Preliminary

Employment Protection and Gross Job Flows[1]

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Abstract

This paper examines the empirical relation between employment protection regulation and gross job flows in a sample of developed and developing countries. By implementing a difference in difference test we avoid the potentially severe endogeneity and omitted variable problems associated with cross-country regressions. This test is based on the hypothesis that job security regulations are more binding in some sectors of economic activity than in others depending on sector-specific characteristics such as product demand volatility or factor specificity. Unlike most of the existing literature, our analysis indicates that more stringent job security regulations slow down job reallocation. This is more so in sectors that require higher labor flexibility. These effects occur within the sample of developed and developing countries and are large in magnitude. Moreover, they are robust to changes in regulatory measures, measurement of sector flexibility requirements, control variables and samples. In contrast, regulations on firm entry and exit seem to play a limited role in reducing job flows

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1. Introduction

A large and growing body of literature has found that a substantial share of productivity growth is associated with the reallocation of workers from less productive to more productive firms and from under-performing firms exiting the market to new firms.[2] In this context, it has been argued that regulations that prevent the reallocation of workers across firms may significantly hinder productivity growth. Yet while many economic models predict that regulations that restrict employment-at-will reduce gross job flows, empirical studies so far have failed to find a conclusive causal relation linking employment protection legislation (EPL) with reduced job turnover (Bertola and Rogerson, 1997; Alogoskoufis et al (1995), OECD, 1996 and 1999; Davis et al (1999)).[3] Thus, much of the evidence so far available suggest that all countries have high rates of job reallocation and that the levels of job reallocation are not significantly correlated with the stringency of the regulatory environment.[4]

This puzzling evidence has spurred substantial modeling efforts to complement the earlier models of employment protection legislation, such as Bertola (1990) and Hopenhayn and Rogerson (1993), with features that can accommodate the apparent lack of relationship between employment protection and job reallocation. Bertola and Rogerson (1997) amend Bertola (1990) by introducing wage bargaining institutions. They argue that countries with high EPL are also countries with very centralized wage bargaining, and that therefore they are characterized by significant wage compression. Faced with a negative shock, firms in countries with rigid wages may end up shedding more labor than firms in countries with lower EPL and less wage compression. Boeri (1999) states that in high EPL countries, firms circumvent regulations by hiring workers on short-term contracts. This again results in high flows despite stringent employment regulations. Following a different line of work, Blanchard and Portugal (2001) argue that the frequency at which the data is analyzed matters; while employment protection regulations may have an effect smoothing short term fluctuations, they might be less effective in preventing flows originated by permanent shocks. Consistent with this notion, they find evidence that while annual job flows are quite similar in the relatively flexible United States than in the relatively rigid Portugal, quarterly job flows are much smaller in the latter.

While the former are important arguments to strengthen any theory of how regulations affect gross job flows, one fundamental problem remains: Measuring the causal relationship between labor market regulations and job flows is a difficult and, by no means, well-accomplished task. Therefore, conjectures based on such weak estimates may be unwarranted. Most estimations of the relationship between job turnover and labor market regulations use simple bivariate or multivariate cross-country analysis

[2] See for instance Foster, Haltiwanger and Krizan (1997) or Scarpetta et al (2002)

[3] See Bertola (1990) and Hopenhayn and Rogerson (1993) for two models where employment protection slows down labor reallocation.

[4] Garibaldi, Konings and Pisarides (1996) show a negative association between EPL and job reallocation but do not report whether such association is statistically significant at conventional levels.

(OECD 1999; Garibaldi et al (1996)). Such methodology, while suggestive, cannot control for a host of unobservable variables that are likely to be correlated with turnover and regulatory measures, potentially biasing the estimates.[5]

First, in the majority of cases, the estimates do not control for the size or the variability of the shocks facing each country. Since it is plausible that countries that experience high turnover rates may have a high demand for strict employment protection regulations, cross countries studies are biased to find a positive relationship between labor market regulations and gross job flows. Second, existing cross section estimates do not account for the fact that definitions of turnover vary across countries introducing substantial measurement error in the dependent variable. Thus, for instance, in some countries reallocation is measured at the firm level, while in others, it is collected from plant-level information. The two measures are not strictly comparable because firm level data misses the reallocation that occurs within plants. Similar problems arise due to differences in the definition of ownership changes and mergers and acquisitions across countries, which imply that in some countries changes in ownership are registered as firm deaths, while in others are not. Third, existing estimates do not control for country differences in the distribution of activity across sectors or the size of firms, which in turn affect aggregate turnover rates. Measurement errors increase the standard errors of the estimates and may explain the lack of statistically significant association between turnover and EPL. Lastly, these estimates are based on a relatively small sample of industrial countries. Inferences based on these results do not necessarily generalize to other parts of the world.

In this paper, we develop a formal test of the causal relationship between labor market regulations and job turnover that overcomes these difficulties. Following Rajan and Zingales (1998), this test exploits differences across sectors to implement a difference in difference methodology. [6] In a simple dynamic labor demand framework, we show that different industries require different level of employment reallocation. Such differences may arise from disparities in the variance of idiosyncratic or sector wide shocks, as well as technological differences. For example, industries with volatile product markets or little use of specific labor require frequent and sizable adjustments in factors while others, characterized by stable product markets or by a high degree of factor specificity, will require small adjustments in labor and capital. In the latter group, attrition may be sufficient to accommodate negative shocks, while regulations will be strongly binding in the first group of industries.

We identify an industry's intrinsic demand for adjustment in various ways. In one test, we first study the correlation of industry job flows across countries and find that this is very large; across countries, some industries tend to exhibit higher levels of job reallocation. This suggests that there are important technological or product market characteristics that determine the volatility of a sector. Given this large cross-country

[5] Caballero et al (2004) and Bartelsman, E. and Scarpeta, S. (2004) are two recent paper that use sector-data to study the relationship between regulation and turnover (the latter only entry and exit).

[6] This type of difference in difference test has been widely used in the corporate finance literature. See Claessens and Laeven (2002), Galindo, Micco and Ordoñez (2001), Galindo and Micco (2004), and Raddatz (2002).

correlation, we can safely identify the relative volatility of an industry by the level of job reallocation of that industry in one given country. Our baseline country is the United States, which according to many measures has the least restrictive employment protection regulation in our sample. However, our results are robust to other choices. The second step consists in identifying whether industries that require higher levels of reallocation, are relatively less volatile in countries with more stringent job regulations.

We also implement a second test based on the parallel hypothesis that industries that employ a higher degree of labor specificity will be less willing to shed labor when faced with a negative shock than industries that employ more general skills. This is because replacing workers with specific skills when conditions improve requires incurring in recruiting and training costs. In these industries, stringent labor regulations should be less binding that in industries where lower human capital specificity is required. As in the formerly described test, we first identify sectors that require specific skills and then test whether in countries with more regulated labor markets, reallocation is relatively less affected in these sectors relative to sectors that use more general skills.

To implement these tests, we construct a sample of average job reallocation rates by industry and country, for a sample of developed and developing countries. We complement this data with some newly available measures of the regulatory environment. Since, these are "*de Jure*" measures, that is, they compare labor laws according to what is written in the labor codes, we also control for differences in the level of enforcement of labor laws. The results indicate that employment protection reduces turnover and that this is particularly the case in industries that are more volatile or require less specific skills. We find that these effects occur both within the sample of developed and developing countries. There is weak evidence that this effect is larger the better is the rule of law in a given country.

These results are robust to changes in the way we measure labor market regulations and sector flexibility requirements. They are also robust to the inclusion of firm entry and exit regulations and additional controls to account for differences in sector volatility across countries. Finally, they are also robust to changes in the sample of countries or sectors used in our study.

The rest of this paper is organized as follows. Section 2 describes the empirical framework. Section 3 describes the data used in this paper as well as the methodology to identify sectors in which regulations are more binding. Section 4 describes our results both using simple cross-country regressions and when implementing our difference in difference approach. It also describes the results of performing a large number of robustness tests. Finally Section 5 concludes.

2. Empirical Framework and Specification

Our empirical strategy is based on the assumption that some sectors require more flexibility to adjust employment than others to operate successfully. On the one hand, industry demand characteristics imply that firms in some industries will face higher volatility in their product demand than firms in other industries. Textile sectors face the swings of fashion which may imply that one a year the demand of a given material or product is high and very low in the following. Firms in those industries are likely to require higher flexibility to hire and fire workers than firms in industries with less volatile product demands. On the other hand, technological characteristics may imply that firms in different industries face different employment adjustment costs. Thus, firms in industries that given their technological characteristics, require a higher degree of labor specificity, may not be willing to adjust labor given a temporary firm-specific shock, since in the future, hiring similar workers may imply large training and recruitment costs. Instead, adjustment costs are likely to be lower in industries where there is no need to make specific investment between workers and the firm. Appendix A formalizes these ideas.

Following the empirical literature on differences in differences, our empirical approach exploits such sector differences to determine whether sectors that require more adjustment flexibility are relatively more affected by stringent employment protection laws than sectors that require less flexibility. This approach allows us to use country fixed effect to control for all observables and unobservable country characteristics. In particular, it allows us to control for differences in country and sector output volatility as well as for differences in differences on coverage and methodology of data collection across countries.

***** APPENDIX A here?

Empirical Specification

In our empirical exercise we estimate two types of specifications. Following the previous literature, the first one is just a cross-section regression, controlling for industry fixed effects. That is [7]

$$S_{ij} = \tau_j + R_i + Z_i + \varepsilon_{ij} \qquad (1)$$

where S_{ij} indicates employment reallocation in country *i* sector *j*, τ_j is a industry fixed effect, R_i is a measure of employment protection regulations that vary across countries and Z_i is a vector of controls at the country level that mainly control for aggregate volatility. While results based on estimating model (1) improve on existing estimates, there are still a host of variables contained in the error term that can be correlated with the regulatory measure. In particular, we may have a severe endogeneity problem. For example, countries with higher volatility may mandate higher level of job security to reduce the uncertainty faced by employees. In addition, differences in the measure of turnover across countries reduce the precision of the estimates. Therefore, we also implement the difference in differences estimation based on expression (1)

$$S_{ij} = \tau_j + \tau_i + X_j * R_i + \nu_{ij} \qquad (2)$$

[7] This is equation A6 without country fixed effect (see Appendix A).

where τ_i is a country fixed-effect, and X_j is a variable that measures the intrinsic employment adjustment requirements of sector j. Therefore, a negative coefficient on the interaction term, when X_j measures intrinsic volatility, indicates that the effect of regulations reducing turnover is larger in those sectors that are intrinsically more volatile -- relative to some reference sector--. Instead, a positive coefficient on the interaction term, when X_j measures the human capital specificity of a sector, suggests that the effect of regulations reducing turnover is larger the less specific are the skills required in a given sector. The next section presents the data used in the paper and the methodology that we follow to compute X_j.

3. Data

Following Davis and Haltiwanger (1999), job reallocation is defined as the sum of job creation and job destruction. The data used in this paper cover sector information at the 2 digit level on manufacturing industries for 18 countries, 11 developed and 7 in the developing world, during the eighties and nineties (see Table 1). Plant level data have been used for most countries, except for Argentina, Italy and United Kingdom, where only firm level information was available. Entry and exit data was available for all countries but Argentina, Uruguay and Venezuela. We also collect excess reallocation data for the few countries in which this measure is available. Excess reallocation data is defined as the difference between job reallocation and net job creation.[8] In absence of heterogeneous job creation and destruction patterns across firms within sectors, excess job reallocation would be zero. Instead, excess reallocation measures tend to be quite large indicating that a large share of job reallocation is not driven by aggregate shocks (more than 70% of job reallocation in our sample is driven by idiosyncratic shocks). In addition, there is a high correlation between sector job reallocation and sector excess job reallocation (0.99). See Appendix B for a further description of sources and data characteristics.

