REGULATION AND MICROECONOMIC DYNAMICS:

A COMPARATIVE ASSESSMENT FOR LATIN AMERICA*

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Abstract

Recent empirical studies have examined the effects of regulatory barriers – particularly those affecting the product market -- on aggregate output and productivity performance across industrial countries. However, the specific mechanism through which regulation impacts on macroeconomic outcomes has received less attention. This paper focuses on that mechanism, and assesses the role of firm entry and exit as channel of transmission of the effects of regulation on productivity growth. Using sector and manufacturing-wide productivity and firm turnover data derived from firm-level information for OECD and Latin American countries, the paper explores the effects of various types of regulations – product-market regulation, labor-market regulation and fiscal regulation – following a two-step approach. The first step examines the impact of regulatory barriers on firm turnover. The second assesses the effects of firm turnover on productivity growth. On the whole, the results are moderately supportive of the view that regulation hampers productivity growth by deterring firm entry and exit, thereby interfering with the Schumpeterian process of creative destruction.

JEL classification: H11, K20, K30, E32, O40.

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1. Introduction

The effects of microeconomic regulation on aggregate economic performance have recently attracted renewed attention in the policy debate. Intricate regulation and its arbitrary enforcement are listed by the World Bank (2005) among the key obstacles to growth in developing countries, while excessive regulation has been likewise blamed by many observers for Europe's lagging performance vis-à-vis the U.S.

Some recent empirical studies have been concerned with the impact of regulation and deregulation on aggregate growth in a cross-country setting. Koedijk and Kremers (1996) find a negative association between measures of product market regulation and GDP growth among 11 European countries. In contrast, they find that labor regulations have no significant association with growth performance. Dutz and Hairy (1999) apply extreme-bounds analysis to estimate the contribution to growth of a variety of (mostly subjective) regulation and competition indicators in a sample of industrial and developing countries. They find significant effects of measures of anti-trust policy and the average age of large firms (taken as proxy for entry and exit barriers).

In contrast, Card and Freeman (2002) fail to find any significant association between subjective measures of economic regulation and growth performance in a panel regression covering OECD countries over 1970-99. More recently, Loayza, Oviedo and Servén (2004) explore the growth impact of synthetic indicators of product market, labor market and fiscal regulation, using a large cross-country sample. On the whole, their results show that product market and labor regulation unambiguously deter per capita income growth, while for fiscal regulation the findings are more mixed. Furthermore, they also find that the adverse growth impact of regulation is exacerbated under conditions of poor governance.

While these studies summarize the empirical relation between regulation and growth performance, they are not directly informative about the mechanisms at work. Conceptually, there are several channels through which regulation may affect aggregate performance (see, e.g., Griffith and Harrison 2004). First, regulation affects the allocation of resources across firms and sectors with different productivity levels, thus impacting on overall efficiency. Second, regulation also affects the level of productivity of existing firms, by changing their incentives to reduce slack and utilize factors more or less intensely. And third, regulation also has an impact

on firms' incentives to innovate and introduce new products and processes, and hence on the pace of expansion of the technological frontier.

The analytical literature has devoted particular attention to the allocative mechanism -- the Schumpeterian process of external restructuring whereby market selection reallocates resources from low-efficiency to high-efficiency firms, through contraction and exit of the former, and expansion and new entry by the latter. Regulatory barriers that disrupt this "creative destruction" process cause a deterioration in aggregate economic performance, by allowing low-productivity activities to survive too long, and discouraging the adoption of new high-productivity activities (Caballero and Hammour 1998).

In turn, the theoretical literature offers conflicting predictions regarding the effect of deregulation on the incentives to innovate. On the one hand, the reduction in rents resulting from increased market contestability may discourage the introduction of new products and processes. On the other hand, incumbent firms may face an increased incentive to innovate in order to escape the pressure of competition (Aghion et al 2003). Thus, the net effect of regulation on innovation is ambiguous on conceptual grounds, and can be determined only empirically.

In this paper we assess empirically the role of firm dynamics as the mechanism linking regulation and growth -- specifically, the growth rate of output per worker -- using both aggregate and sector-wise manufacturing data for a set of OECD and Latin American countries. The paper follows a two-stage approach. In the first stage, we assess the empirical link between regulation and firm turnover. We employ both overall manufacturing data as well as sector-level data on firm entry and exit rates, separately and combined. In the second stage, we relate growth in output per worker to firm turnover using overall manufacturing data. This is done using both OLS regressions as well as instrumental-variable regressions with regulatory indices as instruments for firm turnover, to isolate the variation in the latter due to regulation. Such procedure allows us to assess if firm dynamics provides the link between regulation and productivity performance, as predicted by the "creative destruction" view.

The paper is closely related to other recent attempts to shed light on the link between regulation and aggregate performance. Griffith and Harrison (2004) follow a similar two-step approach to study product-market regulatory reform, but rather than firm turnover they stress instead the role of markup variations. Their implicit assumption is that regulatory reforms impact on

performance only through their effect on the degree of competition among firms, as captured by markup levels. Their empirical tests, using data from OECD countries, yield mixed results: decreased regulation does lead to lower markups, but these in turn seem to be associated with lower, rather than higher, levels and growth rates of productivity and R&D effort. Moreover, in many cases they find that regulatory variables appear to have an independent effect on aggregate performance, above and beyond the effect occurring through the markup.

Other papers focus instead on the Schumpeterian mechanism of firm entry and exit – like we do here. Klapper, Laeven and Rajan (2004) assess the effects of regulation on firm entry using firm-level data for developed and transition European countries. On the whole, they find that regulation deters entry, and also hampers industry-level productivity growth. Cincera and Galgau (2005) are likewise concerned with firm entry and exit, and take a two-step approach similar to ours. They asses the impact of (subjective) product-market regulation measures on entry and exit rates by sector in 9 OECD countries, and examine also the effect of entry and exit on sector-wise productivity. On the whole, their results indicate that product market deregulation increases entry and exit rates, while these in turn have a (weakly) positive impact on the growth of output and labor productivity.

Our paper expands this literature in several dimensions. First, unlike most previous studies, which have focused on selected OECD economies, we consider both industrial and Latin American countries. Second, rather than confining the analysis to product-market regulation alone, which is the concern of the recent literature, we consider three different kinds of regulations – those affecting the product market, those affecting the labor market, and fiscal regulations. Third, we distinguish among the various components of observed productivity growth – i.e., those due to entry, exit, reallocation among incumbent firms, and productivity growth within incumbent firms – to assess if they are affected in different ways by regulation.

The rest of the paper is organized as follows. Section 2 provides a description of firm dynamics and productivity growth in Latin America and a sample of industrial countries. Section 3 discusses differences in regulation across countries, with particular attention to Latin America. In section 4, we lay out the main questions we explore and our estimation strategy, and present results. Section 5 concludes.

2. Microeconomic dynamics in Latin America

The starting point of our analysis is the harmonized data set constructed by Bartelsman, Haltiwanger and Scarpetta (2004) that covers 24 industrialized, developing, and transition countries. Because the focus of this paper is on Latin America, we select only the six Latin American countries of the data set, namely Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. In addition, in order to evaluate the performance of these countries we compare them to nine industrial economies: Denmark, Finland, France, (West) Germany, Italy, The Netherlands, Portugal, the UK, and the US.[1] The data set provides basic firm demographic indicators such as the number (and total employment) of entrants, continuers, and exiting firms by (ISIC 3-digit) industry, size class, and year. It also reports the 5-year labor productivity average growth rate by industry and year, together with the contribution to labor productivity growth of entering, continuing, and exiting firms computed following Foster, Haltiwanger and Krizan (2000), and Griliches and Regev (1995).[2] The sample of countries for which labor productivity data are available is more limited, and we select the following Latin American and industrial countries: Argentina, Brazil, Chile, Colombia, Venezuela, Finland, France, The Netherlands, the UK, and the US.[3]

Firm entry, exit, and turnover

Numerous studies have documented evidence of heterogeneity across firms as well as intensive reallocation of resources across firms in industrial countries (see for instance, Dunne et al., 1989, Bartelsman and Doms, 2000). All find that in the US and Europe the reallocation pace is high, for instance, Bartelsman et al. (2003) report that, on average, close to 20 percent of firms enter and exit the market every year in ten OECD countries. In addition, productivity varies greatly across firms, even within narrowly-defined industries (see Foster et al., 2001). More recently, a few studies have looked at firm dynamics in developing countries and have found, perhaps

[1] We refer the reader to Bartelsman et al. (2004) for a detailed description of the data collection protocol, as well as important discussions of the main indicators constructed.

