Sudden Stops and Reallocation: Evidence from Labor Market Flows in Latin America*

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Job Market Paper
First Version: May 18, 2007
This Version: January 27, 2008
Comments Welcome

Abstract

Sudden stops and international financial crises have been a main feature of developing countries in the last 25 years. While their aggregate effects are well known, the microeconomic channels through which they work have yet to be explored. In this paper we study their effects on microeconomic variables related to job flows using sectoral panel data for four Latin American countries. We find that sudden stops are associated with lower job creation and increased job destruction. Furthermore, these effects are heterogeneous across sectors and across countries. Sectors with higher dependence on external financing experience lower creation. A similar result is observed in sectors with higher indicators of liquidity needs, which experience significantly larger negative job flows, an effect particularly robust among continuing firms. Finally, we find a negative correlation between a country's firing and dismissal costs and labor destruction during sudden stops, mostly affecting the decisions of continuing firms. Our results provide evidence of financial conditions being an important transmission channel of sudden stops within a country. Moreover, they also highlight the relevance of financial factors in the restructuring process in general.

Keywords: sudden stops, gross job flows, reallocation, financial fragility.

*We would like to thank George-Marios Angeletos, Olivier Blanchard, Ricardo Caballero, Kevin Cowan, Francesco Giavazzi, Jeanne Lafortune, Borja Larraín, and seminar participants at Central Bank of Chile, CEA-U. of Chile, MIT, PUC-Chile, Université de Montréal, and the 2007 LACEA Annual Conference at Bogota for very useful comments, and Claudio Raddatz for generously sharing his data on sector level financial characteristics. Tessada thanks his advisors George-Marios Angeletos and Olivier Blanchard for their continuous support, encouragement and feedback. Tessada also acknowledges financial support from the Chilean Scholarship Program and a Finch Fellowship at the MIT Economics Department. The usual disclaimer applies. Future updates of this paper will be available online at http://econ-www.mit.edu/grad/tessada/research.

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1 Introduction

Many emerging economies have suffered sudden stops of capital flows in the last three decades. For example, Rothenberg and Warnock (2006) document that between 1989 and 2005 most of the time there was at least one country experienced a *sudden stop* episode. These sudden stops have had significant impact on most macroeconomic aggregates, including output growth, domestic credit and unemployment among others.[1] While we know from the study of fluctuations and shocks in developed economies that the microeconomics behind the aggregate responses to shocks is important, with different mechanisms affecting differently firms in different sectors, little or nothing is known about the sectoral effects of sudden stops in developing countries. Most of our knowledge on the reaction of gross job flows to shock comes from the study of the effects of (smoother) macroeconomic shocks –such as recessions– on job creation and destruction in developed countries (see Caballero (2007) and the references therein). There is also evidence that in developed countries exchange rate movements affect the process of job creation and destruction, and that sectors react differently to these movements (e.g. Gourinchas (1998), Gourinchas (1999), and Klein et al (2003)).[2] However, no evidence has been provided with regard to the effects sudden stops have in this dimension.

This paper extends our knowledge in this respect by looking at the effects of sudden stops –a large macroeconomic shock– on sector level job creation and destruction in a sample of Latin American countries. Sudden stops are clear big shocks to emerging economies that likely provide an extreme experiment to study the effects of negative shocks on job flows. Moreover, there are good reasons to think that the effects of sudden stops on job flows should be heterogeneous, depending on sector- and country-specific variables. Evidence on these effects is important for two reasons. First, it expands our understanding of sudden stops and their effects on countries that suffer them, particularly by taking an unexplored route looking at the microeconomics behind the observed aggregate response; this opens a channel through which we can think more about dynamics and recovery after a sudden stop. Second, they extend our existing evidence on the effects of macroeconomic shocks on reallocation and restructuring, as we look at shocks that are different from what has been explored so far –business cycles and relative price changes mostly–, and for a different set of countries.

Furthermore, given the nature of sudden stops, we might expect some of their sectoral effects to be linked to financial channels. One may expect sectors where firms depend more on external finance, to the firm, to suffer more from a negative external shock. Likewise, the same argument is true for firms that face larger liquidity needs, and hence may need to have access to liquid resources from financial institutions more often, or in larger amounts. At the same time, we know labor

[1] For instance, output contracts by about 8% during periods of sudden stops; also, sudden stops are associated with big decreases in private credit, which are actually more persistent than the output contractions, see Calvo et al (2006).

[2] Haltiwanger et al (2004) use the same data on job flows to study the effect of real exchange rates and tariffs on total, net and excess reallocation measures.

regulations play a role; thus, countries with more stringent labor regulations probably experience depressed job destruction and, maybe, depressed job creation too.

Overview. We use data for four Latin American countries (Brazil, Chile, Colombia, and Mexico) that we complement with some robustness checks for two additional countries for which we have a limited amount of information (Argentina and Uruguay). The sample includes data on job creation and destruction in manufacturing sectors, at the 2-digit level, and covers various time periods from 1978 to 2001.

Following the literature on sudden stops, we identify these episodes using information on (net) capital flows to each country; our measure of sudden stops detects the quarters in which a country experienced a sudden and large decline in capital flows. Our episodes are in line with previous evidence, and most of them coincide with periods of "bunching" of sudden stops, which occur mostly around big international crises (see Calvo et al (2006) and Rothenberg and Warnock (2006)). Importantly, it has been observed these "bunching" episodes coincide with periods in which the supply of funds to emerging countries and firms with similar credit ratings in the US contracts, as documented by Gallego and Jones (2005). This evidence suggests that most sudden stops are driven mainly by external conditions and not solely by internal conditions, although that latter could make a country more sensitive to changes in external conditions.[3] The last argument is important for our identification assumption in the empirical strategy: if the sudden stops are not related to sector characteristics we can use sector differences to study the patterns of sectoral responses and their relation to sector-specific variables.[4]

Our first results relate to the general effect of sudden stops on gross job flows in our sample. We find that sudden stops are periods during which job creation decreases and job destruction increases.[5] In particular, we find the effect on destruction to be larger and more robust, suggesting that more jobs are lost during periods of distress, such as sudden stops. In the case of job creation we find weaker evidence of a negative effect of sudden stops only in the case of data coming from all plants sampled; when only continuing plants are considered we find no evidence of an effect of sudden stops on job creation at the 2-digit sector level in manufacturing.

We also find evidence on heterogeneity of the effects across sectors. Figure 1 presents some evidence of the differences in sector specific reactions to sudden stops. On the vertical axis we show the estimated sector specific response of job creation for subsectors within manufacturing (2-digit level sectors). This response is measured as the coefficient on the interaction of a measure of sudden stops and sector dummies after controlling for sector and time-country fixed effects. We can that

[3]This would be the case if for example the choice of exchange rate regime makes a country more sensitive to exogenous changes in market perception. Gallego and Jones (2005) find evidence supporting this observation. Edwards (2005) finds no systematic relation between a country's capital mobility index and the probability of the country having a crisis; however, he does find some evidence that countries with higher capital mobility may face a higher cost if hit by a crisis.

[4]Later in the empirical section we elaborate on the exact identification assumption used to interpret our results.

[5]Job destruction takes only positive values, thus an increase in it values implies that more jobs are destroyed.

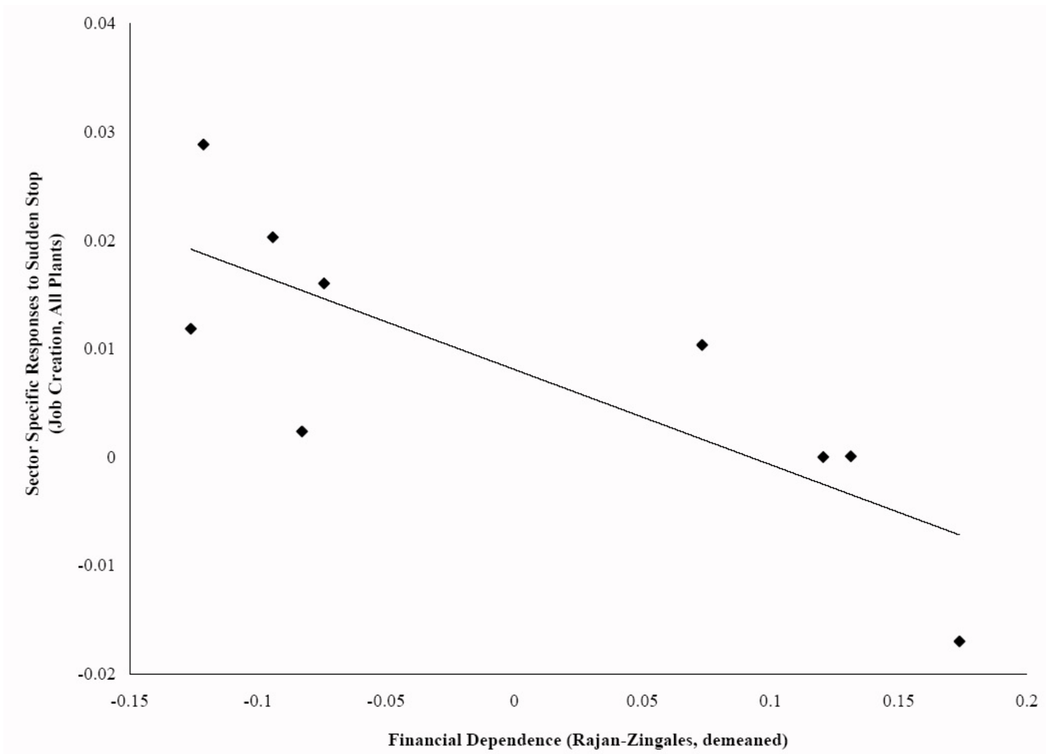

Figure 1. Effects of Sudden Stops on Job Creation by Sector and Financial Dependence. Each point corresponds to the estimated coefficient of the interaction of a measure of sudden stops and sector dummies in a regression of job creation on sector and country-time fixed effects, thus removing the main effect of the sudden stops. Additional controls: sector and time-country fixed effects (for a description of the variables see section 4.2).

the response to sudden stops is heterogeneous across sectors, beyond their effects on aggregate levels; this result implies that sudden stops trigger reallocation and restructuring changes. In order to illustrate one potential reason why sectors' responses may differ, we plot on the horizontal axis the (demeaned) value of the Rajan-Zingales measure of external financing dependence by sectors; we can see that there is a negative relationship between these two sector level measures. This suggests that sectors where sudden stops trigger a larger reduction in the job creation rate are also the sectors in which firms depend more on outside funding.

Motivated by this fact, we relate the country and time variation in sector level gross job flows to country-time variation of sudden stops and to sector-country-time variation of the interaction of sudden stops with proxies for external dependence and liquidity needs of each sector. We find that the negative effect of sudden stops on job creation is stronger in sectors with stronger dependence on external finance (as captured by a Rajan-Zingales measure) as they react more than the average sector to sudden stops. Similarly, the positive effects of sudden stops on job destruction are stronger in sectors with higher indicators of financial needs (measured as the ratio of inventories over sales and the cash conversion cycle measure). We thus provide evidence that sudden stops are a significant source of reallocation and restructuring activity, and that financial conditions are an important determinant of the extent of the impact of shocks on job flows in a country. Moreover, as highlighted in our model, these variables are meant to capture two different aspects of the financial characteristics of a firm, and our empirical results seem to highlight that these two aspects are indeed related to different margins of adjustment by firms when subject to a sudden stop.

Finally, we observe some, weaker, evidence that job creation in countries with more stringent labor regulations reacts more negatively to sudden stops. Additionally, the positive effects of sudden stops on job destruction seem to be weaker in countries with more stringent labor regulations.

