Microeconomic Flexibility in Latin America

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Abstract

In this paper we characterize the degree of microeconomic inflexibility in several Latin American economies and find that Brazil, Chile and Colombia are more flexible than Mexico and Venezuela. The difference in flexibility among these economies is mainly explained by the behavior of large establishments, which adjust more promptly in the more flexible economies, especially when accumulated shocks are large. We also study the path of flexibility in Chile and show that it declined in the aftermath of the Asian crisis. This decline is significant and in itself large enough to account for a substantial fraction of the large decline in TFP-growth in Chile since 1997 (from 3.1 percent for the preceding decade to about 0.3 percent after that). Moreover, if it were to persist, it could permanently shave off almost half of a percent from Chile's structural rate of growth.

Keywords: Microeconomic rigidities, creative-destruction, job flows, restructuring and reallocation, reforms.

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1 Introduction

Although with varying degrees of success, Latin American economies have begun to leave behind some of the most primitive sources of macroeconomic fluctuations. Gradually, policy concern is shifting toward increasing microeconomic flexibility. This is a welcome trend since, by facilitating the ongoing process of creative-destruction, microeconomic flexibility is at the core of economic growth in modern market economies.

But how poorly are these economies doing along this flexibility dimension? Answering this question requires measuring the important but elusive concept of microeconomic flexibility. How do we do this?

One way is to look directly at regulation, perhaps the main institutional factor hindering or facilitating microeconomic flexibility. In particular, there are extensive studies of labor market regulation. Heckman and Pages (2000), for example, document that "even after a decade of substantial deregulation [in most cases], Latin America countries remain at the top of the Job Security list, with levels of regulation similar to or higher than those existing in the highly regulated South of Europe." This is important work. However, in practice labor market flexibility depends not only on labor market regulation, but also on a wide variety of factors, including the political environment, the efficiency and biases of labor courts, as well as cultural variables and accepted practices. Thus, while useful for eventual policy formulation, studies of rules and regulation are unlikely to provide us with the "big picture" of a country's flexibility any time soon — understanding the complex interactions of different regulations and environments is a valuable but very slow process.

At the other extreme, one can look at outcomes directly: How much factor reallocation do we see in different countries and episodes? This is also a useful exercise. However, it is equally incomplete since there is no reason to expect the same degree of aggregate flows in countries facing different idiosyncratic and aggregate shocks. Hence it is always difficult to know whether the observed reallocation is abnormally high or low, since the counterfactual is not part of the statistic.

A third approach, which remedies some of the main weaknesses of the previous ones, is to measure microeconomic flexibility by the speed at which establishments reduce the gap between their labor productivity and wages. Thus, we say an economy is inflexible at the microeconomic level if these gaps persist over time. Conversely, a very flexible economy, firm, or establishment, is one in which gaps disappear quickly due to prompt adjustment. This is the approach we follow in this paper, extending a methodology developed in Caballero, Cowan, Engel and Micco (2003) — the main advantage of this methodology over conventional partial adjustment estimates is its ability to use limited information efficiently, correcting standard biases often present when estimating such models. Our methodology also allows for nonlinearities and state dependency in the response of employment to productivity gaps, as in Caballero and Engel (1993).[1]

We use establishment level observations for all the Latin American economies for which we had access to fairly reliable data: Chile, Mexico and, to a lesser extent, Brazil, Colombia and Venezuela. All in all, about 140,000 observations.

In the first part of the paper we document the main features of adjustment for these economies. We find that:

- While more inflexible than the US, on average (over time) Brazil, Colombia and Chile exhibit a relatively high degree of microeconomic flexibility with over 70 percent of labor adjustment taking place within a year. Mexico ranks lower with about 60 percent of adjustment within a year, and Venezuela is the most inflexible of these economies, with slightly over 50 percent of adjustment within a year.

- With the only exception of Venezuela, in all our economies small firms (below the median number of employees) are substantially less flexible than large establishments (above the 75th percentile of employees). In Brazil the former establishments close about 67 percent of their gap within a year, while the latter close about 81 percent. In Colombia, 68 and 79, respectively; in Chile 69 and 78; Mexico 56 and 61; and Venezuela 53 percent for both.

- It also follows from the previous finding that it is primarily the behavior of large establishments that is behind the substantial differences in flexibility across some of the economies we study.

- In all these economies there is evidence of an "increasing hazard". That is, establishments are substantially more flexible with respect to large gaps than to small ones.

- The increasing hazard feature is particularly pronounced in large establishments in the relatively more flexible economies. In fact, most of the additional flexibility experienced by large establishments in these economies is due to their rapid adjustment when gaps get to be large (above 25 percent). For example, when gaps are below 25 percent in Chile, small establishments have an adjustment coefficient of 0.50 while large ones have one of 0.51. For large deviations, on the other hand, small establishments have a coefficient of 0.79, while

[1] Note that our definition of microeconomic flexibility refers to the speed at which establishments react to changing conditions; *not* to whether the labor market is flexible or not in responding to aggregate shocks. Thus, a labor market regulation that makes the real wage rigid will result in a larger unemployment response to aggregate shocks —that is, it will exhibit *macroeconomic* inflexibility— yet this will not be part of our measure of *microeconomic* inflexibility.

large establishments have one of 0.93. The patterns are similar in Brazil and Colombia, yet less pronounced in Mexico and Venezuela.

In the second part of the paper we specialize on Chile, which has the only long panel in our sample, and explore the evolution of its microeconomic flexibility over time. Our main findings are the following:

- Microeconomic flexibility in Chile experienced a significant decline toward the end of our sample (1997-99). From an average adjustment coefficient of 0.77 for the three years prior to the Asian/Russian crisis episode, the coefficient fell to 0.69 in the aftermath of the crisis.
- When the adjustment hazard is assumed to be constant, the decline in flexibility appears to be subsiding toward the end of the sample. However, this finding is lost and there is no evidence of recovery once the hazard is allowed to be increasing. The reason for the misleading conclusion with a constant hazard is that toward the end of the sample there is a sharp rise in the share of establishments with large negative gaps, to which establishments naturally react more under increasing hazards.
- While it is too early to tell whether the decline we uncover is purely cyclical, or whether there is something more structural going on, there are a few interesting observations to make:
  a) Much of the decline in flexibility is due to a decline in the flexibility of large establishments (as measured by their employment).
  b) While the speed of response to negative gaps remained fairly constant, it is the speed at which establishments adjust to shortages of labor that slowed down more dramatically. This "reluctance to hire" may reflect pessimism respect to future conditions not captured in the current gap. But this is unlikely to be the only factor since otherwise we also should have observed a rise in the speed of firing. In fact, we argue that the increasing hazard nature of the adjustment hazard partly explains the asymmetry seen in the decline of the speed of adjustment with respect to positive and negative gaps during a period of contraction.
  c) Capital-intensive sectors, which are normally quicker in correcting their employment gaps, experienced a much larger decline in their measure of flexibility than labor-intensive sectors did.
  d) However, the sharpest decline in flexibility came from establishments in sectors that normally experience less restructuring (either because of smaller shocks or more inflexibility).

e) We observe no relation between potential financial constraints and the decline in flexibility observed at the end of the 1990s.

In the last part of the paper we explore a different metric for the degree of inflexibility and its economic impact. By impairing worker movements from less to more productive units, microeconomic inflexibility reduces aggregate output and slows down economic growth. We develop a simple framework to quantify this effect. Our findings suggest that the aggregate consequences of micro-inflexibilities in Latin America are significant. In particular, the impact of the decline in microeconomic flexibility in Chile following the Asian crisis is in itself large enough to account for a substantial fraction of the large decline in TFP-growth in Chile since 1997 (from 3.1 percent for the preceding decade to about 0.3 percent after that). Moreover, if it were to persist, it could permanently shave off almost half of a percent from Chile's structural rate of growth.

In section 2 we present our methodology while Section 3 describes our data. Section 4 characterizes average microeconomic flexibility in the Latin American economies in our data. Section 5 explores the case of Chile in more detail, and describes the evolution of its index of flexibility. Section 6 presents a simple model to map microeconomic inflexibility into growth outcomes. Section 7 concludes and is followed by several appendices.

