1.00	3.00
Export growth	2300	2.35	0.66	1.00	3.00
competition is many domestic competitors	3391	0.22	0.41	0.00	1.00
competition is a few large domestic competitors	3391	0.33	0.47	0.00	1.00
competition is one dominant national competitor	3391	0.06	0.23	0.00	1.00
Competition is primarily imports	3391	0.09	0.29	0.00	1.00
competition is multinationals operating in the country	3391	0.30	0.46	0.00	1.00
Email usage in company	3593	6.13	1.60	1.00	7.00
food and beverages	3698	0.10	0.30	0.00	1.00
textiles apparel	3698	0.04	0.19	0.00	1.00
housing/ household	3698	0.03	0.16	0.00	1.00
health	3698	0.03	0.17	0.00	1.00
personal care	3698	0.01	0.12	0.00	1.00
entertainment/ leisure	3698	0.02	0.13	0.00	1.00
general business services	3698	0.13	0.33	0.00	1.00
financial services	3698	0.15	0.35	0.00	1.00
transport	3698	0.07	0.26	0.00	1.00
telecommunications	3698	0.03	0.17	0.00	1.00
office products	3698	0.01	0.08	0.00	1.00
defense	3698	0.00	0.06	0.00	1.00
metals / materials	3698	0.09	0.28	0.00	1.00
petroleum / chemicals	3698	0.08	0.27	0.00	1.00
forest products	3698	0.02	0.14	0.00	1.00
semiconductors / computers	3698	0.02	0.14	0.00	1.00

Table 7. Regression estimates of the impact of company and industry characteristic on global wage levels by occupation.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager	(5) Top-Manager
Dummy variables for the status of the firm					
Dummy variable=1 for domestic based firm that sells in both domestic and foreign markets.	0.01 (0.31)	0.02 (0.61)	0.03 (0.85)	0.06 (1.73)	0.09 (2.27)*
Dummy=1 if Unit/subsidiary of Multinational operating in the country	0.03 (0.74)	0.10 (2.27)*	0.11 (2.83)**	0.12 (2.61)*	0.12 (2.19)*
Dummy=1 for Unit/subsidiary of multinational operating in the country times Dummy=1 if "OECD"	-0.04 (0.68)	-0.06 (1.25)	-0.08 (1.37)	-0.04 (0.63)	-0.06 (0.71)
Sum (p-values for Sum=0)	-.01 (0.93)	0.04 (0.51)	0.03 (0.63)	0.08 (0.21)	0.06 (0.45)
Dummy=1 if Government or Quasi-government enterprise	-0.02 (0.44)	-0.05 (0.91)	-0.14 (2.29)*	-0.09 (1.58)	-0.10 (1.60)
Dummy=1 if Government Organization	-0.13 (3.32)**	-0.15 (3.66)**	-0.59 (16.27)**	-0.31 (6.75)**	-0.54 (10.27)**
Dummy variables for Size of company (measured by employment)					
500-1,000 employees In the country	0.02 (0.63)	-0.00 (0.04)	-0.00 (0.02)	0.02 (0.65)	0.03 (0.66)
1,000-10,000 In the country	-0.00 (0.00)	0.03 (0.93)	-0.04 (1.16)	0.03 (0.74)	0.06 (1.59)
10,000-100,00 In the country	0.02 (0.47)	0.05 (0.72)	-0.11 (2.12)*	0.01 (0.09)	0.03 (0.44)
100,000+ In the country	0.13 (1.02)	0.19 (1.86)	-0.01 (0.12)	-0.02 (0.22)	-0.06 (0.53)
500-1,000 employees Worldwide	0.02 (0.56)	0.07 (1.57)	0.06 (1.34)	0.09 (1.52)	0.06 (0.77)
1,000-10,000 Worldwide	0.07 (1.86)	0.07 (1.87)	0.12 (3.67)**	0.15 (3.94)**	0.16 (3.35)**
10,000-100,00	0.08	0.09	0.19	0.20	0.24

Worldwide	(1.71)	(1.55)	(4.54)**	(3.57)**	(4.06)**
100,000+	-0.00	0.00	0.16	0.24	0.26
Worldwide	(0.06)	(0.01)	(3.12)**	(3.54)**	(3.49)**
Dummy variables for recent performance of the company					
Revenue growth in past three years (1=negative; 2=0%; 3=1-10%; 4=11-20%; 5=20+%)	0.00 (0.33)	-0.00 (0.37)	0.01 (1.05)	0.03 (2.62)*	0.03 (2.98)**
Profitability in past three years (1=declining; 2=stable; 3=increasing)	0.00 (0.01)	0.01 (0.57)	0.00 (0.01)	-0.01 (0.77)	-0.00 (0.27)
Export growth (1=decreasing; 2=steady; 3=increasing)	0.01 (0.53)	0.00 (0.21)	0.01 (0.51)	-0.00 (0.09)	0.04 (1.83)
Dummy variables for Nature of Competition					
Dummy=1 if principal competition is “a few large local competitors”	0.02 (0.89)	-0.05 (1.88)	-0.01 (0.61)	0.01 (0.35)	0.01 (0.13)
Dummy for “One dominant national competitor”	0.08 (1.81)	0.02 (0.48)	0.00 (0.07)	0.09 (1.69)	0.08 (1.31)
Main competition Is “Imports”	-0.00 (0.01)	-0.09 (2.23)*	-0.08 (2.24)*	0.01 (0.11)	-0.03 (0.53)
“Multinationals operating In the country”	0.04 (1.47)	-0.05 (1.75)	-0.00 (0.14)	0.06 (1.24)	0.05 (0.95)
Email	0.02 (2.51)*	0.02 (3.20)**	0.03 (2.70)**	0.04 (2.70)**	0.04 (2.80)**
Dummy Variables for Industry					
textiles/apparel	-0.13 (4.20)**	-0.16 (3.43)**	-0.16 (3.41)**	-0.24 (3.10)**	-0.26 (2.81)**
housing/household	-0.03 (0.48)	-0.01 (0.22)	0.01 (0.17)	0.02 (0.21)	0.02 (0.27)
health	-0.00 (0.02)	0.04 (0.86)	-0.03 (0.57)	-0.10 (1.38)	-0.12 (1.63)
personal care	0.10 (1.13)	0.07 (0.89)	0.13 (1.68)	0.04 (0.56)	0.08 (0.64)
entertainment/leisure	-0.02 (0.20)	-0.01 (0.20)	-0.02 (0.28)	-0.03 (0.31)	-0.06 (0.77)
general business products/services	-0.03 (1.00)	-0.05 (1.40)	-0.04 (1.26)	0.02 (0.45)	-0.04 (0.80)