Our results on the sectoral effects and their association with financial characteristics are robust to changes in the sample, adding countries, using a different definition of our crisis variable, restricting the sample to the 1990s only, and to changes in the empirical specification controlling for additional sources of variation. A simple counterfactual exercise tells us that the magnitudes of the coefficients translate into sizable differences in aggregate responses, particularly so in the case of job destruction.

Layout. The paper is organized as follows. Section 2 discusses some of the available evidence on sudden stops and reviews the related literature that provides a general background for this paper. Section 3 presents a simple model of creation and destruction in the presence of financial constraints; we use this model as a framework for the interpretation of the empirical strategy and results. Section 4 discusses the data and describes the empirical strategy. Section 5 presents the main results of the paper together with some robustness checks. In section 6 we present a summary of our conclusions and suggest directions for future research.

2 Discussion and Relevant Literature

Our paper relates to several strands of literature. First and foremost, we draw from the existing literature on the characteristics of sudden stops and their aggregate effects. Dornbusch et al (1995) were the first to refer to reversals in financial flows as *sudden stops*; shortly thereafter, Calvo (1998) explored the basic mechanism and the implications of these reversals. More recently, Guidotti et al (2004) and Calvo et al (2006) have documented the aggregate effects of sudden stops; in particular, Calvo et al (2006) show that sudden stops are associated with a decline in GDP, TFP, investment, and domestic credit.[6] Guidotti et al (2004) decompose the adjustment in current account into adjustment in exports and imports, and relate them to country specific characteristics; they find that countries that are more open and have lower financial dollarization adjust their current account mostly through exports, which they argue are less costly than an imports-based adjustment. This connection between export-import responses and financial dollarization is related to our approach,

[6] Brei (2007) finds that there is a significant reduction in domestic lending by banks during sudden stops. There is also evidence that some bank characteristics are associated with lower reductions in lending growth during sudden stops.

but they do not look at the particular factors driving the differences across sectors.

The pervasiveness of sudden stops is documented in Calvo et al (2006) and Rothenberg and Warnock (2006), who show that sudden stops tend to come in "bunches", i.e. many countries suffer sudden stops simultaneously or with small time differences, and are fairly frequent, i.e. most of the time there is at least one country suffering a sudden stop –in line with evidence in Gallego and Jones (2005).[7] Similarly, Rothenberg and Warnock (2006) find that crisis are also frequent from a country's point of view; in their sample a country experienced on average 2.5 crises over the 16 years they study.

Another branch of the literature has taken a theoretical approach to the study of sudden stops. Caballero and Krishnamurthy (2004), and other related papers by the same authors, show how borrowing constraints, domestic and international, interact during sudden stops. In their model, the international constraint binds and the country faces a tight *external* financial constraint. In the same vein, other papers have explored the consequences of sudden stops, generally looking at aggregate variables. Using general equilibrium models, Kehoe and Ruhl (2006) and Pratap and Urrutia (2007) study the Mexican crisis of 1994-5, and Gertler et al (2007) focuses on Korea's performance around the Asian crisis. More related to our hypothesis, Pratap and Urrutia (2007), and Gertler et al (2007) incorporate financial frictions in their models and are able to match some of the salient features of the corresponding crises they study.[8] The main result from these papers is that both labor and financial market frictions improve the ability to match some stylized facts of the two sudden stops they study.

Our work is also related to the literature on job flows, labor market dynamics and restructuring. We borrow from this literature the insight that the microeconomic channels behind the aggregate picture gives us information on the mechanisms and the effects of particular shocks and changes in economic conditions. Within this literature the study of the effects of macroeconomic shocks on job and worker reallocation in developed economies has received a lot of attention in the last years; e.g., Blanchard and Diamond (1990), Davis et al (1998), Hall (2005), Shimer (2005), Caballero and Hammour (2005), Shimer (2007), Fujita and Ramey (2007), and Caballero (2007). These papers study how recessions are linked with periods of high job destruction and increased unemployment when analyzed from the jobs side; when looked at from the worker-flows side, these periods seem to be related to decreased transitions from unemployment to employment. Other line of research in this area has looked at the effects of labor market regulation on labor market outcomes, in particular regulations that hinder the dynamic responses to shocks, e.g. Blanchard and Portugal (2001). One conclusion from the literature on job flows and restructuring that is highly applicable

[7] Some recent work has explored possible differences between sudden stops by looking at *gross* capital flows, separating between stops in inflows (sudden stops) and increases in outflows (sudden flight), see Rothenberg and Warnock (2006) and Cowan et al (2007).

[8] Also related to the literature is the work by Chari et al (2005) that presents a very suggestive result. They show how in a relatively standard model of a small open economy, a sudden stop modeled as a tightening of a collateral constraint can, under certain assumptions, generate an increase rather than a decrease in output. The main lesson is that other economic frictions might be needed to generate the usual output drops that accompany sudden stops.

to our work is that firms' reactions to (negative) shocks depend on (i) financial aspects related to the ability of entrepreneurs to raise external funds to keep the firm running, and (ii) labor regulations that determine the costs of destroying a job and the relative bargaining power of entrepreneurs. There is, however, a difference in the focus between our paper and the main work in this literature; we deal with a shock that is larger and that, at least at the country level, corresponds more to a financial shock, instead of business cycle variation or (exogenous) productivity innovations.

An important application of the literature on restructuring and reallocation deals with the effects of real exchange rates in sectoral flows in open economies. Gourinchas (1998) and Gourinchas (1999) study the effects of real exchange rate movements on job reallocation within and across sectors in France between 1984 and 1992 using firm level data and find that exchange rate shocks generate responses in both job creation and destruction: following a real exchange depreciation, job creation and destruction decrease. Klein et al (2003) use sectoral data for US manufacturing firms over the 1973-1993 period and study the effects of trend and cyclical variation of real exchange rates on job reallocation; they find that job destruction decreases and net employment growth increases after a depreciation of the dollar. Their findings on trend movements confirm Gourinchas' results but they also find that movements in trend real exchange rates affect both job creation and destruction in the same way.[9] Finally, Haltiwanger et al (2004) analyze the same topic using the same dataset we use in this paper, and confirm previous results in that real exchange rate appreciations are periods of increased job reallocation. While our methodology is related to this literature, we exploit an extreme case of an external shock, which (i) reflects countries' external financial conditions (and probably much better than the real exchange rate) and (ii) is also more exogenous to sector-specific situations across countries.

Finally, our empirical approach is also related to the literature on finance and sector level outcomes, largely started by Rajan and Zingales (1998) who studied the connection between financial development and growth in a broad sample of countries. Braun and Larrain (2005) show, using a cross-country sample of manufacturing industries over forty years, that industries that are more dependent on external finance are hit harder during recessions. In a related paper, Larrain (2006) shows that output volatility is dampened in countries with more developed bank systems, as they provide firms with more access to countercyclical borrowing. Raddatz (2006) presents evidence on the relation between output volatility, country financial development and liquidity needs at the sector level; his results show that lower financial development magnifies the effects of liquidity needs on sector level volatility. Therefore, all these three papers suggest a possible role for financial frictions in the transmission of sudden stops to sectors; either because there is a reduction in external funds as a whole or because particular sources of financing, i.e. bank lending, are affected.[10] Finally, from a broader perspective, this paper is related to the traditional financial multiplier/accelerator

[9] See also Goldberg et al (1999) and Campa and Goldberg (2001) for related work on the effects of international factors in employment and labor markets.

[10] Although not related to restructuring, Aghion et al (2007) present a model where financial frictions induce entrepreneurs to choose some projects that generate liquid resources; this misallocation lies behind the connection between volatility and growth they study.

literature (e.g. Bernanke and Gertler (1989), Kiyotaki and Moore (1997)).

3 Theoretical Framework

In this section we introduce a simple model of creation and destruction by firms facing financial constraints. The key mechanism in the model is a trade-off between size (creation) and liquidity: firms can choose a larger size at the cost of worsening their financial position ex-post in case they need liquid assets to continue operating. While we do not test the model directly in the empirical work, it does provide us with a simple framework for the interpretation of the empirical results and introduces some issues that will become relevant in the analysis of the results later on.

3.1 Creation, Destruction and Financial Constraints: A Simple Model

In order to introduce the basic intuition of the model, we consider the case of a single firm. We also abstract for now from sudden stops and their effects on financial conditions.

3.1.1 Set-up

Consider a risk neutral entrepreneur with access to a production technology with productivity denoted by a. There are three stages in this problem. The entrepreneurs can start production units, each of them producing a units of a good whose price we normalize to 1. Each entrepreneur can create as many units as she wants or can at a cost $c(k)$, where k is the number of units created and $c(\cdot)$ is assumed to be strictly increasing and convex such that $c(0) = c'(0) = 0$, and $c'(k),\ c''(k) > 0$.

After units are created, they are subject to a purely idiosyncratic liquidity shock θ. The entrepreneur must be able to commit θ dollars per production unit; if the need is met, the unit produces a in the next stage. If the shock is not met for a unit, this unit is destroyed and the entrepreneur will have to pay a destruction (firing) cost η in stage 2. Thus, if the entrepreneur has θk dollars, then all units survive, if not, only a fraction is saved.

Timing. The timing is as follows:

0. Entrepreneurs create k units at a cost $c(k)$. The total amount of resources they can invest is w_0.

1. After investment is made the entrepreneur faces the liquidity shock θ and has access to some liquid resources m (that are exogenous); if the entrepreneur does not have enough liquidity, the unit is destroyed. If the the unit is saved, it will generate the flow a in stage 2. The shock θ is drawn from a distribution with pdf $f(\theta)$ with support in $[0, \infty)$.

2. Entrepreneurs receive the flow a from the surviving units and pay the destruction (firing) cost η for the destroyed units. They consume all that is left after paying all the costs.

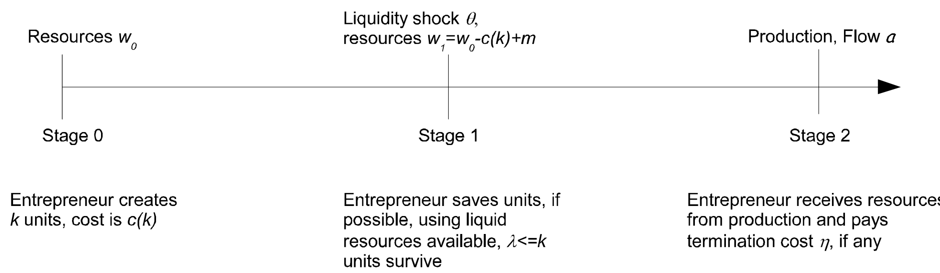

Figure 2. Timeline of the firm's problem.

Financial Constraints. Given our assumptions about financial markets, two financial frictions can potentially play a role here. First, there is a borrowing constraint at the moment the entrepreneur invests. Second, there is another constraint when the liquidity shock arises. As we will see later on when we present the solution to the model, the borrowing constraint may not bind in stage 0, i.e. $c(k) < w_0$, but the constraint will bind with positive probability in stage 1, i.e. for some values of θ the entrepreneur will not be able to save all the units. This pattern arises because the liquidity shock creates a trade-off: more initial investment comes at the cost of lower resources for "saving" units.

3.1.2 Investment Decision Without Liquidity Shocks: A Benchmark

In order to qualify the effects of the liquidity shock on investment (creation) and destruction we first derive the optimal investment decisions in two alternative benchmarks: first best (no financial frictions) and a second best with a financial constraint in stage 0, but no liquidity shock in stage 1.