2 Methodology and Data

2.1 Overview

The starting point for our methodology is a simple adjustment hazard model, whereby the actual change in the number of (filled) jobs in an establishment i between time $t-1$ and t is a probabilistic (at least to the econometrician) function of the gap between desired and actual (before adjustment) employment:

$$\Delta e_{it} = \psi_{it}(e^*_{it} - e_{it-1}), \tag{1}$$

where e and e^* denote the logarithm of employment and desired employment, respectively. The random variable ψ, which is assumed i.i.d. both across agents and over time, takes values in the interval $[0,1]$ and has mean λ and variance $\alpha\lambda(1-\lambda)$, with $0 \leq \alpha \leq 1$. The case $\alpha = 0$ corresponds to the standard quadratic adjustment model, while the case $\alpha = 1$ is the Calvo (1983) model. The parameter λ captures microeconomic flexibility. As λ goes to one, all gaps are closed quickly and microeconomic flexibility is maximum. As λ decreases, microeconomic flexibility declines.

Equation (1) also hints at two important components of our methodology: We need to find a measure of the employment gap, $(e^*_{it} - e_{it-1})$, and an estimation strategy for the mean of the random variable ψ_{it}, λ. We describe both ingredients in detail in what follows. In a nutshell, we construct estimates of e^*_{it}, the only unobserved element of the gap, by solving the optimization problem of the firm, as a function of observables such as labor productivity and a suitable proxy for the average market wage. We estimate λ from (1), based upon the large cross-sectional size of our sample and the assumption that there are significant idiosyncratic components in the realizations of the gaps and the ψ_{it}'s.

An important concern when estimating λ is the likely presence of systematic productivity differences across establishments that tend to persist over time. Simply put, some establishments will tend to have higher quality workers than others, so that their gap will always be higher. If we do not correct for this, our estimates of the speed of adjustment will be downward biased. Therefore a central part of the methodology we derive is a correction for the fixed effect described above that avoids the standard biases associated with dynamic panel estimation while at the same time uses information efficiently.

2.2 Details

Output and demand for establishment i in year t are given by:

$$y_{it} = a_{it} + \alpha e_{it} + \beta h_{it}, \tag{2}$$

$$p_{it} = d_{it} - \frac{1}{\eta} y_{it}, \tag{3}$$

where y_t, e_{it}, a_{it}, h_{it}, d_{it} denote firm output, employment, productivity, hours worked and demand shocks, and η is the price elasticity of demand. We assume that a_{it} and d_{it} are independent random walks.

Firms pay wages that are increasing in the average number of hours worked according to

$$w_{it} = w^o_t + g(h_{it}),$$

where w^o_t represents the wage for the frictionless optimal number of hours $(\bar{h})$.[2] A key assumption of this framework is that firms only face adjustment costs when they change employment levels, not when they change the number of hours worked.[3]

In a frictionless labor market, the nominal marginal productivity of labor v_{it} is equated to the

[2]See Caballero and Engel (1993) for details.

[3]For evidence on this see Sargent (1978) and Shapiro (1986).

wage w_t corresponding to frictionless hours, $\bar{h}$. By contrast, for non-zero labor adjustment costs, Caballero and Engel (1993) show that the gap between the two, $v_t - w_t$, is proportional to the (ex-post, static) employment gap

$$\widehat{e}_{it} - e_{it} \ = \frac{\phi}{1-\alpha\gamma}(v_{it} - w^o_t), \tag{4}$$

where $\alpha\gamma$ is the employment share, and $\phi \equiv \frac{\mu}{\mu-\beta\gamma}$ is decreasing in the elasticity of the marginal wage schedule with respect to average hours worked, $\mu - 1$. This result is intuitive: the employment response to a given deviation of wages from marginal product will be larger if the marginal cost of the alternative adjustment strategy —changing hours— is higher. Also note that $\widehat{e}_{it} - e_{it}$ is the difference between the frictionless optimum $\widehat{e}_{it}$ and realized employment, not the ex-post employment gap $e^*_{it} - e_{it}$ related to the term on the right hand side of (1). However, since we assumed that demand and productivity shocks – Δa and Δd in (2) and (3) – are independent, we have that e^*_{it} is equal to $\widehat{e}_{it}$ plus a constant δ_t.[4] It follows that

$$e^*_{it} - e_{it-1} \ = \ \frac{\phi}{1-\alpha_j\gamma_i}(v_{it} - w^o_{it}) + \Delta e_{it} + \delta_t, \tag{5}$$

where e_{it}, l^*_{it} and v_{it} denote employment, the dynamic target for employment and the marginal productivity of labor.

We estimate the marginal productivity of labor using output per worker multiplied by an industry-level labor share, assumed constant over time.

We obtain an observable counterpart for w^o_{it} as follows. Assume that sectorial wages are proportional to the corresponding aggregate productivity level, so that

$$w^o_{it} = \theta_{it} + \bar{v}_t,$$

where θ_{it} captures variations across establishments in labor force productivity. These differences may arise, for example, from variations in labor force composition. Note that θ_{it} is sector and time specific. In the Appendix we provide evidence in favor of approximating θ_{it} using a two period moving average of relative productivity by establishment.[5] With this in mind our measure of θ_{it} is

$$\widehat{\theta}_{it} \ = \ \frac{1}{2}[(v_{it-1} - \bar{v}_{t-1}) \ + \ (v_{it-2} - \bar{v}_{t-2})].$$

[4] To allow for variations in future expected growth rates of a and d, the constant δ is allowed to vary over time.

[5] An alternative specification that assumes $w^o_{it} = \tau_{it} + \bar{w}_t$, where $\bar{w}_t$ are average wages and τ_{it} is the two period moving average of the ratio of sector productivity to average wages, leads to almost identical results.

The resulting expression for the estimated employment-gap is

$$e_{it}^{*} - e_{it-1} \;=\; \frac{\phi}{1-\widehat{\alpha\gamma}_j}(v_{it} - \widehat{\theta}_{it} - \bar{v}_t) + \Delta e_{it} + \delta_t \;\equiv\; \mathrm{Gap}_{it} + \delta_t, \tag{6}$$

where $\bar{v}_t$ denotes the mean (across establishments) marginal productivity.

Finally, we estimate ϕ (related to the substitutability between hours worked and employment) using

$$\Delta e_{it} \;=\; -\frac{\phi}{1-\widehat{\alpha\gamma}_j}(\Delta v_{it} - \Delta\bar{v}_t) + \kappa_t + \upsilon_{it} + \Delta e_{it}^{*} \;\equiv\; -\phi z_{it} + \kappa_t + \varepsilon_{it}, \tag{7}$$

where κ is a year dummy, Δe_{it}^{*} is the change in the desired level of employment and $z_{it} \equiv (\Delta v_{it} - \Delta\bar{v}_t)/1-\widehat{\alpha\gamma}_j)$. By assumption Δe_{it}^{*} is i.i.d. and independent of lagged variables.[6] To avoid endogeneity and measurement error bias we estimate (7) using $(\Delta w_{it-1} - \Delta\overline{w}_{t-1})$ as an instrument for $(\Delta v_{it} - \Delta\bar{v}_t)$.[7] Table 1 reports the estimation results of (7) across the countries in our sample.[8] We report estimates both with and without the one percent of extreme values for the independent variable. For ease of comparison across countries, based on the estimates reported in Table 1 we choose a common value of ϕ equal to 0.40.

2.3 Summing Up

Our methodology has three advantages when compared with previous specifications used to estimate cross-country differences in speed of adjustment. First, it only requires data on nominal output and employment level, two standard and well-measured variables in most industrial surveys. Most previous studies on adjustment costs require measures of real output or an exogenous measure of sector demand.[9] Second, the methodology is able to summarize in a single variable all shocks faced by a firm. This feature allows us to increase precision, and therefore the power of hypothesis testing, and to study the determinants of the speed of adjustment using interaction terms. Finally, we mention that our approach can be extended easily to incorporate non-linearities in the adjustment function, that is, the possibility that the ψ in (1) depend on the gap before adjustments

[6] The residuals in our regressions are broadly consistent with this assumption.

[7] We lag the dependent variable because it is correlated with the error term, and we use lagged wages to instrument lagged labor productivity to avoid measurement errors.

[8] We do not have wage data for Brazil, so we cannot estimate the parameter for this country.

