Rigidities in Employment Protection and Exporting

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Abstract

There have been significant improvements in traditional trade policies in the past few decades. However, these improvements can only be fully effective when they are complemented with a favorable investment climate. This study focuses on a particular aspect of investment climate, namely labor regulations, and shows how these regulations can be discouraging from exporting. Using firm level data from 26 countries in Eastern Europe and Central Asia region, the paper empirically shows that firms that cannot create new jobs due to stringent labor regulations are less likely to export. Firms that plan to export expand their sizes before they start to export. However the rigidities in labor markets make this adjustment process costly. Higher costs of employment decrease operating profits and lead to a higher productivity threshold level required for entering export markets. As a result, a smaller fraction of firms can afford to export.

Keywords: Exporting, firm heterogeneity, labor regulations, developing countries, Eastern Europe and Central Asia region
JEL Classification: F12, F14, F16, J23

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1. INTRODUCTION

Recent research in international trade literature as reviewed by Bernard et al. (2007) and Greenaway and Kneller (2007) show that exporting firms are larger, more productive and they grow faster. Higher performance of these firms and their significant contribution to economic development make it imperative to understand how investment climate affects their progress. A sound investment climate can be crucial to complement firm specific, technological, or market driven factors in order to make exporting a profitable activity. In fact, Dollar et al. (2006) show that highly bureaucratic and corrupt governments, inefficient financial services, or low quality of infrastructure make it difficult for firms to expand into foreign markets in developing countries. They argue that a good investment climate works in the direction of decreasing the sunk costs of exporting and eventually leads to higher participation in export markets. Focusing only on the elimination of trade barriers without considering the inefficiencies in investment climate might not yield the expected gains from trade. This study investigates the relationship between a particular aspect of investment climate namely labor regulations and exporting. It shows that firms that find it difficult to create new jobs due to stringent labor regulations are less likely to participate in export markets.

Evidence from theoretical and empirical research show that efficient firms self-select themselves into foreign markets. The entry into these markets is associated with significant changes in firm performance. In the data from Enterprise Surveys employment levels of firms that subsequently enter export markets (future-exporters) grow by 13% which is four times higher than the growth rate of non-exporting firms. [3] Bernard and Jensen (1999) who analyze the evolution of future-exporters among the firms in the United States, find that in addition to being larger in employment, shipments, and labor productivity, future-exporters also grow faster than non-exporters in all three measures. They find that growth premiums between future-exporters and non-exporters are 1.4% per year for employment and 2.4% for shipments. Greenaway and Kneller (2007) summarize a collection of studies that similarly find faster total factor productivity or labor productivity growth of future-exporters relative to non-exporters. Alvarez and Lopez (2005) argue how firms increase their productivities with the explicit purpose of becoming exporters. Using data of Chilean manufacturers they show that future-exporters invest more in physical capital than non-exporters. They find that a one percent increase in investment

[3] These surveys are explained in detail in data description section.

increases the probability of exporting by 0.2 percent. All these evidences highlight the changes in performances of firms that self-select themselves into export markets before exporting starts. In this study I show that labor regulations can obstruct this self-selection process and discourage firms from exporting.

Labor regulations form a crucial aspect of investment climate. Studies like Micco and Pages (2007) and Kugler (2007) show that stringent labor regulations hinder job flows in firms by raising the costs of hiring workers. These regulations can also have detrimental effects on exporting. In a recent study, Helpman and Itskhoki (2010) construct a theoretical model that explains how rigidities in labor markets impact trade. In a general equilibrium model of trade with two countries, they show that labor market flexibility is a source of comparative advantage for firms. Frictions in labor markets which cause high hiring costs reduce operating profits. Lower profits decrease the competitiveness of firms and obstruct the self-selection process into foreign markets. In this paper, I present empirical evidence that supports the theoretical results of Helpman and Itskhoki (2010)[4].

For the analysis, I use firm level data from Enterprise Surveys which is conducted in Eastern Europe and Central Asia (ECA) region. Using one of the survey questions, for each firm I compute the difference between its current employment level and a hypothetical level that would be obtained if labor regulations were not constraining. Then I investigate whether firms that are more severely affected by labor regulations in creating new jobs are less likely to export. The analysis shows that a one percent increase in the severity of labor regulations yields a 0.7 percent decrease in the probability of exporting.

Almost all empirical work that analyzes the effects of labor regulations on firm performance has concentrated on the effects on size, investment, and productivity with no particular focus on exporting. Besley and Burgess (2004) analyze how labor regulations affect firm performance across Indian states. They find that restrictive labor regulations lead to lower investment, employment, and productivity in the formal sector. Bassani and Ernst (2002) and Scarpetta and Tressel (2004) show that innovation activity and productivity are negatively affected by the distortions in institutional environment including labor regulations. Khan (2006) performs a similar analysis in French industries and finds that restrictive labor regulations have

[4] In a related work Cunat and Melitz (2009) show that institutional differences in labor markets can give way to comparative advantage even when technologies and relative factor endowments are identical across countries. As a result, countries with more flexible labor markets specialize in sectors with higher volatility.

negative effects on total factor productivity growth. Almeida and Carneiro (2009) find that in Brazil, stricter enforcement of labor regulations reduce firm size measured in both employment and sales. Caballero et al. (2004) find that job security regulations hamper the process of creative destruction especially in countries where these regulations are likely to be enforced. They show that higher levels of job security decrease productivity growth roughly by one percent. In this paper I extend the existing literature on labor regulations by analyzing their relationship with a new dimension of firm activity. I show how detrimental labor regulations can be for trade activities.

A novel feature of this study is that it does not only look at the cross-country differences in labor regulations but also looks at the variation of their effects across sectors like construction, manufacturing, and retail. Even when the same de jure labor laws are applied across all firms in a country, differences in the intrinsic demand and supply shocks can lead to differential effects of labor regulations across sectors. It is also possible that enforcement of these laws could show variation across sectors or industries which could be the reason for the variation in the distortions caused by labor regulations.

Performing a cross-sectoral analysis is also important for the research on international trade. Most of the existing studies analyzing exports focus on export of products in manufacturing sector. Services are the fastest growing sector of the global economy and the growth in service trade has surpassed the growth in goods trade. Data from Enterprise Surveys show that in both 2002 and 2005 roughly 20% of firms in service sector export part of their services. The analysis is also performed across industries within the manufacturing sector. There are only a few studies like Micco and Pages (2007) and Haltiwanger et al. (2008) that perform cross-industry analysis on the differential impacts of labor regulations on firm performance within a country. Both of these studies show that high hiring and firing costs are detrimental to job flows particularly in those industries that require more frequent labor adjustments.

The rest of the paper is organized as follows. In section two, I explain the methodology and the specification of the model. Then in section three, I describe the data used in the analysis. The empirical analysis is presented in section four and a sensitivity analysis using additional controls, different specifications, and the panel data is performed in section five. Finally, in section six I present concluding remarks.