financial services	-0.02	-0.07	0.04	0.13	0.13
	(0.54)	(1.59)	(1.05)	(2.75)**	(2.18)*
transport and logistics	-0.01	0.03	0.00	-0.03	-0.04
	(0.18)	(0.75)	(0.04)	(0.68)	(0.81)
telecommunications	0.02	0.02	0.00	-0.02	-0.10
	(0.33)	(0.34)	(0.03)	(0.23)	(1.19)
office products	-0.04	-0.04	0.03	-0.03	0.03
	(0.34)	(0.33)	(0.63)	(0.30)	(0.20)
defense	-0.16	-0.03	-0.09	-0.23	-0.23
	(1.50)	(0.43)	(0.57)	(1.54)	(1.81)
metals/materials	0.04	0.01	-0.01	0.01	-0.01
	(0.92)	(0.44)	(0.30)	(0.22)	(0.14)
petroleum/chemicals	0.07	0.13	0.14	0.19	0.17
	(1.61)	(3.29)**	(3.35)**	(4.02)**	(3.08)**
forest products	-0.02	-0.02	-0.02	0.05	0.03
	(0.24)	(0.36)	(0.34)	(0.68)	(0.39)
semiconductors/computers	0.04	0.08	0.12	0.26	0.23
	(0.59)	(1.17)	(1.87)	(4.25)**	(2.49)*
Dummy Variables for Country					
Australia	0.91	0.87	0.54	0.16	0.01
	(3.40)**	(2.91)**	(1.46)	(0.38)	(0.03)
Austria	0.75	0.83	0.45	-0.03	-0.17
	(2.81)**	(2.77)**	(1.21)	(0.08)	(0.40)
Belgium	1.02	0.89	0.52	-0.06	-0.33
	(3.75)**	(2.96)**	(1.39)	(0.13)	(0.76)
Bolivia	-1.18	-0.99	-0.89	-0.76	-0.62
	(4.36)**	(3.24)**	(2.38)*	(1.73)	(1.43)
Brazil	-1.02	-0.58	-0.39	-0.37	-0.34
	(3.85)**	(1.97)	(1.07)	(0.87)	(0.81)
Bulgaria	-1.76	-1.68	-2.00	-2.62	-2.67
	(6.57)**	(5.60)**	(5.40)**	(5.99)**	(6.31)**
Switzerland	1.64	1.54	1.21	0.61	0.51
	(6.13)**	(5.15)**	(3.25)**	(1.39)	(1.19)
Canada	0.86	0.79	0.44	0.07	0.02
	(3.21)**	(2.64)*	(1.20)	(0.15)	(0.04)
Chile	-0.31	-0.19	-0.27	-0.12	0.05
	(1.15)	(0.64)	(0.72)	(0.27)	(0.13)
China	-1.97	-1.80	-2.21	-2.84	-2.99
	(7.42)**	(6.09)**	(5.99)**	(6.61)**	(7.08)**
Colombia	-0.71	-0.77	-0.78	-0.29	-0.41
	(2.60)*	(2.52)*	(2.09)*	(0.65)	(0.96)
Costa Rica	-0.52	-0.64	-0.75	-0.67	-1.09
	(1.96)	(2.12)*	(2.02)*	(1.56)	(2.58)*
Czech Republic	-0.92	-0.69	-1.08	-1.34	-1.33
	(3.41)**	(2.32)*	(2.89)**	(3.08)**	(3.13)**
Denmark	1.52	1.31	1.02	0.39	0.31
	(5.66)**	(4.38)**	(2.75)**	(0.91)	(0.73)
Egypt	-1.48	-1.32	-1.16	-1.43	-1.31
	(5.54)**	(4.42)**	(3.16)**	(3.31)**	(3.12)**
El Salvador	-0.76	-0.77	-0.94	-0.80	-0.92
	(2.83)**	(2.57)*	(2.54)*	(1.83)	(2.16)*

Finland	1.13	1.04	0.57	0.10	0.05
	(4.27)**	(3.53)**	(1.57)	(0.22)	(0.13)
France	1.08	1.15	0.78	0.39	0.37
	(3.94)**	(3.81)**	(2.06)*	(0.88)	(0.85)
Germany	0.99	1.10	0.73	0.32	0.28
	(3.66)**	(3.70)**	(1.99)	(0.74)	(0.65)
Greece	0.40	0.34	-0.12	-0.49	-0.40
	(1.48)	(1.15)	(0.32)	(1.13)	(0.94)
Hong Kong	0.78	0.76	0.63	0.49	0.48
	(2.89)**	(2.54)*	(1.70)	(1.15)	(1.16)
Hungary	-1.14	-0.87	-1.25	-1.38	-1.25
	(4.25)**	(2.91)**	(3.41)**	(3.21)**	(2.99)**
Iceland	1.13	1.03	0.65	0.22	0.05
	(4.13)**	(3.33)**	(1.71)	(0.49)	(0.11)
India	-1.80	-1.76	-1.68	-1.93	-1.73
	(6.74)**	(5.85)**	(4.54)**	(4.44)**	(4.08)**
Indonesia	-2.67	-2.38	-1.86	-2.08	-1.90
	(9.98)**	(8.04)**	(5.05)**	(4.83)**	(4.49)**
Ireland	0.52	0.72	0.21	-0.15	-0.20
	(1.89)	(2.38)*	(0.57)	(0.35)	(0.48)
Israel	0.43	0.54	0.09	-0.23	-0.33
	(1.61)	(1.79)	(0.24)	(0.53)	(0.78)
Italy	0.71	0.67	0.21	-0.17	-0.16
	(2.64)*	(2.25)*	(0.57)	(0.38)	(0.39)
Japan	1.23	1.55	0.81	0.44	0.21
	(4.60)**	(5.24)**	(2.20)*	(1.01)	(0.49)
Jordan	-0.95	-0.93	-1.13	-1.39	-1.23
	(3.55)**	(3.08)**	(3.03)**	(3.18)**	(2.90)**
Korea, Republic of	0.43	0.64	0.34	-0.31	-0.64
	(1.61)	(2.15)*	(0.92)	(0.71)	(1.51)
Luxembourg	1.19	1.24	0.95	0.42	0.55
	(4.34)**	(4.09)**	(2.53)*	(0.94)	(1.28)
Malaysia	-1.06	-0.95	-0.78	-0.92	-0.89
	(3.95)**	(3.21)**	(2.09)*	(2.14)*	(2.11)*
Mauritius	-1.04	-1.01	-1.06	-1.14	-1.08
	(3.86)**	(3.35)**	(2.85)**	(2.63)*	(2.57)*
Mexico	-0.90	-0.62	-0.63	-0.21	-0.16
	(3.36)**	(2.11)*	(1.70)	(0.49)	(0.38)
Netherlands	0.96	0.98	0.60	0.06	-0.13
	(3.57)**	(3.32)**	(1.63)	(0.14)	(0.30)
New Zealand	0.71	0.68	0.31	-0.10	-0.12
	(2.62)*	(2.25)*	(0.82)	(0.22)	(0.29)
Norway	1.41	1.23	0.79	0.13	-0.12
	(5.23)**	(4.08)**	(2.12)*	(0.30)	(0.29)
Peru	-0.94	-0.83	-0.85	-0.64	-0.61
	(3.47)**	(2.72)**	(2.27)*	(1.44)	(1.42)
Philippines	-0.93	-1.02	-1.01	-1.10	-0.92
	(3.45)**	(3.38)**	(2.71)**	(2.55)*	(2.18)*
Poland	-0.80	-0.62	-0.81	-1.04	-0.83
	(3.01)**	(2.09)*	(2.22)*	(2.44)*	(2.00)*
Portugal	-0.03	0.06	-0.16	-0.46	-0.40
	(0.11)	(0.19)	(0.44)	(1.06)	(0.95)
Russian Federation	-3.07	-2.60	-3.30	-3.63	-3.60

	(11.58)**	(8.74)**	(8.95)**	(8.37)**	(8.51)**
Singapore	0.04	0.16	0.09	-0.13	-0.08
	(0.16)	(0.55)	(0.24)	(0.29)	(0.19)
South Africa	-0.54	-0.44	-0.43	-0.53	-0.63
	(2.01)*	(1.48)	(1.17)	(1.24)	(1.50)
Spain	0.71	0.68	0.30	-0.12	-0.26
	(2.66)*	(2.29)*	(0.81)	(0.27)	(0.63)
Sweden	1.16	0.93	0.52	-0.04	-0.09
	(4.36)**	(3.13)**	(1.40)	(0.09)	(0.22)
Taiwan	0.53	0.64	0.25	-0.26	-0.52
	(1.99)	(2.18)*	(0.67)	(0.60)	(1.24)
Thailand	-1.11	-1.15	-0.93	-1.06	-0.88
	(4.16)**	(3.85)**	(2.51)*	(2.46)*	(2.10)*
Turkey	-0.54	-0.43	-0.52	-0.71	-0.61
	(2.05)*	(1.45)	(1.42)	(1.66)	(1.48)
United Kingdom	0.85	1.17	0.74	0.44	0.43
	(3.14)**	(3.94)**	(2.00)	(1.01)	(1.02)
United States	1.03	0.96	0.71	0.53	0.71
	(3.85)**	(3.24)**	(1.91)	(1.22)	(1.67)
Ukraine	-2.72	-2.34	-2.79	-3.31	-3.30
	(10.22)**	(7.81)**	(7.52)**	(7.61)**	(7.81)**
Venezuela	-0.50	-0.43	-0.53	-0.51	-0.55
	(1.86)	(1.46)	(1.45)	(1.19)	(1.33)
Vietnam	-2.53	-2.38	-2.78	-3.41	-3.65
	(9.39)**	(7.89)**	(7.53)**	(7.83)**	(8.59)**
Zimbabwe	-2.29	-2.13	-1.40	-1.56	-1.58
	(8.50)**	(7.02)**	(3.80)**	(3.60)**	(3.77)**
Constant	8.28	8.69	9.09	9.95	10.43
	(30.20)**	(27.54)**	(24.11)**	(22.63)**	(24.17)**
Observations	1619	1606	1737	1739	1704
R-squared	0.92	0.91	0.89	0.85	0.82