Brazil and New Zealand stand out as the countries with the highest reallocation rates, while Norway and Germany are the countries with the lowest rates among the sample of countries in which firm entry and exit data are available (see Table 1). Job reallocation is 20.85 per cent in the overall sample (see Table 2.1). On average, job reallocation is very similar in OECD countries (21.14) and in Latin America (20.42). However, this is partly due to the lack of entry and exit data for some Latin American countries. The average reallocation for all Latin American countries with entry and exit data is 26.37. Cross-country comparisons, however, should be treated cautiously. Besides the treatment of entry and exit, differences in the collection and nature of the data, on the definition and treatment of firm mergers as well as differences in the size of shocks imply that data are not strictly comparable. This is a standard problem in cross-country exercises, which we will be able to avoid using a difference in difference methodology to compare countries.

To characterize job security across countries we use mainly two alternative measures. The first measure is constructed by Botero et al (2003) for 85 countries worldwide. This

[8] See Davis and Haltiwanger (1999)

measure, dated in 1997, is the sum of four variables each of which takes on values between 0 and 1; (i) grounds of dismissal, (ii) dismissal procedures, (iii) notice and severance payments and (iv) protection of employment in the constitution. The rules of grounds of dismissal range from allowing the employment relationship be terminated at will, by any party at any time, to allowing the termination only in a very narrow list of "fair" causes. Procedures for dismissal require employers to obtain authorization for third parties (unions, judges, etc) prior to dismissal. Advance notice and severance payments are measured for a worker with a 20 year tenure at a firm.

The second measure of job security is constructed by Heckman and Pagés (2003) (HP) and is narrower in scope, only including provisions that have a direct impact on the monetary cost of dismissing a worker. This measure, however, has the advantage of varying across time, thus better reflecting the regulatory environment during the early years of our sample than the previous measure. It also has the advantage of better reflecting the varying schedule of advance notice and severance pay at different tenure levels. To quantify the effects of the legislation according to advance notice and severance pay, the authors construct a measure that computes the expected future firing costs, discounted at the time a worker is hired. This cost is measured in multiples of monthly wages.

For robustness, we also use a third measure of employment regulation, the EPL index constructed by OECD (1999). Although this measure is only available for OECD countries, earlier versions of the EPL index have been widely used in the employment protection literature (see for instance, Blanchard & Wolfers, 2000; Nickell, 1997; Nickell & Layard ,1999 or Garibaldi & Mauro 2002). This index is computed as a weighted average of two indices that reflect the strictness of employment protection to regular, permanent workers and the strictness of the regulation of temporary work both in the early and in the late 1990's (OECD, 1999 annex 2.B). The higher the EPL index, the more restrictive are the regulations. In the late nineties, the strictest employment protection is observed in Southern European countries (Greece, Italy, Portugal and Spain) while United Kingdom and United States present the least regulated labor markets.

Table 2.1 indicates that the measures of job security are higher in the average for Latin America, than in the OECD sample and that the differences are quite substantial. For instance, according to the HP measure the direct expected cost of dismissal in Latin America amounts to 3.13 months of pay, while in the OECD sample, payments only amount to 1.52 months of pay. The Botero et al (2003) measure also reflects a cost that is much higher in the Latin America sample than in the OECD. The correlation between the Botero et al (2003) and the Heckman and Pagés (2003) measure of job security is positive and statistically significant (0.59) (See Table 2.2) The correlation between the Botero et al (2003) and the OECD constructed EPL index is 0.66.

It can be argued however that the stringency of the regulatory environment depends on the level of enforcement of the law. While direct measures of the degree of enforceability of labor laws do not exist, it is expected that countries with better overall rule of law and more effective governments are more likely to enforce labor laws. We use the simple time average of the rule of law and government effectiveness measures constructed by Kauffman et al (2003) to account for law enforceability differences across countries. These indicators reflect the responses given by a large number of enterprise, citizens and expert survey respondents across the world. The values of this measures are standardized between –2 and 2. Higher values reflect better rule of law and higher government effectiveness. Table 2.1 reflects that both measures are higher in the OECD than in the Latin American sample.

Ranking sectors according to volatility and specificity

In this sub-section we provide evidence that some sectors are intrinsically more volatile or have a higher degree of specificity than others and that these differences are correlated across the countries in our sample.

Table 3 shows the correlations of 2-digit ISIC industry average job reallocation across pairs of countries. It also shows the correlation in job reallocation between each country and the simple average of job reallocation in Anglo-Saxon countries (column 18) as well as with the simple average in our sample (row 19). It is quite remarkable that across countries, the correlation is very high. For instance, the pair-wise correlation between Argentina and Brazil is .87 and it is significant at the 1 percent level (second row, first column). This high correlation indicates that volatile sectors in Argentina tend to be the same than in Brazil. Moreover, the correlation between the sector reallocation in Argentina and all other countries of the sample, with the exception of Finland, Sweden and Venezuela is also very high and statistically significant at conventional levels. As Table 3 shows, this is the case for most pairs of countries in our sample, even across countries that are far, either in terms of economic development or geographic distance. Focusing on the correlations with the US (row 17), the pair-wise correlations with developing and developed countries are positive in 16 out of 17 cases, and statistically significant at the 10 percent level in 12. The correlations between the US and the other three anglo-saxon countries in our sample (Canada, UK and New Zealand) are .85 or higher. The two countries with the lowest pair-wise correlation with the USA, and in general with most countries are France and Sweden.

High cross-country correlation in job reallocation can be driven by product market characteristics or by technological requirements. To study the factors behind this high correlation, we test whether the sectors that require more labor specificity, and therefore exhibit less labor flexibility due to technological reasons, are the same across countries. To do so, we postulate that the degree of labor specificity is positively associated with the stock of human and physical capital per worker and therefore, with labor productivity[9]. This hypothesis relies on the observation that higher skilled workers tend to receive more on the job training than less skilled workers. It also relies on the observation that search and recruiting costs tend to be higher for more skilled workers. We then compute the correlation in sector-level labor productivity across pairs of countries. To estimate these

[9] Assuming that wages are increasing in human capital, we have that the average nominal labor productivity is increasing in human capital and in capital output elasticity: PY/L=W*f (Human capital)/α, where α is the labor share.

correlations we first compute average output per worker within the sample period for each sector and country.[10] Table 4 shows a large correlation in average labor productivity across pairs of countries. The correlation between Argentina and Brazil is .85 and it is statistically significantly at the 5 percent level (second row, first column). We obtain similar results for most pairs of countries in our sample, including France and Sweden. Focusing on the US, the results indicate that pair-wise correlations between sector level productivity in the US and the other countries are very high. For 13 out of 16 cases, these correlations are at least .85 and statistically significant at the 5 % level. The results are very similar if labor productivity is computed as value added per worker.

These results suggest that the sectors with high or low productivity tend to be the same across countries and that sector-specific technology factors may be behind the high correlation between sector-level job reallocation. To confirm this hypothesis, we regress sector job reallocation on sector labor productivity and two measures of sector human capital: "Use of computers in 1989" and "Fraction of employees with some tertiary education" obtained from Autor et al. (1998).[11] To focus only on technological factors and get rid of country specific effects, we use the same measure of sector productivity for all countries, which is computed using US data. Therefore, we allow the standard errors to be clustered by sector. The first two columns in Table 5 show that sector-specific labor productivity is highly correlated with job turnover. Industries with higher levels of specificity, measured by labor productivity, have lower levels of job reallocation. This negative correlation may be driven by the well-known relationship between plant age, reallocation and productivity. Sectors with higher than average firm birth rates will tend to exhibit higher rates of reallocation and lower rates of productivity because across countries, younger firms tend to experience higher rates of reallocation and lower productivity than more mature firms.[12] We therefore use a direct measure of skills to assess whether industries with higher use of human capital experience lower job reallocation rates. Columns three and four present the results for the two measures of use of skills in a given sector. "Use of computers in 1989" enters with the expected negative sign and it is significant at conventional levels. The coefficient on the fraction of workers with "Tertiary education in 1990" is negative, although, it is only significant at the 15 percent level. The next four columns include labor productivity, measured as output per worker (columns 5 and 6) or value added per worker (columns 7 and 8), and one measure of human capital at the same time. In these specifications, all the coefficients on the productivity and the human capital variables are negative and they are jointly significant at 5 percent. These results are suggestive of the hypothesis that sectors that exhibit more labor specificity adjust less their labor forces in response to industry or firm specific shocks. However, we cannot reject that these results are driven by reverse

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[10]For each sector, country and year we compute nominal labor productivity relative to labor productivity in sector 31 (ISIC rev.2). Then, we compute the simple time average of (relative) sector labor productivity in each country. We use these averages to compute pair-wise productivity correlations between countries. The data source is UNIDO.

[11] See Appendix B for a full description of variables and sources.

[12] Many empirical studies for different countries show there is a learning by doing process in manufacturing firms, and therefore mature firms tend to have a higher level of productivity vis a vis young ones. See Baily et al (1992), Cahmi et al (1998) among others.

For this regression we do not include USA observations.

causality, that is, sectors that are inherently more stable are better suited to adopt technologies that rely on factor specificity. In this latter case, job turnover and productivity are both ranking sectors according to their intrinsic volatility.

Finally, in column (9) and (10) we regress sector-job reallocation on US sector job turnover and excess job turnover, respectively.[13] In both cases, the coefficients are highly significant. US sector-level reallocation explains around 33 percent of within countries differences on sector job turnover.

Summarizing, our previous results show that some industries are more volatile and/or have a higher level of labor specificity, as measured by labor productivity, than others, and that these sectors tend to be the same across countries. From these results we can conclude that some industries have higher intrinsic volatility and/or use more specific labor than others and therefore they require/demand more input flexibility. In terms of our specification (2), we measure *Xj,* that is, the requirement for input flexibility, with two alternative measures: the US sector-level job reallocation and the US sector-level labor productivity.

4. Results

Cross country estimates

We start our analysis estimating cross-country regressions as laid out in specification (1). The results are summarized in Table 6. As mentioned above, we view these results as a preliminary and possibly biased first step. We regress sector job reallocation on the Botero measure of job security controlling for country's GDP volatility and sector fixed effects. In addition, we control for differences in survey methodology across countries by including two dummy variables. The first takes a value of one if in a given country the data is collected at the plant level data and zero if it is collected at the firm level. The second dummy takes the value of one if in a given country the survey captures entry and exit of plants and zero if it does not. In addition, since we measure job security regulation but not the rigor with which it is enforced, in some specifications we include a proxy for law enforceability and its interaction term with job security. Given that most repressors only vary across countries, we compute the standard errors allowing for within country clustering in the error terms.

Column one restricts the sample to developed countries whereas column two uses all available countries. In both cases we observe that the coefficient on job security is negative, although not statistically significant at conventional levels. Macro shocks (measured as the standard deviation of the GDP growth rate) have a positive effect on reallocation, although this effect is only statistically significant in the overall sample possibly driven by the higher size of aggregate shocks in developing countries. The coefficient on the dummy for entry and exit is positive and statistically significant, indicating that firm entry and exit explains a good chunk of labor reallocation. Overall, these results are consistent with those found by OECD (1999), that is, at conventional

[13] We allow the errors to be clustered within countries.

levels of significance, higher levels of job security do not appear to reduce turnover. Finally, the coefficient on the plant dummy is negative and statistically significant in some of the specifications.