2. MODEL SPECIFICATION AND METHODOLOGY

The analysis is based on two studies by Melitz (2003) and Helpman and Itskhoki (2010). Melitz (2003) presents a model with heterogeneous firms where efficient firms self-select themselves into export markets. Efficient firms who earn the highest profits are the only ones who can compensate the sunk costs of exporting. Helpman and Itskhoki (2010) construct a two-country model of international trade allowing labor markets to be subject to search and matching frictions and wage bargaining. They introduce Diamond-Mortensen-Pissarides type frictions into an economy with heterogeneous producers as in Melitz (2003). With this setup, they allow firms to exercise market power in the product market on one hand and bargain with workers over wages on the other. They analytically show how labor market frictions impact trade. The rigidities in labor markets increase the costs of hiring workers which results in lower operating profits. In a sense, these increases in hiring costs are similar to a proportional reduction in the productivity of firms. In order to make exporting profitable, the disadvantage created by high hiring costs must be compensated with high productivity levels which cause an increase in the productivity cutoff for exporting. Higher cutoff value leads to lower fraction of exporters.[5]

The uncertainties about a firm's potential performance and its competitiveness in foreign markets might contribute to its decision of not participating in export markets. Besedes and Prusa (2010) show that 30 to 40 percent of firms fail in exporting within their first two years of service. Brenton et al. (2009) also find low survival rates in export markets especially in developing countries. The uncertainties in foreign markets complemented with possible low competitiveness caused by restrictive labor regulations can make firms reluctant to participate in foreign markets.

In the analysis I use data from manufacturing and service sectors. Both Melitz (2003) and Helpman and Itskhoki (2010) present models that are constructed for manufacturing firms. Although the definition of exports is likely to vary across sectors, the idea of self-selection of more efficient firms into export markets and how labor market frictions affect exporting decision can be applied to firms in service sectors. A wholesaler or a construction firm needs to incur extra costs to provide its services for foreign buyers and these firms also have to consider the effects of regulations on the decision of adjusting their workforces.

Enterprise Surveys conducted in 2002 and 2005 include a section regarding firm's employment level. In one of the questions in this section the firm is asked how much it would

[5] See Lemma 1 in Helpman and Itskhoki (2010) for a formal proof of this relationship.

adjust the number of its full-time workers if there were no restrictions in the labor markets for hiring and firing. The exact question is asked as follows:

"If you could change the number of regular full-time workers your firm currently employs without any restrictions (i.e. without seeking permission, making severance payments etc.), what would be your optimal level of employment as a percent of your existing workforce? (e.g., 90% implies you would reduce your workforce by 10%, 110% means you want to expand by 10%)".

The question targets to measure the restrictiveness of labor regulations, on firms' hiring/firing decisions. Out of the firms who responded to this question, 40% want to increase, 20% want to decrease and the rest 40% do not want to change their employment levels. In manufacturing sector these statistics are 40%, 22%, and 38% in respective order.

Using this survey question, I calculate the desired employment growth rate for each firm if it was not constrained by the labor regulations. In finding these growth rates I follow Davis and Haltiwanger (1992). I divide the difference between actual employment level and the ideal level that would be obtained if hiring or firing decision was made by the simple average of both employment levels. Let l_i be the actual employment level of firm i and l'_i be the ideal employment level once hiring or firing decision is made. Define $\bar{l}_i = (l'_i + l_i)/2$ as the average of these two levels. The percentage desired change in employment that would have been achieved by making labor regulations flexible is formulated as

$$g_i = \frac{l'_i - l_i}{\bar{l}_i} .$$

The value of g_i shows the deviation between actual and ideal employment levels that stems from the frictions in the labor market caused by labor regulations. Since this rate is bounded by -2 and 2, the impact of large outliers is diminished.

In the empirical analysis, I treat the rigidity of employment measure as exogenous to firms. However, since this data is cross-sectional and it is collected through firms' own responses to the survey question it can be endogenous to firm performance which would bias the estimates of labor market rigidities. It could be that an inherently efficient firm can work within the exogenously given environment to reduce the cost of hiring an additional worker. Efficient firms could also attract workers with higher skill levels and utilize their workers in a more productive way. This would reduce the additional burden of hiring a new employee relative to an inefficient

firm. Hence they would complain less about the regulations. At the same time, as modeled in Melitz (2003), high efficiency would also make a firm more likely to export.

In order to alleviate this simultaneity problem I measure the rigidity of labor regulations as averages of firm-level observations at country-sector-year level. The dataset from Enterprise Surveys cover all major sectors like manufacturing, wholesale, retail, and construction according to 2-digit ISIC classification. By creating these averages I assume that the average experience of a sample of firms in a particular country-sector-year group is a representation for all firms in that particular group. These measures are also likely to be exogenous to firm's performance. Dollar et al. (2005, 2006) applies a similar approach. The authors use a cross-sectional firm level survey data to analyze the effects trade barriers, power outages, government services, and access to finance on productivity and export performance.[6]

In each sector I find desired job creation (JC) and desired job destruction (JD) rates as weighted averages of firms' desired growth rates. I use firm's employment level as weight. Defining $L_{jc} = \sum_{i \in j} \bar{l}_{ic}$ as the total employment level in sector j in country c, I get

$$JC_{jc} = \sum_{i \in j} \frac{\bar{l}_{ic}}{L_{jc}} g_{ic} \; for \; g_{ic} > 0,$$

$$JD_{jc} = \sum_{i \in j} \frac{\bar{l}_{ic}}{L_{jc}} g_{ic} \; for \; g_{ic} < 0.$$

Then desired net job creation JN_{jc} in sector j is computed as the difference between job creation and job destruction rates $JN_{jc} = JC_{jc} - JD_{jc}$. Higher values of desired net job creation show how constraining it is to create new jobs in the economy. In calculation of the sectoral desired net job creation rates, a single firm's response can dominate the average if there are few firms in the sector. In order to assure that country-sector-year averages are exogenous to each firm's performance, I exclude cells that have less than 20 observations.[7]

[6] They use country-sector-city averages in their estimations.

[7] The value of 20 is arbitrarily chosen. To identify this cutoff level, I looked at the distribution of number of firms across country-sector-year groups. Number of groups that had less than 18 observations corresponded to 10.4% of the data and the number of groups that had less than 20 observations corresponded to 11.6% of the data. The estimation results using 18, 20, or 25 cutoffs gave quite similar results. In the robustness tests that restrict the sample only to manufacturing firms, I use a cutoff of 10 observations since the sample size is much smaller in manufacturing sector. These cutoff values are only used in cross-sectional regressions and not in the regressions with the panel data.

To test whether firms become less likely to export in sectors where they are more discouraged to create new jobs I use a probit model which is described in equation 1,

$$\Pr(z_{ijc}=1)=\Pr(\beta_1 JN_{jc}+\beta_2\log(L)_{ijc}+\beta_3 Age_{ijc}+\beta_4 Foreign_{ijc}+\delta I_j+\lambda I_c+\mu I_t+\varepsilon_{ijc}>0) \quad (1)$$

In this equation z_{ijc} is a discrete random variable equal to one if the firm *i* in sector *j* and country *c* exports any share of its output. In the estimation I include log of employment level and age to control for firm's performance. Foreign owned firms are more likely to be engaged with the rest of the world than firms with full domestic ownership. I include a dummy variable set equal to one if firm has at least 10 percent of foreign ownership. There is also a vector of variables controlling the sector, country, and survey year fixed effects listed in respective order I_j, I_c and I_t. Sectors are likely to vary in intrinsic volatility of demand and supply shocks due to differences in technological or market characteristics. These differences might create a variation in the demands of job creation and destruction across sectors. Hence, sectors might be affected differently by labor regulations. Sectors are also likely to vary in their export orientation. I include sector dummies to control for these possible differences. The country dummies can control for the differences in trade policies and other macroeconomic policy differences. With the inclusion of these controls, I explore the extent to which differences in restrictiveness in creating new jobs explain the remaining variation in exporting. In the estimations error terms can be heteroskedastic and be correlated across firms within the same sector-country group. This could bias the standard errors of the estimated coefficients downward. Therefore I present robust standard errors clustered at country-sector-year level to allow for the possibility of this correlation.