Lemma 1 *Consider the problem of an entrepreneur with access to a technology of productivity a and faces no liquidity shock. The optimal investment level with perfect access to financial markets is*

$$k^{FB}(a) = c'^{-1}(a). \tag{1}$$

Similarly, if the entrepreneur faces a borrowing constraint in stage 0, the optimal investment level is

$$k^{BC}(a, w_0) = \begin{cases} c^{-1}(w) & \text{if } w_0 \leq w^{FB}(a) \\ k^{FB}(a) & \text{if } w_0 > w^{FB}(a) \end{cases}, \tag{2}$$

where w_0 *are the total resources she has available for investment at the beginning of stage 0, and*

$$w^{FB}(a) \equiv c\left(k^{FB}(a)\right) = c\left(c'^{-1}(a)\right)$$

is the amount of resources needed in stage 0 *to finance the first best level of investment.*

These results are intuitive. In the first best, the entrepreneur invests up to the point where the marginal cost equals productivity, irrespective of the initial level of wealth. If the entrepreneur faces a borrowing constraint in stage 0, then for low levels of wealth she will be constrained and will invest all of her resources. Of course, if $w_0 \geq w^{FB}(a)$, the borrowing constraint no longer binds and investment equals the first best.[11]

3.1.3 Investment with Liquidity Shocks

We now study the problem of interest for us. Entrepreneurs are not only restricted on their capacity to borrow to invest in production units, but also have a constraint on the resources they can collect to match their liquidity need. In this case firms face a trade-off between size and ability to cope with the ex-post shock.[12]

Stage 1 problem. Consider a firm that has invested in k production units of productivity a and has $w_0 - c(k)$ dollars left. Facing a shock θ, the entrepreneur always wants to save the units she created in stage 1, the problem is whether she has enough liquidity to do so. Denote by s_0 the amount not spent on new units at stage 0 ("savings") and by w_1 the total liquid resources the entrepreneur has access to during stage 1, in short, cash-on-hand; then $s_0 = w_0 - c(k)$ and $w_1 = s_0 + m$. The extra liquid resources m are not a source of income for the entrepreneur, but they capture the access to a limited amount of liquid funds that can be used to cope with the liquidity shock, e.g. a credit line.

Given the total cash-on-hand w_1, the entrepreneur can save all her units for low enough θ; however, if $\theta > \frac{w_1}{k}$ even if she pledges all her "cash", she can save some but not all the initial production units. Denote by λ the number of units she saves, then

$$\lambda(\theta, k, w_1) \equiv \min\left\{k, \frac{w_1}{\theta}\right\}. \tag{3}$$

Also, denote by

$$\theta^*(w_1, k) \equiv \frac{w_1}{k}, \tag{4}$$

[11] If instead we assume that θ represents real costs, i.e. an stochastic need of extra materials or repairs to machinery for example, then the first best allocation and the allocation with borrowing constraints would also be functions of the distribution of θ.

[12] See Tirole (2006) for a review of related models that explore this trade-off in a setting where liquidity needs arise from run-off shocks. Also, we assume away any information problem in the management of the firm and take financial constraints as given.

the value of θ such that an entrepreneur can save all her productive units.

Consequently, for an entrepreneur who created k production units and faced a reinvestment shock θ, her total resources in period 3 will be

$$R = s_0 + (a + \eta)\,\lambda(\cdot) - \eta k, \tag{5}$$

where λ is as defined in equation (3).

Problem in stage 0. As the entrepreneur consumes at the end of stage 2 and is risk neutral, she will choose k to maximize her expected resources at the end of stage 2.[13] Then the period 0 problem is

$$\max_{k\geq 0}\; s_0 + \int \left[(a+\eta)\,\lambda(\theta, k, w_1) - \eta k\right] f(\theta)\, d\theta \tag{6}$$

subject to

$$\begin{aligned} w_0 &\geq c(k) \\ s_0 &= w_0 - c(k) \\ w_1 &= s_0 + m, \end{aligned}$$

and where $\lambda(\cdot)$ is given in equation (3). Denote by $\overline{k}(w_0)$ the investment level such that $c\left(\overline{k}\right) = w_0$.

The following proposition characterizes the (unique interior) solution to the entrepreneur's problem.

Proposition 1 *Consider the problem of an entrepreneur with initial resources w_0. There exists a function $k^*(w_0, m, a) : \mathbb{R}^+ \longrightarrow \left(0, \overline{k}\right]$ such that $k = k^*$ is the solution to problem (6). The function $k^*(w_0, m, a)$ is strictly positive and if $m < \widehat{m}(w_0, a)$ or $w_0 \geq w^{FB}(a)$,*

$$k^*(w_0, m, a) < k^{BC}(a, w_0) \leq k^{FB}(a),$$

i.e. the liquidity constraint depresses creation.

If $m \geq \widehat{m}(w_0, a)$ and $w_0 < w^{FB}(a)$, then $k^*(w_0, m, a)$ is strictly positive and

$$k^*(w_0, m, a) = k^{BC}(a, w_0) < k^{FB}(a),$$

i.e. creation is not depressed further by the liquidity risk.

In words, proposition 1 states that for any level of wealth, the absence of full insurance against the liquidity needs leads to a reduction in creation, and this effect is beyond the constraint on initial investment, indeed the entrepreneur may or may not hit the borrowing constraint in stage

[13] This expression is derived in Appendix A.1.

0 depending on the *relative liquidity availability* in stages 0 and 1. Although risk neutral, the entrepreneur will self-insure by holding liquid assets (a precautionary motive for holding liquidity), with this demand arising because of the incomplete markets assumption. Even with the liquid asset holdings, the entrepreneur will not be able to always save her units, a consequence of the assumption that the distribution of θ is unbounded from above.[14]

Notice that the results in lemma and proposition 1 imply that the optimal creation decision is independent of the distribution of the shock unless there are incomplete markets and firms have an incentive to save part of their wealth. In that case, which is the one we are interested in, liquid assets have some value if stored and hence the firm faces a portfolio decision. The trade-off arises here: balancing the attractive investment in units vis-a-vis the decision to save liquid (but expensive) assets to cope with the bad time had they come.[15]

3.1.4 Destruction

Before deriving the comparative statics, we need to find an expression for destruction by firms in our economy. Following the same reasoning we used to derive the formula for revenue, we can compute destruction as

$$D\left(k, w_1\right) = \int_{\theta^*}^{\infty} \left[k - \frac{w_1}{\theta}\right] f\left(\theta\right) d\theta. \tag{7}$$

However, we already showed that firms will adjust their sizes at the moment of creation, hence we need to obtain an expression that incorporates this effect. We derive such expression by plugging $k^*\left(a, w_0, m\right)$ into equation (7) to obtain,

$$\widehat{D}\left(w_0, m\right) = \int_{0}^{\infty} \left[k^*\left(\cdot\right) - \lambda\left(k^*\left(\cdot\right), \theta, w_1\right)\right] f\left(\theta\right) d\theta = \int_{\widehat{\theta}}^{\infty} \left[k^*\left(\cdot\right) - \frac{w_1^*}{\theta}\right] f\left(\theta\right) d\theta, \tag{8}$$

where

$$\widehat{\theta}\left(w_0, m\right) \equiv \theta^*\left(w_0, m, k^*\left(\cdot\right)\right), \tag{9}$$

and

$$w_1^* = w_0 - c\left(k^*\right) + m.$$

[14] If we assume that the distribution of θ can only take values up to $\overline{\theta} < \infty$, then we can show that entrepreneurs with a wealth level larger or equal than

$$w_0^{self}\left(a\right) = \max\left\{c\left(k^{FB}\left(a\right)\right) + k^{FB}\left(a\right) * \overline{\theta} - m, 0\right\}.$$

will not be restricted in their investment by the liquidity shock.

Our main conclusions remain true in this case, and we choose to present a simpler model to highlight the main results.

[15] It is worth noting that if we assume the shock is a stochastic real cost and not just a liquidity need the results are qualitatively the same, but we would get some extra effects according to productivity of the firms; given we do not observe productivity in our sample we present here a simpler version.

Equation (8) reflects the fact the firm adjusts its investment decision to changes in w_0 and m (and η). The difference between $D(k, w_1)$ and $\widehat{D}(w_0, m)$ because the timing of the flows, w_0 and m, as the margin of adjustment each firm has depends on the particular stage of the process at which the resources become available.

Our first result implies that ex-ante firms expect some destruction with positive probability, implying that they will never be willing (and able) to completely self-insure against the liquidity shocks.

Remark 1 *Firms never fully insure against the liquidity shock, i.e. there will always be a strictly positive probability of some units being destroyed.*

3.1.5 Comparative Statics

We can now characterize the comparative statics with respect to two variables of interest, w_0 and η. As we just mentioned the timing of the shock (or the news about the shock) matters when determining the margins of adjustment of the entrepreneur. Thus, for destruction we present results that consider the solution to the problem in stage 0, i.e. including the creation decision, and also at stage 1, i.e. when the investment decision is sunk and the firm can only adjust the destruction margin.

Proposition 2 (Comparative Statics) *In problem (6), creation k^* is increasing in wealth w_0 for any w_0, a and m, i.e.*

$$\frac{\partial k^*}{\partial w_0} > 0, \qquad \forall\ w_0, a, m > 0,$$

decreasing in the destruction cost η,

$$\frac{\partial k^*}{\partial \eta} \leq 0,$$

and increasing on liquid funds in stage 1,

$$\frac{\partial k^*}{\partial m} \geq 0$$

The effect of w_0 and m on destruction is ambiguous, i.e.

$$\frac{\partial \widehat{D}}{\partial w_0} \gtreqless 0, \qquad \frac{\partial \widehat{D}}{\partial m} \gtreqless 0.$$

An increase of the destruction cost η reduces destruction,

$$\frac{\partial \widehat{D}}{\partial \eta} < 0.$$

Creation being an increasing function of available financial resources, w_0, is not surprising. If the entrepreneur receives some more resources, she will then choose to keep some aside and to invest the rest in new units. The same is true for the case of m, as an increase in liquidity in stage 1 allows her to save more units, thus she can increase investment reducing her self-insurance s_0.

The result that creation is decreasing on η comes from the fact that a large η makes destruction more expensive, reducing the expected return of a unit for a given amount of liquid wealth (and a given probability of destruction), hence making investment less attractive. Also, reducing creation frees resources to cope with the liquidity needs in stage 1, hence reducing the probability that a unit will be destroyed ex-post, thus helping to counteract the effect on the expected profitability of the units.

An important part of the effects of w_0, m and η on destruction comes from the fact that firms will adjust their sizes in response to the change in available resources, as we have already seen for the comparative statics of creation. This mechanism turns out to be important, particularly for the case of the firing costs. Keeping this observation in mind, the results for destruction are intuitive. An entrepreneur who faces a decrease in the total resources available before investing will adjust the size of the plant through a reduction in the number of units created, and save some resources for the liquidity shock stage; this reaction implies two extra elements: first, there are fewer units to be destroyed; and, second, the reduction in investment leaves more resources available.[16]

Similarly, an increase in the firing cost η has no effect on destruction after the investment decision has been made. But at the same time, the effect on destruction for a firm that can adjust investment is negative, faced with a more expensive liquidation the firm adjusts size, lowering the number of units, reducing then the money needed to cope with the liquidity shock, but also freeing some resources because less is spent on creating the units.[17]

Lemma 2 (Unexpected Liquidity Shock) *An unexpected shock that reduces m in stage 1 increases destruction, i.e.*

$$\frac{\partial D(\cdot)}{\partial m} = \left.\frac{\partial \widehat{D}(\cdot)}{\partial m}\right|_{k,s_0} < 0.$$

If the entrepreneur faces the (unexpected) decrease in m after the investment decision was made, the only effect comes from the lower resources that can be committed in stage 1, thus for each possible realization of θ, fewer units will be

[16] It is possible to show that "savings" $w_0 - c(k^*)$ is an non-decreasing function of w_0.