[9] Abraham and Houseman (1994), Hammermesh (1993), and Nickel and Nunziata (2000)) evaluate the differential response of employment to observed real output. A second option is to construct exogenous demand shocks. Although this approach overcomes the real output concerns, it requires constructing an adequate sectorial demand shock for every country. A case in point are the papers by Burgess and Knetter (1998) and Burgess et al (2000), which use the real exchange rate as their demand shock. The estimated effects of the real exchange on employment are usually marginally significant, and often of the opposite sign than expected.

take place. This feature also turns out to be useful.

Summing up, we estimate the microeconomic flexibility parameter λ from

$$\Delta e_{it} = \lambda(\text{Gap}_{it} + \delta_t) + \varepsilon_{it}, \tag{8}$$

where Gap_{it} is proportional to the gap between marginal labor productivity and the market wage. To correct for labor heterogeneity across establishments, a fixed effect is also included in the gap-measure. This fixed effect is estimated by the average labor productivity in the two preceding periods. As shown in the appendix, the resulting estimator is unbiased (on average). It forces us to discard only two time periods, and can adapt to slow time variations in heterogeneity.

An alternative approach is based upon

$$\text{Gap}_{it} = \lambda a_i + (1-\lambda)\text{Gap}_{it-1} + \varepsilon_{it}. \tag{9}$$

We report results for this specification, using dynamic panel techniques, in the Appendix. They are consistent with the estimates we obtain based on (8) and therefore provide a useful robustness check. Yet they are considerably less precise. Thus our methodology may be viewed as an alternative, for the particular problem at hand, that uses data more efficiently than standard dynamic panel estimation techniques.

3 Data and basic facts

This section describes the source and data used in the empirical analysis. These data are from manufacturing census or surveys conducted by national statistical government agencies in five Latin American countries: Brazil, Chile, Colombia, Mexico and Venezuela. The variables used in our analysis are nominal output, employment, total compensation and industry classification within the manufacturing sector (ISIC at three digits). For the case of Chile, we also use capital stock and a measure of cash flow defined as sales minus total input costs.

For Brazil the data comes from the Manufacturing Annual Survey (Pesquisa Industrial Anual) conducted by the Instituto Brasileiro de Geografia e Estatística. This survey started in 1967 but experienced a severe methodological change in 1996, thus we only use observations from 1996 to 2000. In this, as well as in all other countries, we only include plants that existed during the full period (continuous plants). In the case of Chile the data come from the Chilean Manufacturing Census (Encuesta Nacional Industrial Anual) conducted by the Instituto Nacional de Estadísticas. In principle, the surveys covers all manufacturing plants in Chile with more than ten employees during the period 1979-97. In the empirical section we only use continuous plants during the period 1985-97. We do not use the years before 1985 because they are characterized by large macroeconomic shocks and structural adjustments that introduce too much noise and complications to our methodology. For Colombia we use the Colombian Manufacturing Census (Encuesta Anual Manufacturera y Registro Industrial) conducted by the Departamento Administrativo Nacional de Estadísticas. The survey covers all manufacturing plants with more than twenty employees during the period 1982-99. For plants with less than twenty employees only a random sample is covered. We only use continuous plants during the period 1992-99 due to a methodological change in the survey in 1992.

For Mexico we use the Mexican Manufacturing Annual Survey (Encuesta Industrial Anual) conducted by the Instituto Nacional de Estadística, Geografía e Informática. The survey covers a random sample of firms in the manufacturing sector during the period 1993-2000. Finally, for Venezuela de data come from the Manufacturing Survey (Encuesta Industria Manufacturera) conducted by the Instituto Nacional de Estadistica. The survey covers all plants with more than fifty employees and it has a yearly random sample for plants with less than fifty employees. Due to changes in the methodology we only are able to follows firms during the period 1995-1999.

Table 2 presents the number of observations per size bracket (defined using employment) for each of the five countries. The coverage of plants by size differs across countries. Chile and Colombia have the largest coverage of small plants (less than 50 employees), whereas Venezuela's survey mainly covers large establishments.

In table 3 we compute the average job creation and job destruction for each country. In addition we report the simple average over time of net change in employment and the excess turnover (i.e., the sum of job flows net of the change in employment due to cyclical factors). All statistics are defined following Davis et al (1996) and are computed for plants that stay during the whole period (continuous plants). It is already apparent in these numbers that microeconomic flexibility in these countries is limited: they are of the same order of magnitude of those of developed economies —which presumably need less restructuring than catching-up emerging economies— and substantially below economies such as Morocco or Taiwan.[10]

4 Microeconomic Flexibility

In this section we report our average (over time) flexibility findings. The basic results are reported in Table 4. All of our regressions include year-dummies, d_{jt}. That is, for each country j, we

[10] See e.g., Caballero and Hammour (2000) and references therein.

estimate:

$$\Delta e_{ijt} = d_{jt} + \lambda_j \text{Gap}_{ijt} + \varepsilon_{ijt}. \tag{10}$$

The first apparent result is that microeconomic flexibility is more limited in our economies than in the very flexible US. In the latter, estimates of λ using annual data are aften much closer to 1.[11]

Although comparisons must be interpreted with caution since the samples differ in number of observations, time-periods, establishments' demographics, etc., there seems to be a clear pattern. Within the region, Brazil, Colombia and Chile exhibit a relatively high degree of microeconomic flexibility with over 70 percent of labor adjustment taking place within a year. Mexico ranks lower with about 60 percent of adjustment within a year, and Venezuela is the most inflexible of these economies, with slightly more than 50 percent of adjustment within a year. Interestingly, this ranking is pretty much uncorrelated with the ranking obtained by Heckman and Pages (2000) and Botero et al. (2003) based on measuring labor market regulations (see Table 5). For example, and in contrasts to our results, the Botero et al (2003) index of job security places Venezuela at the same level of flexibility of Brazil and Chile, and Colombia as significantly more flexible than all of the above.

Table 6 reports the results from repeating estimation of regression (10), but conditioning on whether establishments are small or large. The former are defined as those with a number of employees below the median in the preceding year, large ones are those above the 75th percentile in number of employees (also in the preceding year).

In all our economies but Venezuela, small firms are substantially less flexible than large establishments. In Brazil the former close about 67 percent of their gap within a year, while the latter close about 81 percent. In Colombia, 68 and 79, respectively; in Chile 69 and 78; Mexico 56 and 61; and Venezuela 53 percent for both.

It also follows from this table that it is primarily the behavior of "large" establishments that explains the substantial differences in flexibility across some of these economies.

In addition to splitting by size, Table 7 splits observations by the size of the employment-gap. Small gaps are defined as gaps of less than 25 percent, while large ones are for gaps above 25 percent. That is, we re-estimate (10) for each country-size/size-of-gap combination (jsg):

$$\Delta e_{ijsgt} = d_{jsgt} + \lambda_{jsg} \text{Gap}_{ijsgt} + \varepsilon_{ijsgt}. \tag{11}$$

[11] For example, Caballero, Engel and Haltiwanger (1997) find a *quarterly* λ for US manufacturing exceeding 0.4, which implies an annual λ of approximately 0.90.

There are several significant conclusions that follow from this table:

1. In all the economies we study there is evidence of an *increasing hazard*.[12] That is, establishments are substantially more flexible with respect to large gaps than to small ones.

2. The increasing hazard feature is particularly pronounced in large establishments in the relatively more flexible economies.

3. In fact, most of the additional flexibility experienced by large establishments in the more flexible Latin American economies is due to their rapid adjustment when gaps get to be very large (over 25 percent). For example, both small and large establishments have an adjustment coefficient of approximately 0.50 for gaps below 25% in Chile. For large deviations, on the other hand, small establishments have a coefficient of 0.79, while large establishments have one of 0.93. The patterns are similar in Brazil and Colombia, and less pronounced in Mexico and Venezuela.

In conclusion, there is evidence of microeconomic inflexibility in the Latin American economies, and in some cases, such as Mexico and Venezuela, the problem is quite severe. Studies based only on quantifying job flows would be unable to detect either of these facts: Gross job flows are comparable in magnitude to those in the US, and across all the economies we study, or yield the wrong ranking (e.g., Chile would be the second most inflexible of these economies, according to the excess reallocation numbers presented in Table 3). Moreover, we find that allowing for an increasing hazard is important: There is clear evidence of increasing hazards, especially for large establishments in the more flexible economies. To a substantial extent, more inflexible economies seem to be those where large imbalances go uncorrected for sustained periods of time. Conversely, large establishments in the more flexible economies seldom tolerate (or can afford to tolerate) large microeconomic imbalances.