3. DATA DESCRIPTION

The data used in this study is obtained from World Bank's Enterprise Surveys.[8] In the surveys, a random sample of firms is selected that is representative of non-agricultural private sector of each country. The data cover firms from 26 countries in ECA region. There are three rounds of surveys which are conducted in 2002, 2005, and 2008. The survey conducted in 2002 includes 6343 firm and the one in 2005 includes 9265 firms. A panel dataset is constructed from

[8] These surveys were conducted together with European Bank for Reconstruction and Development and they are also called as Business Environment and Enterprise Surveys (BEEPS). A detailed implementation note for the surveys about the sectoral coverage, the representativeness of the samples, and construction of the panel data can be found at http://www.ebrd.com/pages/research/economics/data/beeps.shtml. The data can be found at www.enterprisesurveys.org.

a part of the cross-sectional data. Data from 2008 survey is only used in the analysis with this panel dataset.[9] There are 1552 observations in the panel. 1025 of these firms are surveyed in 2002 and 2005 and 527 of them are surveyed in 2005 and 2008. The size of the panel data for manufacturing sector is 943. The representativeness of the main sample is preserved in the panel dataset. Comparison of the size distribution, the sectoral composition, and proportion of exporters in each size group and each sector are quite similar for the panel firms and the main sample.[10]

The countries that are included in the analysis are Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, FYR Macedonia, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russian Federation, Tajikistan, Turkey, Ukraine, and Uzbekistan. In addition to these countries there are 10 European Union (EU) members: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, and Slovenia.

The survey covers the major sectors and industries in each country. The sectoral and industry composition of the sample was determined by their relative contribution to GDP and they represent the majority of output in each country. The list of the sectors, the industries they cover, and the fraction of exporters in each sector are given in Table 1.[11] Table 2 shows the same statistics for industries covered in manufacturing sector. All of the sectors presented in the table are covered in each country. Manufacturing and wholesales-retail sectors have the largest sample sizes.

Definition of exporting varies across sectors. A guideline of export in services is described in the General Agreement on Trade in Services (GATS) of World Trade Organization. In the surveys, the exact wording of the question for exporting is "*Does your firm currently sell its products or services directly to customers outside the country?*" Hence it covers both exporting of products and services. Two of the most export intensive sectors in the data are transport and communication and manufacturing. Percentage of exporters in each sector and country for 2005 is presented in Table 3. Data for 2002 is quite similar.

Desired net job creation rates across sectors are given in Table 4. The tables show that there is considerable variation in both percentage of exporters and desired net job creation rates

[9] The survey conducted in 2008 is not included in the cross-sectional analysis because the question that is used to measure rigidity of labor regulations is only available in 2002 and 2005 surveys. However, I use the information on export status for the panel firms in 2008.

[10] These tables are available upon request.

[11] The classification of the industries is made according to ISIC classification revision 3.1.

across sectors and countries. In 2005, standard deviation of desired net job creation rates in the sample is 0.06. Decomposition of this variation into between countries and within countries (across sectors) components show that the standard deviation between countries is 0.04 and within countries is 0.05. These differences across sectors and countries could be caused by several reasons. The laws regarding to labor regulations could vary across sectors. Kuddo (2009) shows that in ECA region some countries have mixed systems of collective bargaining giving general or sectored collective agreements the force of law by creating procedures to make them generally binding. These collective agreements which can set national or sectoral minimum wages can create variation in how firms complain about labor regulations. A 2009 survey by Doing Business shows that most of the countries in the region have collective bargaining agreements at sector level and some also have at industry level. [12] Another source of variation in the firms' responses to this question could be the enforcement of these regulations. Kuddo (2009) discusses the concerns about enforcement of labor regulations in the region and lists weak enforcement among the factors that cause ineffectiveness of labor laws in many ECA region countries. There is a question asked in the 2005 round of Enterprise surveys which can be used to measure the restrictiveness of labor regulations and provide information about the different levels of enforcement. This question asks "*How many times in the last 12 months was your establishment either inspected by labor and social security agencies or required to meet with officials from these agencies?*" Using the data for question I calculated the percentage of firms that had labor inspections and average number of inspections in each sector for every country. Standard deviation of percentage of firms that had labor inspections is 0.21. The component of this variation that is between countries is 0.20 and within countries (across sectors) is 0.10. The same decomposition for number of inspections that firms had yields 1.39 overall deviation with components of 0.75 between and 1.17 within variation.

The broad scope of the survey conducted to firms allows me to observe a rich set of variables on firm performance and investment climate. In analyzing the relationship between restrictive labor regulations and exporting, I can control for factors like innovative capacity, skill level in the firm, use of external finance, population of the city where firm is located, and being part of a multi-plant firm. Description of all variables used in the analysis is given in Table 5. The descriptive statistics for these variables are presented in Table 6.

[12] See http://www.doingbusiness.org/methodology for the details of the data and methodology.

4. EMPIRICAL RESULTS

I use several specifications of the model in identifying the relationship between restrictiveness of labor regulations and exporting. The results from probit estimations are given in Table 7. In the tables I report marginal effects of each variable at their mean values and I cluster the standard errors at country-sector-year level. The main estimation result is given in the first column. Using this result, I can compute the estimated fall in probability of exporting moving from a desired net job creation rate of zero to one and ten percent. This could be roughly interpreted as a change in desired net job creation from the levels in the manufacturing sectors of countries like Estonia and Lithuania (see Table 4) to the level in Turkey, Bosnia, or Azerbaijan (all around one percent) and Georgia (11%) which had the highest desired net job creation rate in this sector. Keeping all other variables at their mean values, computation of the change in the probability of exporting shows that: one percent increase in desired net job creation rate yields 0.73% decrease in the probability of exporting and a 10% increase yields 7.1% decrease.[13] This result is not affected by the differences among sectors in their trade orientation or differences among countries in their trade policies due to inclusion of sector and country fixed effects in the regressions. As expected, larger and older firms are more likely to export. Also foreign ownership increases probability of exporting by 24%.