[2] Labor productivity is calculated as a weighted average of firm-level productivity, using value added to calculate output.

[3] We do not include Canada because numbers are only available at the aggregate level (manufacturing). We exclude Brazil and Venezuela from our regressions because we know there could be problems with the quality of the data for these two countries. However, it turns out including them does not alter the significance of our results.

surprisingly, that reallocation and productivity dynamics are in fact similar to that in industrial countries (see, for instance, Roberts and Tybout, 1996).

Figure 1 depicts entry, exit and turnover rates for manufacturing in Latin America and industrial countries over the 1991-2001 period. The entry rate is calculated as the number of entering firms divided by the number of incumbents and entrants in the current year; the exit rate is the number of exiting firms divided by the incumbents in the previous year; and the turnover rate is the sum of entrants and exiting firms divided by the total number of firms in the current year.

From the first panel in the figure, it is evident that the entry, exit, and turnover rates are very similar in Latin America and the sample of industrial countries.[4] Indeed, Mexico has one of the highest turnover rates of the entire sample, along with the UK and the US. All other countries have turnover rates between 10 and 20 percent. The case is similar for entry and exit rates.

Several questions arise upon looking at this figure: first, are these "natural" entry, exit, and turnover rates? Almost surely, the answer is "no." Indeed, our data covers in the best case the entire 1990s decade, but for Argentina, Brazil, Venezuela, and several industrial countries we have data only for the second half of the decade, and in some cases less than five years. Therefore, it is reasonable to believe that much of the movement of firms we observe is related to the cycle in each country.

The second question is then: does this movement in fact reflect responses to shocks? A simple way to measure aggregate shocks is to look at the volatility of terms of trade growth. We use the standard deviation of the growth rate of terms of trade as a proxy for the volatility of the economy, which in turn is an indication of the frequency of the shocks that hit the economy. We prefer this measure to the volatility of, say, per capita GDP growth because, assuming that firms are price takers, shocks to terms of trade represent exogenous shocks to industries and hence are less likely to be affected by firms' dynamics.[5] As it turns out, Latin American countries exhibit much greater volatility of terms-of-trade growth than industrial countries, and industrial countries with high volatility of terms-of-trade growth also exhibit larger rates of entry, exit, and

[4] Excluding Brazil and Venezuela.

[5] This addresses the debate about whether there is a feedback effect from reallocation to the business cycle. See Schuh and Triest (1998).

turnover of firms than other countries. In fact, simply dividing entry, exit, and turnover rates by this measure of volatility gives a completely different picture about firm dynamics: panel 2 in Figure 1 shows that, under this corrected measure, firm dynamics in Latin America are much lower than in most countries in the industrial sample. This picture gives us some preliminary evidence that, indeed, much of the movement of firms in and out of the market occurs as a response to macroeconomic shocks.

Third, we can ask ourselves whether the magnitude of the response in each country corresponds to an efficient scenario. To understand this, we need to look at the counterfactual of what would happen in the absence of barriers to adjustment, such as excessive entry, exit, or labor regulations. Again, by a simple examination of this picture it is reasonable to conjecture that adjustment in Latin America is far from efficient: indeed, given the magnitude of the shocks that hit these countries, adjustment should be much larger in order to obtain "corrected" measures that look similar to those in industrial countries.

Labor productivity growth

A natural question that arises from observing firm dynamics concerns the implications of having a more or less rapid turnover of firms on productivity gains at the firm and industry level. Indeed, a large number firms leaving and entering the market each year is not per se a desirable outcome; it only becomes so if, as a result of this process, the firms that stay in the market experience productivity gains, if not in the short run, at least in the medium to long term.[6] Figure 2 presents the productivity growth decomposition for Finland, France, the UK, the Netherlands, the US, Argentina, Colombia, Chile, and Venezuela. As in Griliches and Regev (1995), the decomposition is as follows

[6] According to theoretical explanations of the negative correlation between job reallocation and the business cycle, the job destruction that takes place during recessions is not entirely "creative destruction." In fact, in the presence of frictions, destruction can be highly inefficient (as in Caballero and Hammour, 1998). However, we expect that in the long run, a relatively frictionless economy will experience productivity gains coming from the entry and exit of firms, a fact that has been documented for several industrial countries by Foster et al. (2001), Barnes et al. (2001?), and others. In addition, an economy that undergoes a liberalization process by tearing down burdensome regulation should indeed experience productivity gains from inefficient firms losing ground to efficient ones.

$$\Delta P_t = \sum_{i \in C} \overline{\theta}_i \Delta p_{it} + \sum_{i \in C} \Delta \theta_{it} \left(\overline{p_i} - \overline{P} \right) + \sum_{i \in N} \theta_{it} \left(p_{it} - \overline{P} \right) - \sum_{i \in X} \theta_{it-k} \left(p_{it-k} - \overline{P} \right)$$

where P is productivity at the industry level, p_i is productivity at the firm level, and θ_i is the share of firm i in the industry (in terms of output). The first term in the decomposition represents the "within contribution" to productivity growth, that is, the amount of productivity growth coming from productivity increments within continuing firms; the second term is the "between" contribution, or the addition to productivity coming from reallocation of resources between firms; and the two last terms represent the portion of productivity growth coming from the entry and exit of firms in the industry. The upper bar over each variable represents the average value between the base and end years.

Since we are mostly interested in knowing whether regulation affects gains in productivity within firms or gains in productivity coming from the creative destruction process, we also look at the sum of all the contributions that come from reallocation, that is, we group the terms in the following way:

$$\Delta P_t = \sum_{i \in C} \overline{\theta}_i \Delta p_{it} + \left[\sum_{i \in C} \Delta \theta_{it} \left(\overline{p_i} - \overline{P} \right) + \sum_{i \in N} \theta_{it} \left(p_{it} - \overline{P} \right) - \sum_{i \in X} \theta_{it-k} \left(p_{it-k} - \overline{P} \right) \right] = within + reallocation$$

Panel 1 of the figure depicts the total growth of labor productivity and the contribution of incumbents that experience productivity gains (within), expand or contract (between), and the contribution of entrants minus exiting firms (net entry). As in the case of firm dynamics, we can see here that the productivity picture is quite similar for Latin America and the industrial sample, or at least, there is no clear pattern that differentiates one group from another. For instance, Argentina and Colombia have experienced higher productivity gains than the US, the UK, the Netherlands, and France. However, we should note again that the time coverage of the data is

quite limited, so that the numbers for each country are not comparable, if only for the different years they cover.[7] In addition, measured surges in labor productivity could in fact reflect temporary changes in utilization in response to shocks, rather than actual productivity gains (see, for instance, Basu, Fernald and Kimball, 1998), especially in the presence of adjustment costs. This should be the case particularly in countries where barriers to adjustment add to the natural adjustment costs.

Once again, we try to understand to what extent the observed changes in productivity correspond to adjustment to temporary shocks unrelated to technological progress. With this purpose in mind, we look at the average growth of terms of trade during the period in which productivity changes were measured (5 years). This measure is more appropriate than the standard deviation of terms of trade growth because we want to capture the direction of the shock, not just the magnitude. A large negative shock may cause a drop in labor productivity growth; in the absence of such shock, productivity growth may have been positive and high.

Panel 2 of the figure shows changes in labor productivity and the average growth of terms of trade during the same period. It is clear from the picture that changes in terms of trade in Latin America are far larger than in industrial countries. However, if we use this measure of shocks to "correct" productivity growth, we could see that a large portion of the changes in labor productivity growth cannot be explained as a pure response to these temporary shocks.

From this simple preliminary analyses, we outline two main empirical questions: first, are firm movements in and out of the market related to the observed productivity gains (or losses)? Second, how much do differences in regulation explain of the differences in dynamics and, ultimately, productivity gains? These are the main questions we address in section 4.

3. Business regulation and reform in Latin America

Cross-country differences in regulation

To begin our assessment of regulation in Latin America, we make a static comparison of the severity of business regulation in six Latin American countries – Argentina, Brazil, Chile,

[7] For instance, Brazil has data for only 2001, while Chile and Colombia have over ten years; moreover, the time periods my not overlap, as is the case for these three countries.