[17] Notice that with a pure liquidity shock, all entrepreneurs want to save as many units as they can irrespective of the productivity levels. One simple way to change that is to assume that at least part of the θ shock comes in the form of run-off costs. That way part of the cost actually represent payments that must be made; consequently high shocks may induce entrepreneurs to save the money instead of paying the cost. For example, if the all the shock is a real cost, then a unit will be destroyed for sure if

$$a + \eta - \theta < 0.$$

3.1.6 Discussion

Linking to Sudden Stops. In order to study the effects of sudden stops we link them to available resources w_0 and m.[18] In the context of our simple model we interpret a sudden stop as a contraction in financial resources available to entrepreneurs, and hence we can study its effects by looking at the effects of a reduction in w_0 and/or m.[19]

Our empirical strategy tries to link responses to sudden stops with exposure to financial conditions. Let us think for a moment that each plant p in sector i in has access to resources

$$w_{0ip} = \omega_i G + \varepsilon_{ip},$$

and

$$m_{ip} = \chi_i G + \zeta_{ip}.$$

Where G is an indicator of aggregate conditions in the financial markets. A sudden stop reduces the availability of funds in the market, hence $\partial G/\partial SS < 0$. Then the coefficients ω_i and χ_i, represent a sector-wide sensitivity to financial conditions. Using the results in proposition 2 and lemma 2, this implies that the effect of sudden stops is larger for sectors with larger ω_i and/or χ_i. Our variables for financial characteristics should then be interpreted as proxies for the ranking of sectors according to ω_i and χ_i.[20]

In addition, in reality the economy is comprised of firms that are in different stages of the production process, hence when the shock arrives (or news about a shock are received) some of them will have already invested while some will be making their decision with respect to size. Notice also another implication of our model: even if a firm does not receive a direct shock from the sudden stop, anticipating a reduction in resources in the future leads to adjustments in the creation margin (the effect of m on k^*).

Extensions. Our model also shows that other variables can affect the investment decision. Some of those variables are likely to be affected by the occurrence of a sudden stop. Consider for example the flow a. In the context of an open economy this variable can respond to demand conditions (e.g. cyclical variations) and prices (e.g. real exchange rate). Both may change during sudden stops. In our empirical analysis we perform robustness checks, using variables that can capture these other channels for sudden stops as controls. As we explain in more detail later we observe that although

[18] Alternatively we can define a sudden stop as a shock that shifts the distribution of θ, in the sense that when in a sudden stop the distribution first order stochastically dominates the distribution in normal times. In this case, the effects of a sudden stop are qualitatively similar, and hence we chose our definition as we consider it simpler to derive and present.

[19] Notice that we are calling a productivity, but it can also be identified as a "demand" parameter, and hence we could assume that sudden stops also affect it. There are many possible channels, e.g. imports, general equilibrium effect on consumption coming from the credit crunch, relative prices, etc.

[20] In Appendix A we present a variation of the model that allow firms to obtain part of the revenue before they face the idiosyncratic shock θ. This alternative model gives one potential reason why some sectors may experience larger effects of sudden stops on their availability of funds at stage 1.

these channels play a role, they do not eliminate the direct effect of sudden stops on gross flows and the role of sectoral financial characteristics.

The model we present here highlights the trade-off between size and liquidity for a *new* entrepreneur facing convex costs of creation. We can relax the latter introducing a small fixed cost of creation, which induces some range of inaction but conditional on entering the entrepreneur still faces the same type of trade-off: size vs. liquidity. We can also think of an existing plant as an entrepreneur that has some initial units at the beginning of period 0; if these units are also subject to the liquidity shock, we face a similar situation with the difference that the entrepreneur may choose not to create new units in order to improve her "liquidity" position for stage 1.[21]

3.2 Summary

Motivated by the previous model and the literature reviewed in section 2 we proceed to study the case of sudden stops in Latin America. In particular, we look for evidence on the following hypotheses:

1. Firms in sectors depending more on external finance should be more affected during sudden stops. Thus, creation will be lower in these sectors. The effect on destruction is ambiguous as plants can adjust their sizes.
2. Firms in sectors more exposed to liquidity needs are likely to destroy more, particularly so during a sudden stop. This effect is stronger when they cannot adjust their size by changing the creation decision.

As our model also suggests that destruction costs do affect creation decisions, we also introduce labor market regulations that affect the cost of firing a worker, as a proxy for the cost of destroying a unit. We also use our data on job flows from continuing versus all plants as the financial position of firms may be affected by previous borrowing or better information (through previous financial operations), if new plants are a significant fraction of the difference, for example. Another reason why the response measured on series for all and continuing plants can differ has to do with the role of pre-existing units: we can think about continuing plants as units that start at stage 0 with some number of units k_0, then continuing plants have an extra incentive to save liquid resources for stage 1.

In the next sections we seek for evidence along these lines using data on gross job flows in Latin America, over a sample period where these countries suffered significant sudden stops.

[21] Notice that if the existing units do not suffer the liquidity shock and give some fresh resources they may actually help improving the ability to cope with liquidity needs.

4 Data and empirical approach

4.1 Empirical Strategy

We estimate the following equation:

$$y_{ijt} = \alpha S_{jt} + \beta x_{jt} + \delta m_j S_{jt} + \rho z_i S_{jt} + \mu + \varepsilon_{ijt}, \tag{10}$$

where y_{ijt} is some measure of job flows (creation, destruction) in sector i, country j, and time t, S is a measure of external shocks to financial conditions –sudden stops in this paper–, x_{jt} is a vector of institutional characteristics and controls that varies at the time and country level, m_j is a vector of country specific institutional variables (e.g. labor market regulation), z_i is a vector of sector specific characteristics (e.g. financial dependence), and μ is a vector of dummy variables and fixed effects. All our regressions include country, year and sector fixed effects, and some specifications also include interactions of (any two) of them; all sector and country variables are included as deviations with respect to their sample means.[22]

The interaction effects ($z_i S_{jt}$ and $m_j S_{jt}$) are the most important part in this regression. The sector specific characteristics are related mainly to financial characteristics of the sectors, and we will follow the existing literature assuming that at least part of the observed differences across sectors in financial outcomes is associated with technological differences. Labor market regulation is a usual suspect in many cases, this case being no exception; theoretical work shows that there are potential connections in this situation, and our work shows empirical correlations along these lines. The α coefficients reflect estimates of the effects of sudden stops on an average country, and hence gives an estimate of the baseline effect of the sudden stops on labor flows.

As has been noted before, our main analysis restricts the sample of countries to Brazil, Chile, Colombia and Mexico. There are two different reasons to drop Argentina and Uruguay. First, we do not identify any sudden stop in Uruguay during the years for which we have labor flows data. Second, the nature of the original surveys from which data was collected in both countries differs from the rest. For both countries there is no information on new plants, as only continuing plants are observed in their sampling. This lack of data makes it impossible to compare continuing and all plants data. We also present results using all countries in Appendix B and there we can observe that our main conclusions do not depend on this selection criteria.

[22] Not all the regressions include the corresponding interactions.

4.2 Data Description

4.2.1 Labor Flows.

Data on sectoral gross flows comes from Haltiwanger et al (2004). Data is at the 2-digit sector level for 6 Latin American countries from 1978 to 2001. The database was originally constructed by the IADB using firm level data from: Argentina, Brazil, Chile, Colombia, Mexico and Uruguay. The original surveys record flows in workers or jobs, not in hours, hence our study captures only the extensive margin on workers. The original data contained employment at the firm level and it was aggregated by sectors.[23]

Consider a given sector and country, let p index the plants and t the period, then $E_{p,t}$ represents employment in plant (firm) p at time t. Net employment growth is given by

$$Net_{p,t} = 2\left(\frac{E_{p,t} - E_{p,t-1}}{E_{p,t} + E_{p,t-1}}\right). \tag{11}$$

Job creation corresponds to the sum of net employment growth over all plants with positive net employment growth (for a given country-sector pair) between period $t-1$ and t,

$$Creation_t = \sum_p \phi_{p,t} \max\left(Net_{p,t}, 0\right), \tag{12}$$

where $\phi_{p,t}$ is employment share of plant p.

Job destruction is then the sum of the absolute value of net employment growth over all plants with negative employment growth between period $t-1$ and t,

$$Destruction_t = \sum_p \phi_{p,t} \left|\min\left(Net_{p,t}, 0\right)\right|. \tag{13}$$

We use data for manufacturing sectors, as it is the only data available for all countries. For each series we have two types of data, continuing and all plants.[24] Data for continuing plants includes information from those plants alive in both t and $t-1$; all plants/firms include all plants observed in t irrespective of whether they are new or not. As previously mentioned, for Argentina and Uruguay we only have data for continuing plants.[25]

Table 1 presents the summary statistics for the whole set of six countries and for the main group of countries in our estimation (Brazil, Chile, Colombia and Mexico). We can see that there is large variation both in creation and destruction across countries; Mexico has the highest rates of creation

[23] See Appendix B for a description of the original sources.

[24] The dataset includes data on plants and firms, but for simplicity we refer only to plants.

[25] There are other differences in the data in the case of Argentina and Uruguay; we explained them in more detail in the outline of our empirical strategy in section 4.1.

(in 1996), but Chile shows the highest destruction rates for all plants (in 1982) and Colombia for continuing plants (in 1992). Chile also presents the largest differences between the maximum and minimum values for creation and destruction in the sample.

Unfortunately, there is one dimension our dataset misses. We do not observe plant turnover data, i.e. we have no information on flows associated with closing down plants, nor the plant flows by sector. The latter dimension is important when studying the effects of financial shocks, as liquidity needs may drive firms out of the market if they cannot borrow to maintain operation. It is also relevant to observe firms that change property, either because of bankruptcy procedures or because of fire-sales when in sudden stops. Thus, although these potential channels are not studied in this paper, our results highlight another potential channel for the transmission and propagation of sudden stops in developing countries.

4.2.2 Sudden Stops.

We follow recent work and identify the sudden stop episodes directly from quarterly capital flows data.[26] In particular, a sudden stop is a period that

1. Contains at least one observation where the year-on-year fall in capital flows lies at least two standard deviations below its sample mean;
2. Begins the first time the annual change in capital flows falls one standard deviation below the mean;
3. Ends once the annual change in capital flows exceeds one standard deviation below its sample mean.

Based on this definition we construct two variables. The first variable measures the fraction of quarters in which a sudden stop happened (henceforth denoted by SS). The second is a dummy variable that takes a value of 1 if there is a sudden stop in any quarter of the year. We present results using the first of the two, but the results are qualitatively the same if we use the latter variable instead.

Table 2 shows the years for which we identify a sudden stop together with the years for which we have job flows data for each of the six countries. We can see that we do not identify any sudden stop for Uruguay according to this definition. On the other hand, we find that Argentina has spent about half of the sample period in sudden stops. All of our sudden stop episodes have been identified before in other studies, and we believe are reasonable according to previous knowledge and work on the topic.[27] Interestingly for our identifying assumptions, with the exception of Mexico 1994-1995,

[26] See for example Calvo et al (2006) and Gallego and Jones (2005).

[27] See Caballero and Panageas (2007) and Calvo et al (2006). Some studies, eg. Caballero and Panageas (2007), have identified a sudden stop in early 1980s in Colombia, but according to our definition this is not the case.

all the sudden stops identified in our sample correspond to periods of bunching of sudden stops in the paper by Rothenberg and Warnock (2006), which in turn correspond to periods in which credit conditions worsen due to exogenous reasons as documented in Gallego and Jones (2005).

4.2.3 Sector Characteristics.

We use two types of sector characteristics; one related to financial conditions, and the other to turnover and labor reallocation.

Financial Characteristics. We use two sets of financial characteristics; one is related to the original Rajan and Zingales (1998), RZ (1998) hereafter, measure of external financing needs. The other corresponds to variables that are associated with liquidity needs, and hence refer to more immediate, or short-run, financing.