In the next two columns, we re-estimate the baseline specification once we include a control for rule of law as a proxy of law enforcement. The coefficient on job security remains negative and it becomes larger (in absolute value), especially for the sample that includes less developed countries. Yet, it remains statistically insignificant at conventional levels. Column (5) presents the results of re-estimating the former specification with a dataset that includes alternative sources of data for Brazil and Mexico. Instead of data obtained from social security registries, we use data from a manufacturing census survey, which only collects information on continuing plants. In this sample, the coefficient on job security regulations is negative and statistically significant at conventional levels. Overall these results suggest that the effect of job security provisions on job turnover is negative, but estimated with a large standard error.

In Columns (6)-(8), we present the results of estimating specification (3) adding an interaction term between rule of law and the JS regulations measure. A negative coefficient on this variable indicates that the negative effect of JS regulations on turnover is larger (in absolute value) the better is the rule of law in a given country. The results are again ambiguous. In the sample of developed countries, the interaction term between job security and rule of law is negative and statistically significant at conventional levels. However, in the overall sample of countries, this coefficient is lower (in absolute value) and not statistically significant regardless of the source of data for Brazil and Mexico.

We also experimented with government effectiveness as an alternative control for labor law enforceability and the results are identical. Controlling for this variable yields an interaction coefficient that is negative but statistically significant only in the sample of developed countries.

Table C1 in appendix C, presents the results of performing the same exercise for two alternative measures of job security: Heckman and Pagés (2003) and the OECD indices of Job Security. Results with the HP measure are more ambiguous than those obtained with the Botero et al (2003) one. For instance, in a regression controlling for GDP growth volatility and survey dummies, the coefficient on JS yields coefficients that are positive but statistically not different from zero. Similarly, controlling for rule of law yields coefficients on job security that are negative but statistically not different from zero. In addition, the coefficient on the interaction between rule of law and JS is negative but it is not statistically significant. The OECD 1990 measure, EPL90, yields results that are similar to those obtained with the Botero et al (2003) measure for OECD countries, while the 1980 measure is not statistically correlated with turnover, even when controlling for rule of law.

Summarizing, table 6 (and Table C1 in Appendix C) presents evidence that job security is only weakly associated with lower turnover. Only, when controlling for rule of law, in some particular sub-samples and with some measures of job security, are these regulations negatively associated with turnover. While the results here are somewhat more promising than those found in the previous literature, they do not appear as sufficiently robust. However, simple cross-country estimates may be severely biased due to engodogeneity or omitted variable problems. In addition, despite the relatively large number of observations, the identification comes from regulatory differences across 18 countries. The next sub-section presents the results of implementing the difference in difference methodology described above, which allows us to circumvent these problems. We show below that the results change substantially once such country effects are properly controlled for.

Difference in differences estimation

The main advantage of this procedure is that by focusing on the differential effect across sectors within countries, we can now control for all observable and unobservable country characteristics, greatly reducing the scope for omitted variables. It can also control for endogeneity since we control for a country propensity to implement more restrictive regulations with country fixed effects and focus on differences across sectors using US measures (which we assume are not correlated with labor regulations in the other countries). The second advantage is that this procedure relies on the differences across sectors in countries with different levels of regulation, thus multiplying the sources of variation used to estimate this equation.

Table 7 shows the results of estimating specification (2). The main result of this paper is presented in Column 1. After controlling for country and sector fixed effects, we find that more intrinsically volatile industries present lower levels of job turnover relative to less volatile sectors in countries with more stringent employment protection laws. The sign of the coefficient is negative and significant. The row labeled *differential in job reallocation* at the bottom of the table shows the magnitude of the impact of job security on job turnover differentials across sectors and countries, according to our estimation. For example, in Column 1 this differential is 5.8%. This number should be interpreted as follows: job reallocation in an industry in the 90th percentile of flexibility requirement relative to an industry in the 10th percentile is 5.8 percentage points lower in a country with high employment protection (that is, in the 90th percentile of job security) than in a country with low employment protection (in the 10th percentile). These are large numbers if we consider that the average level of job turnover in our sample is 22%.

It could be argued that these results are driven by differences in sector volatility across countries with different levels of income per capita, which in turn are correlated with differences in regulatory levels.[14] To control for such possible income effects, we add to the regression the interaction between income per capita and US job reallocation. Controlling for such effect yields a larger coefficient and a larger magnitude of the impact of jobs security on turnover. In column (2), an increase in job security from the 10 to the 90 (80 to 20) percentile reduces job reallocation in 8.4 (6.4) percentage points. The coefficient on the income and flexibility requirement interaction is also negative and

[14] Heckman and Pages (2003) and Botero et al (2003) show that, across countries, the stringency of job security regulations decreases with income levels.

statistically significant at the 5 percent level, suggesting that job reallocation in more volatile sectors is relatively higher in less developed countries. Figure 1 shows the scatter plot of job reallocation against the interaction of US job reallocation and job security once country fixed effects, sector fixed effects and income levels are taken into account (regression reported in column 2, table 7). The graph shows a clear negative relation between these two variables.

These results are robust to alternative classifications of sector flexibility requirements. In Column (3) we measure sector flexibility requirements according to average sector job reallocation in the sample of Anglo-Saxon countries. While the coefficient in the interaction term is smaller, the magnitude of the impact of regulations on sector reallocation becomes slightly larger.[15] In Column (4) we measure sector-specific flexibility requirements with average excess reallocation in the US. Using excess reallocation allows us to focus only on plants idiosyncratic shocks. The results are qualitatively unchanged. Measuring sector flexibility requirements according to the ranking of US sector reallocation, and computing job reallocation differences across sectors in percentage rates rather than in percentage points (ln SUM) does not alter the results (column 5 and 6). The magnitude of the effect in column (5) is comparable to the one estimated in column (1) that is, increasing job security from the 10 to the 90 percentile reduces turnover in volatile sectors relative to non-volatile sectors in 27%.

In Columns (7) to (9) we assess the robustness of our results to alternative measures of regulations. Measuring the stringency of job security with the HP measure yields a coefficient on job security that is negative and statistically significant at the 10 percent level. The coefficient on the income*flexibility requirement interaction is also negative and statistically significant. The coefficient on the job security interaction is also negative and statistically significant at 5 percent when we use the OECD-elaborated measures of employment protection. These results indicate that employment protection regulations reduce turnover regardless of the regulatory measure considered.

Finally, columns (10) and (11) show that the previous results do not depend on whether we use the manufacturing census data or the social security registry data for Brazil and Mexico. However, the coefficient on job security and the estimated magnitude of the effect on turnover is larger if manufacturing census data is used.

In sum, the results on table 7 suggest that using a difference in difference methodology that controls for country, sector and income effects allows to identify a large and negative effect of job security on turnover.

We next assess whether these results hold within the samples of developed and developing countries. The results are reported in Table 8. Columns (1) - (3) examine our main difference in difference estimation in the Latin American (LAC) and the developed country (DEV) samples. The coefficient is negative and statistically significant in the sample of developed countries and statistically different from zero in the LAC sample

[15] This result comes from the fact that sector job reallocation varies more within Anglo Saxon countries than within the USA.

when we use the manufacturing census data for Mexico and Brazil. The results are very similar if we measure sector flexibility requirements with US excess job reallocation. Finally, the last three columns present the results once we control for law enforceability. We also include the interaction effect between job security and rule of law to check whether job security regulations are more effective in countries with better rule of law. The results provide weak evidence for this hypothesis. However, rule of law may be a poor proxy for labor law enforcement.

Regulations on entry and exit of firms versus employment protection regulations

The entry and exit of firms explains a large share of total labor reallocation. Therefore, regulations that increase the cost of entry and exit of firms can also dampen labor reallocation. Since it is quite plausible that across countries, the political economy that leads to the enactment of job security regulations also leads to the enactment of regulations on entry and exit, our formerly estimated coefficients may be capturing the effects of entry and exit regulations rather than, or in addition to, the effects of job security. To assess whether this is the case, we control for measures of the cost of entry and the cost of bankruptcy.[16] These are the following:

- Cost of entry: We use two alternative measures constructed by Djankov et al (2002). The first measure is the minimum time required to complete all the procedures to start a firm (measured in years). The second is the minimum number of procedures that are required to open a firm.
- Bankruptcy costs: We use three alternative measures constructed by Djankov et al (2003). The first is the average duration that insolvency lawyers estimate is necessary to complete a bankruptcy process (in years). The second is the cost of the entire bankruptcy process, including court costs, insolvency practitioners' costs, the cost of independent assessors, lawyers and accountants, as a proportion of the insolvent state.[17] The third measure documents the order in which claims are paid in the insolvency process, including payment of post-petition claims. Higher value of this measure indicate that creditors claims are given first priority over the claims of workers, tax collectors or shareholders.

We aggregate the cost of entry and exit measures to create two measures, which we name *CEE1* and *CEE2*. The first, *CEE1, i*s the average of the time cost (in years) of creating and closing a firm. To construct *CEE2* we first standardize the number of procedures to open a firm and the cost of bankruptcy as a % of the insolvent state between zero and one. We then take the simple average of the two standardized values.

Table 9 shows the correlations between job security and the cost of entry and exit measures. As expected, most correlations are statistically significant at 10 percent. Countries where the cost of firm entry and exit is low tend to give priority to creditors in the insolvency process. Interestingly, there is also a strong negative correlation between *Absolute Priority* and the job security measures. This suggests that the enactment of strict job security provisions is associated with giving lower priority to creditors and higher

[16] These measures are available online. The address is http://rru.worldbank.org/DoingBusiness/default.aspx
[17] The cost of bribes is not included in this measure.

priority to workers' claims in the bankruptcy process. Within our sample Canada, Germany, Finland, United Kingdom, Norway, New Zealand, Sweden, Uruguay, the United States and Venezuela, give first priority to creditors. The rest give higher priority to other claims. Instead, the correlation between job security provisions and *CEE1* and *CEE2* is positive but not statistically significant at 10%.

Table 10 shows the results of estimating our baseline specification once we control for entry and exit regulations. Including *CEE1*, *CEE2* or *Absolute Priority* does not alter our baseline results. The coefficient on the interaction between US reallocation and the Job Security measures does not vary much and remains statistically significant at 1 percent. The coefficients on the cost of entry and exit measures and on the priority measure are negative but not statistically significant.

We next investigate whether stringent regulations on firm entry and exit are more likely to reduce turnover in those sectors that experience higher labor reallocation due to entry and exit of firms. We measure a sector's intrinsic birth and death propensity with US data on labor reallocation caused by firm' births and deaths by sector. Our results suggest that entry and exit regulations play a smaller role in affecting sector differences in turnover than job security regulations.

Finally, we investigate whether firm entry and exit regulations increase the effect of job security provisions on turnover. This is the case if employers can evade labor regulations by declaring bankruptcy, laying off workers without paying workers' claims, and opening another firm shortly afterwards. Yet, there is no evidence that firms engage in such practices to avoid incurring the costs associated with labor laws. Yet to a large extent this is due to the lack of relevant variation. In two out of three cases, the coefficient on the interaction of US sector reallocation and job security is still statistically significant while the triple interaction is not. In the case of the absolute priority measure, both the main effect and the triple interaction become statistically insignificant. Yet, both coefficients are jointly significant. The large correlation between job security and absolute priority measures does not allow identifying these coefficients separately.