Colombia, Mexico, and Venezuela – and ten industrial countries – Canada, Denmark, Finland, France, Germany, Italy, The Netherlands, Portugal, the UK, and the US.[8] To keep in line with the regression exercises described below, we focus on three main regulation aspects: labor market regulation, product market regulation, and fiscal burden. We use the indices presented in Loayza, Oviedo and Servén (2004), which combine *de jure* and *de facto* measures of regulation, thus accounting for the practical restrictions and complications brought about by certain rules.[9] Each index measures the intensity of the regulatory system on a scale from 0 to 1 (1 representing the lightest regulation).[10] Because all measures used in the construction of these indices refer to the late 1990s, this initial comparison as useful starting point: it allows us to see where Latin America stands today vis-à-vis industrial countries in terms of regulation. In the next sections, we discuss the evolution of business regulation in Latin America by looking at specific reforms that took place during the 1990s.

Panels A-D in Figure 4 present each index by country and region. The index of labor regulation combines the percentage of workers that belong to a union, the minimum mandatory working conditions, and the degree of hiring and firing flexibility granted by the law. Both samples of countries reach modest average scores (0.6 in the industrial sample and 0.49 in Latin America), but here again, Argentina (0.46), Chile (0.61), Colombia (0.54), and El Salvador (0.53) have less stringent labor regulation than Finland (0.48), Italy (0.52) and Portugal (0.37). This may seem surprising given the current debate about the need for more flexible labor markets, however, notice that some Latin American countries carried out extensive labor market reforms in the

[8] Although we mention El Salvador in this section of the paper for comparative purposes, this country is not included in the firm dynamics and productivity database.

[9] We use six data sources for the construction of our indices: Doing Business (The World Bank Group), Index of Economic Freedom (The Heritage Foundation), Economic Freedom of the World (The Fraser Institute), Labor Market Indicators Database (M. Rama and R. Artecona, 2000), The Corporate Tax Rates Survey (KPMG), and International Country Risk Guide (The PRS Group). These sources cover the largest number of countries and areas under regulation, and their measures use a clear methodology and are straightforward. Except for the Labor Market Indicators Database, all sources are public.

[10] Each component was rescaled according to the following formula:

$\frac{X_i - X_{\min}}{X_{\max} - X_{\min}}$, if higher values of X indicate heavier regulation and $\frac{X_{\max} - X_i}{X_{\max} - X_{\min}}$, if lower values of X indicate heavier regulation.

1990s and in some European countries labor markets are still excessively regulated.[11] The country with the least stringent labor regulation is the United States, with a score of 0.8.

The index of fiscal burden measures direct taxation --that is, the maximum tax rate applied to individuals and businesses-- and fiscal spending. Industrial countries not only score worse on average than Latin American countries (0.34 versus 0.61); even the country with the best score in the industrial sample, the United States (0.51), stands all Latin American countries but Brazil (0.48). The country with the highest score is El Salvador (0.83) and the country with the lowest score is France (0.2).

The product market regulation index is the simple average of the entry, financial, contract, trade, and bankruptcy regulation indices. We construct this composite index to summarize regulation in areas in which the rankings for both regions are highly correlated, suggesting that governments regulate these areas with similar magnitudes. Once again, the average score from the industrial sample is significantly higher (0.77) than the average score of the Latin American sample (0.58), and the highest score is held by the UK (0.85) while the lowest score is held by Venezuela (0.44). After taking into account the relatively different labor and fiscal regulation indices the overall regulation index is on average still higher in the industrial sample (0.68 against 0.57).

4. Regulation and microeconomic dynamics in Latin America

Having described how the regulatory environment varies across countries, our objective for this section is examining whether regulations have an impact on firm dynamics and ultimately on productivity growth performance. Regulations are imposed for a variety of reasons. Officially, they are enacted to serve specific social purposes, from consumer health safety to the protection of domestic employment. In reality, however, the imposition of regulation follows a more complex political economy process, where legitimate social goals are mixed with the objectives of particular interest groups (see Djankov et al., 2002). Whatever their justifications and objectives, regulations are likely to have an impact beyond their area of control.

[11] See, for instance, Heckman and Pagés (2000), who construct a job security index for Latin America and reach similar qualitative conclusions.

Our main question is: is firm dynamics the channel through which regulation affects labor productivity growth? In order to answer this question, we need to, first link regulation to firm dynamics; second, link firm dynamics to labor productivity growth rates, and finally, establish whether the effect of firm dynamics on labor productivity growth is explained by the component of firm dynamics due to business regulation flexibility (for which we use an instrumental variable procedure). In exploring the link between regulation and firm dynamics, we also look at the role of firm dynamics in the adjustment from macroeconomic shocks, and how it is affected in the presence of more or less flexible regulation.

Sample and specification

Our empirical methodology is based on panel regression analysis. We conduct separate regressions for each dependent variable of interest, namely, firm entry rate, exit rate, turnover rate, growth rate of labor productivity, and the "within" and "reallocative" components of labor productivity growth. In each case, we use as explanatory variables a measure of regulation and a set of basic control variables. All variables included in the empirical exercises are briefly presented below, except the regulation indices that were introduced in the previous section.

Our sample consists of 12 countries in the firm dynamics analysis, and 7 countries in the productivity analysis. In the first sample, we have 4 Latin American and 8 industrial countries.[12] All observations for each variable correspond to the period 1990-2001 for firm demographics and 1988-2001 for productivity, although our panel is unbalanced, so that for some countries the time variation is more limited. We voluntarily ignore observations before the late 1980s for two reasons: first, most internationally comparable regulation measures are available only for the 1990s and therefore any comparison for a much earlier period based on regulation data could be misleading. Second, our initial intention was to assess the impact of the reforms carried out in the early 1990s on the behavior of firms later in the same period, an exercise that turned out to be difficult due to the quality of time-varying regulation data. Indeed, we carried out several exercises using the time-varying regulation indices, but, having found only inconclusive results,

[12] Argentina, Chile, Colombia, Germany, Denmark, Finland, France, UK, Italy, Mexico, Netherlands, and Portugal. We also include the US, but we use it as a reference for dynamics in the other countries. In the productivity regressions we include Argentina, Chile, Colombia, Finland, France, UK, and the Netherlands, again using the US as a reference country.

we only present regressions using the static indices from Loayza, Oviedo, and Servén (2004) for the remaining of the paper.

Within each country-year category, we observe employment-weighted entry, exit, and turnover rates for 23 stan-0 (ISIC Rev. 3) industries, and five size categories (<20, [20-49], [50-99], [100-499], 500+). We also observe labor productivity growth and its decomposition for 22 stan-0 industries, that is, we observe the contribution to productivity growth coming from "within," "between," and "net entry" in each country.

We conduct two exercises that relate firm dynamics and regulation. In the first exercise, we measure whether the response of firm dynamics to macroeconomic shocks is hampered by the presence of burdensome regulation, taking into account the fact that the "natural" response to shocks may vary across sectors and sizes. Hence, we estimate the following regression equation for (employment-weighted) entry, exit, and turnover rates (calling the dependent variable *y*):

$$y_{c,i,s,t} = \alpha_0 + \alpha_c + \alpha_i + \alpha_s + \alpha_t + \beta\left(R_c \times \overline{turnover_{US,i,s}}\right) \times sdtotgr_c + \varepsilon_{c,i,s,t} \qquad (1)$$

where c = country, i = industry, s = size, and t = year. The regulation index in country c, R_c, is multiplied by the average (employment-weighted) turnover rate in the US and the standard deviation of terms-of-trade growth over the period 1985-2000. This regression is motivated by the fact that firm dynamics in Latin America do not (at least in plain view) differ much from dynamics in more developed countries. Then, the appropriate question is not whether regulation impedes the movement from firms in and out of the market. Instead, the correct question is whether in the face of large macroeconomic shocks, such as the shocks to terms of trade that hit Latin American countries during the 1990s, firms have the possibility to adjust fully. If they don't, the degree of "turbulence" observed could still be intense, although lower than it would be in a more flexible regulatory environment. For instance, if a negative shock hits the economy and a large number of firms is pushed to the destruction cutoff level (so that they would normally exit the market), some firms may in fact remain in the market because dismissal and other bankruptcy costs are excessively high, thus weakening the adjustment that would otherwise take place.