In the data there are firms that wanted to create or destruct high amounts of jobs. Although the way desired growth rate is calculated bounds this measure by -2 and 2, the estimation results could still be sensitive to extreme values. In each country, I excluded the observations that had desired growth rates that are outside three standard deviations from the mean level. This estimation result is presented in the second column. The effect of desired net job creation rate changes only slightly. In the third column, I introduce an alternative definition of exporting. In this definition, a firm is considered as an exporter if it gains more than 10% of its total revenue from foreign sales (call this as conservative definition of exporting).[14] If a firm exports very small fraction of its sales, this might show that exporting decision does not play a crucial role in firm's maximization problem or the firm is only experimenting on exporting. Hence the firm might not need to go through a substantial capacity adjustment process for exporting. Defining exporters with this restriction accentuates the distinction between exporters

[13] We can also say all else equal, a one standard deviation increase in desired net job creation rate (5.9%) decreases the probability of exporting by 0.9%.
[14] In the data 17% of all exporters gain less than 10% revenue from exports.

and non-exporters. The estimation result is similar to the main result in the first column except that the coefficient of age is no longer significant.[15]

In the data 90% of the firms export directly where the rest participate in export markets indirectly through a distributor. Selling part or all of output to some distributor who exports is less costly than exporting directly to foreign markets as these firms do not need to search for foreign customers or do not have to deal with transportations and customs services. Although their products must still satisfy the high standards needed by foreign customers and be competitively priced, it might be ambiguous to consider them in the same category as direct exporters. To see whether this distinction plays any role in the results I include only direct exporters in the fourth specification. Next, in the fifth specification, I use log of labor productivity, measured as real sales per worker, as a control for firm's performance instead of its current employment level. In this measure, real sales are calculated by deflating nominal sales by GDP deflators which are obtained from World Bank Development Indicators database.

Firms that plan to export in the future increase their capacities and grow faster than non-exporters before they start to export. Hence a firm's past growth performance can be a better determinant of its current exporting decision than its employment level. In the sixth specification, instead of controlling current firm size, I control for the past employment growth of firms. The survey includes information on firm's employment level in the last fiscal year and three years before that. Using this information, I calculate the past growth rates. In the last specification I include actual net job creation rate in each sector using the past growth rates calculated for each firm. Sectors with successful growth outcomes could be relatively more encouraging for the firms in them to search for new markets for their products. Both firms' and sectors' past growth performance are positively and significantly correlated with the decision to export. In all specifications presented in the table the coefficient of desired net job creation rate is negative and significant. Moreover, the magnitude of this coefficient changes only slightly across the specifications which imply that different definitions of exporting or the use of different performance measures do not affect the results.

[15] All estimations presented in the rest of the paper are also performed using this conservative definition of exporting and the results are quite similar.

5. SENSITIVITY ANALYSIS

To test the sensitivity of the results, I perform several tests. In the first group of tests I include additional variables in the estimation that might affect export decision and could bias the results when they are omitted. Results with additional controls are presented in Table 8. In the first specification, I control for the firm's access to external finance. Higher availability of external finance even when it is not directly used for exporting decreases the sunk costs incurred in searching new markets for products. The estimation result confirms this hypothesis. Dollar et al. (2006) uses information on whether firms have overdraft facilities as a measure of access to finance and conclude that those firms are more likely to export.

In the second specification, I control for past innovative performance of firms. As a proxy measure for innovation I use the survey question asking whether the firm has developed a major new product line or service in the last three years. It is important to note that the question also includes services. Bernard and Jensen (1999) show that among manufacturing firms in the US, the ones that have recently introduced new products are more likely to export. Introduction of new products or services brings a new source of revenue and firms can have high comparative advantage in exporting these innovations. Results show that innovative firms are almost 10 % more likely to export. The skill level of workers is another factor that can influence the decision of exporting. Cross-country or cross-sector differences in the supply of skilled workers are controlled by the country and sector fixed factors. However, there can still be significant variation in skill levels among firms. To assess how this factor affects the impact of stringent labor regulation on exporting, I include share of non-production workers in the firm. Just like the successful innovations, higher skill level can increase the comparative advantage of the firm and can put the firm in an advantageous position in export markets. The third specification shows higher skill level in the firm is associated with higher probability of exporting. The next specification includes controls for city population. Cities with large population might have better investment climates and this can affect firm's decision on exporting. Infrastructure, customs services, and government services could be more efficient in large cities (unless the city is over populated). The fourth specification uses four dummy variables that represent the population of the city where the firm is located except the capital city which is included as a separate group. The city groups are: a) capital city, b) larger than 1 Million, c) 250,000-1 Million, d) 50,000-250,000, e) less than 50,000. The omitted group is small cities with less than 50,000 residents. It

is seen that firm's location is important in its importing decision. Firms in capital or populous cities are more likely to export.

The unit of observation in the survey is plant. A plant that is a subsidiary of a larger enterprise can find it easier to overcome the sunk costs required for exporting. Moreover the knowledge and skill embodied in the firm can be easily disseminated across establishments within a firm which might facilitate the subsidiaries' entry into foreign markets. The fifth specification controls for multi-plant firms by including a dummy variable set to one for the plants that are part of larger enterprises. A quarter of the plants in the data are part of a multi-plant firm with at least 2 plants, and seven percent are part of a more than five plant enterprises. The coefficient of the dummy variable for multi-plant firms is positive although not significant. Finally the last column includes all control variables. The coefficient for desired net job creation continues to be significant with slightly less magnitude.

As a second group of robustness tests, I repeat the estimation for some sub-samples obtained from the original dataset. Firms that are constrained by labor regulations may be more inclined to hire temporary workers and provide training to their existing workers. Use of temporary workers and training programs can allow firms to escape the heavy burden of labor regulations. Contracts of temporary workers are usually less restrictive for firms than the contracts of full-time permanent workers. When labor adjustment costs are high, training programs can be a valid alternative to hiring as a source to upgrade the workforce to the needs of new technologies. Pierre and Scarpetta (2004) find that firms that perceive labor regulations as constraining are more likely to hire temporary workers and use training programs. Hallward-Driemeier and Helppie (2007) also find that firms are more likely to hire temporary workers in countries with more restrictive labor laws. In the first column of Table 9, I exclude firms that hire temporary workers and provide training programs assuming that these firms would be more likely to be constrained by the labor regulations. The estimation results are in accordance with the previous findings.

In the data, small firms, those with less than 20 employees, are the ones that want to grow most. These firms have desired net job creation rate of 7.6% which is almost four times higher than the rate for medium size firms (firms between 20 and 100 workers). Large firms had the least desired net creation rate. Small firms are also the least likely group to export. More than half of the data is formed by firms in this size group. The negative relationship between desired

net job creation rate in sectors and exporting can be affected by the existence of large number of small firms in the data. In the second column of Table 9 I perform the regression analysis excluding small firms. The coefficient of desired net job creation rate is significantly negative.

One concern with the survey question I use to proxy stringency of labor regulations is that it could proxy for some other issue in firm's inefficiency such as lack of managerial ability. In order to alleviate this concern I provide a third group of robustness tests in which I replace the measure for desired net job creation rate with other variables. First I use the question on whether the firm was inspected by labor or social security agents. For each sector-country cell, I computed the percentage of firms that had labor inspections. Correlation between this variable and desired total job reallocation is 0.25 which is significant at one percent level. This evidence supports the use firms' responses to the hypothetical question as a proxy for the rigidities of labor regulations. However, although the correlation coefficient is informative, it does not control for sectoral or cross-country differences. In the estimation, I replaced the sectoral desired net job creation rate with a dummy variable set equal to one if the firm has been inspected by labor or social security service officials. The result is presented in Table 10. The results show that firms that have been inspected are two percent less likely to export.