In sum, regulations on entry and exit of firms and job security regulations are correlated our main results are not driven but such correlation. In addition, there is little evidence that entry and exit regulations affect turnover either directly, or indirectly by increasing the effect of job security provisions.

Specificity

We implement a second test based on the hypothesis that industries that rely on unskilled labor or general human capital demand more flexibility, and therefore should be more affected by stringent employment protection laws that industries that rely on very specific human capital. These differences arise from differences in labor shares or in the investments in recruitment and training incurred by firms in industries that require very specific skills when hiring or replacing human capital. As discussed in section 3, we measure the level of labor specificity by the level of labor productivity in US sectors. As shown, the large correlation between sector productivity across countries indicates that we can safely measure relative productivity across sectors in a country by using average labor productivity in the US manufacturing disaggregated at the two-digit ISIC level. This allows us to control for the possibility that some of the differences across sector productivity in a given country are endogenous to regulations. In that case, the level of productivity would not only capture sector-specific characteristics, but also other country effects related to the regulations. In addition, we also measure labor specificity by the use of computers and the percentage of workers with tertiary education in a given sector in the United States.

Table 11 summarizes our results using US sector labor productivity as well as sector human capital measures as proxies for sector flexibility requirements. As in the previous regressions we include country and sector fixed effects. Columns 1 and 2 measure specificity with average sector labor productivity in the United States. Labor productivity is computed as output per worker and value added per worker, respectively. In both regressions, the coefficient on the interaction term between US labor productivity by sector and job security has a positive sign and is statistically significant at the 5 percent. This positive sign implies that reallocation in sectors that use more general skills (that is, low productivity sectors) tends to decline relative to reallocation in more productive sectors as labor market regulations become more stringent. As in our former estimates, the estimated magnitude of the effect is large. The difference in turnover between low and high productivity sectors is reduced in 5.6 percentage points as job security increases from the 10^{th} percentile to the 90^{th}. In Column (3) we measure sector specificity by the sector use of computers in the United States in the year 1990. The coefficient on the job security-productivity interaction is positive and statistically significant at the 10 percent level. Column 4 reports the results once labor reallocation is measured in logarithms. Defining differences in turnover between high and low productivity sectors in percentage terms does not alter our estimates. In addition, the estimated impact of job security remains large. Finally, the last two columns report results using manufacturing census data instead of social security registries data for Mexico and Brazil. As in the estimates reported in Table 7, using this alternative sample increases the size of the estimated effects of job security on turnover. For instance, according to the results reported in column (6) –Table 11- an increase in job security from the 10^{th} percentile to the 90^{th} would reduce job reallocation by 30% in low productivity sectors relative to the high productivity ones.

These results confirm our previous results showing that employment protection reduces job turnover. Moreover, this effect would be higher in low productivity sectors. This in turn suggest that the higher recruiting and training costs incurred by high productivity sectors result in less binding job security regulations. Instead, flexibility requirements are high in sectors, such as Textile where productivity is low and hiring and recruiting costs are minimal. These are the sectors that suffer relatively the most in countries with very protected labor markets. Of course, we cannot reject the hypothesis that the low levels of turnover in high productivity sectors are explained by reverse causality, that is, relatively stable sectors have been able to develop technologies that yield high productivity. In that case, differences in the degree of specificity may be irrelevant to explain why some sectors are more volatile than others, however, our main results would still be maintained: job security reduces turnover, particularly in very volatile sectors.

Robustness to sample changes

It is well known that cross-country regressions suffer from lack of robustness. In this paper we are able to control for a host of observable and unobservable country and sector effects using a difference in difference methodology. Our main results are robust to changes in regulatory measures, measurement of sector flexibility requirements, control variables and use of different sub-samples. However, it could still be the case that the results are driven by the inclusion or exclusion of a given country or sector. To test for this possibility, we re-run our baseline estimates (columns (2) and columns (6) in Table 7) excluding one country and one sector at a time.

Table 12 reports the results of re-estimating our baseline results excluding one country at a time. The results are very robust. In all cases, the coefficient on the interaction term is negative and statistically significant at the one percent level. Excluding Mexico and Uruguay, a very small country where average job reallocation is computed with lower precision, increases the size of the estimates.[18] Similarly, Table 13 indicates that our main results do not depend on the inclusion of a given sector of activity.

4. Conclusions

This paper has shown that some sectors exhibit larger volatility and productivity than others and that these differences are strongly correlated across countries. We develop a simple empirical framework to show how technological or product market factors lead to differences in the demand for factor adjustment across sectors. The model also predicts that sectors with a higher demand for factor adjustment should be more affected by stringent employment protection regulations. We implement an econometric test of this hypothesis using a difference in difference estimation. Our results suggest that strict job security regulations slow down job reallocation and that these effects are larger in sectors with a higher demand for factor adjustment. In addition, the magnitudes of these effects are large. These results are in line with the predictions of economic models, such as Bertola (1990) or Hopenhayn and Rogerson (1993).

Some implications emerge from this analysis. First, if productivity gains resulting from job reallocation are important, constraints on dismissals may reduce an economy productive efficiency by a substantial amount, unless such losses are compensated by productivity gains derived from more stable employment relationships. Second, labor market regulations may be specially binding in low-income countries. This is because poorer countries tend to be specialized in the production of goods that require unskilled labor or workers with very general skills.

[18] Ideally one should weight the estimates by each sector standard deviation in job reallocation. However these data was only available for the Latin American sample.

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Appendix A: Analytical Framework

In this appendix we provide theoretical support for our empirical specification. Consider an environment where firm *i* faces the following demand and production function (logs)

$$y_{ijct} = d_{ijct} - \eta(p_{ijct} - p_{.jct}) \qquad \eta > 1$$
$$y_{ijct} = a_{ijct} + \alpha_j l_{ijct} \qquad 0 < \alpha_j < 1$$

where y_{ijct} denotes the (log) production of firm *i* in sector *j*, country *c* and period *t*, p_{ijct} is the (log) production price of such firm, d_{ijct} is a demand shifter and $p_{.jct}$ is the average (log) price in sector *j*, period *t* country *c*. In addition, a_{ijct} represent a productivity parameter and α_j denotes the labor share in sector *j*. Both a_{ijct} and d_{ijct} are i.i.d random walks. Assuming free mobility of labor within sectors and that firms take the real wage as given (which also is a RW), the log-change of the desired level of employment in the absence of adjustment costs can be written as:

$$\Delta l^*_{ijct} = \frac{1}{1-\alpha_j\gamma}\left[(1-\gamma)\Delta d_{ijct} + \gamma\Delta a_{ijct} - (\Delta w_{.jct} - \Delta p_{.jct})\right] \tag{A1}$$

and $\gamma = 1 - \frac{1}{\eta}$

l* is the desired level of employment (log), if there were not adjustment cost, of firm *i* in sector *j*, country *c* and period *t.*[19]

Defining the aggregate demand, TFP and real wage shocks as the simple average of firm and sector specific shocks at the country level,[20] equation [1] becomes

$$\Delta l^*_{ijct} = \frac{1}{1-\alpha_j\gamma}\left[IDS_{ijct} + AGS_{.ct}\right] \tag{A2}$$

were *IDS* denotes the idiosyncratic (firm and sector) demand, supply and real wage shocks, and *AGS* denotes the same aggregate shocks.[21]

In addition, assume a quadratic employment adjustment cost, then, the optimal path of employment l_{ijct} is given by[22]

$$l_{ijct} = (1-\lambda_{jc})l^*_{ijct} + \lambda_{jc} l_{ijct-1} \tag{A3}$$

where l_{ijct} denotes the (log) observed level of employment, λ_{jc} is the adjustment cost in sector *j* in country *c*.

[19] From now on wages are assumed as the numeraire.

[20] The aggregate demand shock is defined as $\Delta d_{.ct} = \frac{1}{N_j}\sum_{ij} \Delta dijct$.

[21] $IDS = \frac{1}{\eta}(\Delta d_{ijct} - \Delta d_{.ct}) + \gamma(\Delta a_{ijct} - \Delta a_{.ct}) + -(\Delta w_{ijct} - \Delta p_{ijct} - (\Delta w_{.ct} - \Delta p_{.ct}))$

[22] This result assumes a Random Walk without trend. The result is easily extended to the case of a Random Walk with trend.

Using recursively equation (A3) and applying the variance operator to the first difference of the resulting equation yields

$$\operatorname{var}(\Delta l_{jc}) = \frac{(1-\lambda_{jc})^2}{1-\lambda_{jc}^{\;2}} \operatorname{var}(\Delta l^*_{jc}) \qquad \text{(A4)}$$

Replacing equation (A2) in the previous result we obtain

$$\operatorname{var}(\Delta l_{ijct}) = \tilde{\lambda}_{jc} \frac{\operatorname{var}(IDS_{ijct}) + \operatorname{var}(AGS_{.ct})}{(1-\alpha_j \gamma)^2} \qquad \text{(A5)}$$

where $\tilde{\lambda}_{jc} = \dfrac{1-\lambda_{jc}}{1+\lambda_{jc}} < 1$

The former expression implies that the variance of employment in a given sector will depend on (i) the stringency of the regulatory measures and the sector-specific technologically based adjustment cost (summarize in $\tilde{\lambda}_{jc}$); (ii) the variance of idiosyncratic (firm and sector) shocks (Var(*IDS*)); (iii) the variance of aggregate country shocks (Var(*AGS*)) and (iv) the labor share in a given sector ($\alpha_j \gamma$)[23]

Assuming that the variance of idiosyncratic (firm and sector) shocks is equal across countries up to a constant term, $var(\Delta l_{jc})$ can be written as:

$$\operatorname{var}(\Delta l_{jc}) = \tilde{\lambda}_{jc} \frac{VAR_j}{(1-\alpha_j\gamma)^2} + \tilde{\lambda}_{jc} \frac{VAR_c}{(1-\alpha_j\gamma)^2} \qquad \text{(A6)}$$

Equation (A6) is our baseline to estimate the effect of labor regulations on job flows. If job security increase adjustment costs (a decline in $\tilde{\lambda}_{jc}$) job flow should fall. To estimate equation (A6) we can use three different assumptions.

The first is that sectors only differ in the volatility of their sector and idiosyncratic shocks but there are no technology-based sector-specific adjustment costs, therefore all sectors face the same adjustment costs within countries. This implies that $\tilde{\lambda}_{jc} = \tilde{\lambda}_c$. Taking the adjustment costs in the US as the numeraire ($\tilde{\lambda}_{USA} = 1$),[24,25] and using the US sector variance as proxy for $VAR_j/(1-\alpha_j\gamma)^2$,[26] expression (A6) implies

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[23] Sectors with a lower labor share will suffer lower variance of employment for a given variance of sector or country shocks.

[24] Taking HP Job Security index for the USA at the face value the adjustment costs in the US is zero and therefore $\tilde{\lambda}_{jc}$=1.

[25]While in recent years most US courts have adopted wrongful discharge doctrines, the United States still ranks very low in terms of mandatory dismissal costs in international terms. For several of the regulatory measures that we use in this paper, the US displays the lower costs of regulations in the OECD sample.