5 The Evolution of Flexibility

Has microeconomic flexibility improved over time? Unfortunately, we only count with a long time dimension for the case of Chile. In what follows we specialize our analysis to this case, and conclude that the answer to this question is negative. Quite the opposite, flexibility has declined significantly since the Asian crisis.

[12] See Caballero and Engel (1993) for a description of increasing hazard models and their aggregate implications.

Table 8 reports different variants of the regression:

$$\Delta e_{ijt} = [\lambda_{0jt} + \lambda_{1j}\{|\text{Gap}_{ijt}| > 0.25\} + \lambda_{2j}\{\text{Gap}_{ijt} < -0.05\}]\text{Gap}_{ijt} + \\ + d_{1j}\{|\text{Gap}_{ijt}| > 0.25\} + d_{2j}\{\text{Gap}_{ijt} < -0.05\} + \varepsilon_{ijsgt}, \quad (12)$$

where we include, but do not report, constants, time and group dummies. Figure 1 plots the path of the λ_{0jt}'s, with their mean subtracted. The solid lines represent the results for all firms, the dashed lines those for large firms, and the dotted lines those for small firms.

Column 1 in Table 8 and the continuous line in the upper panel of Figure 1 show that the index of flexibility exhibited fluctuations in the second half of the 1980s and early 1990s, eventually settled at a fairly high value in the mid 90s, but then declined sharply during the 1997-99 period. From an average adjustment coefficient of 0.77 for the three years prior to the Asian/Russian crisis episode, this coefficient fell to 0.69 in the aftermath of the crisis.

Note also that when the adjustment hazard is assumed to be constant, the decline in flexibility appears to be subsiding toward the end of the sample. However columns 4 and 7 in Table 8, and the continuous lines in the middle and lower panels of Figure 1, show that this finding is lost and there is no evidence of recovery once the hazard is allowed to be nonlinear. The reason for the misleading conclusion with a constant hazard is that toward the end of the sample there is a sharp rise in the share of establishments with large negative gaps (see Figure 2), to which establishments naturally react more under increasing hazards.

While it is too early to tell whether this decline in microeconomic flexibility we uncover is purely cyclical, or whether there is something more structural going on, there are a few interesting observations we can make at this time. We begin by noting that the remaining columns in Table 8 and series in Figure 1 show that much of the decline in flexibility is due to a decline in the flexibility of large establishments (as measured by their lagged employment).

Continuing with the characterization of the decline in microeconomic flexibility, Table 9 shows that while the speed of response to negative gaps remained fairly constant, it is the speed at which establishments adjust to shortages of labor that slowed down more dramatically.[13] This "reluctance to hire" may reflect pessimism respect to future conditions not captured in the current gap. But this is unlikely to be the only factor since otherwise we also should have observed a rise in the speed of firing, which we do not. In fact, the increasing hazard nature of the adjustment hazard partly explains the asymmetry seen in the decline of the speed of adjustment with respect to positive and negative gaps. Since there was a substantial number of establishments that developed large negative

[13] Between 1994-96 and 1997-99, the latter fell from 0.86 to 0.71, while the former fell from 0.75 to 0.71.

gaps (excess labor) during the slowdown, the increasing hazard implied that their adjustment did not slow down as much as the decline in the average speed of adjustment.

Table 10 shows that capital-intensive sectors, which are normally quicker in correcting their employment gaps, experienced a much larger decline in their measure of flexibility than labor-intensive sectors did.

However Table 11 illustrates that the sharpest decline in flexibility came from establishments in sectors that normally experience less restructuring (either because of smaller shocks or more inflexibility), where we have used measures of restructuring in the US to classify our sectors.[14] The latter serves the role of an instrument.

Finally, we explore whether financial constraints play a significant role in the slowdown in flexibility. Unfortunately we do no have a direct measure of financial constraints. Instead, we use the correlation between investment and cash flows (at the establishment level) as a proxy for such constraint.[15] Table 12 reports the results, which show no evidence of financial constraints playing a significant role in raising the type of microeconomic inflexibility that our procedure can detect.

Figure 3 shows the evolution of our measure of microeconomic flexibility, for less and more constrained establishments. It is apparent that the evolution of flexibility is highly correlated across both groups of establishments: the correlation between the first differences is 0.66. Yet equally apparent are secular trends in both series pointing in opposite directions.[16] Between 1986 and 1996 the flexibility of less financially constrained establishments exhibits a clearly increasing trend, which is reversed dramatically during the 1997-99 period. By contrast, establishments facing high financial constraints saw their flexibility decrease during most of the period, with the exception of a spike during 1995-96.

In conclusion, while we cannot pinpoint to a specific reason for why microeconomic flexibility declined toward the end of the 1990s, we clearly identified such a decline. Moreover, we found that the increasing nature of the hazard is important to show that the recovery in average flexibility toward 1999 does not seem to correspond to a real increase in flexibility. Instead, it simply reflects the interaction between an increasing hazard and a depressed phase of the business cycle. Flexibility declined in 1997 and remained down until the end of our sample, particularly so for large establishments. We also found that the decline in flexibility is more pronounced in capital-intensive sectors and in those sectors that normally restructure less. If the latter is a consequence

[14] See the Appendix for details.

[15] Less constrained establishments are those with a correlation between investment rates and cash flow below the median correlation among establishments. The remaining establishments are classified as 'more constrained'.

[16] That the average measure of flexibility for our sample is the same for high and low constrained establishments hides this fact.

of larger adjustment costs, then their relative slowdown is worrisome since the cost of reducing their restructuring further is particularly large. In the next section we turn to gauging some of the potential costs of microeconomic inflexibility.

6 Gauging the Costs of Microeconomic Inflexibility

By impairing worker movements from less to more productive units, microeconomic inflexibility reduces aggregate output and slows down economic growth. In this section we develop a simple framework to quantify this effect. Any such exercise requires strong assumptions and our approach is no exception. Nonetheless, our findings suggest that the costs of microeconomic inflexibilities in Latin America are significant. In particular, the impact of the decline in microeconomic flexibility in Chile following the Asian crisis is significant and in itself large enough to account for a substantial fraction of the large decline in TFP-growth in Chile since 1997 (from 3.1 percent for the preceding decade to about 0.3 percent after that). Moreover, if it were to persist, it could permanently shave off about 0.4 percent from Chile's structural rate of growth.

6.1 Model

Consider a continuum of establishments, indexed by i, which adjust labor in response to productivity shocks, while their share of the economy's capital remains fixed over time. Their production functions exhibit constant returns to (aggregate) capital, K_t, and decreasing returns to labor:

$$Y_{it} = B_{it} K_t L_{it}^{\alpha}, \tag{13}$$

where B_{it} denotes plant-level productivity and $0 < \alpha < 1$. The B_{it}'s follow geometric random walks, that can be decomposed into the product of a common and an idiosyncratic component:

$$\Delta \log B_{it} \equiv b_{it} = v_t + v_{it}^{I},$$

where the v_t are i.i.d. $\mathcal{N}(\mu_A, \sigma_A^2)$ and the v_{it}'s are i.i.d. (across productive units, over time and with respect to the aggregate shocks) $\mathcal{N}(0, \sigma_I^2)$. We set $\mu_A = 0$, since we are interested in the interaction between rigidities and idiosyncratic shocks, not in Jensen-inequality-type effects associated with aggregate shocks.

The price-elasticity of demand is $\eta > 0$. Aggregate labor is assumed constant and set equal to one. We define *aggregate productivity*, A_t, as:

$$A_t \;=\; \int B_{it} L_{it}^{\alpha} di, \tag{14}$$

so that aggregate output, $Y_t \equiv \int Y_{it} di$, satisfies

$$Y_t \;=\; A_t K_t.$$

Units adjusts with probability λ in every period, independent of their history and of what other units do that period.[17] The parameter that captures microeconomic flexibility is λ. Higher values of λ are associated with a faster reallocation of workers in response to productivity shocks.