Robust t-statistics in parentheses
* significant at 5%; ** significant at 1%

Table 8. Regression estimates of the impact of company and industry characteristic on global wage levels by occupation (preferred specification).

Regressions of log wages by occupation on dummy variables for the status of the company, size of the company, performance of the company, and economic sector. Regression errors are assumed to be independent across countries but correlated within countries.

The excluded categories for the dummy variables are:

Country: Argentina.
Status of Firm: "domestically based firm that sells mainly in the domestic market".
Size of firm: 0-500 employees worldwide.
Sector: food and beverages.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Dummy variables for the status of the firm					
Dummy variable =1 for domestic based firm that sells in both domestic and foreign markets.	0.01 (0.54)	0.02 (0.65)	0.03 (0.86)	0.07 (2.00)	0.09 (2.53)*
dummy var=1 Unit/subsidiary of Multinational operating in the country	0.04 (0.90)	0.07 (1.90)	0.16 (3.92)**	0.14 (2.98)**	0.12 (2.37)*
Unit/subsidiary of Multinational operating in the country Times Dummy variable for "OECD"	-0.04 (0.68)	-0.06 (1.17)	-0.10 (1.74)	-0.04 (0.66)	-0.05 (0.62)
Sum of previous two estimated coefficients (F-test for sum=0)	0.00 (0.00)	0.01 (0.12)	0.06 (2.02)	0.10 (3.27)	0.07 (1.66)
Dummy =1 for Government or Quasi government enterprise	0.00 (0.04)	-0.02 (0.42)	-0.12 (2.03)*	-0.08 (1.41)	-0.11 (1.72)
Dummy =1 for Government Organization	-0.11 (2.14)*	-0.01 (0.14)	-0.19 (1.04)	-0.17 (2.17)*	-0.45 (4.87)**
Dummy variables for Size of company (measured by employment)					
Dummy =1 if category is 500-1,000 employees Worldwide; 0 otherwise	0.04 (1.60)	0.08 (2.45)*	0.07 (2.13)*	0.11 (2.47)*	0.09 (1.69)
1,000-10,000 Worldwide	0.06 (2.22)*	0.09 (2.92)**	0.09 (3.14)**	0.17 (4.61)**	0.21 (5.02)**

10,000-100,000 Worldwide	0.09 (2.82)**	0.11 (3.33)**	0.13 (3.76)**	0.22 (5.22)**	0.28 (6.88)**
100,000+ Worldwide	0.02 (0.49)	0.04 (0.88)	0.11 (2.48)*	0.26 (4.27)**	0.30 (4.56)**
Categorical variables for recent performance of the company					
Revenue growth in past three years (1=negative; 2=0%;3=1-10%;4=11-20%; 5=20+%)	0.00 (0.42)	-0.00 (0.12)	0.01 (0.94)	0.03 (2.97)**	0.03 (3.21)**
Export growth (1=decreasing; 2=steady;3=increasing)	0.01 (0.55)	-0.00 (0.02)	0.01 (0.27)	-0.00 (0.14)	0.04 (1.82)
E-mail usage (scale of 7, with 7 highest)	0.02 (2.80)**	0.02 (3.21)**	0.03 (3.02)**	0.04 (2.81)**	0.04 1 to (2.89)**
Dummy Variables for Industry					
textiles/apparel	-0.15 (5.14)**	-0.18 (3.97)**	-0.16 (3.83)**	-0.24 (3.27)**	-0.26 (2.83)**
housing/household	-0.04 (0.80)	-0.02 (0.27)	0.02 (0.32)	0.01 (0.09)	0.01 (0.10)
health	0.01 (0.11)	0.04 (0.77)	-0.01 (0.11)	-0.06 (0.86)	-0.10 (1.32)
personal care	0.09 (1.11)	0.04 (0.59)	0.19 (2.39)*	0.08 (1.22)	0.09 (0.85)
entertainment/leisure	-0.02 (0.28)	-0.01 (0.07)	0.00 (0.01)	0.00 (0.01)	-0.03 (0.41)
general business services	-0.04 (1.22)	-0.05 (1.58)	-0.03 (1.02)	0.02 (0.49)	-0.04 (0.92)
financial services	-0.02 (0.71)	-0.07 (1.72)	0.05 (1.31)	0.12 (2.69)**	0.12 (2.22)*
transport and logistics	-0.01 (0.27)	0.03 (0.65)	-0.00 (0.06)	-0.04 (0.83)	-0.05 (0.99)
telecommunications	0.00 (0.04)	-0.00 (0.06)	-0.01 (0.21)	-0.03 (0.38)	-0.12 (1.39)
office products	-0.06 (0.47)	-0.05 (0.44)	0.04 (0.86)	-0.03 (0.26)	0.03 (0.24)

defense	-0.17	-0.07	-0.13	-0.23	-0.24
	(1.53)	(0.88)	(0.81)	(1.57)	(2.02)*
metals/materials	0.04	0.01	-0.01	0.01	-0.02
	(1.00)	(0.39)	(0.23)	(0.29)	(0.31)
petroleum/chemicals	0.07	0.12	0.15	0.21	0.18
	(1.81)	(3.29)**	(3.61)**	(4.45)**	(3.23)**
forest products	-0.01	-0.01	-0.04	0.07	0.03
	(0.17)	(0.25)	(0.56)	(0.99)	(0.49)
semiconductors/computers	0.04	0.05	0.11	0.25	0.21
	(0.65)	(0.71)	(1.69)	(3.85)**	(2.13)*
Dummy Variables for Country included but not shown					
Observations	1685	1670	1810	1811	1775
R-squared	0.92	0.91	0.89	0.85	0.82

Robust t-statistics in parentheses
* significant at 5% level; ** significant at 1% level

"OECD" is not the official membership of the OECD but a shorthand for Austria, Australia, Belgium, Switzerland, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Sweden, United Kingdom, United States.

Table 9. Regression estimates of the impact of country-specific variables on average wage levels by country and occupation, holding constant per-capita GDP.

	(1) Janitors wage	(2) Drivers wage	(3) Secretarys wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Ln(GDP/L)	0.95	1.02	1.12	1.52	1.58
	(5.32)**	(6.38)**	(7.47)**	(8.01)**	(6.87)**
Minimum wage	0.14	0.09	0.08	0.08	0.03
	(2.20)*	(1.72)	(1.51)	(1.16)	(0.45)
Competition	0.34	0.34	0.27	0.33	0.33
	(2.32)*	(2.98)**	(1.91)	(1.95)	(1.80)
Foreign Language (FL)	0.56	0.62	1.20	2.06	2.32
	(1.84)	(2.46)*	(4.95)**	(6.04)**	(5.81)**
ln(GDP/L) * FL	-0.04	-0.06	-0.11	-0.20	-0.22
	(1.35)	(2.07)*	(3.90)**	(5.63)**	(5.27)**
Constant	-2.63	-2.63	-3.73	-6.89	-7.37
	(1.57)	(1.84)	(2.49)*	(3.62)**	(3.32)**
Observations	57	57	57	57	57
R-squared	0.93	0.94	0.92	0.85	0.83

Robust t-statistics in parentheses
* significant at 5%; ** significant at 1%

Ln(GDP/L) is log of GDP in dollars per worker in 1998, converted at market exchange rates.