Another way to look at the response of firm dynamics to shocks is to directly assume that entry and exit of firms are proportional to shocks. We take this view and conduct a second exercise in which we estimate the following regression equation:

$$z_{c,i,s,t} = \gamma_0 + \gamma_c + \gamma_i + \gamma_s + \gamma_t + \phi\left(R_c \times \overline{turnover_{US,i,s}}\right) + v_{c,i,s,t} \qquad (2)$$

where z is the ratio of the dependent variable to the standard deviation of terms-of-trade growth over the period 1985-2000. Both specifications include country, industry, size, and year fixed effects. We interpret the dependent variable as the level of activity that takes place beyond adjustments to exogenous shocks, because of technological progress, idiosyncratic shocks, and so on, and that constitutes the natural movement of firms in and out of an industry. Here again, in the presence of stringent regulation we should observe activity that is below this natural level. Similar to equation (1), here we account for the fact that firm dynamics may "naturally" vary across industries and sizes.

Regressions (1) and (2) are similar in spirit to Rajan and Zingales (1998), in that the coefficient β is interpreted as the effect of the regulation level on the dependent variable relative to a reference, or "natural" rate. Rajan and Zingales (1998) and following studies such as Klapper et al. (2004), and Micco and Pagés (2004), use the dependent variable in the same category (typically industry, year) in the US as the "natural" rate in the absence of burdensome or distortive regulation. Such a specification allows for a difference-in-difference analysis whereby one can study the effect of a change in regulation on the "natural difference" of the dependent variable between two sectors, with the added advantage of reducing the distortion caused by measurement errors. We choose the average (employment-weighted) turnover rate in the corresponding category in the US as our "natural" reference level in all regressions. We have two reasons for doing so: first, because US data are available for a smaller number of years (1990-1997 for dynamics; 1992 and 1997 for productivity) we use the average values, thereby abstracting from cyclical changes of the "natural" rate in the US. Second, we prefer to use the same measure across regressions, and we choose this particular measure over all others, because we start from the prior that creative destruction (measured by turnover) leads to increases in productivity, so that we should observe a stronger impact of regulation on productivity in sectors that are naturally experiencing higher turnover. Also, the high correlation between entry, exit, and turnover also justify the use of turnover in the regressions of entry and exit.

Our measure of macroeconomic shocks is given by the standard deviation of terms of trade growth, obtained from the World Bank Development Indicators (2003). We believe this measure to be preferable to, say, volatility of GDP growth, because it is the least subject to endogeneity concerns.

As described in the previous section, our explanatory variables of interest are indices that quantify a country's regulatory burden. We consider, in turn, product market, labor, and fiscal regulation indices. In all regressions, we use the cross-country regulation indices constructed by Loayza, Oviedo and Servén (2004) from several sources.

The second set of exercises involves studying the channel by which regulation affects productivity growth. First, productivity growth can be directly affected by regulation, for instance, incentives for conducting R&D or adopting new technologies might be hurt in the presence of excessive regulation. In addition, if the movement of firms in and out of the market is really a "creative destruction" process, then productivity growth increases (at least to some extent) as more firms enter and leave the market.[13] This creates a second channel for regulation to affect productivity: the effect of regulation on firm dynamics will in the long run also have an effect on productivity growth.

To understand the direct and indirect effect of regulation on productivity growth, we estimate the following regression equations:

$$y_{c,t} = \alpha_0 + \gamma_1 \overline{\ln(GDP)}_c + \gamma_2 avtotgr_{c,t} + \gamma_3 outgap_{c,t} + \beta\left(R_c \times \overline{turnover_{US}}\right) + \varepsilon_{c,t} \qquad (3)$$

$$y_{c,t} = \alpha_0 + \gamma_1 \overline{\ln(GDP)}_c + \gamma_2 avtotgr_{c,t} + \gamma_3 outgap_{c,t} + \gamma_3 \left(\frac{turnover_{c,t-5}}{sdtotgr_{c,5}}\right) + w_{c,t} \qquad (4)$$

where *y* is the dependent variable (labor productivity growth, and each component of the growth decomposition equation), and *t* represents the end year of a 5-year period. As in regressions (1) and (2), the regulation index in country *c* is multiplied by the average rate of (employment-weighted) turnover in the US. In regressions (3) and (4), we only use observations aggregated at the manufacturing level. We include macroeconomic control variables, namely the average log

[13] Of course, over the cycle things could be different, especially if there exist frictions that give place to an inefficient selection process, as in Caballero and Hammour (1998), or Ouyang (2004)

GDP per capita over the period (different for each country) to control for development effects; the average (annual) growth rate of terms of trade over each 5-year period to control for exogenous external effects, and the output gap over each 5-year period to control for cyclical effects.

In regression (3) , we explore the direct relation between productivity growth and regulation; in regression (4) we look at the effect of regulation on productivity growth through the channel of firm dynamics. To this effect, we use the log of the (employment-weighted) turnover rate divided by the standard deviation of terms-of-trade growth in the 1985-2000 period. We estimate regression (4) using ordinary least squares and also by instrumental variable estimation, where our instruments are in fact the regulation indices. We discuss the choice of instruments as well as the results of these estimations in the next sub-section.

Results

Table 1 presents the results of the estimation of regression (1) for entry, exit, and turnover. The coefficients of product market, labor regulation, and fiscal burden are positive and significant in all regressions, meaning that in countries with more flexible regulation (an index closer to one), the response of firm dynamics to shocks is more pronounced in (industry-size) categories that naturally display sharper adjustment to shocks. Conversely, more stringent regulation hurts adjustment to shocks precisely in categories that respond naturally more. When all three regulation indices are included in the regression, labor regulation and fiscal burden still have positive and significant coefficients (except for the labor regulation coefficient in the turnover regression). However, the coefficients of product market regulation all have the opposite sign, and are statistically significant. This result is not surprising from the fact that the correlation between all three variables is extremely high (over 0.98), because they are interacted with the same variables (turnover in the US and volatility of term of trade growth). Therefore, we believe it is preferable to use only one regulation index at a time in the regression.

The results from our first exercise are confirmed in the second exercise (regression (2)), presented in Table 2. Here again, all coefficients of regulation indices are positive and significant, except for the product market regulation for entry and fiscal burden for turnover. In this case, the interpretation of the coefficients is slightly different, however. They measure the

effect of regulation on firm movements in and out of the market that are not a response to shocks.

We now turn to the analysis of the impact of regulation on productivity growth. The first set of regressions look at the direct effect of labor, product market regulation, and fiscal burden on productivity growth and its components. Results are reported in Table 3.

Consistently with our previous study, where we find evidence that business regulation negatively affects per capita GDP growth, our results at the micro level suggest that some types of business regulation indeed have a negative effect on the average growth rate of output per worker of firms in the manufacturing sector. In particular, a more flexible product market regulation clearly encourages labor productivity growth, while the effect of labor or tax regulation flexibility is less clear. Furthermore, the effect of product market regulation is significant for total productivity growth and for its net entry components. The effect on other components is less clear.

To analyze the passage from regulation and firm dynamics to productivity growth, we provide two pieces of evidence in Table 4. The first panel presents the result of a regression that uses industry-level data organized in rolling five-year periods spanning 1984-2001. The regression controls for country, industry, and time (period) effects. In order to identify the effect of regulation flexibility (which doesn't vary over time or industries), we assume that it is directly proportionally related to optimal, benchmark turnover rates (given by those corresponding to the U.S.) According, to this exercise, all types of business regulation flexibility affect firm dynamics positive and significantly when they are jointly included in the regression.

The second panel presents the results of a regression that uses country-level data from the manufacturing sector, organized in the same periods. We control for country and time effects by including as explanatory variables the output gap at the beginning of the period, the level of per capita GDP, and the average terms of trade shocks. In this way, we can identify the effect of regulation flexibility directly. We confirm the results from the previous exercise but only in the case of product market regulation flexibility. Labor regulation flexibility seems to be unrelated to firm dynamics, while tax regulation flexibility has a surprisingly negative effect on firm dynamics.

Table 5 provides results for the link between firm dynamics and productivity. In order to emphasize business regulation information as the main source of data variation, we work with

country level data (at the manufacturing level). Also, for consistency with the other manufacturing-level exercises, we work with the same sample of OECD and Latin American countries organized in the same periods. First, we run OLS regressions of productivity growth rates on firm dynamics. Then, we run IV regressions of productivity growth rates on firm dynamics, where we isolate the variation of firm dynamics due to business regulation flexibility. In both cases we control for country and time effects by including as explanatory variables the output gap at the beginning of the period, the level of per capita GDP, and the average terms of trade shocks.