[26] In section 3 we provide additional motivation and evidence to support this assumption.

$$\mathrm{var}(\Delta l_{jc}) - \overline{\mathrm{var}(\Delta l_{jc})} = \tilde{\lambda}_{jc}\left(\mathrm{var}(\Delta l_{jUSA}) - \overline{\mathrm{var}(\Delta l_{jUSA})}\right) \qquad \text{(A7)}$$

where $\overline{\mathrm{var}(\Delta l_{ijc})}$ is the country average.

that is, the difference between the volatility of employment in high (low) and the average volatile sectors is lower the more stringent are labor regulations. It is important to note that the previous equation is exactly a country fixed effect regression. In our preferred empirical specification (Equation (2) in the text), we compute equation (A7) using country-sector job reallocation (S_{jc}), a set of job security measures to proxy $\tilde{\lambda}_c$, and sector and country fixed effect.

An alternative identification assumption is that sectors only differ in their labor share, therefore, the variance of the sector shocks is equal across sectors, i.e. $VAR_j = \overline{V}$ and $\tilde{\lambda}_{jc} = \tilde{\lambda}_c$. Then expression (A6) implies

$$\mathrm{var}(\Delta l_{jc}) - \overline{\mathrm{var}(\Delta l_{jc})} = \tilde{\lambda}_c \overline{V}\left(\frac{1}{(1-\alpha_j\gamma)^2} - \overline{\frac{1}{(1-\alpha_j\gamma)^2}}\right)$$

that is, the difference between the volatility of employment in high and the average volatile sectors is lower the more stringent are labor regulations. In that case, our proxy for sector differences is $1/(1-\alpha_j\gamma)^2$, which we compute using sector labor share ($=\alpha_j\gamma$). In this setup, we estimate $\tilde{\lambda}_c \overline{V}$.

Finally, using a completely different approach, we can also estimate expression (A6) considering that adjustment cost driven by labor market regulations affects disproportionably more sector with lower than higher technology-based sector-specific adjustment cost. Assume a cost of adjustment (level), $C=f(\phi_c,\phi_j)(\Delta l_{ijct})^2$, where ϕ_c is the cost driven by regulatory differences across countries, and ϕ_j is a technology-based sector-specific adjustment costs. Then, using a second order Taylor expansion around l*, our measure of adjustment costs (or better speed of adjustment) $\tilde{\lambda}_c$ becomes $1/(1+\Omega^* f(\phi_c,\phi_j))$.[27] Therefore, under the plausible assumption that the cross-derivate of f is non-positive, industries that face higher technologically based adjustment costs will be less affected by labor market regulations. The latter is true for a regulation that imposes monetary firing-compensation across sectors (in this case f is lineal in ϕ_c and ϕ_j). Another appealing case, in which the cross-derivate in non-positive, is when the adjustment cost that is binding for the industry is the largest between the regulatory and the technological one ($f(.)=\min(\phi_c,\phi_j)$). Using $\tilde{\lambda}_{jc} \approx \tilde{\lambda}_c + \tilde{\lambda}_j + \tilde{\lambda}_j\tilde{\lambda}_c$ and assuming that labor productivity (*LP*) is a good proxy for labor specificity and then for technology-based sector-specific adjustment cost ($LP_j = \lambda_j$), expression (A7) implies:

[27] In our example $\Omega^* = L^* W(1-\alpha\gamma)$

$$\mathrm{var}(\Delta l_{jc}) - \overline{\mathrm{var}(\Delta l_{jc})} = \tilde{\lambda}_c \left(LP_j - \overline{LP_j}\right)\overline{V} + \left(LP_j - \overline{LP_j}\right)\overline{V}$$

Appendix B: Data Description

The data for job reallocation comes from several sources. In some cases, like in Chile, Mexico, Brazil and Venezuela, we computed the reallocation measures based on industrial surveys. For the other countries, we use data available from published articles to build a sector-country data set. See Table A1 for a complete description of sources for each country. The data set covers industries in the manufacturing sector defined according to the 2-digit ISIC Rev.2 classification. The periods covered, the unit of observation (whether plant or firm) and the treatment of entry and exit differ across countries (see Table B1)/ The variables for human capital in the United States were kindly provided by Autor et al. (1998) and they are described in table A2.

Table B1: Data Source

Country	Period	Sectors	Unit	Entry/Exit	Source
ARG	1991-2001	9	Firms	No	Butler and Sanchez (2003)
BRA	1992-2000	8	Plants	Yes	Menezes-Filho coordinator (2003)
BRA (IS)	1997-2000	9	Firms	No	Authors Construction [1]
CAN	1979-1988	9	Plants	Yes	Baldwin, Dunne and Haltiwanger (1998)
CHL [2]	1991-1999	8	Plants	Yes	Bergoeing, Hernando & Repetto (2003)
COL [3]	1993-1999	9	Plants	Yes	Medina, Meléndez & Seim (2003)
DEU	1986-1989	9	Plants	Yes	Grey (1995)
FIN	1985-1988	9	Plants	Yes	Grey (1995)
FRA	1984-1988	9	Plants	Yes	Gourinchas (1999)
GBR	1987-1989	9	Firms	Yes	Barnes & Haskel (2002)
ITA	1987-1989	9	Firms	Yes	Grey (1995)
MEX	1994-2000	9	Plants	Yes	Kaplan, Martínez & Robertson (2003)
MEX (IS)	1994-2000	9	Firms	No	Authors Construction [4]
NOR	1984-1986	9	Plants	Yes	Grey (1995)
NZL	1986-1989	9	Plants	Yes	Grey (1995)
PRT	1992-1996	9	Plants	Yes	Blanchard and Portugal (2001)
SWE	1980-1991	9	Plants	Yes	Grey (1995)
URY	1988-1995	6	Plants	No	Casacuberta, Fachola & Gandelman (2003)
USA	1973-1993	9	Plants	Yes	Baldwin, Dunne and Haltiwanger (1998)
VEN	1996-1999	9	Plants	No	Authors Construction [5]

Note: All information is restricted to the manufacturing sector. Industries are defined using 2dig. ISIC rev2 classification.
For the case of BRA (IS), CAN, FRA, MEX(IS) and UK we use correspondences between national classifications and ISIC rev2.
We do not include sectors that have in average less than 40 plants.
1 BRA uses data from the social security agency (*Relação Anual de Informações Sociais*),and BRA (IS) from the Manuf. Annual Survey (*Pesquisa Industrial Anual*).
2 Due to changes in the Chilean employment protection laws in 1990, we restrict the data to the period 1991-1999.
3 Due to both methodology and employment protection laws changes in 1992, we restrict the data to the period 1993-1999.
4 MEX uses data from the social security agency (*Instituto Mexicano del Seguro Social*). BRA (IS) use data from the Manuf..Annual Survey (*Encuesta Industrial INEGI.*).
5 VEN uses data from the Industrial Survey (*Encuesta Industrial de Venezuela – Instituto de Estadísticas de Venezuela*).

Table B.2 : Human Capital Variables

Variable	Description	Source
Use of computers in 1989	Percentage of employees that use computers in the work place in 1989 in USA	Autor et al. (1998)
Fraction of employees with some tertiary education	Some College + College Graduates share in USA wage bill in 1990	Autor et al. (1998)

Appendix C: Alternative Measures of Job Security

Table C1: Job Reallocation and Job Security (HP and EPL1). Cross Section

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Sum	sum	sum	sum	sum	sum	sum	sum	sum	sum	sum	sum
Job Sec HP.	0.392	0.587	-0.056	-0.176	2.650	-1.357	5.350	-1.262				
	(0.942)	(0.801)	(1.693)	(1.060)	(5.495)	(1.206)	(3.619)	(1.494)				
Rule Law (RL)			-2.628	-1.668	11.014	-8.341			-6.289	65.665	-7.790	-9.334
			(7.344)	(1.574)	(30.828)	(7.812)			(5.211)	(17.492)a	(4.144)c	(22.152)
JS HP*RL					-4.246	1.987						
					(9.220)	(2.220)						
Gov. Effect. (GE)							30.296	-9.111				
							(22.701)	(6.360)				
JS. HP* GE							-9.434	2.134				
							(8.570)	(1.530)				
JS. EPL1_90									-2.128	14.646		
									(1.445)	(4.003)a		
EPL1_90*RL										-22.192		
										(5.690)a		
JS. EPL1_80											-1.173	-1.467
											(1.104)	(4.043)
JS. EPL1_80*RL												0.387
												(5.600)
GDP growth Volat.	1.242	1.758	1.587	1.567	1.303	1.048	1.492	1.068	1.567	-1.509	1.088	1.146
	(4.619)	(0.950)c	(4.623)	(0.862)c	(4.617)	(1.085)	(4.021)	(0.953)	(3.376)	(2.368)	(2.595)	(2.758)
Entry/Exit Dummy	0.000	16.825	0.000	17.492	0.000	16.280	0.000	16.514	0.000	0.000	0.000	0.000
	(0.000)	(3.568)a	(0.000)	(3.322)a	(0.000)	(2.879)a	(0.000)	(2.719)a	(0.000)	(0.000)	(0.000)	(0.000)
Plant Dummy	-2.473	-2.348	-1.478	-1.948	-4.365	-0.377	-8.390	-0.711	-2.104	-4.307	-0.389	-0.310
	(4.435)	(1.155)c	(4.874)	(1.330)	(7.832)	(1.993)	(6.583)	(1.541)	(4.561)	(4.225)	(3.391)	(3.598)
Observations	99	157	99	157	99	157	99	157	99	99	90	90
R-squared	0.21	0.49	0.22	0.51	0.24	0.53	0.27	0.52	0.31	0.52	0.37	0.37
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Dev.	ALL	Dev.	ALL	Dev.	ALL	Dev	ALL	Dev.	Dev.	Dev.	Dev.

Note: Robust standard errors in parentheses, clustered by country. c significant at 10%; b significant at 5%; a significant at 1%. Job Sec. HP is the Job Security Index developed by Heckman and Pagés (2003). JS. EPL1_90 and JS. EPL_80 are the indices of stringency of job security developed by OECD (1999). RL=Rule of Law and GE. = Government Efficiency, both are institutional variables from Kaufmann et. al. (2003) Entry/Exit is a dummy that indicates whether the entry and exit of firms can be observed in the data set. Plant is a dummy for the unit of observation (1 plants, 0 firms)

Table 1: Job Reallocation and Institutional Variables

Country	Period	Sectors	Unit	Job Realloc.	Exc. Realloc.	Entry / Exit	Job Sec. Bot.	Job Sec. HP	Rule of Law	Gov. Eff.
ARG	1991-2001	9	Firms	14.54	9.61	No	0.44	2.99	-0.84	-0.71
BRA	1992-2000	8	Plants	32.14	27.90	Yes	0.69	3.04	-1.22	-1.23
BRA (IS)	1997-2000	9	Firms	9.49	6.46	No	0.69	3.04	-1.22	-1.23
CAN	1979-1988	9	Plants	21.78		Yes	0.17	0.79	0.86	0.84
CHL91	1991-1999	8	Plants	23.22	17.87	Yes	0.31	2.56	0.20	0.18
COL93	1993-1999	9	Plants	22.52	17.25	Yes	0.62	3.60	-1.65	-1.12
DEU	1986-1989	9	Plants	13.20		Yes	0.50	0.75	0.81	0.70
FIN	1985-1988	9	Plants	16.27		Yes	0.57	1.61	0.99	0.77
FRA	1984-1988	9	Plants	23.02		Yes	0.31	1.34	0.43	0.45
GBR	1987-1989	9	Firms	24.86	19.14	Yes	0.20	1.44	0.87	1.01
ITA	1987-1989	9	Firms	22.13		Yes	0.24	3.22	-0.11	-0.20
MEX	1994-2000	9	Plants	27.92	20.13	Yes	0.71	3.16	-1.35	-0.91
MEX (IS)	1994-2000	9	Firms	6.82	4.95	No	0.71	3.16	-1.35	-0.91
NOR	1984-1986	9	Plants	14.28		Yes	0.30	0.88	1.00	0.75
NZL	1986-1989	9	Plants	30.23		Yes	0.04	0.22	0.98	0.72
PRT	1992-1996	9	Plants	23.83		Yes	0.70	4.48	0.18	0.10
SWE	1980-1991	9	Plants	23.53		Yes	0.39	1.97	0.89	0.72
URY	1988-1995	6	Plants	13.06	8.59	No	0.03	2.23	-0.51	-0.43
USA	1973-1993	9	Plants	19.42	13.77	Yes	0.08	0.00	0.73	0.68
VEN	1996-1999	9	Plants	8.73	5.11	No	0.64	3.94	-1.75	-1.85