Minimum Wage is subjective rating of whether minimum wage legislation is binding (rated on a scale of 1-7 where higher value means binding). Positive sign means that wages are higher in countries where minimum wage rules are binding, *ceteris paribus*.

Competition is subjective rating of the intensity of competition in local product markets (rated on a scale of 1-7 where higher value means most intense competition). Positive sign means that wages are higher in countries with more competition.

Foreign Language: for non-English speaking countries, this is the subjective rating of extent to which managers in the country speak a foreign language, English or other. This is rated on a 1-7 scale where the higher value indicates maximum language attainment. For English-speaking counties, since the managers already speak the lingua franca, this is set equal to 6.

Ln(gdp/L) * FL: This is an interaction variable between log GDP per worker and the foreign language attainment variable. The negative sign indicates that the positive correlation between managerial pay and GDP per-worker of the country is attenuated in countries in which managers speak some foreign language or English. For high levels of foreign language attainment, the coefficient estimates imply that the wage-GDP elasticity falls from 1.0 to about 0.2, suggesting that professionals with foreign language skills participate in a global, not local, labor market.

Table 10. List of variables found not to be significantly related to wages after controling for the variables in table 9.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Democracy Index (0-1=max democracy) (Rodrik 1999)	0.03 (0.16)	-0.07 (-0.39)	-0.03 (-0.18)	0.02 (0.08)	-0.01 (-0.04)
De-centralized wage setting (Survey rating)	0.01 (0.11)	0.01 (0.31)	0.02 (0.44)	0.07 (1.10)	0.08 (1.20)
Percent of the population in Agriculture	0.012 (1.92)	0.010 (1.75)	0.007 (1.10)	-0.001 (-0.17)	-0.0008 (-0.09)
Foreign born population (percent)	0.0019 (0.37)	0.0011 (0.23)	0.0086 (2.04)	0.013 (2.46)	0.013 (2.30)
Collective bargaining power of Unions (Survey rating)	-0.07 (-1.01)	-0.06 1.07	0.003 0.05	0.09 1.11	0.09 1.05
Average of Union density and percent of contracts covered by Collective bargaining agreement	-0.001 -0.31	0.00 0.23	-0.001 -0.37	-0.001 -0.48	-0.00 -0.09

Table 11. Wage-GDP slopes for high and low values of foreign language attainment.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Evaluated at high foreign language attainment (FL=6.3)	-	-	0.45	0.28	0.19
(p-value for test if slope=0)			(0.00)	(0.00)	(0.03)
Evaluated at low foreign language attainment (FL=2.6)			0.89	1.07	1.09
(p-value for test if slope=1)			(0.33)	(0.61)	(0.59)

Table 12. Robust versions of regressions in Table 8.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Ln(GDP/L)	0.86	0.85	1.24	1.73	1.66
	(4.86)**	(6.21)**	(7.26)**	(7.76)**	(5.95)**
Minimum wage	0.11	0.07	0.05	0.04	0.01
	(2.19)*	(1.70)	(1.07)	(0.61)	(0.17)
Competition	0.09	0.23	0.19	0.28	0.38
	(0.80)	(2.72)**	(1.75)	(1.82)	(2.08)*
Foreign Language (FL)	0.31	0.37	1.34	2.44	2.57
	(1.05)	(1.74)	(5.05)**	(6.51)**	(5.54)**
ln(GDP/L) * FL	-0.02	-0.03	-0.12	-0.23	-0.24
	(0.59)	(1.10)	(4.13)**	(5.84)**	(4.87)**
Constant	-0.51	-0.85	-4.29	-8.80	-8.31
	(0.32)	(0.72)	(2.88)**	(4.41)**	(3.29)**
Observations	51	52	53	54	52
R-squared	0.95	0.97	0.94	0.88	0.81

Absolute value of t-statistics in parentheses

* significant at 5%; ** significant at 1%

Excluded Countries					
	Singapore	Singapore	Russia	India	India
	Switzerland	Switzerland	Switzerland	Bolivia	Indonesia
	Zimbabwe	Japan	Hungary	Russia	Bolivia
	Japan	Russia	Japan		Vietnam
	Russia	Korea			Russia
	Ukraine				Luxembourg

Absolute value of t-statistics in parentheses

* significant at 5% level; ** significant at 1% level

Ln(GDP/L) is log of GDP in dollars per worker in 1998, converted at market exchange rates.

Minimum Wage is subjective rating of whether minimum wage legislation is binding (rated on a scale of 1-7 where higher value means binding). Positive sign means that wages are higher in countries where minimum wage rules are binding, *ceteris paribus*.

Competition is subjective rating of the intensity of competition in local product markets (rated on a scale of 1-7 where higher value means most intense competition). Positive sign means that wages are higher in countries with more competition.

Foreign Language: for non-English speaking countries, this is the subjective rating of extent to which managers in the country speak a foreign language, English or other. This is rated on a 1-7 scale where the higher value indicates maximum language attainment. For English-speaking counties, since the managers already speak the lingua franca, this is set equal to 6.

Ln(gdp/L) * FL: This is an interaction variable between log GDP per worker and the foreign language attainment variable. The expected negative sign means that the wage-GDP link is attenuated for managers with high foreign language attainment.

Appendix 1 Table 1. Additional wage regressions: effect of ownership status of companies.

Regressions of log wages by occupation on dummy variables for the nature of the company, economic sectors and countries. Estimated by G.L.S. where the error variances are assumed to vary by country. The regressions cover 58 countries. The excluded category is a "domestically based firm that sells mainly in the domestic market" in the food and beverages sector in Argentina.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Dummy variable =1 for domestic based firm that sells in both domestic and foreign markets.	0.03 (1.48)	0.04 (1.73)	0.04 (1.57)	0.09 (3.84)**	0.13 (4.87)**
Dummy =1 if Unit/subsidiary of Multinational operating in the country	0.10 (3.06)**	0.13 (4.38)**	0.24 (5.59)**	0.24 (5.37)**	0.27 (4.95)**
Dummy=1 for Unit/subsidiary of Multinational operating in the country times Dummy=1 if "OECD"	-0.09 (1.91)	-0.09 (2.48)*	-0.17 (3.38)**	-0.09 (1.41)	-0.12 (1.55)
Sum of previous two estimated coefficients (F-test for sum=0)	0.01 (0.09)	0.04 (1.52)	0.07 (4.62)**	0.13 (9.21)**	0.15 (5.78)**
Dummy=1 if Government or Quasi-government enterprise	0.05 (0.99)	0.07 (1.82)	-0.02 (0.35)	-0.03 (0.51)	-0.08 (1.41)
Dummy=1 if Government Organization	-0.05 (1.26)	-0.08 (1.99)	-0.15 (2.66)*	-0.17 (2.79)**	-0.34 (4.80)**
Industry dummies	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes
Observations	2747	2726	2989	2993	2922
R-squared	0.91	0.91	0.89	0.86	0.83

Robust t-statistics in parentheses
* significant at 5% level; ** significant at 1% level

"OECD" is not exactly the official membership of the OECD but a shorthand for Austria, Australia, Belgium, Switzerland, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Sweden, United Kingdom, United States.

Appendix 1 Table 2. Wage determination by size of company.