Doing Business collects data to construct a rigidity of employment index which is available for 2005. This index is the average of 3 sub-indices: a difficulty of hiring index, a rigidity of hours index and a difficulty of redundancy index. All sub-indices take values between 0 and 100, with higher values indicating more rigid regulation. Each sub-index has several components which are presented in the Appendix. Since this data is at country level, it has to be interacted with some sectoral measure of reliance on labor. Using the survey data, I computed two measures of reliance on labor for each sector-country cell. One of these measures is the labor intensity. For each firm I calculated the ratio of cost of labor to output and averaged this at sector-country level (LabShare). This can be used as a proxy for the labor intensity in the sector. In the second measure, for each firm I calculated the ratio of share of unskilled workers to capital intensity where capital intensity is measured as ratio of total replacement value of capital to output. Then again I averaged this at sector-country level (Unskilled_CapShare).[16]

[16] I would like to thank to the referee for the suggestion on using an external source to measure the rigidity of labor markets.

Using the interaction of the rigidity of employment index with measures of reliance on labor, I obtained a new variable that could replace desired net job creation rate in the estimations. The regression results are presented in the second and third columns of Table 10. The interaction terms are negatively and significantly correlated with the probability of exporting. Stringent labor regulations affect the probability of exporting more severely in sectors that have higher reliance on labor. Although not included in the paper, replacing rigidity of employment index with its components: difficulty of hiring, rigidity of hours, and difficulty of redundancy indices give similar significant coefficients.

(a) Analysis for manufacturing industries

The analysis performed so far explained how the restrictiveness of labor regulations related to participation in export markets for firms across sectors. The sectors are broadly defined and what is exported shows great variation across sectors. In this section, I restrict the sample to 2-digit industries within manufacturing sector which were described in Table 2. Definition of exporting is relatively more homogeneous within manufacturing sector than across all sectors. However this restriction reduces the sample size to a one third of the original size. In these estimations I cluster the standard errors at industry-country-year level and I replace sector fixed effects with industry fixed effects.

Table 11 shows the estimation results. The results are similar to the analysis presented in Table 7 and Table 8. However the magnitude of the decrease in probability of exporting is higher for industries in manufacturing sector. The result in the first column shows that one standard deviation increase in desired net job creation rate (5.4%) decreases probability of exporting by almost two percent. The second column replaces log of employment level with employment growth rate. In the rest of the table except the last column, I perform the same robustness analysis that was performed in Table 8. Results are significant in all of the specifications.

In the last column of Table 11, I use an alternative estimation method and apply difference-in-difference methodology to test whether sector level differences in the intrinsic volatility of demand and supply shocks lead to differential effects of employment protection across sectors. Labor regulations might be more binding in relatively more volatile sectors as they would require more frequent labor adjustments. Following the recent works of Micco and Pages (2007) and Haltiwanger et al. (2008), I identify the intrinsic employment volatility of a 2-digit manufacturing industry by the relative job reallocation of that industry in the United States

(US).[17] Here, I assume that industry reallocation in US industries identify the frictionless level of reallocation. The US job reallocation data for industries during 1994-1998 is obtained from the database used by Davis, Haltiwanger, and Schuh (1998)[18]. I construct an interaction term between US job reallocation and the desired net job creation rate for each manufacturing industry in every country. The coefficient of the interaction term is negative and significant which shows that stringent labor regulations reduces probability of exporting more in relatively more volatile industries once industry and country fixed effects are controlled for.[19] This result complements the findings of Micco and Pages (2007) and Haltiwanger et al. (2008). Micco and Pages (2007) find that stringent regulations reduce value added and labor productivity in industries with higher intrinsic volatility.

(b) Analysis with the panel data

A group of firms in the data were surveyed twice in three years. Despite of its small size, this panel dataset has an advantage over the cross-sectional data in handling the concerns on the endogeneity in desired net job creation. In the regressions with the panel dataset, current export status of firms (at time *t*) is regressed on the past values of explanatory variables (all of which are given at time *t-3*). Since firm's hiring/firing decision is evaluated at t-3, I use firm's own response in these estimations and I do not restrict the number of observation in each country-sector cell to be larger than 20. The specification used for the panel data is given in equation 2

$$\Pr\left(z_{ijc,t}=1\right)=\Pr\left(\beta_1 JN_{ijc,t-3}+\beta_2\log(L)_{ijc,t-3}+\beta_3 Age_{ijc,t-3}+\beta_4 Foreign_{ijc,t-3}+\delta I_j+\lambda I_c+\mu I_t+\varepsilon_{ijc}>0\right). \quad (2)$$

The regression results are given in Table 12. The first result shows that firms that couldn't create jobs due to restrictive labor regulations at time t-3 are less likely to export at time t. With the panel data I can control for the past export experience of firms. Bernard and Jensen (1999) show that firms that export grow faster in employment both before and after they enter the export market. Since firms with recent exporting experience would have information on the benefits of exporting, they might want to create more new jobs than the firms that have not exported. To control for this effect, in the second specification, I restrict the sample to firms that did not export three years ago. The coefficient of desired net job creation is only significant when the conservative definition of exporting is used which is given in the third specification. In

[17] Job reallocation is calculated as the summation of job creation and job destruction rates.
[18] The data is available at http://econweb.umd.edu/~haltiwan/download.htm.
[19] Inclusion of all additional controls that are shown in the specification given in column eight did not affect this result.

the fourth column I include actual future growth rate of the firm. Firms with good future growth opportunities could be those that declare high desired job creation rates. These firms could also observe a large increase in export participation in the future starting from a currently low level. In this column, current export status of the firm (at time t) is regressed on current desired job creation rate (at time t) and future actual job creation rate (between t and t+3). The estimation result shows that firms that will grow in the future are less likely to export today. However its coefficient is not significant. Finally in fifth and sixth columns I replicate the estimations presented in the first two columns for manufacturing firms. The fifth column includes all manufacturing firms and the last column restricts the sample to manufacturing firms that did not export at *t-3*. Results are significant in both specifications.[20]

6. CONCLUSION

A large number of studies have shown that firms that export are better performers than non-exporting firms. These firms employ more workers, grow faster and they are more productive. They make a significant contribution to aggregate growth and economic development. Dollar et al. (2006) highlight the importance of the investment climate in determining the entry of firms into foreign markets. They show that in addition to technological or market driven factors, factors like finance, infrastructure, and customs services affect a firm's decision to expand into foreign markets. In this study I focus on another aspect of the investment climate. I analyze how rigid labor regulations can distort the exporting decision. Evidence shows that future exporters start to increase their size before they start to export and they have to be competitive in order to survive in foreign markets. However stringent labor regulations increase the opportunity cost of hiring workers and lead to lower competitiveness of firms. Although these regulations are established to protect workers and increase aggregate welfare, they can have distortive effects on labor demand of firms. This discouragement in creating jobs can make firms reluctant to enter foreign markets.

Most studies that analyze the effects of labor regulations resort to cross country data in institutions and regulations using different data sources which might create problems due to differences in measurement across countries. These problems are ruled out here because the data used is homogeneous in unit of observations, the measures of firm performance, and labor

[20] All these tests except the one in column four are repeated using log labor productivity instead of log employment level. Desired net job creation rate had significantly negative coefficient in all specifications.

regulations. In my analysis, I use firm level data from ECA region. I look at the variation in the stringency of labor regulations across sectors and show how much of that variation explains the variation in the decision to export. The results show that sectors in which firms want to create more new jobs have lower shares of exporters. The same conclusion is drawn when the analysis is restricted to industries in the manufacturing sector. Next, I show that these findings are not sensitive to inclusion of additional firm level control variables like access to finance, past innovative performance, and the skill level. The results are also not sensitive to the use of alternative measures for labor market rigidities obtained from other questions from the surveys and from Doing Business database. Evidence from the panel data provides further support to the robustness of the findings.