Standard calculations show that the growth rate of output, g_Y, satisfies:[18]

$$g_Y \;=\; sA - \delta, \tag{15}$$

where s denotes the savings rate (assumed exogenous) and δ the depreciation rate for capital.

Consider now what happens when microeconomic flexibility decreases from λ_0 to λ_1. Aggregate productivity decreases, reflecting slower reallocation of workers from less to more productive units. Indeed, from (14) we have that :

$$\Delta A \;=\; \int B_{it} \Delta L_{it}^{\alpha} di,$$

where ΔL_{it}^{α} denotes the difference between the value of L_{it}^{α} for the new value of λ and the value it would have had under the old λ. A tedious, but straightforward calculation relegated to the appendix shows that:

$$\Delta A \;\simeq\; \left[\frac{1}{\lambda_0} - \frac{1}{\lambda_1}\right] \theta A_0,$$

with

$$\theta \;=\; \frac{\alpha\gamma(2-\alpha\gamma)}{2(1-\alpha\gamma)^2}(\sigma_I^2 + \sigma_A^2),$$

and $\gamma = (\eta - 1)/\eta$.

[17] More precisely, whether unit i adjusts at time t is determined by a Bernoulli random variable ξ_{it} with probability of success λ, where the ξ_{it}'s are independent across units and over time.

[18] Here we use that $g_A = 0$, since we assumed $\mu_A = 0$.

Using (15) to get rid of A_0 provides our main result:

$$\Delta g_Y \simeq (g_{Y,0} + \delta) \left[\frac{1}{\lambda_0} - \frac{1}{\lambda_1} \right] \theta, \tag{16}$$

where $g_{Y,0}$ denotes the growth rate of output before the change in λ.

We choose parameters to apply (16) as follows: The mark-up is set at 20%. Parameters $g_{Y,0}$, σ_I and σ_A are set at their average values for Chile over the 1987–96 period, namely 7.9%, 19% and 4%. We also set $\delta = 6\%$. The microeconomic flexibility parameters are set at their average values during 1994-96 and 1997-99,[19] considering large establishments, which arguably concentrate most production. We then conclude that the reduction in flexibility has reduced structural output growth by 0.4%. This *permanent* cost is due to the effect of reduced productivity on capital accumulation. One must add to this the initial direct effect of a decline in productivity on output growth, which amounts to 2.7 percent.[20] The sum of these two *structural* costs is certainly very relevant. In fact, it can account for a significant share of the decline in Chilean TFP growth from an average of 3.1 percent per year during the decade preceding the Asian crisis to 0.3 during the 1997-99 period.

Going back to the average results presented in Section 3, Table 13 reports the potential gain in structural growth that each country could obtain from raising microeconomic flexibility to US levels. Our estimates indicate that, on the low end, Chile and Colombia would have an initial gain in the range between 2 and 4% and a permanent increase in the structural rate of growth of approximately 0.3%. On the high end, Venezuela would see an initial gain of 22.2%, even the impact on its growth rate is less pronounced, due to it having had the lowest growth rate in our sample. By contrast, Mexico could expect an initial gain of 7.4% and an impressive permanent rise of growth of 0.70%, while the corresponding percentages for Brazil are 5.0 and 0.43. These numbers are large. We are fully aware of the many caveats that such ceteris-paribus comparison can raise, but the point of the table is to provide an alternative metric of the potential significance of observed levels of inflexibility in our region.

[19] Equal to 0.688 and 0.892, respectively, see Table 8.

[20] This is equal to:

$$\frac{\Delta A}{A_0} \simeq \left[\frac{1}{\lambda_0} - \frac{1}{\lambda_1} \right] \theta.$$

7 Concluding Remarks

There is the nagging feeling within our region that the microeconomic structure of our economies is rather inflexible, and that this is a significant obstacle to growth. Not surprisingly, pro-flexibility structural reforms are high in most well-aimed policymakers' agendas.

Despite this widespread belief, there is very little in terms of formal and systematic evidence, both on the extent of inflexibility and on its costs. The data and methodological obstacles to produce this evidence are significant.

In this paper we collect extensive data sets for several Latin American countries. We then develop a methodology suitable to gauge an answer to the inflexibility questions from these data sets.

Our estimates confirm the above fears. Microeconomic inflexibility is significant and very costly in our region. Moreover, in Chile, where we could measure the time path of flexibility with some precision, the trend does not seem to be pointing in the right direction. Our initial estimates suggest that the decline in flexibility observed at the end of the 1990s, if it were to persist, could shave off near 0.5 percent from Chile's potential growth rate.

References

[1] Abraham, K. and Houseman, S. (1994). "'Does Employment Protection Inhibit Labor Market Flexibility: Lessons From Germany, France and Belgium." In: R.M. Blank, editor. Protection Versus Economic Flexibility: Is There A Tradeoff? Chicago, United States:University of Chicago Press.

[2] Bertola, G. (1990). "Job Security, Employment and Wages," *European Economic Review*, **34**: 851-86.

[3] Botero, J., S. Djankov, R. La Porta, F. Lopez-de-Silanes and A. Shleifer (2003)."The Regulation of Labor". Harvard mimeo

[4] Burgess, S. and M. Knetter (1998). "An International Comparison of Employment Adjustment to Exchange Rate Fluctuations." *Review of International Economics*, **6**(1): 151-163.

[5] Burgess, S., M. Knetter and C. Michelacci (2000). "Employment and Output Adjustment in the OECD: A Disaggregated Analysis of the Role of Job Security Provisions," *Economica* **67**, 419-435.

[6] Caballero, R., K. Cowan, E. Engel and A. Micco (2003). "Microeconomic Inflexibility and Labor Regulation: International Evidence," Mimeo, October 2003.

[7] Caballero R. and E. Engel (1993). "Microeconomic Adjustment Hazards and Aggregate Dynamics." *Quarterly Journal of Economics.* 108(2): 359-83.

[8] Caballero, R., E. Engel and J. Haltiwanger (1997). "Aggregate Employment Dynamics: Building from Microeconomic Evidence", *American Economic Review*, **87** (1), 115–137, March 1997.

[9] Caballero, R. and M. Hammour (2000). "Creative Destruction and Development: Institutions, Crises, and Restructuring," *Annual World Bank Conference on Development Economics 2000*, 213-241.

[10] Calvo, G (1983). "Staggered Prices in a Utility Maximizing Framework." *Journal of Monetary Economics*, **12**, 383-98.

[11] Davis, S., J. Haltiwanger and S. Schuh (1996), *Job Creation and Destruction*, Cambridge, Mass.: MIT Press.

[12] Heckman, J and C. Pages (2000). “The Cost of Job Security Regulation: Evidence from Latin American Labor Markets.” Inter-American Development Bank Working Paper 430.

[13] Hamermesh, D.(1993). ”Labor Demand”, Princeton University Press.

[14] Nickell, S., and L. Nunziata (2000). “Employment Patterns in OECD Countries,” Center for Economic Performance Dscussion Paper 448.

[15] Sargent, T. (1978), “Estimation of Dynamic Labor Demand under Rational Expectations,” *J. of Political Economy*, **86**, 1009–44.

[16] Shapiro, M.D., “The Dynamic Demand for Capital and Labor,” *Quarterly Journal of Economics*, **101**, 513–42.

Table 1: ESTIMATING ϕ

COUNTRY:	Colombia	Chile	Mexico	Venezuela
$\hat{\phi}$ with extreme values:	0.414	0.460	0.372	0.336
	(0.035)	(0.028)	(0.033)	(0.108)
$\hat{\phi}$ without extreme values:	0.394	0.495	0.365	0.317
	(0.035)	(0.037)	(0.037)	(0.118)
Observations:	20,268/20,065	21,149/20,938	27,752/27,475	2,906/2,877

Robust standard errors in parenthesis.

Table 2: DESCRIPTIVE STATISTICS I

COUNTRY:	Brazil	Colombia	Chile	Mexico	Venezuela
Observations:	42,525	27,440	24,450	37,384	4,950
Establishments:	8,505	3,430	1,630	4,673	990
Employment (% obs.):					
$(0\ ,\ 50)$:	15.9	45.1	56.7	21.0	9.9
$[50\ ,\ 100)$:	28.5	22.8	17.9	21.4	31.5
$[100\ ,\ 250)$:	28.9	19.5	15.4	29.4	33.7
≥ 250:	26.6	12.7	9.9	28.2	24.9
Period:	1996-2000	1992-1999	1985-1999	1993-2000	1995-1999

'Employment' reports the percentage of observations with employment below 50, between 50 and 100, between 100 and 250, and larger than 250. Only continuous plants are considered.