Regressions of log wages by occupation on dummy variables for the employment size of the company, both within the country and worldwide, and economic sectors and countries. Estimated by G.L.S. where the error variances are assumed to vary by country. The regressions cover 58 countries. The excluded category is a firm with 0-500 employees in the food and beverages sector in Argentina.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
500-1,000 employees	-0.00	-0.01	-0.03	0.03	0.06
In the country	(0.18)	(0.49)	(0.92)	(0.90)	(1.46)
1,000-10,000	-0.02	0.00	-0.08	-0.00	0.03
In the country	(0.57)	(0.06)	(2.57)*	(0.12)	(0.83)
10,000-100,000	-0.02	-0.00	-0.16	-0.03	0.01
In the country	(0.57)	(0.10)	(4.13)**	(0.77)	(0.23)
100,000+	0.00	0.04	-0.14	-0.08	0.02
In the country	(0.00)	(0.44)	(1.66)	(0.86)	(0.18)
500-1,000 employees	0.03	0.07	0.08	0.08	0.06
Worldwide	(1.03)	(2.05)*	(2.33)*	(1.70)	(1.16)
1,000-10,000	0.06	0.07	0.13	0.16	0.18
Worldwide	(1.78)	(2.30)*	(3.61)**	(4.19)**	(3.84)**
10,000-100,000	0.12	0.14	0.25	0.26	0.30
Worldwide	(2.97)**	(3.37)**	(5.51)**	(4.77)**	(4.71)**
100,000+	0.07	0.10	0.28	0.37	0.39
Worldwide	(1.27)	(1.84)	(4.63)**	(5.13)**	(4.43)**
Industry dummies	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes
Observations	2798	2777	3042	3046	2975
R-squared	0.91	0.91	0.89	0.86	0.83

Robust t-statistics in parentheses
* significant at 5% level; ** significant at 1% level

Appendix 1 Table 3. Effect of recent company performance on wages and salaries.

Regression of log wages by occupation on variables measuring recent revenue growth, profitability and export growth, controlling for industry and country fixed effects. G.L.S. estimates where the error variances are assumed to correlated within but not across the 58 countries.

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Revenue growth in past three years (1=negative; 2=0%;3=1-10%;4=11-20%; 5=20+%)	0.00	0.00	0.02	0.04	0.04
	(0.51)	(0.38)	(1.20)	(3.75)**	(3.23)**
Profitability in past three years (1=declining; 2=stable; 3=increasing)	-0.00	0.01	0.01	-0.01	-0.00
	(0.04)	(0.45)	(0.55)	(0.49)	(0.23)
Export growth (1=decreasing; 2=steady;3=increasing)	0.01	0.01	0.02	0.02	0.07
	(0.81)	(0.44)	(0.94)	(1.11)	(3.28)**
Industry dummies	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes
Observations	1742	1730	1870	1870	1832
R-squared	0.92	0.91	0.89	0.85	0.81

Robust t-statistics in parentheses
* significant at 5% level; ** significant at 1% level

Appendix 1 Table 4. Wages and nature of competition.

Regressions of log wages by occupation on dummy variables for the nature of competition, controlling for industry and country fixed effects. The excluded category is a firm in the food and beverages sector in Argentina whose principal competition is "numerous domestic competitors".

	(1) Janitor's wage	(2) Driver's wage	(3) Secretary's wage	(4) Mid-Manager Salary	(5) Top-Manager Salary
Dummy =1 if principal competition is "a few large local competitors"	0.02 (0.73)	-0.01 (0.67)	0.01 (0.33)	0.05 (1.62)	0.07 (1.82)
Dummy for "One dominant national competitor".	0.05 (1.29)	0.04 (1.15)	0.04 (0.97)	0.14 (3.14)**	0.13 (2.29)*
Main competition Is "Imports"	0.01 (0.52)	-0.01 (0.44)	-0.05 (1.65)	0.06 (1.38)	0.03 (0.70)
"Multinationals operating In the country"	0.06 (2.30)*	0.02 (0.76)	0.10 (2.93)**	0.15 (3.87)**	0.17 (3.49)**
Industry dummies	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes
Observations	2593	2570	2816	2819	2754
R-squared	0.91	0.90	0.88	0.85	0.82

Robust t-statistics in parentheses
* significant at 5% level; ** significant at 1% level

6 Appendix 2

The following question generated the wage variables.

Please note that when the following questions ask about your country, it means the main country of operations of your company. If your …rm is a branch or subsidiary, it refers to the country where your branch or subsidiary operates.

Please provide the typical monthly salary of the following kinds of workers at your company (responses will be presented only as averages for the entire country).

* In your country's currency
* Based on full time work: i.e. 40 hours per week.
* TAKE-HOME PAY; i.e. do not include any payroll taxes paid by the …rm, or any income taxes that the worker may eventually have to pay.

O¢ce cleaner _____.

Driver _____.

Mid-level secretary (for example, 5-years experience) _____.

Mid-level management _____.

Senior Management _____.

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Figure 1

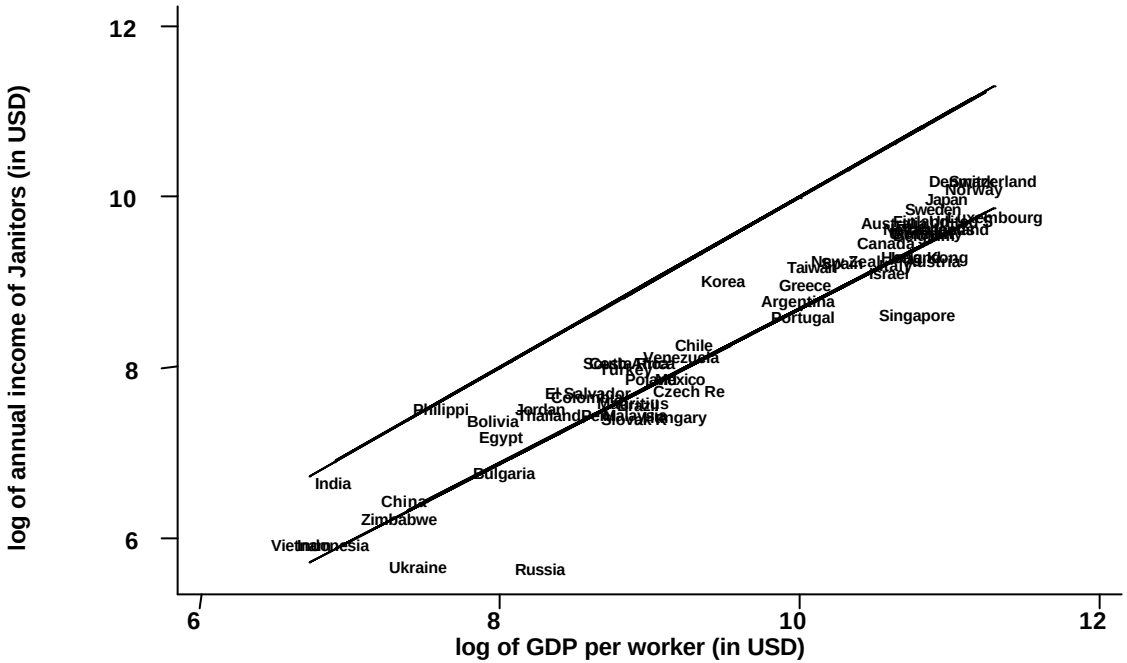

log of annual income of Janitors (in USD)
12
10
8
6
6
8
10
12
log of GDP per worker (in USD)
Switzerland
Norway
Japan
Sweden
Luxembourg
Canada
Korea
Taiwan
Greece
Israel
Argentina
Portugal
Singapore
Chile
Venezuela
Mexico
Czech Re
Philippi
Bolivia
Egypt
Bulgaria
India
China
Zimbabwe
Ukraine
Russia