There are few studies that analyze the detrimental effects of labor regulations on firm and industry performance. In a recent study, Helpman and Itskhoki (2010) construct a structural model where they show that stringent hiring laws distort exporting decision of firms. They also show that lower the frictions in labor markets the more a country starts to gain from lower trade barriers. Although the link between labor regulations and exporting may not be too obvious, stringent regulations can carry a high cost in the form of negative consequences for job growth which effect entry into export markets.

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Table 1 Data coverage across sectors

ISIC	Sector	2002 % of Firms	2002 % of Exporters	2005 % of Firms	2005 % of Exporters
45	Construction	12	13	10	11
15-37	Manufacturing	25	51	40	37
60-64	Transport, Storage, Communication	8	42	7	38
50-52	Wholesale, Retail trade	31	18	25	16
70-74	Real Estate, Rent, and Business	10	22	9	16
55	Hotels &Restaurants	7	14	5	14
92-93	Other Services	6	15	5	13
	Totals	6,343	27	9,265	25

[a] The last row shows total number of firms and total percentage of exporters in each year.

Table 2 Data coverage across industries in manufacturing sector

ISIC	Industries	2002 % of Firms	2002 % of Exporters	2005 % of Firms	2005 % of Exporters
17	Textiles	6	64	4	50
18	Garments	7	58	14	36
15	Food	23	33	29	22
27,28,29	Metals and machinery	18	63	27	43
31	Electronics	4	75	1	64
24	Chemicals and pharmacy	5	63	3	64
20,36	Wood and furniture	12	48	7	39
25,26	Non-metallic and plastic	9	45	6	45
21	Paper	1	62	1	59
22	Printing & Publishing	6	27	4	25
	Other manufacturing	8	64	5	57
	Total	1,617	51	3,678	37

[a] The last row shows total number of firms and total percentage of exporters in each year.

Table 3 Percentage of exporters across sectors in 2005

	Construction	Manufacturing	Transport, Communic.	Wholesale, Retail	Real Estate, Business	Hotels, Restaurant	Other Services	Average	Std Dev
Albania	0.05	0.50	0.65	0.10	0.18	0.60	0.44	0.36	0.48
Armenia	0.00	0.31	0.09	0.00	0.13	0.00	0.17	0.22	0.41
Azerbaijan	0.03	0.15	0.40	0.03	0.13	0.10	0.20	0.13	0.33
Belarus	0.18	0.56	0.53	0.12	0.15	0.22	0.00	0.25	0.43
Bosnia	0.33	0.47	0.86	0.19	0.14	0.19	0.20	0.35	0.48
Bulgaria	0.17	0.50	0.40	0.12	0.15	0.08	0.36	0.24	0.43
Croatia	0.07	0.61	0.65	0.27	0.16	0.55	0.00	0.37	0.48
Czech	0.04	0.54	0.24	0.20	0.23	0.04	0.27	0.26	0.44
Estonia	0.23	0.58	0.50	0.22	0.25	0.12	0.44	0.31	0.46
FYROM	0.21	0.61	0.43	0.14	0.31	0.00	0.08	0.29	0.46
Georgia	0.10	0.47	0.11	0.06	0.17	0.00	0.06	0.18	0.38
Hungary	0.14	0.48	0.23	0.22	0.11	0.38	0.10	0.36	0.48
Kazakhstan	0.11	0.13	0.17	0.08	0.02	0.00	0.00	0.11	0.31
Kyrgyzstan	0.13	0.42	0.20	0.10	0.18	0.00	0.08	0.21	0.40
Latvia	0.15	0.59	0.61	0.17	0.06	0.20	0.00	0.25	0.44
Lithuania	0.12	0.64	0.50	0.35	0.09	0.08	0.40	0.34	0.48
Moldova	0.00	0.35	0.36	0.12	0.33	0.00	0.08	0.26	0.44
Poland	0.08	0.33	0.31	0.17	0.13	0.00	0.06	0.25	0.43
Romania	0.00	0.30	0.35	0.10	0.09	0.29	0.05	0.24	0.43
Russia	0.08	0.26	0.22	0.16	0.02	0.00	0.00	0.14	0.34
Slovakia	0.19	0.74	0.44	0.24	0.40	0.06	0.07	0.35	0.48
Slovenia	0.15	0.84	0.71	0.44	0.23	0.07	0.45	0.47	0.50
Tajikistan	0.00	0.29	0.00	0.12	0.00	0.00	0.00	0.12	0.32
Turkey	0.25	0.57	0.43	0.31	0.31	0.23	0.24	0.38	0.48
Ukraine	0.06	0.29	0.44	0.09	0.19	0.15	0.12	0.19	0.39
Uzbekistan	0.03	0.43	0.22	0.02	0.13	0.05	0.00	0.15	0.35
Average	0.11	0.37	0.38	0.16	0.16	0.14	0.13	0.25	0.43
Std Dev	0.31	0.48	0.49	0.36	0.37	0.35	0.34	0.43	

Table 4 Desired net job creation across sectors in 2005

	Construction	Manufacturing	Transport, Communic	Wholesale, Retail	Real Estate, Business	Hotels, Restaurant	Other Services	Average	Std Dev
Albania	0.01	-0.01	-0.31	0.11	0.04	0.14	0.07	0.01	0.12
Armenia	0.04	0.07	-0.14	0.08	0.28	-0.03	-0.01	0.07	0.07
Azerbaijan	0.02	0.01	-0.02	0.03	0.01	0.00	0.02	0.02	0.01
Belarus	0.11	-0.04	0.02	0.00	0.12	-0.11	0.20	0.04	0.07
Bosnia	-0.01	0.01	-0.08	0.05	-0.03	-0.20	0.02	0.00	0.07
Bulgaria	-0.06	-0.02	-0.03	0.03	-0.12	0.04	-0.09	-0.01	0.05
Croatia	0.09	-0.04	0.04	-0.11	0.01	-0.20	-0.03	-0.04	0.07
Czech	0.05	0.02	-0.07	0.01	0.02	0.07	0.02	0.02	0.03
Estonia	0.03	0.00	-0.06	0.02	-0.01	-0.04	-0.03	0.00	0.03
FYROM	-0.14	0.01	-0.22	0.03	0.17	0.00	0.18	0.01	0.10
Georgia	0.18	0.11	0.02	0.09	0.09	0.00	0.00	0.08	0.05
Hungary	0.04	-0.02	0.01	-0.04	0.02	0.06	0.18	0.00	0.04
Kazakhstan	0.01	0.03	-0.05	0.04	-0.01	-0.03	0.01	0.02	0.02
Kyrgyzstan	0.33	0.02	0.01	0.07	0.01	0.04	0.03	0.07	0.10
Latvia	-0.03	0.03	0.04	0.03	0.10	-0.02	0.12	0.04	0.04
Lithuania	0.06	0.00	-0.08	-0.01	-0.03	-0.03	0.02	-0.01	0.04
Moldova	0.54	-0.01	0.02	0.01	0.43	0.08	0.06	0.02	0.08
Poland	0.02	0.02	0.02	0.02	0.03	0.11	-0.02	0.02	0.01
Romania	0.11	0.03	0.05	0.05	0.14	-0.07	-0.07	0.04	0.04
Russia	-0.02	-0.01	-0.07	0.06	0.03	0.03	-0.01	0.01	0.04
Slovakia	0.02	-0.07	0.01	0.01	-0.02	-0.03	-0.03	-0.02	0.03
Slovenia	0.08	-0.06	0.01	-0.02	0.01	0.00	-0.06	-0.01	0.05
Tajikistan	0.09	-0.02	-0.04	0.02	0.03	0.04	0.00	0.01	0.04
Turkey	-0.01	0.01	0.03	0.03	0.03	0.00	0.04	0.02	0.02
Ukraine	0.05	0.02	-0.02	0.01	0.04	0.01	0.03	0.02	0.02
Uzbekistan	0.06	-0.02	0.00	-0.01	-0.05	-0.02	0.01	-0.01	0.03
Average	0.05	0.01	-0.03	0.02	0.03	0.00	0.02	0.02	0.05
Std Dev	0.08	0.03	0.08	0.04	0.07	0.07	0.07	0.05	