The first panel reports results from the OLS regressions. When the full variation of firm dynamics (or turnover rates) is used to explain the variation of productivity growth, firm dynamics appears to promote productivity growth only in the case of productivity's net entry component. However, in the IV estimation reported in panel 2, when variation of firm dynamics (or turnover rates) is limited to the portion explained by business regulation flexibility (67%), firm dynamics appears to significantly promote growth in the cases of total labor productivity and its net entry component. For the within and between components, regulation flexibility also carries a positive coefficient but not statistically significant.

5. Concluding Remarks

The macroeconomic impact of microeconomic regulation has attracted renewed interest in the academic and policy debate. Recent empirical studies have examined the effects of regulatory barriers – particularly those in the product market -- on the growth rates of output and productivity at the aggregate level, mostly across industrial countries.

This paper has focused on the mechanism linking regulation and labor productivity growth. Much of the analytical literature points toward the dynamics of firm entry and exit – i.e., the Schumpeterian process of creative destruction – as the main channel through which microeconomic regulatory barriers are reflected in aggregate economic performance. The paper offers an empirical evaluation of this view following a two-stage approach, first relating regulation to firm dynamics, and then assessing the effects of firm dynamics on productivity growth. In contrast with most of the preceding literature, which has focused on the effects of product-market regulation in industrial countries, here we examine a variety of regulatory dimensions and consider both OECD and Latin American countries.

On the whole, our empirical results, using both sector-level and overall manufacturing data on productivity growth and firm dynamics, are moderately supportive of the role of firm entry and exit as transmission mechanism between regulation and aggregate performance. Regarding the link between regulation and firm entry and exit, we find that product-market, labor and fiscal regulations, taken in turn, all affect negatively firm turnover in the sector-level data. When taken jointly, however, results are somewhat mixed. In the overall manufacturing data, firm turnover is again negatively affected by product-market regulation, whether taken individually or jointly with other regulations; in contrast, fiscal regulations appear to encourage firm turnover.

As for the link between firm turnover and labor productivity growth, we find that it is positive for overall productivity growth as well as its separate components, except for that associated with resource reallocation across incumbent firms, which shows a negative effect. When we consider the overall variation in firm dynamics, we find that the only productivity component exhibiting a positive and significant effect of regulation is that associated with net entry of firms, while that associated with reallocation among incumbents is significantly negative. However, when we restrict our attention to the variation in firm dynamics accounted for by regulation – using an instrumental variable estimation procedure -- the positive effect now arises for both overall productivity growth as well as its net entry component, while the negative reallocation effect ceases to be significant.

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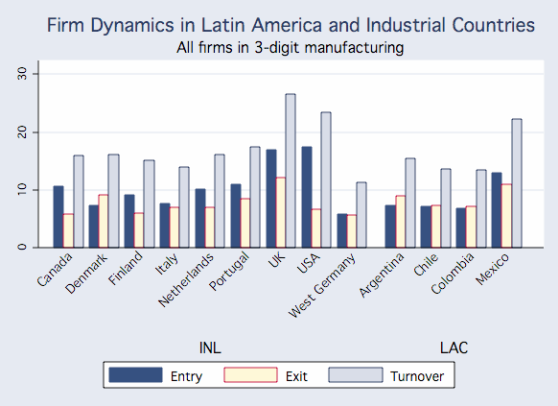
Figure 1: Firm dynamics



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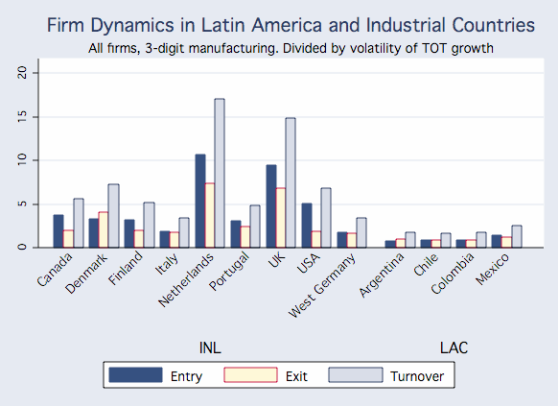

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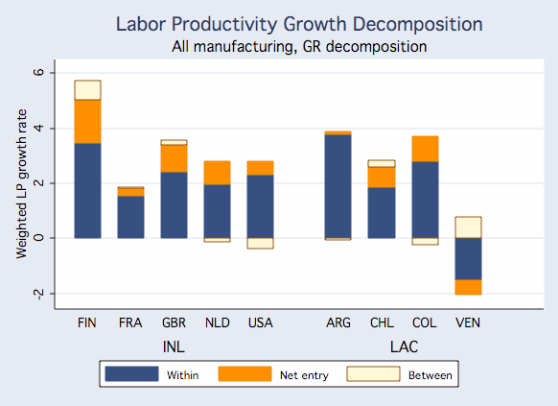
Figure 2: Labor productivity growth decomposition



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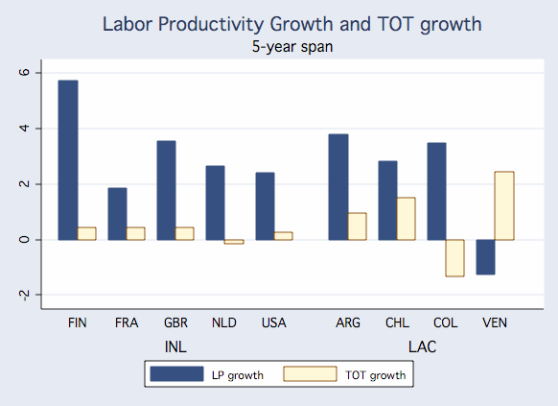

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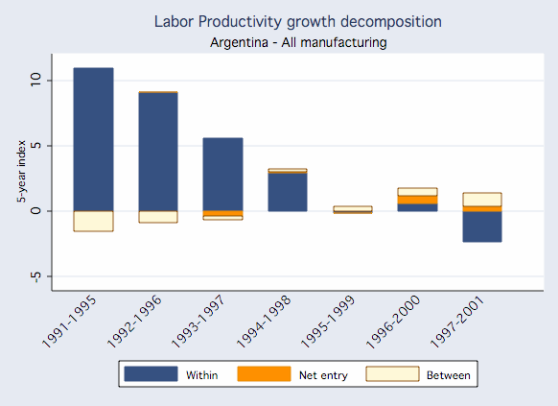

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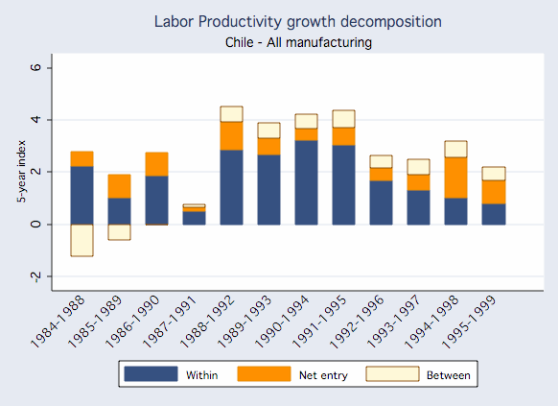

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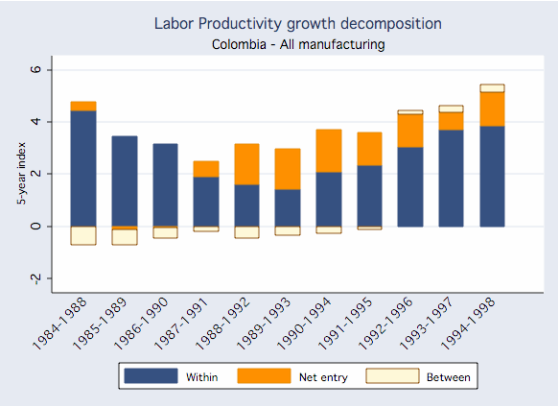