Figure 2

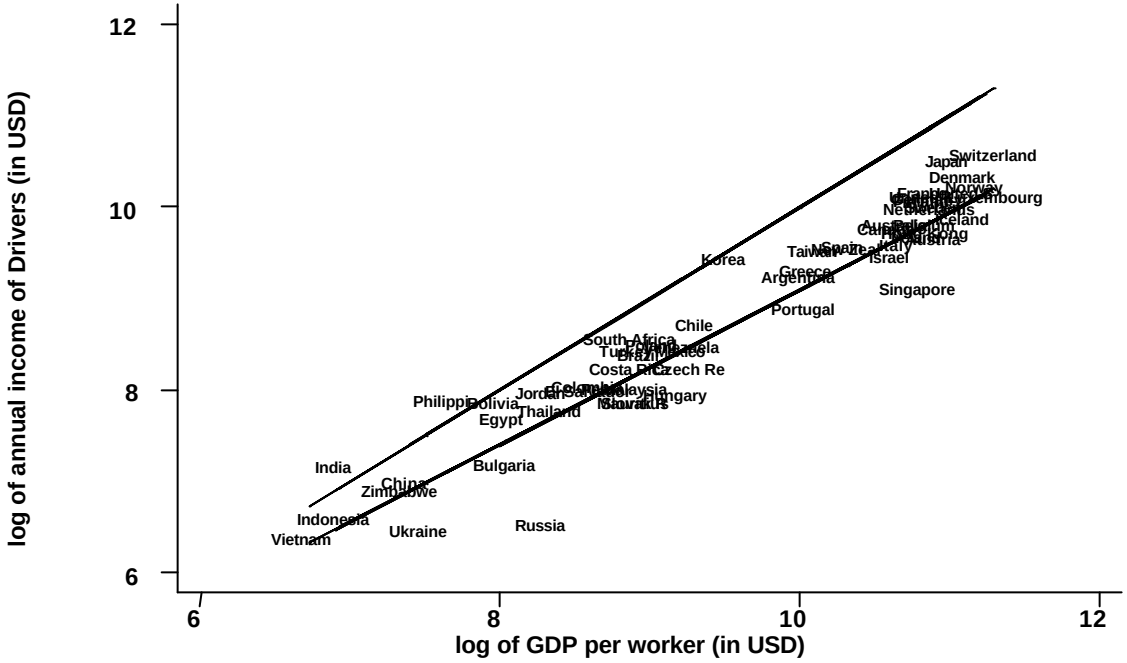

log of annual income of Drivers (in USD)
12
10
8
6
6
8
10
12
log of GDP per worker (in USD)
Switzerland
Japan
Denmark
Luxembourg
Iceland
Korea
Israel
Greece
Argentina
Singapore
Portugal
Chile
Costa Rica
Czech Re
Hungary
Philippines
Bolivia
Thailand
Egypt
India
Bulgaria
China
Zimbabwe
Indonesia
Ukraine
Russia
Vietnam

Figure 3

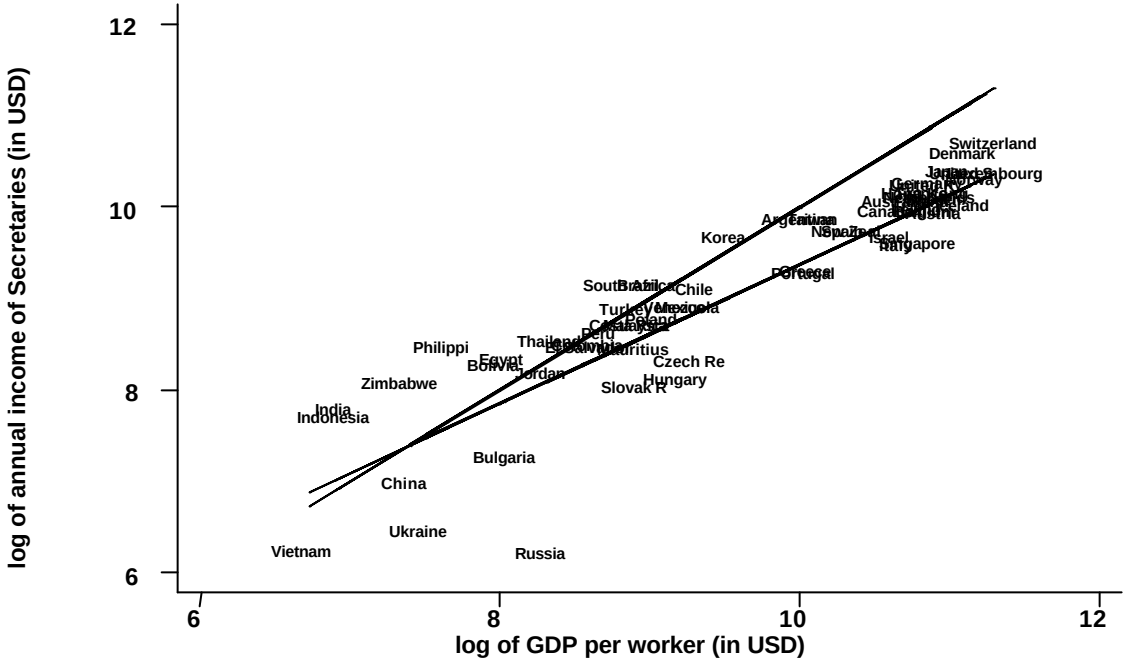

log of annual income of Secretaries (in USD)
12
10
8
6
6
8
10
12
log of GDP per worker (in USD)
Switzerland
Denmark
Korea
Chile
Philippi
Egypt
Bolivia
Jordan
Zimbabwe
India
Indonesia
Bulgaria
China
Ukraine
Vietnam
Russia
Czech Re
Hungary
Slovak R
Mauritius
Singapore