Table 5 Description of the variables

Variable	Definition
Export	Dummy variable equal to one if firm exports any product or services to customers outside the country.
Export (≥ %10)	Dummy variable equal to one if at least 10% of firm's revenue is gained from direct or indirect exports. (I refer to this as the *conservative definition of exporting*)
Foreign (≥ %10)	Dummy variable equal to one if more than 10% of the firm is owned by private foreign individuals, companies, or organizations.
Log(Labor)	Log of number of full time workers.
Log(Pro)	Log of labor productivity (real sales per number of workers).
Growth	Annual growth rate of employment between the last complete fiscal year before the survey was conducted and three years before that.
Innovate	Dummy variable equal to one if the firm developed a major new product line or service in last three years.
Age	Survey year minus year the firm started operation.
ExternalFin	Proportion of investment that is financed through external sources (banks, financial institutions etc.).
City	5 groups determining the population of the city that the firm is located
Inspect	Dummy variable equal to one if the firm was inspected or was required to meet agents from labor and social security services.
NonProdWrk	Share of non-production workers (e.g., managers, administration, sales) in all workers.
Multi-plant	Dummy variable equal to one if the firm has more than one establishment in the country.
*IUS*NetJobCr*	Interaction between job reallocation in US manufacturing industries with desired net job creation rates in industries constructed from the data.

Table 6 Descriptive Statistics

Variable	Observation	Mean	Standard Dev.
Desired NetJobCr	13895	0.001	0.059
Export	13873	0.265	-
Export (≥ %10)	13873	0.220	-
Foreign (≥ %10)	13895	0.136	-
Log(Labor)	13874	3.072	1.678
Log(Pro)	10299	-2.096	1.145
Growth	13698	0.031	0.153
Innovate	13870	0.362	-
Age	13887	14.833	17.335
ExternalFin	13895	10.989	26.574
NonProdWrk	13687	0.408	0.306
Inspect	8506	0.478	-
Multi-plant	13884	0.259	-

Table 7 Probit estimates of export status

VARIABLES	I	II	III	IV	V	(VI)	(VII)
Desired NetJobCr	-0.160	-0.168	-0.162	-0.168	-0.211	-0.199	-0.188
	(0.086)*	(0.088)*	(0.075)**	(0.083)**	(0.0102)**	(0.098)**	(0.090)**
Log(Labor)	0.070	0.070	0.055	0.065			0.070
	(0.004)***	(0.004)***	(0.004)***	(0.004)***			(0.004)***
Age	0.001	0.001	0.000	0.001	0.003	0.004	0.001
	(0.000)***	(0.000)***	(0.000)	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Foreign	0.241	0.241	0.205	0.225	0.334	0.320	0.240
	(0.016)***	(0.016)***	(0.016)***	(0.015)***	(0.019)***	(0.017)***	(0.016)***
Log(Pro)					0.051		
					(0.009)***		
Growth						0.132	
						(0.033)***	
Actual NetJobCr							0.086
							(0.050)*
Observations	13845	13845	13845	13845	10279	13669	13845
Pseudo R^2	0.224	0.224	0.206	0.218	0.199	0.179	0.225

Robust standard errors clustered by country, sectors, and years are in parentheses. In all regressions, I control for sector, survey year, and country fixed effects. (I) is main probit estimate, (II) controls for outliers in desired net job creation rate, (III) sets the indicator variable for exporting to one if the firm gains more than 10% revenue from export, (IV) sets the indicator variable for exporting to one if the firm exports directly, (V) uses log of labor productivity as control (VI) uses past employment growth as a control, (VII) uses actual past net job creation as a control. Coefficients for the probit regressions show the marginal effects at their mean values. *** p<0.01, ** p<0.05, * p<0.1.

Table 8 Robustness tests

VARIABLES	I	II	III	IV	V	VI
Desired NetJobCr	-0.163	-0.154	-0.202	-0.151	-0.160	-0.143
	(0.087)*	(0.087)*	(0.082)**	(0.088)*	(0.086)*	(0.087)*
Log(Labor)	0.068	0.066	0.076	0.069	0.070	0.069
	(0.004)***	(0.004)***	(0.004)***	(0.004)***	(0.005)***	(0.005)***
Age	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Foreign	0.242	0.235	0.229	0.229	0.240	0.218
	(0.016)***	(0.016)***	(0.016)***	(0.016)***	(0.016)***	(0.016)***
ExternalFin	0.001					0.001
	(0.000)***					(0.000)***
Innovate		0.096				0.084
		(0.010)***				(0.010)***
NonProdWorker			0.133			0.116
			(0.020)***			(0.019)***
Capital City				0.069		0.051
				(0.015)***		(0.015)***
>1Million				0.071		0.053
				(0.025)***		(0.023)**
250K-1 Million				0.026		0.019
				(0.014)*		(0.013)
50K-250K				0.000		-0.005
				(0.012)		(0.012)
Multi-plant					0.003	-0.005
					(0.013)	(0.012)
Observations	13845	13823	13659	13845	13834	13627
Pseudo R^2	0.227	0.233	0.229	0.228	0.224	0.242

Robustness tests with additional controls. Robust standard errors clustered by country, sector, and year are in parentheses. In the regressions, I control for sector, survey year, and country fixed effects. (I) controls for use of external finance for investment, (II) controls for past innovative experience of the firm, (III) controls for ratio of non-production workers to all workers,(IV) controls for population of the city that firm is located,(V) controls for being part of a multi-plant enterprise, (VI) includes all controls. Coefficients for the probit regressions show the marginal effects at their mean values. *** p<0.01, ** p<0.05, * p<0.1.