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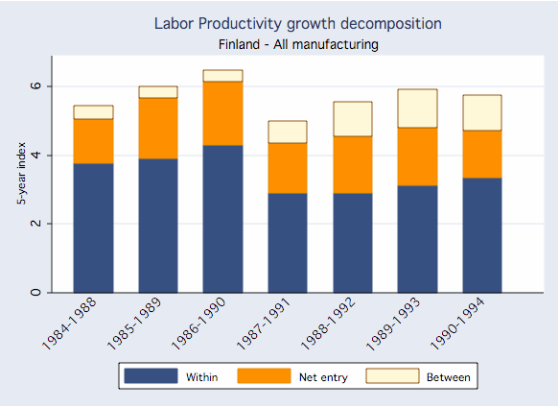

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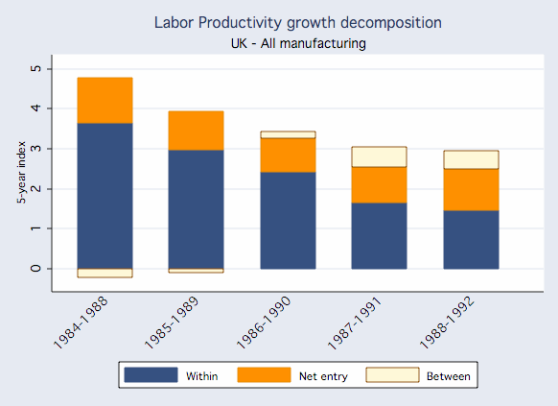

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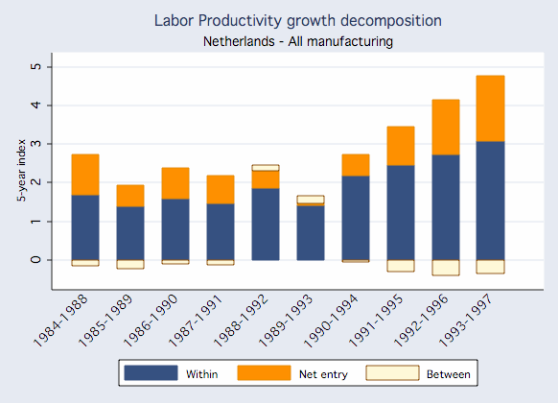

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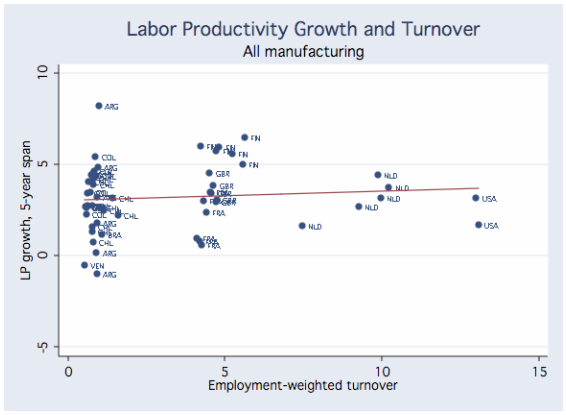
Note: the productivity decomposition showed is calculated following Griliches and Regev (1995). Labor productivity is a weighted average of firm productivity (weighted using value added), and the growth rate shown in the graphs corresponds to an average annual growth rate, based on the 5-year growth rate.

Figure 3: Labor productivity growth and firm dynamics



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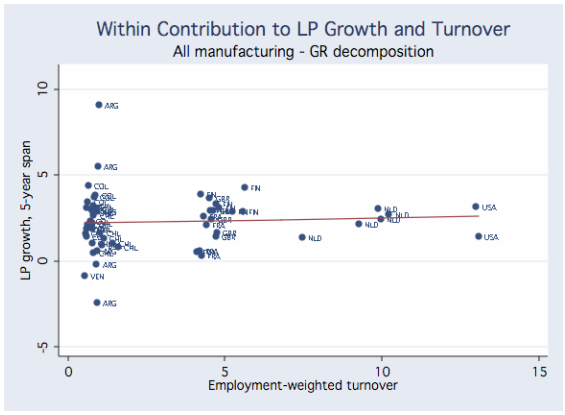

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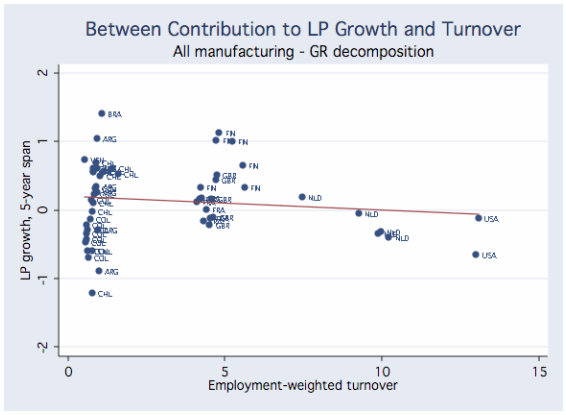

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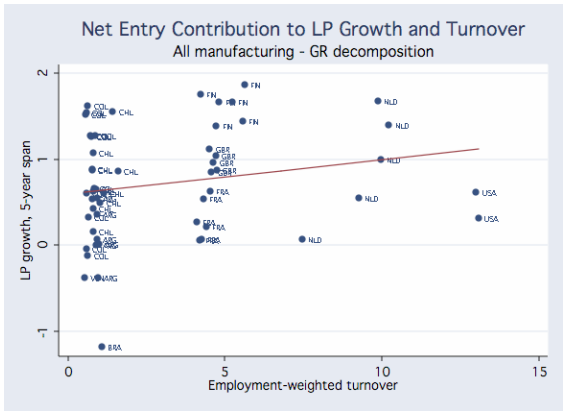

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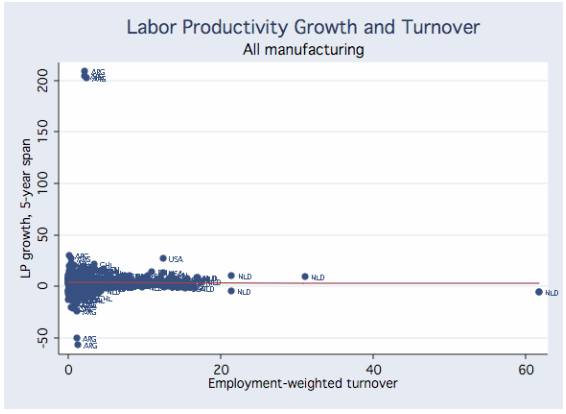

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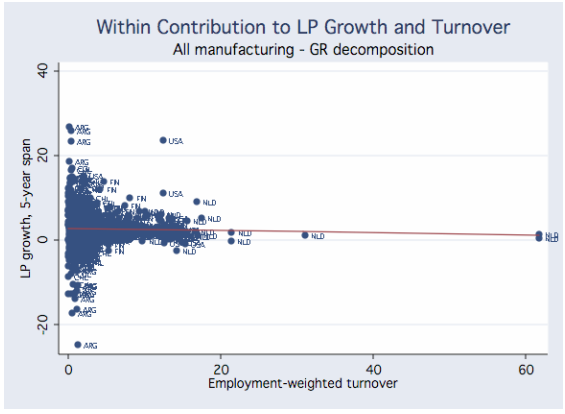

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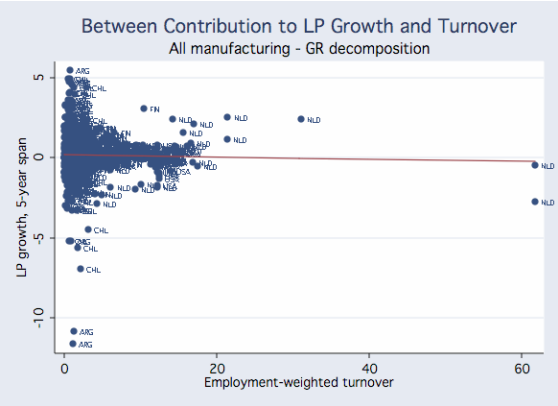

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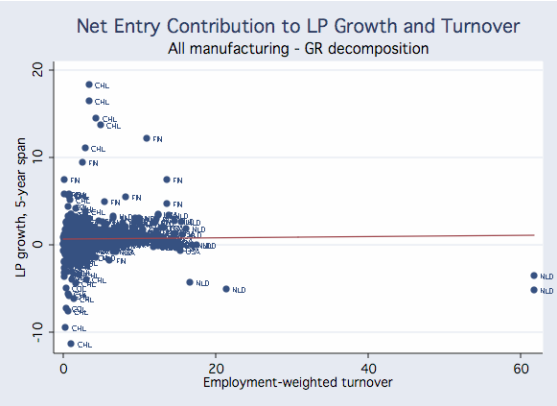

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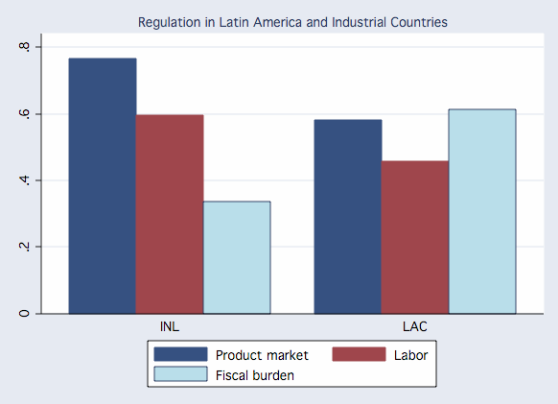
Note: the employment-weighted turnover rate was corrected by dividing it by the standard deviation of terms of trade growth over the 1985-2000 period. The time coverage for each country is as follows: Argentina, 1996-2001; Brazil, 2001; Chile, 1994-1999; Colombia, 1994-1998; Finland, 1994; France, 1994,1995; Netherlands, 1994-1997; USA, 1997; Venezuela, 1999. Panels E-H show data at the stan-0 level.