Figure 4

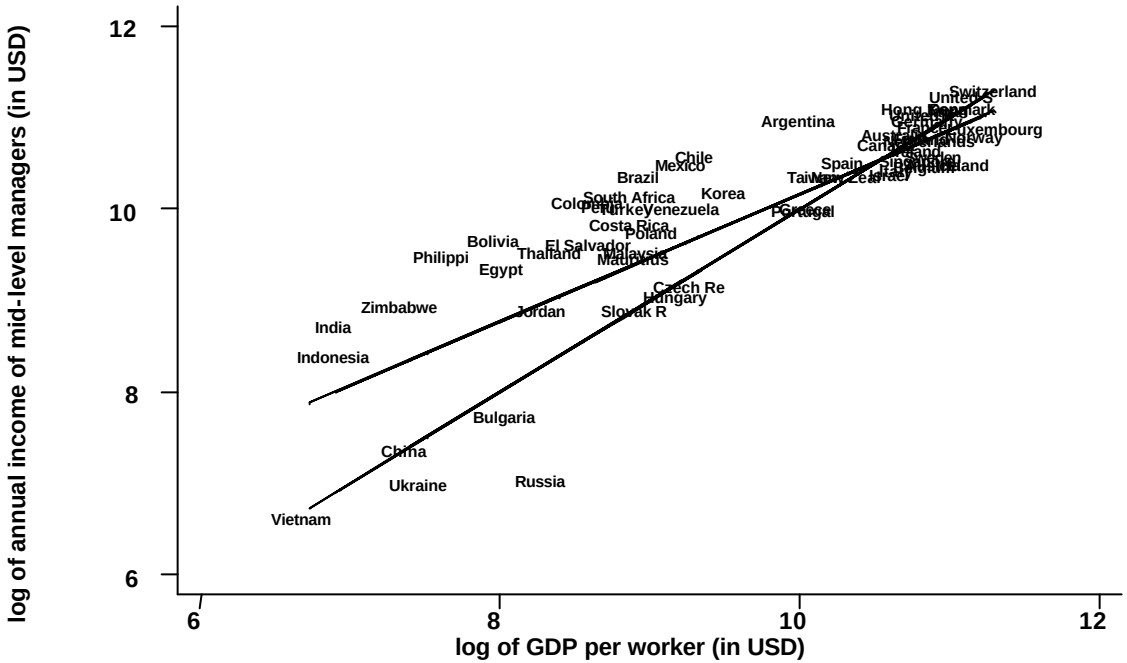
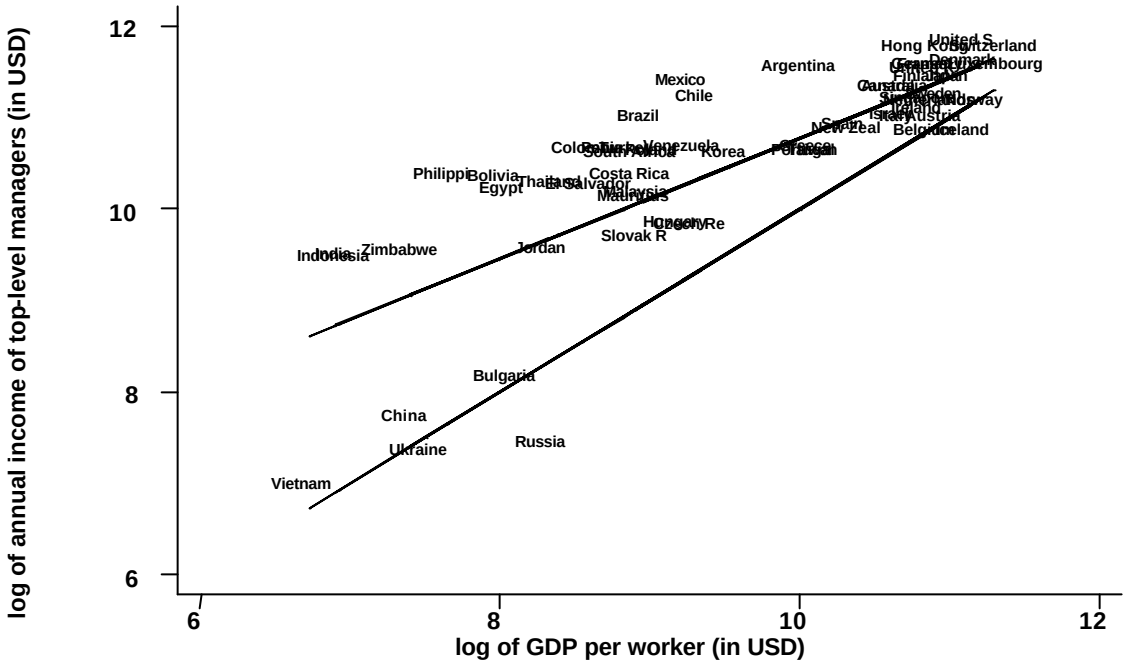

log of annual income of mid-level managers (in USD)
12
10
8
6
6
8
10
12
log of GDP per worker (in USD)
Switzerland
Argentina
Luxembourg
Chile
Mexico
Brazil
Korea
Venezuela
Costa Rica
Poland
Bolivia
El Salvador
Philippi
Thailand
Egypt
Zimbabwe
Jordan
Slovak R
Hungary
Czech Re
India
Indonesia
Bulgaria
China
Ukraine
Russia
Vietnam

Figure 5



log of annual income of top-level managers (in USD)
12
10
8
6
6
8
10
12
log of GDP per worker (in USD)
Argentina
Mexico
Chile
Brazil
Korea
Costa Rica
Philippi
Bolivia
Egypt
Slovak R
Jordan
Zimbabwe
Bulgaria
China
Ukraine
Russia
Vietnam

Figure 6

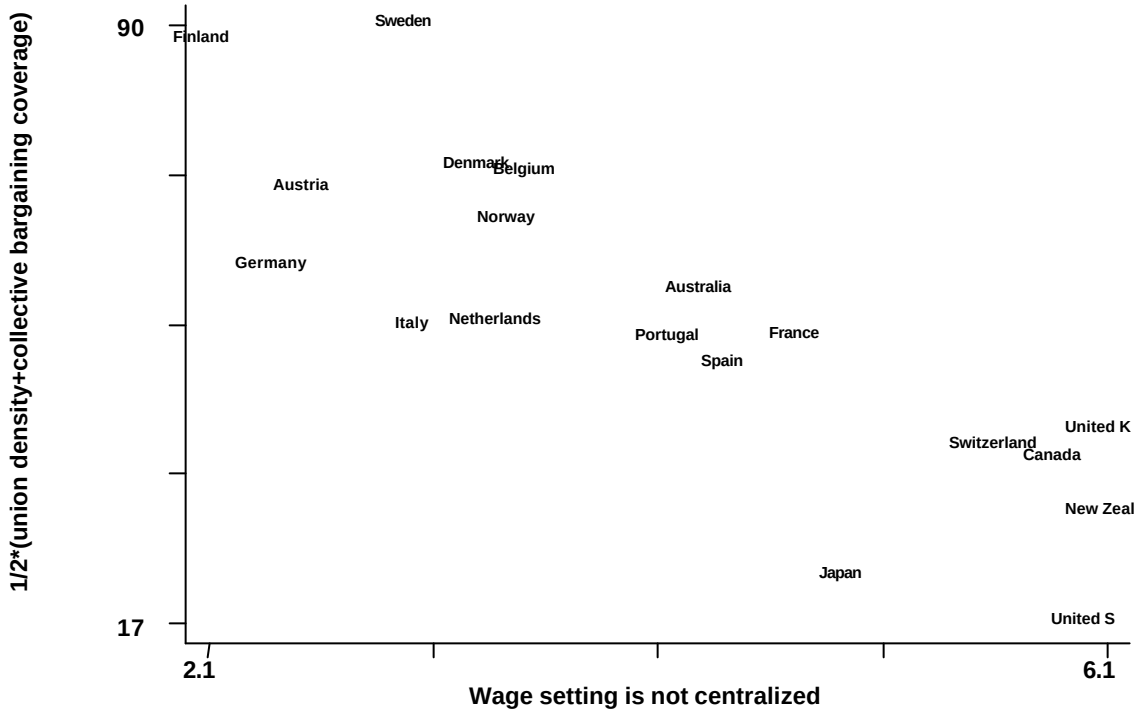

1/2*(union density+collective bargaining coverage)
90
17
Sweden
Finland
Denmark
Belgium
Austria
Norway
Germany
Australia
Italy
Netherlands
Portugal
France
Spain
United K
Switzerland
Canada
New Zeal
Japan
United S
2.1
6.1
Wage setting is not centralized