Table 9 Tests with sub-samples

VARIABLES	I	II
Desired NetJobCr	-0.201	-0.245
	(0.091)**	(0.144)*
Log(Labor)	0.060	0.078
	(0.005)***	(0.009)***
Age	0.000	0.001
	(0.000)	(0.000)***
Foreign	0.206	0.261
	(0.025)***	(0.019)***
Observations	5490	6579
Pseudo R^2	0.215	0.210

Robustness tests with sub-samples. Robust standard errors clustered by country, sector, and year are in parentheses. In the regressions, I control for sector, survey year, and country fixed effects. (I) excludes firms with temporary workers and that perform training, (II) excludes firms that have less than 20 full-time employees. Coefficients for the probit regressions show the marginal effects at their mean values. *** p<0.01, ** p<0.05, * p<0.1.

Table 10 Alternative measures of labor market rigidities

	(I)	(II)	(III)
Log(Labor)	0.069	0.071	0.071
	(0.005)***	(0.006)***	(0.006)***
Age	0.001	0.001	0.001
	(0.000)**	(0.000)**	(0.000)**
Foreign	0.241	0.242	0.243
	(0.021)***	(0.023)***	(0.023)***
LabShare*Rigidity		-0.011	
		(0.005)**	
Unskilled_CapShare*Rigidity			-0.0002
			(0.000)**
Inspect	-0.019		
	(0.012)*		
Observations	9244	6929	6929
Pseudo R^2	0.220	0.2240	0.2236

Robustness tests with using alternative measures to proxy rigidity of labor regulations. Robust standard errors clustered by country and sectors are in parentheses. In the regressions, I also control for sector, and country fixed effects. (I) uses a dummy variable set equal to one if firm has been inspected by labor and social security agencies, (II) uses interaction of labor intensity and rigidity of employment, (III) uses interaction of the ratio of unskilled workers share to capital intensity, *** p<0.01, ** p<0.05, * p<0.1.

Table 11 Regression results for manufacturing industries

VARIABLES	I	II	III	IV	V	VI	VII	VIII	IX
NetJobCr	-0.323	-0.407	-0.309	-0.359	-0.312	-0.319	-0.313	-0.328	
	(0.174)*	(0.182)**	(0.174)*	(0.169)**	(0.178)*	(0.174)*	(0.173)*	(0.172)*	
Log(Labor)	0.140		0.136	0.135	0.143	0.140	0.141	0.135	0.144
	(0.008)***		(0.008)***	(0.008)***	(0.009)***	(0.008)***	(0.008)***	(0.008)***	(0.008)***
Age	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)***	(0.001)*	(0.001)*	(0.001)	(0.001)	(0.000)	(0.001)**	(0.001)
Foreign	0.308	0.424	0.310	0.304	0.300	0.305	0.307	0.299	0.302
	(0.033)***	(0.029)***	(0.034)***	(0.033)***	(0.033)***	(0.034)***	(0.034)***	(0.034)***	(0.035)***
Growth		0.177							
		(0.058)***							
ExternalFin			0.001					0.001	
			(0.000)***					(0.000)***	
Innovate				0.124				0.112	
				(0.020)***				(0.020)***	
NonProdWorker					0.080			0.059	
					(0.046)*			(0.045)	
Capital City						0.011		-0.008	
						(0.030)		(0.029)	
>1Million						-0.000		-0.005	
						(0.043)		(0.043)	
250K-1Million						-0.033		-0.035	
						(0.025)		(0.025)	
50K-250K						-0.043		-0.043	
						(0.027)		(0.028)	
Multi-plant							-0.002	-0.010	
							(0.029)	(0.028)	
US*NetJobCr									-0.015
									(0.008)*
Observations	3804	3763	3804	3800	3759	3804	3795	3747	3676
Pseudo R^2	0.280	0.183	0.284	0.290	0.281	0.281	0.280	0.295	0.281

Analysis with manufacturing firms. Robust standard errors clustered by country, industry, and year are in parentheses. In the regressions, I control for 2-digit industry, survey year, and country fixed effects. (I) main result for manufacturing industries, (II) uses employment growth as a control instead of employment level, (III) controls for use of external finance for investment, (IV) controls for past innovative experience of the firm, (V) controls for ratio of non-production workers to all workers,(VI) controls for population of the city that firm is located,(VII) controls for being part of a multi-plant enterprise, (VIII) includes all controls. Coefficients for the probit regressions show the marginal effects at their mean values, (IV) performs analysis relative to US industries. *** p<0.01, ** p<0.05, * p<0.1.

Table 12 Estimation results with the panel data

	All Data				Only Manufacturing	
VARIABLES	I	II	III	IV	V	VI
Desired JobCr /Firm	-0.109	-0.027	-0.049	-0.108	-0.210	-0.123
	(0.056)*	(0.033)	(0.027)*	(0.066)*	(0.101)**	(0.068)*
Log(Labor)	0.072	0.023	0.014		0.165	0.055
	(0.011)***	(0.006)***	(0.005)***		(0.017)***	(0.012)***
Foreign	0.233	0.033	0.061	0.440	0.183	0.130
	(0.040)***	(0.033)	(0.032)*	(0.038)***	(0.059)***	(0.077)*
Age	0.000	-0.000	-0.000	0.004	-0.002	-0.001
	(0.001)	(0.001)	(0.000)	(0.001)***	(0.001)*	(0.001)
Future Growth				-0.027		
				(0.043)		
Observations	1501	962	1006	1496	922	446
Pseudo R^2	0.267	0.135	0.141	0.260	0.308	0.175

Analysis with the panel data. Robust standard errors clustered by country, sector, and year (for manufacturing at country, industry, year level) are in parentheses. In the regressions, I also control for sector, survey year, and country fixed effects. (I) uses firm level net job creation as dependent variable, (II) restricts the sample to firms that did not export three years ago, (III) same as (II) but uses conservative definition of exporting, (IV) controls for future growth performance. (V) and (VI) repeats the first two specifications for manufacturing firms only. In the last two specifications standard errors are clustered at country-industry-year level. Coefficients for the probit regressions show the marginal effects at their mean values. *** p<0.01, ** p<0.05, * p<0.1.

Appendix

Three components of rigidity of employment index for Doing Business Database which is available on www.doingbusiness.org is summarized below:

1- The difficulty of hiring index measures (i) whether fixed-term contracts are prohibited for permanent tasks; (ii) the maximum cumulative duration of fixed-term contracts; and (iii) the ratio of the minimum wage for a trainee or first-time employee to the average value added per worker

2- The rigidity of hours index has 5 components: (i) whether there are restrictions on night work; (ii) whether there are restrictions on weekly holiday work; (iii) whether the workweek can consist of 5.5 days or is more than 6 days; (iv) whether the workweek can extend to 50 hours or more (including overtime) for 2 months a year to respond to a seasonal increase in production; and (v) whether the average paid annual leave for a worker with 1 year of tenure, a worker with 5 years and a worker with 10 years is more than 26 working days or fewer than 15 working days

3- The difficulty of redundancy index has 8 components: (i) whether redundancy is disallowed as a basis for terminating workers; (ii) whether the employer needs to notify a third party (such as a government agency) to terminate 1 redundant worker; (iii) whether the employer needs to notify a third party to terminate a group of 9 redundant workers; (iv) whether the employer needs approval from a third party to terminate 1 redundant worker; (v) whether the employer needs approval from a third party to terminate a group of 9 redundant workers; (vi) whether the law requires the employer to reassign or retrain a worker before making the worker redundant; (vii) whether priority rules apply for redundancies; and (viii) whether priority rules apply for reemployment.