1. *External financing dependence*: The first sector level characteristic we use corresponds to the RZ (1998) measure of external financing dependence. It captures a sector's dependence on external financing by measuring the fraction of the assets that is financed with external funds. A sector with a higher RZ (1998) measure should suffer more in the event of a financial crunch or any other reduction in the access to credit. (We denote it by *Fin1*.)
   Alternatively, we also use the RZ (1998) measures from Micco and Pages (2006) and Raddatz (2006) as a robustness check, and the results are qualitatively similar.[28] (These variables are denoted by *Fin2* and *Fin3*, respectively.)

2. *Liquidity "needs"*: Following Raddatz (2006) we use two different proxies for the liquidity needs of firms. First, the cash conversion cycle (denoted by *CCC*), which corresponds to an estimate of the length in days between the moment a firm pays for the raw materials and the moment it finally receives the payment for the sale of the final goods it produces; we use the median value across firms in a 2-digit sector. Second, we use the median value of the ratio of total inventories to sales (denoted by *Inv/Sales*) across firms in each sector.

The two sets of financial characteristics require some explanation. Given their definition, these measures capture different dimensions of the financial needs of firms. The first set, based on the initial Rajan-Zingales approach, measures dependence on the base of the use (in equilibrium) of external funds in asset acquisition, and hence it relates more to long-run and investment decisions. On the other hand, the liquidity needs measures explicitly capture financial needs arising from delays between production and sales revenue collection. This is obviously related to short-run liquidity needs and the dependence on financial markets to cope with them during the production process.

[28] Unlike the other measures, the one based on data from Raddatz (2006) is computed as the median across firms in each 2-digit sector. The previous two consider the mean of the same measure across sub-sectors in each 2-digit sector. Consequently, the different measures have different sensitivity to heterogeneity within each 2-digit sector.

Labor Reallocation. Taken from Micco and Pages (2006), it measures industry reallocation in US industries as the sum of job creation and job destruction as fraction of total employment. Like in the case of the RZ (1998) measure for financial exposure, the underlying assumption is that measures in the US capture technological components that are valid to rank sectors in other countries.

4.2.4 Labor Regulation.

Labor regulation measures are taken from La Porta et al (2004). Out of all the measures they compute we focus on the cost of firing workers and the number of procedures required to dismiss a worker; in our estimations we follow Micco and Pages (2006) and use the sum of the two, but the results are robust to controlling separately for both measures. The cost of firing workers is a measure of how expensive it is for a firm to fire 20% of the workers; it includes all the compensations and penalties needed to pay in this case. The dismissal procedures variable counts the number of measures a firm must undertake in order to be able to dismiss a worker. The highest value of the labor regulation measure in our sample corresponds to Mexico with 1.28 out of a maximum of 2; the minimum is 0.83 in Colombia.

It is worth to keep in mind that the La Porta et al (2004)'s study compares labor regulation as of 1997 for a total of 85 countries. This is particularly relevant because some countries in our sample underwent labor market reforms during the period, thus we later consider regressions using samples restricted to the 1990s only.

4.3 Identification

The use of sector level data allows us to use two sources of identification. First, sector level data allows us to control for unobserved country characteristics and rely on particular sector specific (but not country-sector specific) variables to identify sector specific effects of sudden stops. Part of this effect comes from interaction effects between sector characteristics and the prevalence of sudden stops, e.g. we expect sectors that rely more on external financing or have less access to collateral to suffer more during a sudden stop than sectors with better chances of self-financing its operations (or at least part of them). The same argument follows for the liquidity related variables, as the source of identification is the same.

Second, cross country variation in labor market regulation allows us to compare sectors across countries. While not absolutely bulletproof, this identification strategy provides initial evidence on whether these variables may indeed affect the reallocation process.[29]

The identification assumption differs according to the source of variation we are exploiting. In the case of country characteristics, we need that neither intensity nor timing/frequency determi-

[29] Our baseline regressions include also the interaction of rule of law and sudden stops as a way to capture the general institutional environment in the country.

nants of sudden stops are correlated with labor market regulations or their determinants. Suppose a country is pegging its nominal exchange rate, if tighter labor market regulations make the country less likely to defend against a speculative attack because the cost of the defense is higher, we would have a case where there is some reverse causality and hence our identification assumption is violated. Similarly, if labor market regulation is endogenous to the intensity and/or frequency of sudden stops, then the same problem would arise.[30]

In the case of sector level variation, the identification assumption is milder and more likely to hold. We need any determinant of the sudden stop (or its size) not to be systematically correlated with sector characteristics that determine the sensitivity of firms in each sector to the sudden stop, which in our case are financial dependence and liquidity needs (or any other sector characteristic that is correlated with any of these two characteristics). Notice that it does not require the sudden stop to be independent of country characteristics, but to be uncorrelated with determinants of the sector specific sensitivity to them. We believe this condition to be weaker than the one mentioned in the paragraph above, and also likely to hold in our sample.

Our discussion above implies that of the two sets of estimates we obtain, it is more plausible to give some structural or causal interpretation to the sector characteristics. Even if we were not able to interpret some of the coefficients as causal effects, our results are still interpretable as stylized facts about correlations between financial characteristics and the extent of the response of sectoral gross job flows to sudden stops.

The use of US-based measures has caused some controversy in the literature because of the assumption that we can extrapolate to different countries. There are two elements to consider in this respect. First, there is evidence that rankings based on the RZ (1998) measure of financial dependence performs well in other countries. Second, as we are interested in intrinsic (most likely technological) characteristics that make sectors differ in their financial decisions, we can think of equation (10) as the reduced form of an IV estimation where the US-based measure is used as an instrument for the country specific variables.

5 Results

5.1 Sudden Stops and Labor Flows

The main results for the effects of sudden stops can be observed in the top row of each panel in tables 3 and 4. Table 3 shows the effects on job creation, where we can see that, after controlling for labor regulation and sectorial financial exposure, sudden stops have a (weakly significant) negative effect on job creation by all firms. We can also see that the results are very similar if we compare the *all* and *continuing* plant series; this implies that the responses are not concentrated on existing

[30] Another potential source of concern would be if contagion is selective, i.e. international investors liquidate their positions first in countries that are more likely to suffer (like in a currency attack model).

plants adjusting their size, but they seem to affect other margins too. The results for job destruction are in the first row of each panel in table 4; there we observe that during sudden stops destruction is between 50% and 85% larger than in an average year (in the average sector and country), implying a very large effect of sudden stops on labor flows, particularly on destruction of jobs. As in the case of job creation, we can also see that the effect of sudden stops is not sensitive to the use of *all* or *continuing* plant series.

Although not surprising, these results are important, particularly because they imply that labor market flows (and potentially frictions) are relevant in any model that wants to explain the economic effects of sudden stops on a developing economy. In particular, higher destruction and depressed creation hint that at least within manufacturing the adjustment requires a change in the direction of the flows, hence the speed of the recovery will definitely be affected by the particular characteristics of the labor market.

A Detour: Labor Market Regulation. In our main specification (equation 10) we also include as a control the interaction between our labor market regulation measure and the sudden stop variables (δ in our regression). This coefficient reflects the variation in the response of labor flows to a sudden stop that arises from the different levels of labor market regulation. Although many theoretical models predict these type of effects, the empirical literature available has not been successful in identifying them. In our case, we do not identify the effects during tranquil times, but are able to discuss the relative magnitude of the reaction to a shock. We believe an exploration of this particular result, while interesting, is for now beyond the scope of this paper (and of the data we have at hand).[31]

Table 3 present the effects on job creation. We can observe a significant negative effect on job creation by continuing firms, with a point estimate of roughly 0.1, implying that for the *average* sector, job creation would be 4.4 percentage points lower if moved from Colombia to Brazil (the minimum and maximum of labor regulation in our sample) during a year long sudden stop.[32] For the case of data for all plants, we do not find evidence of a significant effect of labor market regulation. Results for job destruction are presented in the second row of each panel in table 4. As expected, we find a significant negative effect of labor market regulation on job destruction during a sudden stop. For the case of continuing plants, our point estimate implies that moving from Colombia's to Brazil's labor regulation level would decrease job destruction by approximately 6 percentage points. The effect on job destruction of all plants is somewhat smaller and less significant, but it is still robust to the inclusion of sectorial controls. We perform one further exploration of the relation between firing costs and job flows during sudden stops. We use data on labor reallocation, defined as the sum of job creation and job destruction, by sectors in the US, taken from Micco and Pages (2006), and interact it with the sudden stop variable and the labor market regulation measure.

[31] As we explained before in our discussion on the sources of identification we exploit, these results must be treated with caution.

[32] Remember that our main results include a variable that measures the fraction of the year a country is in sudden stop (taking values from 0 to 1 at intervals of 0.25).

The results are in line with our previous results, but they also imply that firing costs and dismissal procedures affect the most those sectors with higher labor reallocation.[33]

5.2 Sectoral Effects

While the results on the average effect of sudden stops are important and highlight an aggregate pattern for the effects in manufacturing sectors, they also hide significant differences across sectors. As we mentioned before, figure 1 shows the sector specific response of job creation to a sudden stop. There we can see that the responses to the sudden stop differ by sector, a pattern that can also be observed in the case of job destruction, regardless of whether we use data for continuing or all plants. Previous literature and our theoretical framework suggest that financial fragility or exposure to financial market conditions are likely to affect hiring and firing decisions by firms: new projects may be delayed, some plants/firms may reduce their scale because of financing problems, etc. Motivated by this we now turn our attention to the relation between sector specific responses of job destruction and job creation to sudden stops and financial characteristics of the sectors, dependence on external financing and liquidity needs.[34]

5.2.1 (Long-run) Financial Dependence

Tables 3, and 4 present the results of our benchmark estimations. The rows labeled *Fin1*SS* correspond to the interaction of the RZ (1998) measure of financial dependence by sector with the sudden stop. We can observe a clear pattern; job creation is lower during sudden stops and more so in sectors with higher financial dependence. Moreover, there is some weak evidence that new firms are more sensitive to financial dependence, as the point estimates for all plants/firms are larger in absolute value than the ones for continuing firms only. The rows labeled as *Fin2*SS* and *Fin3*SS* correspond to two alternative (more recent) measures of the Rajan-Zingales indicator; the picture that emerges from them is the same, although with smaller coefficients. In this case the difference on the effect on job creation between all and continuing plants is smaller too. It is important to mention that there are also differences in the exact way these measures deal with potential heterogeneity across subsectors, and this does not seem to affect the point estimates, suggesting we are indeed capturing a technological component in this respect.[35]

Our main results using *Fin1*SS* suggest that during a year long sudden stop, job creation in the sector with the highest financial exposure is approximately 2.7 percentage points smaller than

[33] Results are available upon request from the authors.

[34] Another margin refers to destruction of plants and the consequent separation of workers, unfortunately, as we mentioned before, we cannot study this last channel.

[35] We also tried a "pooled" specification with data from both continuing and all plants. We find the same results for the general effect of sudden stops. The relation between specific sector responses and financial characteristics is also robust to this change: investment related financial characteristics (RZ) are related to a larger decrease in creation, while sectors with higher values of the liquidity variables experience larger increases in destruction.

in the sector with the smallest financial exposure, and approximately 1.6 percentage points smaller than in the average sector of our sample.[36]

5.2.2 (Short-run) Liquidity Needs

The results for short-run liquidity needs are in the rows labeled as *CCC*SS* (for the cash conversion cycle variable) and *(I/S)*SS* (for inventories over sales) in tables 3 and 4. The results are extremely clear and complement the results for the (long-run) financial dependence variables. We observe that while most of the coefficients are negative for job creation they are not statistically significant. The opposite picture arises in the case of job destruction in table 4, where the coefficients are positive and statistically different from 0. Notice also that although the numbers are slightly smaller for continuing firms, they are not very different from the results using the data for all firms. The results are also relevant in magnitude, for the case of continuing plants, on average the sector with the highest cash conversion cycle variable exhibits a job destruction flow 3.9 percentage points higher than the sector with the lowest value.[37] In the case of the inventories to sales ratio, the difference between the maximum and the minimum is associated with an average increase in job destruction of approximately 3.1 percentage points. These numbers represent approximately between two-fifths and one-half of the effect of a sudden stop on job creation in the average sector (using the data on continuing firms).[38] Overall, these results suggest that patterns of job flows across sectors during a sudden stop are related to the financial characteristics of the sectors.