Figure 7

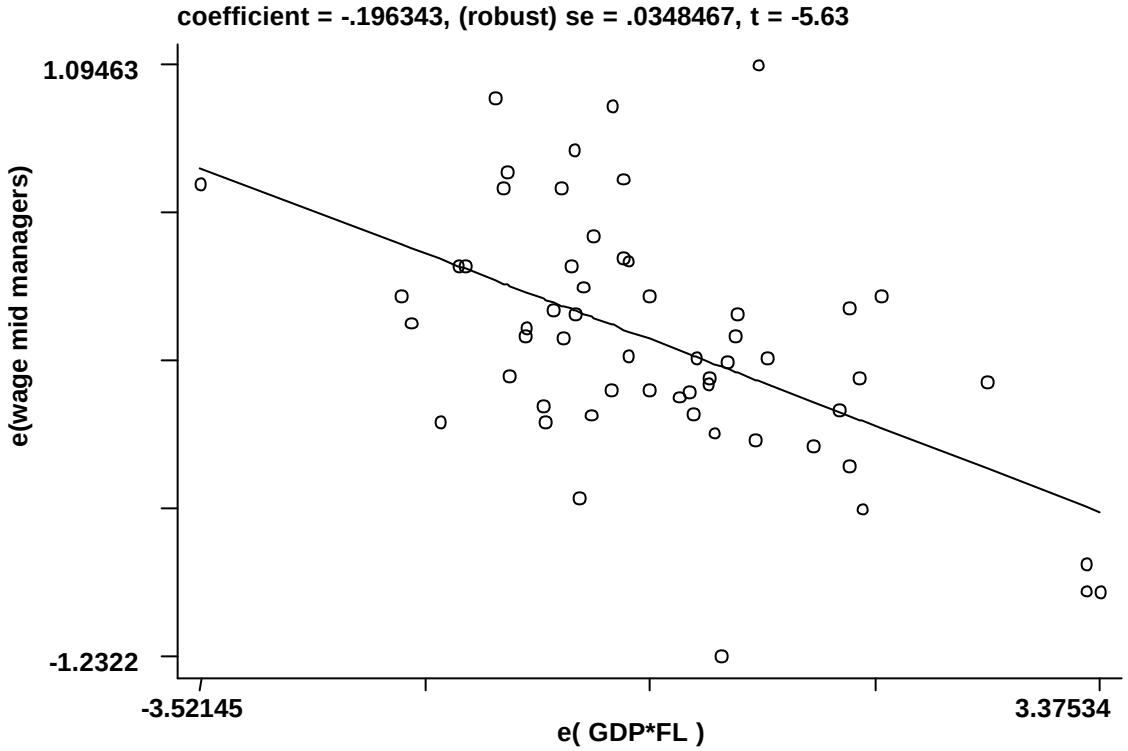

coefficient = -.196343, (robust) se = .0348467, t = -5.63
1.09463
-1.2322
e(wage mid managers)
-3.52145
3.37534
e(GDP*FL)

Figure 8

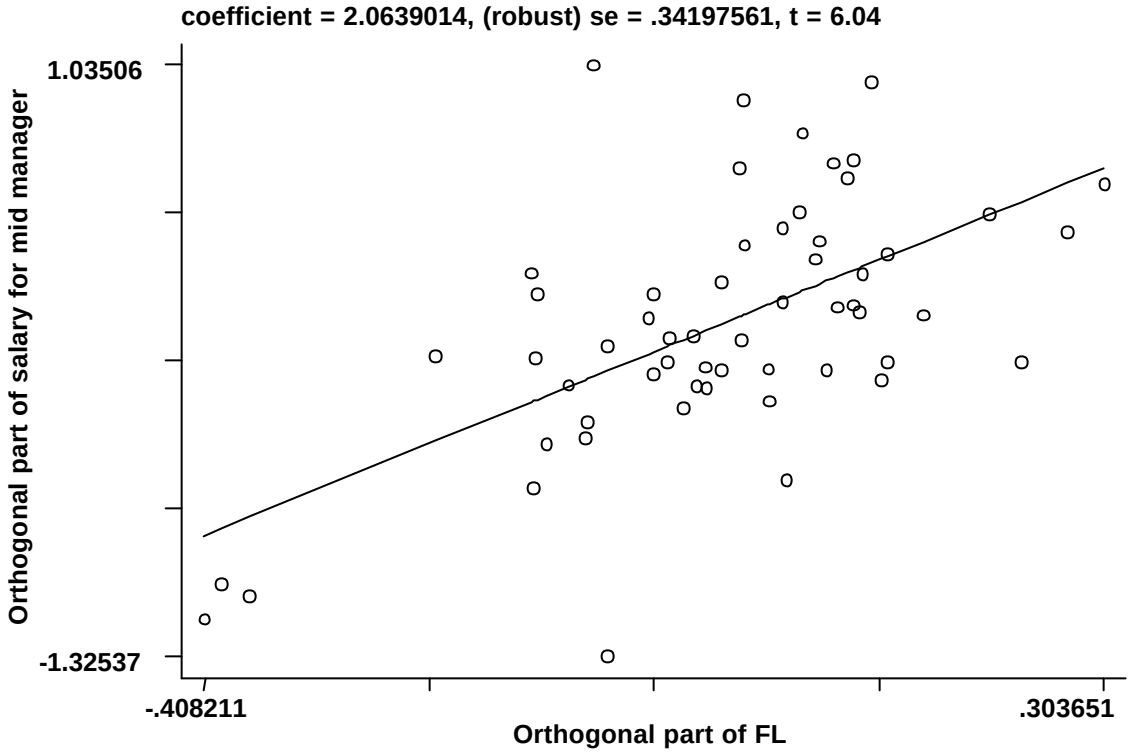
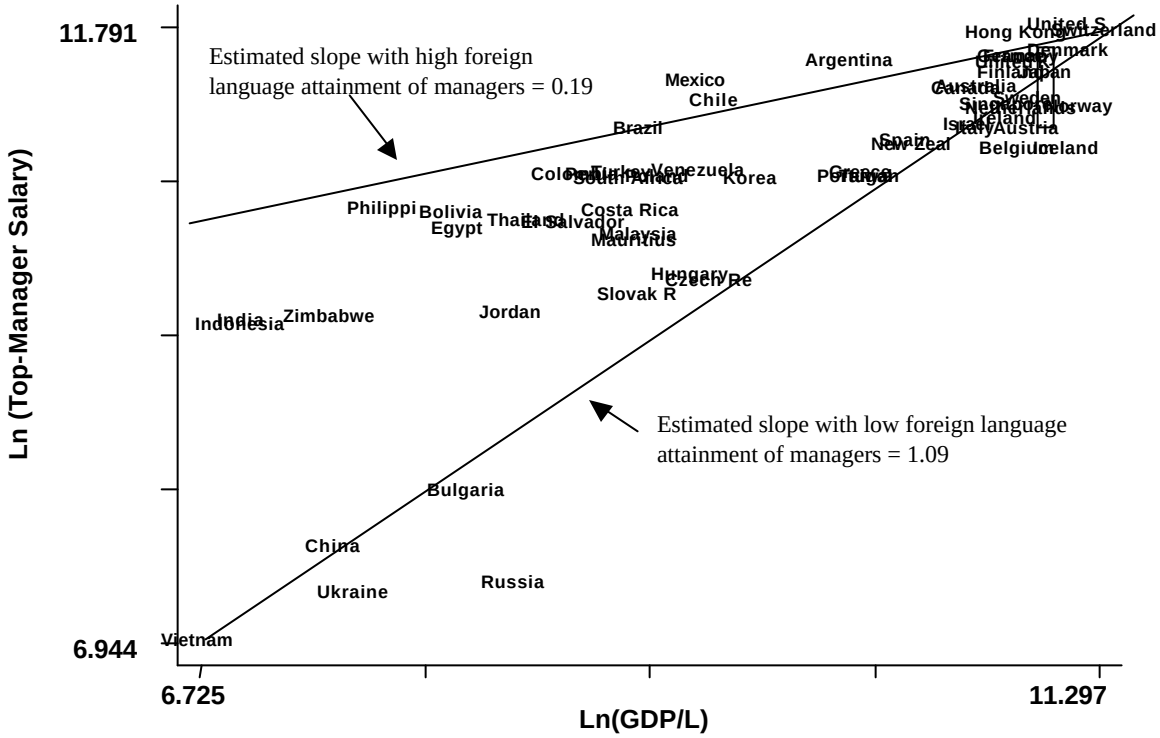

coefficient = 2.0639014, (robust) se = .34197561, t = 6.04
1.03506
-1.32537
Orthogonal part of salary for mid manager
-.408211
.303651
Orthogonal part of FL

Figure 9



11.791
6.944
6.725
11.297
Ln (Top-Manager Salary)
Ln(GDP/L)
Estimated slope with high foreign language attainment of managers = 0.19
Estimated slope with low foreign language attainment of managers = 1.09
Hong Kong
United S
Switzerland
Denmark
Finland
Japan
Argentina
Mexico
Chile
Brazil
Australia
Canada
Sweden
Norway
Ireland
Israel
Italy
Austria
Spain
New Zeal
Belgium
Iceland
Venezuela
Korea
Philippi
Bolivia
Egypt
Costa Rica
Malaysia
Mauritius
Hungary
Czech Re
Slovak R
India
Indonesia
Zimbabwe
Jordan
Bulgaria
China
Ukraine
Russia
Vietnam