Table 3: DESCRIPTIVE STATISTICS II

COUNTRY:	Brazil	Colombia	Chile	Mexico	Venezuela
Employment:	2,555,035	461,441	169,813	1,214,776	233,746
Net Change:	−0.024	−0.013	0.021	0.018	−0.023
Job Creation:	0.074	0.072	0.080	0.071	0.069
Job Destruction:	0.098	0.086	0.059	0.053	0.091
Reallocation:	0.173	0.158	0.139	0.123	0.160
Excess Reallocation:	0.135	0.124	0.099	0.086	0.125
Period:	1997-2000	1993-1999	1986-1999	1994-2000	1996-1999

Quantities reported are yearly averages over the sample period. Defition of all variables follows Davis et al. (1996).

Table 4: AVERAGE FLEXIBILITY ESTIMATES

COUNTRY:	Brazil	Colombia	Chile	Mexico	Venezuela
Gap:	0.701	0.722	0.724	0.581	0.539
	(0.004)	(0.005)	(0.005)	(0.004)	(0.014)
R-squared:	0.50	0.53	0.50	0.47	0.37
Observations:	25,260	20,375	20,979	27,757	2,941
Period:	1998-2000	1995-1999	1988-1999	1995-2000	1997-1999

Robust standard errors in parenthesis. All estimates in this table are significant at the 1% level. All regressions have year dummies. All estimates based on one regression per country, using all available observations.

Table 5: COMPARING FLEXIBILITY MEASURES

COUNTRY:	Brazil	Colombia	Chile	Mexico	Venezuela
Job Security Index (Heckman and Pages, 2000):	3.0	3.2	3.4	3.2	3.0
Job Security Index (Botero et al, 2003):	0.69	0.31	0.62	0.71	0.64
Excess Reallocation:	0.135	0.124	0.099	0.086	0.125
Microeconomic flexibility index (this paper):	0.701	0.722	0.724	0.581	0.539

Table 6: AVERAGE FLEXIBILITY ESTIMATES BY PLANT SIZE

		COUNTRY				
	Plant Size	Brazil	Colombia	Chile	Mexico	Venezuela
Gap:	Small	0.670	0.675	0.685	0.561	0.529
		(0.006)	(0.007)	(0.007)	(0.006)	(0.020)
	Large	0.808	0.790	0.783	0.607	0.529
		(0.009)	(0.010)	(0.010)	(0.007)	(0.026)
R^2:	Small	0.47	0.52	0.49	0.44	0.35
	Large	0.57	0.56	0.54	0.53	0.39
Obs.:	Small	12,560	10,087	10,404	13,784	1,469
	Large	6,340	5,131	5,265	7,008	741
Period:		1998-2000	1995-99	1988-99	1995-2000	1997-99

Small: below 50th percentile of the lagged employment distribution. Large: above the 75th percentile of the lagged employment distribution. Robust standard errors in parenthesis. All estimates in this table are significant at the 1% level. All regressions have year dummies.

Table 7: AVERAGE FLEXIBILITY ESTIMATES BY PLANT SIZE AND GAP SIZE

			COUNTRY				
			Brazil	Colombia	Chile	Mexico	Venezuela
	Plant Size	Gap Size					
Gap:	Small	Small	0.473	0.440	0.499	0.330	0.275
			(0.010)	(0.010)	(0.009)	(0.009)	(0.033)
		Large	0.722	0.752	0.790	0.626	0.570
			(0.013)	(0.012)	(0.016)	(0.010)	(0.031)
	Large	Small	0.541	0.551	0.513	0.418	0.222
			(0.011)	(0.014)	(0.013)	(0.010)	(0.044)
		Large	0.870	0.890	0.927	0.682	0.540
			(0.018)	(0.020)	(0.023)	(0.015)	(0.040)
R^2:	Small	Small	0.21	0.22	0.27	0.14	0.08
		Large	0.56	0.65	0.65	0.57	0.41
	Large	Small	0.28	0.29	0.29	0.26	0.06
		Large	0.64	0.65	0.68	0.68	0.40
Obs.:	Small	Small	9,204	7,493	8,844	9,812	886
		Large	3,356	2,594	1,560	3,972	583
	Large	Small	4,903	4,052	4,342	5,729	441
		Large	1,437	1,079	923	1,279	300
Period			1998-2000	1995-99	1988-99	1995-2000	1997-99

Plant size can be small (below 50th percentile of the lagged employment distribution) or large (above the 75th percentile of the lagged employment distribution). Gap size can be small (absolute value less than 0.25) or large (absolute value larger than 0.26). Robust standard errors in parenthesis. All estimates in this table are significant at the 1% level. All regressions have year dummies.

Table 8: EVOLUTION OF FLEXIBILITY: CHILE 1987–99

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	Constant hazard				Increasing (and asymmetric) hazard				
Plant size:	all	small	large	all	small	large	all	small	large
Gap 87:	0.745	0.742	0.782	0.490	0.514	0.537	0.343	0.384	0.365
	(0.030)	(0.036)	(0.068)	(0.030)	(0.038)	(0.064)	(0.030)	(0.039)	(0.063)
Gap 88:	0.674	0.707	0.716	0.424	0.481	0.445	0.272	0.344	0.270
	(0.031)	(0.041)	(0.059)	(0.031)	(0.040)	(0.058)	(0.031)	(0.040)	(0.060)
Gap 89:	0.776	0.714	0.854	0.533	0.504	0.564	0.381	0.377	0.381
	(0.038)	(0.042)	(0.054)	(0.034)	(0.043)	(0.054)	(0.035)	(0.043)	(0.055)
Gap 90:	0.677	0.656	0.765	0.441	0.478	0.488	0.274	0.326	0.289
	(0.031)	(0.039)	(0.072)	(0.030)	(0.039)	(0.068)	(0.032)	(0.041)	(0.072)
Gap 91:	0.731	0.688	0.806	0.501	0.503	0.578	0.335	0.362	0.374
	(0.033)	(0.053)	(0.058)	(0.032)	(0.050)	(0.055)	(0.034)	(0.051)	(0.058)
Gap 92:	0.740	0.705	0.758	0.520	0.522	0.503	0.359	0.380	0.302
	(0.039)	(0.063)	(0.065)	(0.036)	(0.058)	(0.063)	(0.038)	(0.062)	(0.064)
Gap 93:	0.706	0.640	0.812	0.492	0.474	0.547	0.322	0.327	0.347
	(0.034)	(0.047)	(0.066)	(0.032)	(0.046)	(0.060)	(0.033)	(0.047)	(0.065)
Gap 94:	0.730	0.656	0.913	0.515	0.487	0.639	0.345	0.339	0.443
	(0.036)	(0.050)	(0.071)	(0.035)	(0.049)	(0.066)	(0.036)	(0.050)	(0.070)
Gap 95:	0.775	0.743	0.907	0.547	0.569	0.641	0.370	0.415	0.434
	(0.034)	(0.048)	(0.072)	(0.032)	(0.044)	(0.065)	(0.033)	(0.046)	(0.069)
Gap 96:	0.808	0.706	0.856	0.577	0.531	0.582	0.402	0.378	0.386
	(0.035)	(0.055)	(0.059)	(0.034)	(0.054)	(0.056)	(0.035)	(0.055)	(0.059)
Gap 97:	0.686	0.648	0.667	0.469	0.495	0.395	0.301	0.346	0.206
	(0.033)	(0.043)	(0.073)	(0.032)	(0.042)	(0.072)	(0.034)	(0.046)	(0.074)
Gap 98:	0.669	0.614	0.667	0.425	0.446	0.377	0.242	0.285	0.168
	(0.040)	(0.051)	(0.095)	(0.038)	(0.051)	(0.091)	(0.040)	(0.052)	(0.092)
Gap 99:	0.705	0.655	0.712	0.418	0.455	0.367	0.250	0.309	0.172
	(0.034)	(0.045)	(0.076)	(0.035)	(0.048)	(0.075)	(0.038)	(0.050)	(0.080)
Gap($\|Gap\| > .25$):				0.371	0.295	0.407	0.479	0.410	0.508
				(0.016)	(0.023)	(0.031)	(0.016)	(0.023)	(0.032)
Gap(Gap $< -.05$):							−0.095	−0.172	−0.012
							(0.031)	(0.420)	(0.062)
$\|Gap\| > .25$:				0.002	0.027	−0.023	0.004	0.019	−0.012
				(0.004)	(0.006)	(0.009)	(0.005)	(0.007)	(0.010)
Gap $< -.05$:							−0.093	−0.097	−0.087
							(0.003)	(0.004)	(0.007)
R^2:	0.50	0.49	0.54	0.53	0.51	0.57	0.55	0.54	0.59

Plant size can be small (below 50th percentile of the lagged employment distribution) or large (above the 75th percentile of the lagged employment distribution). Robust standard errors in parenthesis. All regressions have year dummies.