It is important to emphasize that for both measures of financial characteristics, financial dependence and liquidity needs, the effects remain significant even if we include them together in our baseline regressions. There is one result we would like to highlight: the difference in the margins to which each financial variable is related. This dichotomy is interesting and we believe it to be reasonable, particularly in light of the mechanisms highlighted in our simple model in section 3; furthermore, these effects on separate margins are also robust to changes in the specification of the regressions. This is a new result in the literature on financial frictions and sector outcomes; previous results, see for example Braun and Larrain (2005), Larrain (2006), Raddatz (2006) and references therein, just show that both dimensions are correlated with volatility at the sectoral level, but do not distinguish between both margins –because of the lack of data. Analyzing two separate margins on gross flows allows us to depict a slightly more detailed picture of the mechanics behind some of this correlations; we believe this to be evidence that there is indeed a connection to both aspects of finance, as suggested by our simple model, and that we are not capturing a more general idea of financial constraints. From the point of view of the effects of sudden stops,

[36] The same numbers are 1.8 and 1.0, respectively, for continuing plants only.

[37] The maximum value, after removing the sample mean is 0.416, and the minimum is −0.495; hence the difference is approximately 0.9. Multiplying this number for the estimated coefficient for *CCC*SS* gives the number in the text.

[38] The minimum value of *(I/S)*SS*, after removing the sample mean is −0.053, and the maximum is 0.057; hence the difference is approximately 0.11. The effect in the text is the product of the estimated coefficient (0.285) and the difference we just mentioned.

the point estimates also suggest that financial characteristics play a role in net job flows and total reallocation, defined as the sum of creation and destruction for a sector, during a sudden stops.[39]

A "Back of the Envelope" Calculation. In the above sections we have presented evidence that sector specific responses are related to financial characteristics of the sectors. However, we would like to give a sense of how important is the aggregate effect on job flows that is attributable to these sector differences. Given that our identification relies on variation within a country, we can answer this using a counterfactual exercise.

Consider a particular country, at a certain moment in time, each sector represents a particular share of manufacturing employment and has its particular measures of financial characteristics. Let us then construct another economy with the same shares of employment for each sector, but where all sectors have financial characteristics equal to the minimum value observed in the sample. Using the coefficients from tables 3 and 4 and the sectoral employment shares for the case of Chile, we estimate that the effect of a sudden stop on job destruction would be between 1.73, for continuing plants, and 2.02, for all plants, percentage points lower in this economy as compared to one with the same employment shares but the original measures of financial dependence.[40] These effects represent approximately between 17% and 23% of the average destruction rate for Chile in our sample.

We can also compute the effect on job creation using the same counterfactual economy. In this case the numbers are smaller. Job creation would be slightly larger in our counterfactual economy, 1 and 0.3 percentage points higher for all and continuing plants respectively; the effects are between 8% and 4% percent of average job creation in the sample for Chile.

5.2.3 Real Exchange Rate Channel

In many cases sudden stops are accompanied by abrupt changes in relative prices, particularly in the real exchange rate. Consequently our sudden stop variable may be capturing, partially at least, the effect of real exchange rate changes during the periods of current account reversals. We thus add the real exchange rate (in different specifications) to our baseline regression, and we estimate

$$y_{ijt} = \alpha S_{jt} + \beta x_{jt} + \delta m_j S_{jt} + \rho z_i S_{jt} + \pi RER_{jt} + \mu + \varepsilon_{ijt}, \tag{14}$$

where all variables are as defined in section 4.1, and RER_{jt} is a measure of the real exchange rate. The results are presented in table 5. We can see that both for creation and destruction our results on the sectoral financial characteristics are robust to the inclusion of real exchange rates, both in

[39] These results are confirmed with regressions using net and total flows for a sector as left-hand side variable. However, results in these cases are slightly less robust to the inclusion of both financial variables together, but in no case are signs overturned nor the magnitudes themselves are affected.

[40] We take the shares of employment to be equal to the average in Chile between 1992 and 1997, right before the sudden stop suffered after the Asian crises.

levels and changes. The point estimates do not change significantly and they remain significant.

The results for the real exchange rate present also some interesting facts. The estimated values of π imply that a more depreciated real exchange rate (a higher measured real exchange rate according to our definition) is associated with higher job creation and lower job destruction; this result is not surprising as the sectors included in our sample can be safely considered tradable sectors. This also implies that if a depreciated real exchange rate accompanies a sudden stop it may help counteract the effects on job flows.

Even within manufacturing we may expect to have that different sectors might have different sensitivity to real exchange rate variation. In particular we estimate

$$y_{ijt} = \alpha S_{jt} + \beta x_{jt} + \delta m_j S_{jt} + \rho z_i S_{jt} + \widetilde{\pi}_i RER_{jt} + \mu + \varepsilon_{ijt}, \tag{15}$$

where $\widetilde{\pi}_i$ is a sector specific sensitivity to the real exchange and the rest of the variables are as in equation (14). First of all we can see in table 5, columns 5-8 that the results on finance and sectoral responses, the vector ρ, are robust to sector-specific responses to real exchange rates. This specification also allows to estimate the sector specific responses $\widetilde{\pi}_i$; our results indicate a positive and significant effect of the real exchange rate but the point estimates are different in magnitude for each sector.[41]

5.3 Robustness Checks

In order to check the robustness of our results we perform two different tests. First, we reestimate our main equations with a restricted sample that considers data only after 1990. Additionally we perform a second check, and estimate the main equations using country-time fixed effects in addition to the interaction of financial dependence and sudden stop variables.

Restricted Sample: 1990-2000. There are two main reasons why restricting the sample in the regressions could potentially lead to changes in the results. First, given the unbalanced panel data, we repeat our benchmark regressions using data only from the 1990s. Chile is usually identified as having done reforms earlier than the rest of the Latin America. In our sample it also is the only country for which we identify a sudden stop in the 1980s. Consequently we eliminate the series of data available for the 1980s from Chile and Colombia. This reduces our sample to 296 observations and we lose the debt crisis observations for Chile. Hence, this sample change reduces the weight of Chile and Colombia in our estimates, yielding a more homogeneous set of observations.

Second, our labor regulation and financial dependence variables are both measured in the 1990s,

[41] If we use the changes in the real exchange instead of the level we observe that a real exchange rate depreciation is associated with lower creation and higher destruction. However, in this case the effects are not robust to allowing for heterogeneity across sectors and are not significant in most of the specifications. More importantly for us, the results on financial characteristics are robust to the inclusion of the changes in the exchange rate.

hence restricting the sample also allows us to avoid problems arising from changes in both measures coming from labor or financial market reforms.

The results using the restricted sample with observations after 1990 are in Tables 6 (creation) and 7 (destruction). Qualitatively the picture remains similar to our results with the full sample. Sudden stops are also periods in which we find significant increases in job destruction across the board, with relatively similar magnitudes too.

Evidence for financial dependence at the sector level is also similar to the results in our regressions using the full dataset. Higher financial dependence is correlated with lower creation during sudden stops, with point estimates of similar magnitude to the ones before. We also observe some evidence of more sensitivity by new firms in the samples. Although all coefficients are positive, we do not find significative effects of financial dependence on destruction, which confirms the same qualitative results we described in section 5.2.

The results on liquidity needs show a slightly different pattern. The effect on continuing firms is robust to the sample change, confirming the positive correlation between liquidity needs and job destruction. On the other side, the effects on all firms lose some significance and the point estimates are somewhat different, but still with the same sign, implying a positive but not very significant correlation between job destruction and liquidity needs. Given the robustness of the estimates for continuing firms, the main reason must be connected to new firms.

Regarding labor market regulation, we observe a negative effect on job destruction, with an effect on destruction on all firms that is more than twice as large as before (and more significant too), while for continuing plants, the effect is of the same magnitude.

Time-Country Fixed Effects Regression. Given that not all sudden stops are equal, we may be concerned that the aggregate responses at the country level might differ–either because the country itself is more sensible to sudden stops or because sudden stops are different across countries and time. For example, exchange rate policy responses may vary and hence not all the resulting changes need to be the same. If different firms respond more to financial aspects (because of currency or maturity mismatch), then the exact mix of outflow and other aggregate effects of the sudden stop may matter.[42]

To address this issue, at least in part, we reestimate the regressions with the full set of country-time fixed effects. This specification captures any time varying variable at the country level, but it does not control for interactions of these variables and sector specific effects, as we did before in the case of real exchange rates. The results are presented in Tables 8 and 9, where we observe that our previous estimations of the effect of sectorial exposure remain robust to the inclusion of country-time fixed effects. Furthermore, the point estimates do not change much when compared to those in our benchmark specifications in tables 3 to 4, and hence the interpretation of the effects

[42] Financial conditions are not the only ones. As previously discussed, sudden stops may also affect domestic demand conditions, hence affecting all sectors through a demand component.

remains the same.

We also ran this specification with the restricted sample from the 1990s only. As we explained before, this leads to a significant reduction on the sample size, and so the standard errors are likely to increase in this specification. Leaving aside this consideration, the coefficients on the sectoral financial characteristics are not sensitive to the inclusion of the country-time fixed effects. The point estimates are remarkably similar to the ones in tables 6 and 7.[43] All in all, these additional regressions confirm that at least the correlations between sector characteristics and the responses to sudden stops, as measured by gross job flows, are indeed robust to country-time aggregates omitted in the main specifications.

Additionally, and consistent with the concern that our sudden stop interactions could be capturing some interaction between country and sector characteristics, we also run the regressions with additional controls. First, we use time-sector fixed effects, and obtain point estimates and standard errors of the same magnitude as in the baseline regressions. Second, we control for both time-country and time-sector fixed effects, and if anything our results appear to be stronger than in the baseline specifications, although the differences are not particularly large.

6 Conclusions and Future Research

This paper studies the effects of sudden stops on job creation and destruction in a sample of Latin American countries, as captured by a measure of gross job flows at the sector level.

We find consistent evidence that sudden stops are associated with decreased job creation and increased job destruction. Importantly, we also observe the effects of the sudden stops on job creation to be heterogeneous and that this heterogeneity is related to financial characteristics of the sector: job creation tends to react more to sudden stops in sectors with strong dependence on external finance. Similarly, the increasing effect of sudden stops on job destruction is also related to financial characteristics of the sector but of a different nature: the response of job destruction is larger in sectors with higher liquidity needs. A back of the envelope calculation suggests that the total effect of financial variables is not negligible.

Studying the connection between reallocation and restructuring, and financial characteristics in response to sudden stops moves us forward in two different, but related, areas. First, and central to the main interest of this paper, it provides us with a novel look at the mechanics of sudden stops within countries. Since differences in the creation and destruction flows can affect the speed of adjustment and recovery during and after shocks, our results also signal the relevance of further studying the dynamics of the flows in the labor markets before, during and after a sudden stop. This paper also provides some prima facie evidence that restructuring, as evidenced by gross job flows, is indeed a possible reason why responses may differ across countries and across

[43] Detailed results are available upon request from the authors.

sudden stops. Moreover, to the extent that the responses of different sectors are correlated with financial characteristics, the empirical results also suggest that we should incorporate financial market frictions into our study of the effects of sudden stops and why these differ across countries. The results on the relation between external financial dependence (RZ type of measures), liquidity needs (e.g. cash conversion cycle), and the response of gross job flows to a country level shock, a sudden stop in this case, also complement previous studies on the relation between financial frictions and sectoral outcomes, in particular with respect to the effects on volatility and sensitivity to shocks.