Note: CHL91 stands for Chile during the period 1991-1999 and COL93 stands for Colombia during 1993-1999.
Job Reallocation is the sum of Job Creation and Job Destruction. Exc. Realloc.=Excess Reallocation is the Job Reallocation minus the absolute value of the net employment change. Rule of Law and Government Efficiency both are institutional variables from Kaufmann et. al. (2003).
Job Sec. Botero is the Job Security Index developed by Botero et. al. (2003). Job Sec. HP is the Job Security Index developed by Heckman and Pagés (2003)
BRA (IS) Brazil with data from the Manufacturing Annual Survey (Pesquisa Industrial Anual) conducted by the Instituto Brasileiro de Geografia e Estatística.
MEX (IS) Mexico from industrial survey: Encuesta Industrial INEGI.

Table 2.1: Summary Statistics

Whole Sample

Variable	Obs.	Mean	St.Dev.	Min	Max
All Sum	157	20.88	7.42	4.48	39.57
USA Sum	157	19.18	2.93	15.44	23.44
Excess Reallocation	76	15.56	7.42	1.94	32.32
Job. Sec. Botero	157	0.39	0.22	0.03	0.71
Job. Sec. HP	157	2.11	1.31	0.00	4.48
Gov. Effectiveness	157	1.09	0.85	-0.80	2.07
Rule of Law	157	1.11	0.97	-0.69	2.07

LAC

Variable	Obs.	Mean	St.Dev.	Min	Max
All Sum	58	20.42	8.87	4.48	39.57
USA Sum	58	19.04	2.87	15.44	23.44
Excess Reallocation	58	15.29	8.15	1.94	32.32
Job. Sec. Botero	58	0.52	0.21	0.03	0.71
Job. Sec. HP	58	3.13	0.52	2.23	3.94
Gov. Effectiveness	58	0.15	0.60	-0.80	1.23
Rule of Law	58	0.00	0.64	-0.69	1.26

Developed Countries

Variable	Obs.	Mean	St.Dev.	Min	Max
All Sum	99	21.14	6.45	7.30	38.90
USA Sum	99	19.27	2.98	15.44	23.44
Excess Reallocation	18	16.46	4.38	7.91	25.40
Job. Sec. Botero	99	0.32	0.20	0.04	0.70
Job. Sec. HP	99	1.52	1.27	0.00	4.48
Gov. Effectiveness	99	1.65	0.34	0.85	2.07
Rule of Law	99	1.76	0.35	0.95	2.07

Table 2.2: Correlation Between Job Security Indexes

	EPL_80	EPL_90	Job Sec. HP	Job Sec. Bot.
EPL_80	1			
EPL_90	0.9557	1		
Job Sec. HP	0.6919	0.6988	1	
Job Sec. Botero	0.6613	0.6653	0.5961	1

Table 3: Pairwise Correlation for sectoral job reallocation between countries.
Job reallocation as the sum of job creation and job destruction

	ARG	BRA	CAN	CHL	COL	DEU	FIN	FRA	GBR	ITA	MEX	NOR	NZL	PRT	SWE	URY	USA	VEN
ARG	1																	
BRA	0.8722*	1																
	0.0047																	
CAN	0.7536*	0.6357*	1															
	0.019	0.0902																
CHL	0.7445*	0.5654	0.7015*	1														
	0.0341	0.1441	0.0525															
COL	0.7624*	0.6674*	0.5948*	0.9198*	1													
	0.0169	0.0705	0.0912	0.0012														
DEU	0.7763*	0.8015*	0.6313*	0.7469*	0.7919*	1												
	0.0139	0.0167	0.0683	0.0332	0.011													
FIN	0.5219	0.2718	0.5937*	0.58	0.6862*	0.3941	1											
	0.1495	0.515	0.0919	0.1318	0.0412	0.294												
FRA	0.6388*	0.6126	0.0569	0.1713	0.3335	0.5258	-0.1739	1										
	0.064	0.1064	0.8845	0.685	0.3805	0.146	0.6546											
GBR	0.8458*	0.7980*	0.7781*	0.6752*	0.4851	0.6493*	0.3811	0.474	1									
	0.0041	0.0176	0.0135	0.0662	0.1856	0.0584	0.3116	0.1973										
ITA	0.7405*	0.9141*	0.5988*	0.3987	0.2416	0.5217	0.1896	0.5404	0.9242*	1								
	0.0225	0.0015	0.0885	0.3279	0.5312	0.1497	0.625	0.1331	0.0004									
MEX	0.7512*	0.7418*	0.7924*	0.592	0.7514*	0.7466*	0.6319*	0.2406	0.6997*	0.4684	1							
	0.0196	0.0351	0.0109	0.1221	0.0196	0.0208	0.0679	0.5328	0.0359	0.2034								
NOR	0.6867*	0.5594	0.8446*	0.7494*	0.6478*	0.6138*	0.7292*	-0.0034	0.5221	0.4104	0.5796	1						
	0.041	0.1494	0.0042	0.0323	0.0592	0.0787	0.0258	0.9931	0.1494	0.2725	0.1019							
NZL	0.7406*	0.7095*	0.9325*	0.5384	0.3666	0.5507	0.381	0.1883	0.8385*	0.7810*	0.6487*	0.7522*	1					
	0.0225	0.0487	0.0002	0.1686	0.3319	0.1244	0.3116	0.6276	0.0047	0.013	0.0587	0.0194						
PRT	0.8199*	0.6480*	0.6388*	0.9464*	0.8976*	0.8252*	0.6106*	0.3994	0.6195*	0.4972	0.6074*	0.7553*	0.5234	1				
	0.0068	0.0823	0.0641	0.0004	0.001	0.0062	0.0807	0.287	0.0752	0.1733	0.0828	0.0186	0.1481					
SWE	-0.3965	-0.0402	-0.4902	-0.5221	-0.4272	-0.1074	-0.7092*	0.2275	-0.3983	-0.3543	-0.3031	-0.5835*	-0.4148	-0.5632	1			
	0.2907	0.9247	0.1804	0.1844	0.2515	0.7833	0.0324	0.5561	0.2883	0.3495	0.4278	0.099	0.267	0.1143				
URY	0.7670*	0.8004*	0.9175*	0.434	0.5463	0.6197	0.5388	0.3194	0.8313*	0.7944*	0.8363*	0.8411*	0.9141*	0.4419	0.1585	1		
	0.0442	0.0306	0.0036	0.3306	0.2045	0.1377	0.2121	0.485	0.0205	0.0329	0.019	0.0177	0.004	0.3209	0.7343			
USA	0.7816*	0.7760*	0.9482*	0.6749*	0.554	0.7045*	0.3825	0.2482	0.8546*	0.7129*	0.8062*	0.6971*	0.9386*	0.6213*	-0.3562	0.8587*	1	
	0.0129	0.0236	0.0001	0.0663	0.1217	0.0341	0.3096	0.5195	0.0033	0.0311	0.0087	0.0369	0.0002	0.0741	0.3468	0.0133		
VEN	0.5296	0.3722	0.7044*	0.9202*	0.7273*	0.5721	0.449	-0.0185	0.4039	0.1661	0.4535	0.7265*	0.5162	0.7543*	-0.4427	0.28	0.6283*	1
	0.1426	0.3639	0.0341	0.0012	0.0264	0.1075	0.2254	0.9624	0.281	0.6693	0.2202	0.0266	0.1548	0.0189	0.2327	0.543	0.07	
Anglo Saxon	0.8195*	0.7535*	0.9589*	0.6836*	0.5243	0.6601*	0.466	0.2501	0.9111*	0.7922*	0.7696*	0.7424*	0.9717*	0.6310*	-0.4432	0.9396*	0.9761*	0.5890*
	0.0069	0.0309	0	0.0616	0.1474	0.053	0.2061	0.5163	0.0006	0.0109	0.0153	0.022	0	0.0684	0.2322	0.0017	0	0.0952
All	0.9294*	0.8579*	0.9097*	0.7871*	0.7550*	0.8514*	0.5677	0.4149	0.8733*	0.7244*	0.8667*	0.7854*	0.8618*	0.8068*	-0.4024	0.9084*	0.9286*	0.6358*
	0.0003	0.0064	0.0007	0.0204	0.0187	0.0036	0.1108	0.2668	0.0021	0.0273	0.0025	0.0121	0.0028	0.0086	0.283	0.0046	0.0003	0.0657

Note: The first line indicates the correlation coefficient and the second the significance level (p-value), * significant at the 10 per cent level.
All pairwise correlation are estimated with either 8 or 9 observation (depending whether we have information for sector 39 ISIC Rev2)
Anglo Saxon is the simple average of sectoral job reallocation for Canada, Great Britain, New Zealand and USA.
All is the simple average of sectoral job reallocation for all countries.

Table 4: Pairwise Correlation for Sectoral Labor Productivity (Y/L) between countries.
Labor Productivity is the Sector Labor Productivity (Y/L) with respect to Sector 32 ISIC Rev.2 in each country.