Table 9: EVOLUTION OF FLEXIBILITY AND ASYMMETRIC HAZARDS

	Gap		(Gap $< -.05$)		
Year	Coeff.	St. Error	Coeff.	St. Error	No. Obs.
1987	0.689	0.030	0.227	0.062	1300
1988	0.720	0.030	−0.079	0.058	1216
1989	0.729	0.033	0.155	0.061	1248
1990	0.702	0.036	0.016	0.060	1155
1991	0.815	0.036	−0.097	0.061	1153
1992	0.752	0.035	0.061	0.067	1151
1993	0.721	0.037	0.034	0.064	1124
1994	0.831	0.039	−0.135	0.066	1073
1995	0.891	0.036	−0.152	0.060	1134
1996	0.859	0.039	−0.040	0.063	1139
1997	0.710	0.039	0.028	0.062	1146
1998	0.734	0.046	−0.078	0.069	1144
1999	0.698	0.052	0.031	0.070	1252
Simple Average:	0.758		−0.002		

Table 10: EVOLUTION OF FLEXIBILITY AND CAPITAL-LABOR INTENSITY.

	Capital Intensive Sectors			Labor Intensive Sextors		
Year	Coeff.	St. Error	No. Obs.	Coeff.	St. Error	No. Obs.
1987:	0.806	0.024	926	0.636	0.030	685
1988:	0.748	0.025	838	0.603	0.026	772
1989:	0.864	0.026	817	0.673	0.027	792
1990:	0.712	0.026	866	0.642	0.025	751
1991:	0.777	0.023	889	0.663	0.028	723
1992:	0.749	0.027	821	0.726	0.028	796
1993:	0.768	0.026	812	0.629	0.025	810
1994:	0.792	0.026	864	0.659	0.027	760
1995:	0.852	0.023	860	0.673	0.029	761
1996:	0.903	0.025	857	0.699	0.027	754
1997:	0.657	0.025	887	0.725	0.028	727
1998:	0.791	0.028	813	0.551	0.028	803
1999:	0.789	0.028	802	0.624	0.028	793
Simple Average:	0.785			0.654		

Table 11: EVOLUTION OF FLEXIBILITY AND EX-ANTE RESTRUCTURING

	High Restructuring			Low Restructuring		
Year	Coeff.	St. Error	No. Obs.	Coeff.	St. Error	No. Obs.
1987:	0.766	0.021	1113	0.691	0.038	498
1988:	0.762	0.022	1102	0.482	0.033	508
1989:	0.822	0.022	1116	0.655	0.037	493
1990:	0.708	0.022	1131	0.614	0.031	486
1991:	0.760	0.022	1112	0.665	0.033	500
1992:	0.758	0.023	1120	0.703	0.034	497
1993:	0.734	0.022	1126	0.622	0.031	496
1994:	0.758	0.023	1126	0.674	0.033	498
1995:	0.770	0.021	1116	0.785	0.035	505
1996:	0.824	0.023	1118	0.777	0.033	493
1997:	0.760	0.023	1115	0.537	0.030	499
1998:	0.699	0.023	1120	0.579	0.036	496
1999:	0.730	0.024	1103	0.642	0.036	492
Simple Average:	0.631			0.668		

Table 12: EVOLUTION OF FLEXIBILITY AND FINANCIAL CONSTRAINTS

	High Correl (I/K,CF)			Low Correl (I/K,CF)		
Year	Coeff.	St. Error	No. Obs.	Coeff.	St. Error	No. Obs.
1987:	0.809	0.025	818	0.675	0.027	793
1988:	0.715	0.025	821	0.630	0.026	789
1989:	0.803	0.027	815	0.752	0.026	794
1990:	0.691	0.026	818	0.664	0.025	799
1991:	0.750	0.026	818	0.709	0.025	793
1992:	0.708	0.026	820	0.776	0.028	797
1993:	0.681	0.025	822	0.727	0.027	800
1994:	0.707	0.028	822	0.749	0.025	802
1995:	0.770	0.025	822	0.778	0.027	799
1996:	0.785	0.026	816	0.832	0.026	795
1997:	0.652	0.026	820	0.726	0.026	794
1998:	0.698	0.029	822	0.636	0.026	794
1999:	0.708	0.029	812	0.703	0.027	783
Simple Average:	0.729			0.720		

Table 13: GAINS FROM ACQUIRING US-TYPE FLEXIBILITY

COUNTRY:	Brazil	Colombia	Chile	Mexico	Venezuela
σ_I (%):	27. 6	25.8	19.3	24.1	38.1
$g_{Y,0}$ (%):	2.7	2.7	6.6	3.5	2.0
Additional Growth Upon Impact (%):	5.0	3.8	2.1	7.4	22.2
Increase in Growth Rate (%):	0.43	0.33	0.27	0.70	0.18

Figure 1:

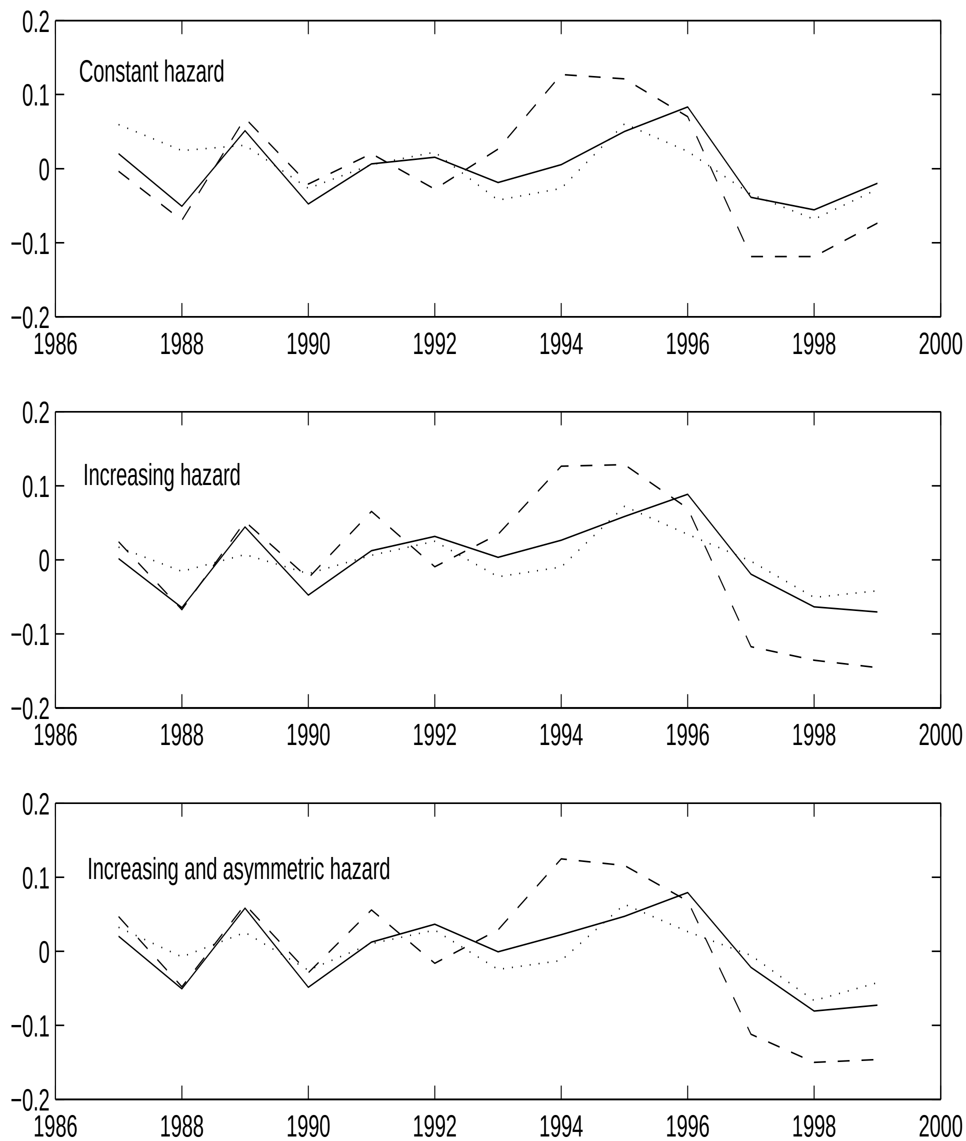

Constant hazard
Increasing hazard
Increasing and asymmetric hazard
0.2
0.1
0
−0.1
−0.2
1986
1988
1990
1992
1994
1996
1998
2000

Figure 2:

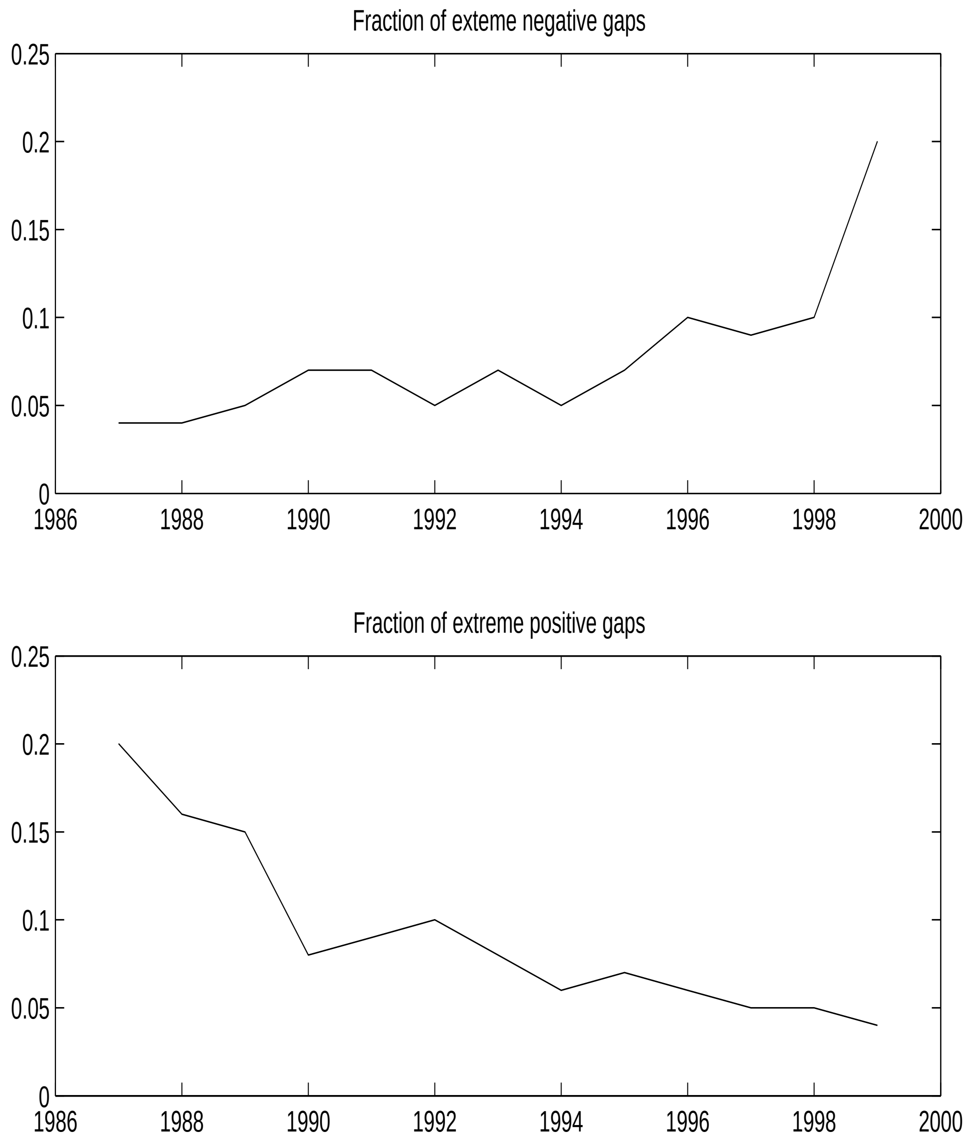
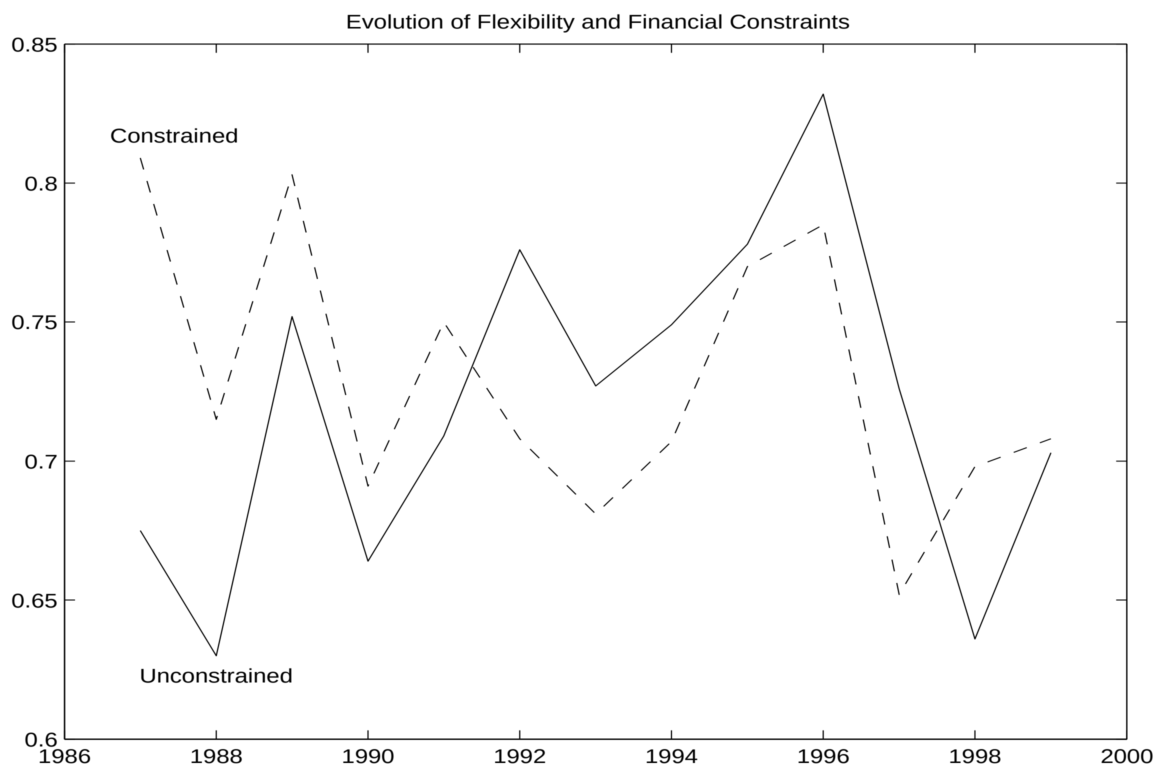

Fraction of exteme negative gaps
0.25
0.2
0.15
0.1
0.05
0
1986
1988
1990
1992
1994
1996
1998
2000
Fraction of extreme positive gaps
0.25
0.2
0.15
0.1
0.05
0
1986
1988
1990
1992
1994
1996
1998
2000

Figure 3:



Evolution of Flexibility and Financial Constraints
0.85
0.8
0.75
0.7
0.65
0.6
1986
1988
1990
1992
1994
1996
1998
2000
Constrained
Unconstrained