Figure 4: Regulation indices



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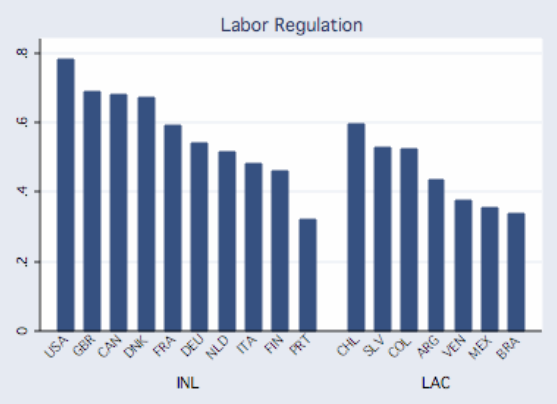

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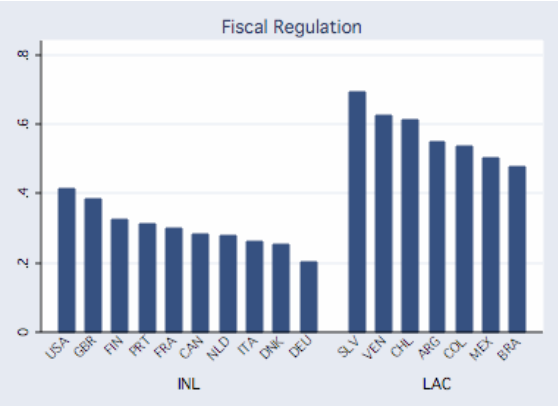

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Note: panels A-D show indices from Loayza, Oviedo and Servén (2004), with the scale of the original indices inverted so that all indices take values from 0 to 1, where 1 represents the lowest regulation (i.e., most flexible).

Regression Tables

1. Dynamics: interaction of regulation with turnover in the US and volatility of terms of trade growth*

Dependent variable:	Entry	Exit	Turnover
Product market regulatior	0.116***	0.104***	0.150***
	[0.015]	[0.013]	[0.018]
Constant	-0.119	-1.708**	3.091**
	[0.980]	[0.848]	[1.201]
Observations	5587	5187	5108
R-squared	0.18	0.21	0.32

Dependent variable:	Entry	Exit	Turnover
Labor regulation	0.138***	0.121***	0.174***
	[0.019]	[0.016]	[0.023]
Constant	0.468	-1.048	4.080***
	[0.942]	[0.824]	[1.169]
Observations	5587	5187	5108
R-squared	0.18	0.21	0.32

Dependent variable:	Entry	Exit	Turnover
Fiscal burden	0.115***	0.100***	0.148***
	[0.013]	[0.011]	[0.015]
Constant	0.353	-1.156	3.698***
	[0.861]	[0.743]	[1.057]
Observations	5587	5187	5108
R-squared	0.18	0.22	0.32

* All entry, exit, and turnover rates used in these exercises are employment-weighted (percent) rates. Robust standard errors are presented below each coefficient. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Entry	Exit	Turnover
Product Market Regulatic	-0.305***	-0.178***	-0.272***
	[0.074]	[0.066]	[0.093]
Labor regulation	0.201**	0.122*	0.147
	[0.081]	[0.069]	[0.100]
Fiscal burden	0.219***	0.157***	0.265***
	[0.026]	[0.023]	[0.035]
Constant	3.511***	0.639	6.563***
	[0.910]	[0.793]	[1.142]
Observations	5587	5187	5108
R-squared	0.19	0.22	0.32
Country FE	y	y	y
Industry FE	y	y	y
Size FE	y	y	y
Year FE	y	y	y

Note: all regulation indices come from Loayza, Oviedo and Servˇn (2004). They are interacted with employment-weighted turnover in the US (in the corresponding size and industry), and with the standard deviation of TOT growth over the period 1985-2000

Countries: Argentina, Chile, Colombia, Germany, Denmark, Finalnd, France, UK, Italy, Mexico, Netherlands, Portugal. Years: 1990-2001.

Industries: Food and beverages; Textiles; Wood and wood products; Paper and paper products; Fuel; Pharmaceuticals; Chemicals except pharmaceuticals; Rubber and plastics; Other non-metallic minerals; Basic metals; Fabricated metals; Machinery; Machinery n.e.c.; Office and computing equipment; Electric machinery n.e.c.; Radio, TV, and communications equipment; Medical and optical equipment; Motor vehicles; Ships and boats; Rail; Aircraft; Others.

2. Dynamics: interaction of regulation with turnover in the US. Dependent variable is divided by volatility of terms of trade growth

Dependent variable:	Entry	Exit	Turnover
Product market regulation	0.038	0.060***	0.154***
	[0.026]	[0.021]	[0.027]
Constant	0.963***	0.103	0.729***
	[0.274]	[0.217]	[0.268]
Observations	5587	5187	5108
R-squared	0.4	0.53	0.68

Dependent variable:	Entry	Exit	Turnover
Labor regulation	0.176***	0.126***	0.250***
	[0.032]	[0.026]	[0.034]
Constant	0.044	-0.235	0.373
	[0.254]	[0.208]	[0.264]
Observations	5587	5187	5108

Dependent variable:	Entry	Exit	Turnover
Fiscal burden	0.104***	0.067***	0.038
	[0.026]	[0.021]	[0.026]
Constant	0.475*	0.133	1.882***
	[0.253]	[0.209]	[0.266]
Observations	5587	5187	5108
R-squared	0.4	0.53	0.67

Dependent variable:	Entry	Exit	Turnover
Product market regulation	-0.489***	-0.175***	-0.202**
	[0.079]	[0.056]	[0.082]
Labor regulation	0.698***	0.320***	0.547***
	[0.096]	[0.068]	[0.100]
Fiscal burden	0.018	-0.001	-0.131***
	[0.029]	[0.024]	[0.031]
Constant	0.784***	0.039	1.218***
	[0.284]	[0.230]	[0.272]
Observations	5587	5187	5108
R-squared	0.42	0.54	0.68
Country FE	y	y	y
Industry FE	y	y	y
Size FE	y	y	y
Year FE	y	y	y

Note: the dependent variable is divided by the standard deviation of TOT growth over the period 1985-2000. All regulation indices come from Loayza, Oviedo and Servˇn (2004). They are also interacted with employment-weighted turnover in the US (in the corresponding size and industry).

Countries: Argentina, Chile, Colombia, Germany, Denmark, Finalnd, France, UK, Italy, Mexico, Netherlands, Portugal. Years: 1990-2001.

Industries: Food and beverages; Textiles; Wood and wood products; Paper and paper products; Fuel; Pharmaceuticals; Chemicals except pharmaceuticals; Rubber and plastics; Other non-metallic minerals; Basic metals; Fabricated metals; Machinery; Machinery n.e.c.; Office and computing equipment; Electric machinery n.e.c.; Radio, TV, and communications equipment; Medical and optical equipment; Motor vehicles; Ships and boats; Rail; Aircraft; Others.