Finally, as sudden stops constitute large financial shocks for a country as a whole, we also contribute to the literature on job flows, reallocation/restructuring, and financial conditions by presenting additional evidence from this "extreme" shock in emerging economies, which complements the existing evidence drawn from the effects of recession and business cycles in developed economies. The relation between sectoral financial characteristics, sector responses to sudden stops and the financial nature of the shock lends support to the idea that financial conditions do matter for the process of restructuring. Moreover, these results are qualitatively relevant for other situations and relate to the existing evidence on the microeconomic responses to macroeconomic shocks, particularly about the different responses of job creation and destruction.

Future Research. While the welfare implications of our results are not clear, they motivate some different areas of research within the study of sudden stops. A potential way to proceed is to embed some of the results from this paper into a multi-sector open economy model. Such a model allows us to evaluate the overall impact of a sudden stop on sectoral reallocation and gross job flows. In particular, evaluating the effects sectoral reallocation and job market flows can have on aggregate variables –such as employment, unemployment, measured productivity and wages, and the dynamics of the recovery in general equilibrium– will help us answer how important this channel can be when understanding the responses of countries to sudden stops. Finally, calibrating a model of this type provides some guidance about optimality of responses and can allow us to put the estimated effects in terms of welfare and efficiency measures.

While assessing the aggregate magnitudes and the importance of the channel at a sector level is an important first step, we can also explore within sector effects that are also relevant. For example, the use of a richer dataset in plant level information would allow us to explore more precise patterns of reallocation within and across sectors. A wealth of data in this dimension can also allow us to explore the dynamics of the response to the shocks, productivity and firm size for example, and the extent to which financial characteristics and financial frictions can affect the reallocation flows. In this same direction, it would be interesting to see what margins are affected the most during the recovery phase, as there is evidence that depressed creation seems to be the main reason why recoveries differ, as suggested by Caballero (2007) and others. Unveiling firm patterns within sectors will further contribute to understanding of the effects of sudden stops, and it may also help uncover specific microeconomic channels that explain the patterns and relations we observed in our study of the effects at the sector level.

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Table 1. Descriptive Statistics: Job Creation and Destruction, main countries. Numbers in parenthesis are years included in the data.

Brazil (1992-2000)

Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	72	0.088	0.024	0.044	0.147
Creation	All	72	0.158	0.035	0.085	0.245
Destruction	Cont	72	0.108	0.026	0.056	0.183
Destruction	All	72	0.164	0.032	0.104	0.263

Chile (1980-99)

Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	160	0.082	0.041	0.006	0.213
Creation	All	160	0.119	0.055	0.010	0.267
Destruction	Cont	160	0.074	0.046	0.005	0.294
Destruction	All	160	0.119	0.070	0.005	0.370

Colombia (1977-91; 1993-9)

Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	189	0.067	0.026	0.011	0.135
Creation	All	189	0.095	0.034	0.025	0.197
Destruction	Cont	189	0.105	0.043	0.029	0.316
Destruction	All	189	0.103	0.042	0.029	0.310

Mexico (1994-2000)

Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	63	0.126	0.041	0.064	0.254
Creation	All	63	0.174	0.055	0.098	0.310
Destruction	Cont	63	0.078	0.029	0.035	0.171
Destruction	All	63	0.105	0.041	0.047	0.232

Main Countries

Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	484	0.083	0.038	0.006	0.254
Creation	All	484	0.123	0.053	0.010	0.310
Destruction	Cont	484	0.092	0.043	0.005	0.316
Destruction	All	484	0.118	0.055	0.005	0.370

All Countries: Main Countries plus Argentina and Uruguay

Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	646	0.075	0.038	0.006	0.254
Destruction	Cont	646	0.091	0.041	0.005	0.316

Table 2. Sample Coverage and Years in Sudden Stop

Country	Sample	Year in SS
Brazil	1992-2000	1997-9
Chile	1980-1999	1981-4, 1998-9
Colombia	1978-1991, 1993-1999	1998-9
Mexico	1994-2000	1994-5
Argentina	1991-2001	1994-5, 1998-2001
Uruguay	1989-1995	None

Source: Authors' calculations.

For a detailed description of the definition of a sudden stop see section 4.2.

Table 3. Job Creation, main countries.
Dependent variable is *Creation* for all and continuing plants, as written on each panel. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. Country, time and sector fixed effects are included, we also control for Rule of law.

Panel (a). All Plants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	-0.03	-0.031	-0.031	-0.025	-0.031	-0.031	-0.031
	[0.017]*	[0.016]*	[0.017]*	[0.017]	[0.016]*	[0.017]*	[0.016]*
Labor*SS	0.042	0.045	0.044	0.044	0.045	0.044	0.044
	[0.063]	[0.064]	[0.065]	[0.063]	[0.063]	[0.064]	[0.064]
Fin1*SS		-0.093					-0.099
		[0.038]**					[0.053]*
CCC*SS			-0.024				0.004
			[0.017]				[0.023]
Fin3*SS				-0.055			
				[0.019]***			
Fin2*SS					-0.055		
					[0.020]***		
(I/S)*SS						-0.117	
						[0.133]	
N. Obs.	484	484	484	484	484	484	484
R-squared	0.62	0.63	0.62	0.63	0.63	0.62	0.63

Panel (b). Continuing Plants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.009	0.008	0.008	0.012	0.008	0.009	0.008
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
Labor*SS	-0.099	-0.097	-0.098	-0.097	-0.097	-0.099	-0.098
	[0.047]**	[0.048]**	[0.048]**	[0.048]**	[0.048]**	[0.047]**	[0.048]**
Fin1*SS		-0.057					-0.077
		[0.028]**					[0.039]**
CCC*SS			-0.008				0.014
			[0.013]				[0.017]
Fin3*SS				-0.04			
				[0.015]***			
Fin2*SS					-0.04		
					[0.015]***		
(I/S)*SS						0.012	
						[0.099]	
N. Obs	484	484	484	484	484	484	484
R-squared	0.56	0.56	0.56	0.56	0.56	0.56	0.56

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table 4. Job Destruction, main countries.
Dependent variable is *Destruction* for all and continuing plants, as written on each panel. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. Country, time and sector fixed effects are included, we also control for Rule of law.

Panel (a). All Plants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.087	0.088	0.089	0.083	0.088	0.089	0.089
	[0.020]***	[0.019]***	[0.019]***	[0.020]***	[0.019]***	[0.019]***	[0.019]***
Labor*SS	-0.116	-0.119	-0.121	-0.118	-0.118	-0.12	-0.121
	[0.064]*	[0.064]*	[0.063]*	[0.064]*	[0.064]*	[0.063]*	[0.063]*
Fin1*SS		0.082					0.013
		[0.050]					[0.072]
CCC*SS			0.051				0.047
			[0.019]***				[0.029]*
Fin3*SS				0.042			
				[0.024]*			
Fin2*SS					0.026		
					[0.026]		
(I/S)*SS						0.325	
						[0.144]**	
N. Obs	484	484	484	484	484	484	484
R-squared	0.62	0.62	0.62	0.62	0.62	0.62	0.62

Panel (b). Continuing Plants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.087	0.087	0.088	0.083	0.087	0.088	0.088
	[0.018]***	[0.017]***	[0.017]***	[0.018]***	[0.018]***	[0.017]***	[0.017]***
Labor*SS	-0.15	-0.152	-0.154	-0.152	-0.151	-0.154	-0.154
	[0.054]***	[0.054]***	[0.054]***	[0.054]***	[0.054]***	[0.054]***	[0.054]***
Fin1*SS		0.056					-0.012
		[0.045]					[0.060]
CCC*SS			0.043				0.047
			[0.016]***				[0.023]**
Fin3*SS				0.037			
				[0.023]			
Fin2*SS					0.026		
					[0.023]		
(I/S)*SS						0.285	
						[0.121]**	
N. Obs	484	484	484	484	484	484	484
R-squared	0.61	0.61	0.62	0.61	0.61	0.62	0.62

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table 5. Real Exchange Rates, Financial Variables, and Job Destruction and Creation, Main Countries.
Dependent variables as indicated on headers of panels. Estimates correspond to the specifications on equations (14) and (15), see section 5.2.3. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. All regressions include time, country and sector fixed effects. We also control for labor market regulation and rule of law.

Panel (a). Destruction.

	All Plants		Continuing Plants		All Plants		Continuing Plants	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SS	0.094	0.095	0.093	0.094	0.095	0.096	0.095	0.096
	[0.019]***	[0.018]***	[0.017]***	[0.017]***	[0.018]***	[0.018]***	[0.017]***	[0.017]***
$Fin1 * SS$	0.085		0.06		0.086		0.055	
	[0.050]*		[0.044]		[0.050]*		[0.045]	
$CCC * SS$		0.052		0.044		0.047		0.04
		[0.018]***		[0.016]***		[0.019]**		[0.016]**
$\ln(RER)$	-0.056	-0.056	-0.054	-0.054				
	[0.020]***	[0.020]***	[0.014]***	[0.014]***				
$\ln(RER)$ $*Sector$	No	No	No	No	Yes	Yes	Yes	Yes
N. Obs.	466	466	466	466	466	466	466	466
R-squared	0.62	0.62	0.63	0.63	0.64	0.64	0.64	0.64

Panel (b). Creation.

	All Plants		Continuing Plants		All Plants		Continuing Plants	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SS	-0.041	-0.041	0.001	0.002	-0.04	-0.04	0.002	0.002
	[0.015]***	[0.016]***	[0.011]	[0.011]	[0.015]**	[0.016]**	[0.011]	[0.012]
$Fin1 * SS$	-0.092		-0.056		-0.097		-0.057	
	[0.038]**		[0.028]**		[0.038]**		[0.028]**	
$CCC * SS$		-0.026		-0.01		-0.031		-0.012
		[0.017]		[0.013]		[0.016]*		[0.013]
$\ln(RER)$	0.086	0.086	0.06	0.06				
	[0.018]***	[0.018]***	[0.014]***	[0.014]***				
$\ln(RER)$ $*Sector$	No	No	No	No	Yes	Yes	Yes	Yes
N. Obs.	466	466	466	466	466	466	466	466
R-squared	0.64	0.64	0.58	0.58	0.65	0.65	0.58	0.58

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table 6. Job Creation, main countries 1990-2000.
Dependent variable is *Creation* for all and continuing plants, as written on each panel. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. Country, time and sector fixed effects are included, we also control for Rule of law.

Panel (a). All plants.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.007	0.006	0.006	0.012	0.006	0.006	0.006
	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]
Labor*SS	-0.074	-0.071	-0.071	-0.071	-0.071	-0.072	-0.071
	[0.110]	[0.111]	[0.110]	[0.111]	[0.110]	[0.110]	[0.111]
Fin1*SS		-0.093					-0.103
		[0.045]**					[0.059]*
CCC*SS			-0.023				0.006
			[0.022]				[0.028]
Fin3*SS				-0.058			
				[0.024]**			
Fin2*SS					-0.055		
					[0.025]**		
(I/S)*SS						-0.137	
						[0.164]	
N. Obs	296	296	296	296	296	296	296
R-squared	0.61	0.61	0.61	0.62	0.61	0.61	0.61

Panel (b). Continuing plants.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.028	0.028	0.028	0.032	0.028	0.028	0.028
	[0.024]	[0.024]	[0.024]	[0.024]	[0.024]	[0.024]	[0.024]
Labor*SS	-0.163	-0.161	-0.162	-0.161	-0.161	-0.163	-0.162
	[0.080]**	[0.080]**	[0.080]**	[0.081]**	[0.080]**	[0.080]**	[0.080]**
Fin1*SS		-0.057					-0.078
		[0.034]*					[0.040]*
CCC*SS			-0.008				0.014
			[0.017]				[0.020]
Fin3*SS				-0.038			
				[0.020]*			
Fin2*SS					-0.037		
					[0.019]*		
(I/S)*SS						-0.01	
						[0.121]	
N. Obs	296	296	296	296	296	296	296
R-squared	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table 7. Job Destruction, main countries 1990-2000.
Dependent variable is *Destruction* for all and continuing plants, as written on each panel. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. Country, time and sector fixed effects are included, we also control for Rule of law.