	ARG	BRA	CAN	CHL	COL	DEU	FIN	FRA	GBR	ITA	MEX	NOR	NZL	PRT	SWE	URY	USA	VEN
ARG	1																	
BRA	0.8546*	1																
	0.0302																	
CAN	0.8663*	0.9025*	1															
	0.0025	0.0138																
CHL	0.5275	0.8736*	0.4617	1														
	0.1791	0.023	0.2495															
COL	0.8413*	0.7960*	0.9036*	0.6262*	1													
	0.0045	0.0582	0.0008	0.0967														
DEU	0.6190*	0.4576	0.7776*	0.2277	0.8486*	1												
	0.0755	0.3616	0.0136	0.5876	0.0038													
FIN	0.7460*	0.7746*	0.7886*	0.8377*	0.8974*	0.6633*	1											
	0.021	0.0705	0.0115	0.0094	0.001	0.0514												
FRA	0.8554*	0.7711*	0.9397*	0.4371	0.9584*	0.8949*	0.8014*	1										
	0.0033	0.0726	0.0002	0.2788	0.000	0.0011	0.0094											
GBR	0.9082*	0.8369*	0.9665*	0.528	0.9289*	0.7995*	0.8330*	0.9714*	1									
	0.0007	0.0377	0.000	0.1786	0.0003	0.0097	0.0053	0.000										
ITA	0.7325*	0.5971	0.7795*	0.4295	0.8960*	0.9273*	0.7603*	0.9081*	0.8580*	1								
	0.0248	0.2108	0.0133	0.2882	0.0011	0.0003	0.0174	0.0007	0.0031									
MEX	0.5953*	0.9134*	0.7234*	0.8713*	0.7933*	0.4626	0.8596*	0.6405*	0.6801*	0.5238	1							
	0.0908	0.0109	0.0276	0.0048	0.0107	0.2099	0.003	0.0631	0.0438	0.1478								
NOR	0.8793*	0.8027*	0.9226*	0.7195*	0.9190*	0.7362*	0.8837*	0.9182*	0.9614*	0.7908*	0.7853*	1						
	0.0018	0.0546	0.0004	0.0442	0.0005	0.0237	0.0016	0.0005	0.000	0.0112	0.0122							
NZL	0.8226*	0.8860*	0.8691*	0.7304*	0.9502*	0.6910*	0.9379*	0.8840*	0.9079*	0.8245*	0.8485*	0.9022*	1					
	0.0065	0.0187	0.0023	0.0396	0.0001	0.0393	0.0002	0.0016	0.0007	0.0062	0.0038	0.0009						
PRT	0.9631*	0.8783*	0.9111*	0.4031	0.8603*	0.7042*	0.7420*	0.9177*	0.9533*	0.7996*	0.5399	0.8708*	0.8468*	1				
	0.000	0.0213	0.0006	0.3221	0.0029	0.0342	0.0221	0.0005	0.0001	0.0097	0.1335	0.0022	0.004					
SWE	0.8145*	0.7189	0.8952*	0.5628	0.9118*	0.8336*	0.9138*	0.9265*	0.9423*	0.8783*	0.6681*	0.9130*	0.8954*	0.8769*	1			
	0.0075	0.1074	0.0011	0.1464	0.0006	0.0052	0.0006	0.0003	0.0001	0.0018	0.0492	0.0006	0.0011	0.0019				
URY	0.9777*	0.8281*	0.8906*	0.8495*	0.8986*	0.7188*	0.7795*	0.9107*	0.9210*	0.8203*	0.6548	0.9237*	0.8456*	0.9609*	0.8106*	1		
	0.0001	0.0418	0.0072	0.0155	0.006	0.0687	0.0388	0.0044	0.0032	0.0238	0.1105	0.003	0.0165	0.0006	0.027			
USA	0.8916*	0.8125*	0.9596*	0.4382	0.9486*	0.8803*	0.7941*	0.9877*	0.9791*	0.9115*	0.6416*	0.9186*	0.8824*	0.9402*	0.9250*	0.9379*	1	
	0.0012	0.0494	0.000	0.2775	0.0001	0.0017	0.0106	0.000	0.000	0.0006	0.0625	0.0005	0.0016	0.0002	0.0004	0.0018		
VEN	0.9754*	0.9122*	0.9407*	0.5951	0.9049*	0.6807*	0.8100*	0.9064*	0.9571*	0.7741*	0.7216*	0.9401*	0.8939*	0.9552*	0.8614*	0.9776*	0.9386*	1
	0.000	0.0112	0.0002	0.1197	0.0008	0.0435	0.0081	0.0008	0.0001	0.0144	0.0282	0.0002	0.0012	0.0001	0.0028	0.0001	0.0002	
Anglo Saxon	0.8983*	0.8704*	0.9805*	0.5293	0.9540*	0.8200*	0.8458*	0.9761*	0.9922*	0.8678*	0.7249*	0.9498*	0.9262*	0.9420*	0.9381*	0.9233*	0.9874*	0.9588*
	0.001	0.0241	0.000	0.1774	0.0001	0.0068	0.0041	0.000	0.000	0.0024	0.0271	0.0001	0.0003	0.0001	0.0002	0.003	0.000	0.000
All	0.8569*	0.8861*	0.8899*	0.8143*	0.9499*	0.7056*	0.9567*	0.8814*	0.9185*	0.7970*	0.8847*	0.9644*	0.9623*	0.8328*	0.9068*	0.9331*	0.8882*	0.9254*
	0.0032	0.0187	0.0013	0.0139	0.0001	0.0337	0.0001	0.0017	0.0005	0.0101	0.0015	0.000	0.000	0.0053	0.0007	0.0021	0.0014	0.0003

Note: The first line indicates the correlation coefficient and the second the significance level (p-value), * significant at the 10 per cent level.
All pairwise correlation are estimated with either 8 or 9 observation (depending whether we have information for sector 39 ISIC Rev2) except in Uruguay where there are only 6 sectors with more than 40 firms.
Anglo Saxon is the simple average of sectoral average labor productivity for Canada, Great Britain, New Zealand and USA.
All is the simple average of sectoral average labor productivity for all countries.

Table 5: Labor Reallocation and Labor Productivity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Sum					
USA Labor Prod. (Y/L)	-1.838				-1.104	-1.53				
	(0.751)b				-0.72	-0.95				
USA Labor Prod. (VA/L)		-2.721					-1.637	-2.616		
		(0.860)b					-1.04	(1.509)		
USA Comp.Use 89			-16.597		-12.095		-10.064			
			(7.060)b		-7.441		(8.437)			
USA Terciary 90				-11.693		-6.03		-1.018		
				(6.926)		-7.93		(9.667)		
USA SUM									0.841	
									(0.095)a	
USA EX-SUM										0.89
										(0.152)a
Observations	157	157	157	157	157	157	157	157	157	157
R-squared	0.73	0.74	0.74	0.71	0.76	0.74	0.75	0.74	0.8	0.79
Ctry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Joint F test. (Prob>F)					0.01	0.03	0.01	0.03		

Note: Robust standard errors in parentheses (Clustered by country). c significant at 10%; b significant at 5%; a significant at 1%

USA Labor Prod is the USA Relative Sector Labor Productivity with respect to sector 32 ISIC Rev.2

USA Terciary'90 is the share on the total wage bill of USA workers with some College and College graduates in 1990 in USA, Index developed by Autor et al. (1989).

USA Comp.Use'89 is the share of workers in each sector that used computers in their work place in 1989 in USA, Index developed by Autor et al (1989).

USA SUM and USA EX-SUM is the time average of the job reallocation and excess job reallocation at the sector level.

Sample includes all the countries but USA

Table 6: Job Reallocation and Job Security: Cross Section

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
Job Sec. Botero	-10.655	-2.927	-14.862	-10.146	-10.270	20.294	-7.655	-8.322	14.158	-8.538
	(9.273)	(5.266)	(8.312)	(6.225)	(5.834)c	(8.650)b	(5.326)	(4.563)c	(7.311)c	(5.764)
Rule of Law			-7.487	-3.231	-1.950	16.048	1.230	1.624		
			(5.354)	(1.538)c	(1.010)c	(6.673)b	(3.706)	(3.274)		
JS Bot.* R. of law						-48.322	-7.309	-6.277		
						(10.987)a	(6.155)	(6.135)		
Gov. Efficiency									15.164	1.163
									(4.910)b	(3.469)
JS Bot. * Gov. Eff.									-48.869	-8.562
									(10.973)a	(6.281)
GDP growth volatility	2.510	2.152	3.174	1.745	1.006	3.327	1.844	1.416	2.980	1.935
	(3.414)	(1.124)c	(2.499)	(0.971)c	(0.543)c	(1.386)b	(0.820)b	(0.594)b	(1.323)b	(0.847)b
Entry/Exit dummy	0.000	17.294	0.000	20.006	14.844	0.000	18.391	15.493	0.000	19.695
	(0.000)	(3.758)a	(0.000)	(3.821)a	(1.948)a	(0.000)	(3.916)a	(2.007)a	(0.000)	(4.184)a
Plant Dummy	-3.384	-2.834	1.144	-1.481	-1.629	-7.199	-2.249	-2.945	-6.332	-2.694
	(3.389)	(1.342)b	(4.770)	(1.504)	(1.361)	(3.162)b	(1.501)	(1.279)b	(3.160)c	(1.455)c
Constant	22.943	7.280	24.504	8.223	13.741	13.522	7.771	11.489	15.929	7.144
	(4.225)a	(6.600)	(4.200)a	(5.453)	(3.999)a	(3.553)a	(4.980)	(3.347)a	(2.968)a	(5.011)
Observations	99	157	99	157	158	99	157	158	99	157
R-squared	0.31	0.49	0.37	0.56	0.63	0.53	0.58	0.64	0.50	0.59
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Dev.	ALL	Dev.	ALL	ALL*	Dev.	ALL	ALL*	Dev.	ALL

Note: Robust standard errors in parentheses (Clustered by Country). c significant at 10%; b significant at 5%; a significant at 1%. Job Sec. Botero is the Job Security Index developed by Botero et. al. (2003) R. Law=Rule of Law and Gov. Eff. = Government Efficiency, both are institutional variables from Kaufmann et. al. (2003). Entry/Exit is dummy that indicates whether the entry and exit of firms can be observed in the data set. Plant is a dummy for the unit of observation (1 plants, 0 firms) * For Brazil and Mexico we use the manufacturing census data (only continuous plants) instead of the registry information. Dev. denotes developed countries.

Table 7: Job Reallocation and Job Security: Differences in Differences

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Sum	Sum	Sum	Sum	Sum (ln)	Sum (ln)	Sum	Sum	Sum	Sum	Sum (ln)
USA SUM*JS Bot.	-1.041	-1.742								-2.327	
	(0.423)b	(0.456)a								(0.457)a	
AS SUM*JS Bot.			-1.377								
			(0.318)a								
Exc. USA SUM*JS Bot.				-1.854							
				(0.628)a							
Index USA SUM*JS Bot.					-0.053	-0.079					-0.092
					(0.020)a	(0.024)a					(0.026)a
USA SUM* Job. Sec. HP.							-0.243				
							(0.130)c				
USA SUM*EPL_90								-0.245			
								(0.116)b			
USA SUM*EPL_80									-0.228		
									(0.114)b		
USA SUM*Income (GDPpc)		-0.333					-0.369	-0.738	-0.666	-0.220	
		(0.131)b					(0.210)c	(0.359)b	(0.364)c	(0.127)c	
AS SUM* Income (GDPpc)			-0.253								
			(0.102)b								
Exc. USA SUM*GDPpc				-0.453							
				(0.181)b							
Index USA SUM*GDPpc						-0.013					-0.010
						(0.008)					(0.008)
Observations	148	148	157	148	148	148	148	90	81	149	149
R-squared	0.83	0.84	0.84	0.84	0.86	0.87	0.83	0.76	0.70	0.86	0.89
Country and Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All+USA	All	All	All	All	Dev.	Dev.	All*	All*
Diff. In Job Real. P90-P10	-5.813	-9.728	-11.661	-12.359	-0.280	-0.417	-6.949	-7.25	-7.52	-12.9	-0.48
Diff. In Job Real. P80-P20	-4.412	-7.383	-6.425	-4.628	-0.165	-0.246	-4.694	-5.59	-5.57	-9.86	-0.28

Note: Robust standard errors. Sectors are defined at the 2 digit ISIC (rev 2). c significant at 10%; b significant at 5%; a significant at 1%. All regressions have sector and country fixed effects. *USA SUM* denotes Sector Job Reallocation in USA; *Index USA SUM* denotes the ranking of USA Sector Job Reallocation; *AS SUM*= Simple average of Sector Job Reallocation for USA, Canada, Great Britain, and New Zealand. *JS Bot.* is the Job Security Index developed by Botero et. al. (2003). *Job Sec. HP* is the Job Security Index developed by Heckman and Pages (2003). Sample *All* includes all countries but USA. *Dev.* only includes developed countries. Sample *All** includes manufacturing census data (only continuous plants) for Brazil and Mexico, instead of the Social Security registry information.