3. Labor productivity growth and regulation

Dependent variable:	Change in LP	Within contr.	Between contr.	Net entry contr.
Average (log) GDP over period	-0.801	-0.389	0.043	-0.455***
	[0.495]	[0.518]	[0.135]	[0.137]
Output gap	8.836	3.826	2.747	2.263
	[16.549]	[16.219]	[3.775]	[3.989]
Average growth of TOT over 5-year period	-0.006	0.051	-0.047	-0.009
	[0.173]	[0.174]	[0.053]	[0.031]
Product market regulation	10.162**	3.713	1.2	5.249***
	[4.613]	[5.017]	[0.940]	[0.921]
Constant	3.477	3.341	-1.139	1.276
	[2.965]	[2.587]	[1.099]	[1.200]
Observations	53	53	53	53
R-squared	0.12	0.02	0.07	0.28

Dependent variable:	Change in LP	Within contr.	Between contr.	Net entry contr.
Average (log) GDP over period	0.052	-0.202	0.396*	-0.142
	[0.548]	[0.511]	[0.217]	[0.189]
Output gap	5.167	2.823	1.634	0.71
	[17.134]	[15.614]	[3.816]	[5.102]
Average growth of TOT over 5-year period	0.015	0.072	-0.073	0.016
	[0.165]	[0.159]	[0.053]	[0.035]
Fiscal burden	-0.704	-0.877	1.164*	-0.991
	[2.572]	[2.467]	[0.647]	[0.756]
Constant	3.118	4.665	-4.110*	2.564
	[5.976]	[5.667]	[2.255]	[2.033]
Observations	53	53	53	53
R-squared	0.01	0.01	0.11	0.04

Dependent variable:	Change in LP	Within contr.	Between contr.	Net entry contr.
Average (log) GDP over period	0.305	0.052	0.183	0.069
	[0.360]	[0.276]	[0.121]	[0.150]
Output gap	2.34	0.628	1.767	-0.056
	[15.814]	[15.261]	[3.956]	[5.250]
Average growth of TOT over 5-year period	0.032	0.075	-0.04	-0.003
	[0.155]	[0.172]	[0.054]	[0.037]
Labor regulation	-4.513	-3.171	-0.925	-0.417
	[3.157]	[3.412]	[0.869]	[0.925]
Constant	3.051	3.72	-1.052	0.382
	[3.202]	[3.211]	[1.103]	[1.277]
Observations	53	53	53	53
R-squared	0.06	0.03	0.08	0.01

Dependent variable:	Change in LP	Within contr.	Between contr.	Net entry contr.
Average (log) GDP over period	-1.601	-0.88	0.283	-1.004***
	[0.995]	[1.181]	[0.243]	[0.208]
Output gap	7.356	3.138	1.262	2.956
	[14.033]	[16.294]	[3.724]	[2.585]
Average growth of TOT over 5-year period	0.093	0.109	-0.063	0.046*
	[0.158]	[0.160]	[0.053]	[0.026]
Product market regulation	17.750***	8.032*	1.894*	7.824***
	[4.109]	[4.699]	[1.120]	[0.724]
Fiscal burden	-1.456	-0.991	1.286*	-1.751***
	[3.050]	[3.565]	[0.666]	[0.520]
Labor regulation	-9.786***	-5.449	-1.959**	-2.378***
	[2.937]	[3.390]	[0.943]	[0.586]
Constant	11.842*	8.44	-3.334	6.736***
	[7.041]	[8.248]	[2.037]	[1.906]
Observations	53	53	53	53
R-squared	0.32	0.09	0.19	0.5

Sizes: all sizes
Industries: all manufacturing

Note: all regulation indices come from Loayza, Oviedo and Servˇn (2004).
Countries: Argentina, Chile, Colombia, Denmark, Finalnd, France, UK, Netherlands. Years: 1988-2001.

4. Turnover and regulation: employment-weighted turnover rate (aggregated over sizes and/ or industries)

Dependent variable: log of tunover rate				
Product market regulation	1.351***			0.807***
	[0.167]			[0.249]
Labor regulation		1.205***		0.823***
		[0.190]		[0.240]
Fiscal burden			0.052	0.182
			[0.144]	[0.127]
Constant	-0.444***	-0.052	0.670***	-0.667***
	[0.169]	[0.156]	[0.162]	[0.256]
Observations	1885	1885	1885	1885
R-squared	0.7	0.7	0.69	0.71
Country FE	y	y	y	y
Industry FE	y	y	y	y
5-year period FE	y	y	y	y

Sizes: all sizes

Industries: Food and beverages; Textiles; Wood and wood products; Paper and paper products; Fuel; Pharmaceuticals; Chemicals except pharmaceuticals; Rubber and plastics; Other non-metallic minerals; Basic metals; Fabricated metals; Machinery; Machinery n.e.c.; Office and computing equipment; Electric machinery n.e.c.; Radio, TV, and communications equipment; Medical and optical equipment; Motor vehicles; Ships and boats; Rail; Aircraft; Others.

Dependent variable: log of turnover rate				
Average (log) GDP over period	0.666***	0.863***	0.588***	0.196***
	[0.100]	[0.114]	[0.075]	[0.061]
Output gap	-2.68	-3.592	-2.734	-1.596
	[2.078]	[2.432]	[1.958]	[2.786]
Average growth of TOT over 5-year period	-0.043***	-0.040**	-0.012	0.001
	[0.015]	[0.016]	[0.015]	[0.012]
Product market regulation	1.952***			3.397***
	[0.468]			[1.053]
Labor regulation		-0.246		-0.786
		[0.679]		[0.819]
Fiscal burden			-1.330**	-1.714***
			[0.526]	[0.343]
Constant	-6.767***	-7.067***	-4.030***	-2.177***
	[0.895]	[0.858]	[0.831]	[0.444]
Observations	53	53	53	53
R-squared	0.61	0.58	0.62	0.68

Sizes: all sizes

Industries: all manufacturing

Note: the dependent variable is divided by the standard deviation of TOT growth over the period 1985-2000. All regulation indices come from Loayza, Oviedo and Servˇn (2004). They are also interacted with employment-weighted turnover in the US (in the corresponding industry).

Countries: Argentina, Chile, Colombia, Denmark, Finalnd, France, UK, Netherlands. Years: 1990-2001.

Note: in the second panel, regulation indices are not interacted with turnover rates.

5. Labor productivity growth

OLS estimation

Dependent variable:	Change in LP	Within contr.	Between contr.	Net entry contr.
Average (log) GDP over period	0.034	-0.171	0.427**	-0.222
	[0.616]	[0.454]	[0.186]	[0.212]
Output gap	5.433	2.935	1.194	1.305
	[17.652]	[16.030]	[3.795]	[5.482]
Average growth of TOT over 5-year period	0.007	0.06	-0.06	0.007
	[0.160]	[0.162]	[0.054]	[0.034]
Log of (empl. weighted) turnover rate/sd(TOTgr)	0.188	0.17	-0.311***	0.328*
	[0.488]	[0.419]	[0.113]	[0.178]
Constant	2.809	3.824	-3.599**	2.583
	[5.250]	[3.859]	[1.632]	[1.857]
Observations	53	53	53	53
R-squared	0.01	0.01	0.12	0.07

Instrumental variable estimation

Dependent variable:	Change in LP	Within contr.	Between contr.	Net entry contr.
Average (log) GDP over period	-2.564**	-1.389	0.202	-1.376***
	[1.099]	[1.216]	[0.292]	[0.320]
Output gap	15.914	7.852	2.1	5.962
	[20.513]	[17.555]	[3.545]	[6.203]
Average growth of TOT over 5-year period	0.133	0.119	-0.049	0.063*
	[0.155]	[0.147]	[0.051]	[0.034]
Log of (empl. weighted) turnover rate/sd(TOTgr)	3.218**	1.592	-0.049	1.675***
	[1.532]	[1.490]	[0.305]	[0.462]
Constant	24.488***	13.996	-1.725	12.217***
	[9.026]	[10.008]	[2.479]	[2.709]
Observations	53	53	53	53
First Stage Centered R2	0.6735	0.6735	0.6735	0.6735

Instrumented variable: Log of employment- weighted turnover rate divided by sd(TOTgr) over the period 1985-2000.
Instruments: Product market regulation, labor regulation, fiscal burden.

Sizes: all sizes
Industries: all manufacturing

Note: all regulation indices come from Loayza, Oviedo and Servén (2004).
Countries: Argentina, Chile, Colombia, Denmark, Finalnd, France, UK, Netherlands. Years: 1988-2001.