Diff. In Job Real. p90-p10 measures the decline in job reallocation (in percentage points) of an industry at the 90th percentile level of flexibility requirement relative to an industry at the 10th percentile level when such industries are located in a country at the 90th percentile of Job Security Regulation rather than at the 10th percentile.

Table 8: Job Security and Job Reallocations for Different Regions. Difference in Difference Estimation

	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Sum	Sum	Sum	Sum (ln)	Sum (ln)	Sum (ln)	Sum	Sum	Sum
USA SUM* JS Bot.	-0.789	-2.608	-2.100				-1.503	-1.698	-1.421
	(0.907)	(0.749)a	(0.518)a				(0.620)b	(1.851)	(1.345)
Index USA SUM* JS Bot.				-0.087	-0.116	-0.078			
				(0.048)c	(0.050)b	(0.027)a			
Index USA SUM* JS Bot*Rule of Law							-0.729	-3.148	-1.224
							(0.644)	(2.076)	(1.698)
USA SUM* Rule of Law							0.168	2.051	-0.125
							(0.385)	(1.181)c	(0.892)
USA SUM*Income (GDPpc)	-0.337	-0.577	-0.797						
	(0.343)	(0.283)b	(0.336)b						
Index USA SUM*Income (GDPpc)				-0.011	-0.019	-0.012			
				(0.020)	(0.020)	(0.018)			
Observations	58	59	90	58	59	90	148	58	90
R-squared	0.93	0.94	0.78	0.94	0.93	0.78	0.84	0.93	0.78
Sample	LAC	LAC*	Dev.	LAC	LAC*	Dev.	All	LAC	Dev.
Country & Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors. c significant at 10%; b significant at 5%; a significant at 1%. All regressions have Sector and Country fixed effects. *USA SUM* denotes sector job reallocation in USA, *Index USA SUM* denotes a ranking of sector job reallocation in USA. *JS.Bot*, is the Job Security Index developed by Botero et. al.(2003). *Rule of Law* is developed by Kaufmann et. al. (2003). Sample *All* * uses manufacturing census data (continuous plants only) for Brazil and Mexico instead of the Social Security registry information.

Table 9: Correlation between Job security and Cost of Entry and Exit Measures

	Absolute Priority	CEE1	CEE2	JS (Bot.)	JS (HP)
Absolute Priority	1				
CEE1	-0.5398*	1			
CEE2	-0.4627*	0.4967*	1		
JS (Bot.)	-0.4949*	0.3008	0.4802*	1	
JS (HP)	-0.6232*	0.3897	0.7363*	0.6877*	1

* indicates significance at 10%

CEE1 denotes average cost of firm entry and exit measured in years, while *CEE2* denotes average cost of entry and exit according to a simple average of cost of entry -measured in number of procedures to open a firm and cost of exit -measured as % of the insolvent state-- once both measured have been standardized between 0 and 1. *Absolute Priority* documents the order in which claims are paid in the insolvency process, including payment of post-petition claims. Higher values of this measure indicate lower priority for workers' claims

Table 10: Job Security versus Firm Entry and Exit Regulations. Difference in Difference Estimation

	sum	sum	sum	sum	sum	sum	sum	sum
USA Sum*JS Bot.	-1.698	-1.605	-1.894	-1.711	-1.681	-2.764	-1.287	-0.421
	(0.469)a	(0.518)a	(0.495)a	(0.469)a	(0.499)a	(0.844)a	(0.657)c	-1.59
USA Sum*CEE1	-0.095					-0.593		
	(0.11)					(0.43)		
USA Sum**CEE2*		-0.727					-0.222	
		(0.65)					(1.45)	
USA Sum**Absolute Priority*			-0.006					0.003
			(0.00)					(0.01)
USA SUMbirth&death**CEE1*				-0.184				
				(0.25)				
USA SUMbirth&death**CEE2*					-0.955			
					(1.48)			
USA SUMbirth&death*Income (GDPpc)								
USA SUM**CEE1**JS Bot.						0.812		
						(0.61)		
USA SUM**CEE2**JS Bot.							-1.218	
							(2.53)	
USA SUM**Abs. Priority* *JS Bot.								-0.019
								(0.02)
USA Sum*Income (GDPpc)	-0.398	-0.442	-0.205	-0.375	-0.382	-0.482	-0.469	-0.183
	(0.163)b	(0.174)b	(0.13)	(0.148)b	(0.153)b	(0.180)a	(0.177)a	(0.13)
Observations	148	148	148	148	148	148	148	148
R-squared	0.84	0.85	0.85	0.84	0.84	0.85	0.85	0.85
Country and Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors. c significant at 10%; b significant at 5%; a significant at 1%. *CEE1* denotes average cost of entry and exit measured in years, while *CEE2* denotes average cost of entry and exit according to a simple average of cost of entry –measured in number of procedures to follow to open a firm—and cost of exit –measured as percentage of the insolvent estate--, once both measures have been standardized between zero and one. *Abs. Priority* documents the order in which claims are paid in the insolvency process, including payment of post-petition claims. Higher value of this variable reflect higher priority for creditors. See text for data sources.

Table 11: Job Reallocation and Job Security. Difference in Difference Analysis using Labor Specificity

	(1) Sum	(2) Sum	(3) Sum	(4) Sum(ln)	(5) Sum	(6) Sum(ln)
USA Labor Prod.(Y/L)*JS Bot.	2.78			0.10	4.41	0.15
	(1.198)b			(0.058)c	(1.143)a	(0.062)b
USA Labor Prod.(VA/L)*JS Bot.		3.61				
		(1.585)b				
USA Use of Computers* JS Bot.			16.60			
			(9.616)c			
USA Labor Prod.(Y/L)*Income (GDPpc)	0.43			0.01	0.09	0.00
	(0.33)			(0.02)	(0.31)	(0.02)
USA Labor Prod.(VA/L)*Income (GDPpc)		0.50				
		(0.42)				
USA Use Computer*Income (GDPpc)			2.75			
			(2.50)			
Observations	148.00	148.00	148.00	148.00	149.00	149.00
R-squared	0.83	0.83	0.83	0.86	0.85	0.89
Country and Sector Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	All	All*	All*
Diff. In Job.Real. P90-p10	5.692	7.380	3.341	0.213	9.023	0.305
Diff. In Job.Real. P80-p20	3.385	4.389	2.313	0.127	5.366	0.181

Note: Robust standard errors. c, b and a significant at 10%; 5% and at 1%. All regressions include country and sector fixed effects.

USA Labor Prod.= Sectoral labor productivity in the USA

Job Sec. Botero is the Job Security Index developed by Botero et. al. (2003). Job Sec.

Use of Computers is the Sector Use of Computers Index developed by Autor, Katz and Krueger (1998)

Differential in Job Reallocation p90-p10 measures (in percentage terms) how less job reallocation an industry at the 90th percentile level of flexibility requirement (measured by labor productivity) has with respect to an industry at the 10th percentile level when it is located in a country at the 90th percentile of Job Security regulation rather than in one at the 10th percentile.

* For Brazil and Mexico we use the manufacturing census data (only continuous plants) instead of the registry information.

Table 12: Robustness to changes in the sample of Countries

	Dependent Variable SUM				Dependent Variable SUM (ln)			
	USA SUM*JS Bot.	(t)	Observations	R-squared	Index USA SUM*JS Bot.	(t)	Observations	R-squared
Without Argentina	-1.769	(0.457)a	139	0.84	-0.079	(0.024)a	139	0.86
Without Brazil	-1.799	(0.472)a	140	0.82	-0.077	(0.024)a	140	0.85
Without Canada	-1.555	(0.495)a	139	0.85	-0.069	(0.025)a	139	0.87
Without Chile	-1.664	(0.439)a	140	0.85	-0.072	(0.022)a	140	0.88
Without Colombia	-1.735	(0.455)a	139	0.85	-0.078	(0.024)a	139	0.87
Without Germany	-1.856	(0.492)a	139	0.83	-0.092	(0.025)a	139	0.86
Without Finland	-1.779	(0.500)a	139	0.84	-0.077	(0.026)a	139	0.87
Without France	-1.737	(0.451)a	139	0.86	-0.079	(0.024)a	139	0.89
Without UK	-1.642	(0.479)a	139	0.84	-0.079	(0.025)a	139	0.86
Without Italy	-1.588	(0.437)a	139	0.86	-0.074	(0.023)a	139	0.87
Without Mexico	-2.036	(0.449)a	139	0.85	-0.085	(0.024)a	139	0.86
Without Norway	-1.752	(0.461)a	139	0.84	-0.079	(0.024)a	139	0.87
Without New Zealand	-1.776	(0.567)a	139	0.83	-0.096	(0.028)a	139	0.86
Without Portugal	-1.834	(0.518)a	139	0.84	-0.078	(0.028)a	139	0.86
Without Sweden	-1.584	(0.429)a	139	0.87	-0.07	(0.024)a	139	0.89
Without Uruguay	-1.902	(0.514)a	142	0.84	-0.076	(0.028)a	142	0.86
Without Venezuela	-1.656	(0.454)a	139	0.82	-0.081	(0.024)a	139	0.83

Robust standard errors. c, b and a significant at 10%; 5% and at 1%. Each coefficient is obtained from a separate regression which includes the variables contained in table 7 Column (2), that is country and sector fixed effect and an interaction term that multiplies USA SUM*Income (GDPpc), where USA SUM denotes sector USA labor reallocation and Income is GDP per capita. Index USA SUM refers to a ranking of sector reallocation across US Sectors. JS Bot. refers to the Job Security Measures created by Botero et al (2003).

Table 13: Robustness to Exclusion of Sectors

	Dependent Variable SUM				Dependent Variable SUM (ln)			
	USA SUM*JS Bot.	(t)	Observations	R-squared	Index USA SUM*JS Bot.	(t)	Observations	R-squared
Without sector 31	-1.701	(0.466)a	131	0.85	-0.076	(0.024)a	131	0.87
Without sector 32	-1.982	(0.515)a	131	0.84	-0.08	(0.026)a	131	0.86
Without sector 33	-2.103	(0.503)a	132	0.83	-0.091	(0.024)a	132	0.86
Without sector 34	-1.757	(0.567)a	131	0.84	-0.076	(0.036)b	131	0.86
Without sector 35	-1.804	(0.479)a	131	0.83	-0.085	(0.026)a	131	0.86
Without sector 36	-1.767	(0.463)a	131	0.85	-0.081	(0.024)a	131	0.87
Without sector 37	-1.733	(0.441)a	132	0.87	-0.081	(0.021)a	132	0.91
Without sector 38	-1.737	(0.454)a	131	0.84	-0.077	(0.024)a	131	0.87
Without sector 39	-1.088	(0.456)b	134	0.86	-0.057	(0.027)b	134	0.87

Robust standard errors. c, b and a significant at 10%; 5% and at 1%. Each coefficient is obtained from a separate regression which includes the variables contained in table 7 Column (2), that is country and sector fixed effect and an interaction term that multiplies USA SUM*Income (GDPpc), where USA SUM denotes sector USA labor reallocation and Income is GDP per capita. Index USA SUM refers to a ranking of sector reallocation across US Sectors. JS Bot. refers to the Job Security Measures created by Botero et al (2003).

Figure 1: Job Real. v/s the Interaction of US Job Real. and Job Security:

Controlling for Country, Sector and Income Effects. (Regression 2 in Table 7)