Panel (a). All firms.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.175	0.176	0.177	0.171	0.176	0.177	0.177
	[0.034]***	[0.033]***	[0.033]***	[0.034]***	[0.033]***	[0.033]***	[0.033]***
Labor*SS	-0.377	-0.38	-0.381	-0.38	-0.379	-0.381	-0.382
	[0.103]***	[0.103]***	[0.102]***	[0.103]***	[0.103]***	[0.103]***	[0.103]***
Fin1*SS		0.08					0.047
		[0.058]					[0.084]
CCC*SS			0.035				0.022
			[0.021]*				[0.032]
Fin3*SS				0.044			
				[0.030]			
Fin2*SS					0.033		
					[0.031]		
(I/S)*SS						0.209	
						[0.172]	
N. Obs	296	296	296	296	296	296	296
R-squared	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Panel (b). Continuing firms.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.078	0.08	0.081	0.075	0.079	0.08	0.081
	[0.024]***	[0.024]***	[0.023]***	[0.024]***	[0.024]***	[0.024]***	[0.023]***
Labor*SS	-0.126	-0.128	-0.13	-0.128	-0.128	-0.13	-0.13
	[0.072]*	[0.072]*	[0.071]*	[0.072]*	[0.072]*	[0.071]*	[0.071]*
Fin1*SS		0.081					0.032
		[0.048]*					[0.066]
CCC*SS			0.042				0.033
			[0.017]**				[0.025]
Fin3*SS				0.044			
				[0.026]*			
Fin2*SS					0.036		
					[0.026]		
(I/S)*SS						0.289	
						[0.130]**	
N. Obs	296	296	296	296	296	296	296
R-squared	0.59	0.59	0.6	0.6	0.59	0.6	0.6

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table 8. Job Creation main countries, time-country fixed effects with full sample.
Dependent variable is *Creation* for all and continuing plants, as written on each panel. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. All regressions include time-country and sector fixed effects.

Panel (a). All Plants.						
	(1)	(2)	(3)	(4)	(5)	(6)
Fin1*SS	-0.09					-0.099
	[0.034]***					[0.044]**
CCC*SS		-0.022				0.006
		[0.015]				[0.019]
Fin3*SS			-0.054			
			[0.017]***			
Fin2*SS				-0.053		
				[0.017]***		
(I/S)*SS					-0.101	
					[0.120]	
N. Obs	484	484	484	484	484	484
R-squared	0.76	0.76	0.76	0.76	0.76	0.76
Panel (a). Continuing Plants.						
	(1)	(2)	(3)	(4)	(5)	(6)
Fin1*SS	-0.056					-0.077
	[0.026]**					[0.033]**
CCC*SS		-0.007				0.015
		[0.012]				[0.015]
Fin3*SS			-0.04			
			[0.014]***			
Fin2*SS					-0.04	
					[0.014]***	
(I/S)*SS				0.019		
				[0.094]		
N. Obs	484	484	484	484	484	484
R-squared	0.71	0.71	0.72	0.71	0.72	0.72

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table 9. Job Destruction, main countries, time-country fixed effects with full sample. Dependent variable is *Destruction* for all and continuing plants, as written on each panel. All explanatory variables, except SS, are expressed as deviations with respect to their sample means. All regressions include time-country and sector fixed effects.

Panel (a). All Plants.

	(1)	(2)	(3)	(4)	(5)	(6)
Fin1*SS	0.078					0.013
	[0.046]*					[0.060]
CCC*SS		0.049				0.045
		[0.017]***				[0.024]*
Fin3*SS			0.041			
			[0.022]*			
Fin2*SS				0.025		
				[0.024]		
(I/S)*SS					0.307	
					[0.128]**	
N. Obs	484	484	484	484	484	484
R-squared	0.76	0.77	0.76	0.76	0.77	0.77

Panel (a). Continuing Plants.

	(1)	(2)	(3)	(4)	(5)	(6)
Fin1*SS	0.056					-0.012
	[0.039]					[0.054]
CCC*SS		0.043				0.047
		[0.014]***				[0.021]**
Fin3*SS			0.037			
			[0.019]**			
Fin2*SS				0.026		
				[0.021]		
(I/S)*SS					0.282	
					[0.106]***	
N. Obs	484	484	484	484	484	484
R-squared	0.73	0.73	0.73	0.73	0.73	0.73

Robust standard errors in brackets.

* significant at 10%, ** significant at 5%, *** significant at 1%

A Proofs and Extensions to the Model

A.1 Omitted Proofs from Section 3

Proof of Lemma 1. The entrepreneur problem is

$$\max_k \; w_0 - c(k) + ak + \mu [w_0 - c(k)],$$

where μ is the Lagrange multiplier for the resource constraint $w_0 - c(k) \geq 0$. With unrestricted access to financial markets this constraint is not relevant and the first order condition of the problem implies

$$c'(k) = a,$$

which leads to equation (1).[44] The case with a borrowing constraint is simple, if the first best is achievable, i.e. if $w_0 \geq c\left(k^{FB}\right)$, then $k = k^{FB}$ is the solution; if $w_0 < c\left(k^{FB}\right)$, the entrepreneur will invest the maximum she can. The liquidity shock plays no role because ex-post the entrepreneur can always borrow resources to meet the needs and then return it (as it is not a real cost). ■

Writing the Entrepreneur's Problem in Equation 6. In period 1 the entrepreneur maximizes expected resources in period 3 by choosing the number of production units to build. The expected resources in period 3 is obtained computing the expected value of

$$R(\theta) = \begin{cases} w_0 - c(k) + ak & \text{if } \theta < \theta^* \\ w_0 - c(k) + (a+\eta)\frac{w_1}{\theta} - \eta k & \text{if } \theta \geq \theta^* \end{cases},$$

using the assumption that the lower bound of the distribution is 0:

$$\begin{aligned} R(k|w_0) &= \int_0^{\theta^*} [s_0 + ak] f(\theta) d\theta \\ &\quad + \int_{\theta^*}^{\infty} [s_0 + a \underbrace{\frac{w_1}{\theta}}_{=\lambda} - \eta(k - \underbrace{\frac{w_1}{\theta}}_{=\lambda})] f(\theta) d\theta \\ &= s_0 + \int_0^{\theta^*} akf(\theta) d\theta + \int_{\theta^*}^{\infty} [(a+\eta)\lambda - \eta k] f(\theta) d\theta \\ &= s_0 + \int_0^{\theta^*} [(a+\eta)k - \eta k] f(\theta) d\theta + \int_{\theta^*}^{\infty} [(a+\eta)\lambda - \eta k] f(\theta) d\theta \\ R(k|w_0) &= s_0 + \int_0^{\infty} [(a+\eta)\lambda - \eta k] f(\theta) d\theta, \end{aligned}$$

where in the last step we use the fact that $\lambda = k$ for $\theta < \theta^*$. ■

Proof for Proposition 1. First notice that the problem must admit a solution because the objective function is concave and we are maximizing over a compact set (a closed interval on the

[44] The assumptions about $c(\cdot)$ imply the inverse exists.

real line).

The first order condition is

$$\frac{\partial R}{\partial k} = -c'(k) + \int_0^{\theta^*} af(\theta)\,d\theta - \int_{\theta^*}^{\infty} \left[(a+\eta)\frac{c'(k)}{\theta} + \eta\right] f(\theta)\,d\theta = 0, \tag{16}$$

where θ^* is defined in equation (4).[45]

Let us start with the case when $w_0 < w^{FB}$.

Evaluate equation (16) at $k = 0$, there we obtain

$$\left.\frac{\partial R}{\partial k}\right|_{k=0} = \int_0^{\infty} af(\theta)\,d\theta = a > 0,$$

and that established that $k^*(\cdot) > 0$. On the other hand, at $k = \overline{k}$ we obtain

$$\left.\frac{\partial R}{\partial k}\right|_{k=\overline{k}} = -c'\left(\overline{k}\right) + \int_0^{m/\overline{k}} af(\theta)\,d\theta - \int_{m/\overline{k}}^{\infty} \left[(a+\eta)\frac{c'\left(\overline{k}\right)}{\theta} + \eta\right] f(\theta)\,d\theta,$$

which can be positive or negative. Notice though that for $m = 0$, this expression must be negative; however, as $m \to \infty$, then the expression becomes positive. We can also show that it is monotonically increasing in m, hence there exists a value of m such that this expression is 0, denote this value by $\widehat{m}(w_0, a)$. This implies that if $m > \widehat{m}(\cdot)$, then the solution is such that the entrepreneur invests all her available resources in stage 0, and uses m to cope with the liquidity shock.[46] Intuitively, in this case the shadow value of keeping aside one dollar in stage 0, i.e. creating fewer units, is too high compared to the benefit in terms of saving extra units in stage 1.

Consider now the case when $m < \widehat{m}(\cdot)$, using the fact that θ^* is strictly decreasing on k and continuous on $[0, \overline{k}]$, and the assumption that $f(\theta)$ is strictly positive, we obtain that the right hand side of equation (16) is continuous and decreasing on k, for $k \in \left[0, \overline{k}\right]$. Then, if $m < \widehat{m}(\cdot)$ there is a *unique interior* solution to equation (16) in the interval $\left(0, \overline{k}\right)$. As mentioned before, the second order conditions confirm that the solution to equation (16) is indeed a maxima.[47] This solution implies also that $k^* < k^{BC}$, for $w < w^{FB}$ and $m < \widehat{m}(\cdot)$.

Finally, let us consider the cases when $w_0 > w^{FB}$, so $k^{BC} = k^{FB}$. Notice in this case, for any $m < \infty$, if $k = k^{FB}$ there always is a positive probability of losing at least some units (and maybe

[45] The second order condition confirms that at an interior point, the solution to this equation is indeed a maxima. The proof deals with the cases where one of the corners is a solution.

[46] Intuitively, in this case the shadow value of keeping aside one dollar in stage 0 is too high compared to the benefit in terms of saving extra units.

[47] If we had allowed for $F(\cdot)$ to have an atom at 0, then it would also be possible to have a solution with $k = \overline{k}$ for low enough levels of w_0.

all of them). We can see that k^{FB} cannot be a solution if we evaluate the first order condition,

$$\begin{aligned}\left.\frac{\partial R}{\partial k}\right|_{k=k_{FB}} &= -\underbrace{c'\left(k^{FB}\right)}_{=a} + \int_0^{\theta_{FB}} af\left(\theta\right)d\theta - \int_{\theta^{FB}}^{\infty}\left[\left(a+\eta\right)\frac{c'\left(k^{FB}\right)}{\theta}+\eta\right]f\left(\theta\right)d\theta \\ &= -a\left(1-F\left(\theta^{FB}\right)\right) - \int_{\theta^{FB}}^{\infty}\left[\left(a+\eta\right)\frac{a}{\theta}+\eta\right]f\left(\theta\right)d\theta < 0,\end{aligned}$$

where $\theta^{FB} \equiv \theta^*\left(w_0, m, k^{FB}\right)$. Thus, the entrepreneur will always choose $k^* < k^{FB}$ even if she can pay the creation cost $c\left(k^{FB}\right)$.

The intuition behind this result is not complicated, around the first best a marginal reduction in creation has two benefits: first, at the margin, the expected return of the last unit is negative because the expected return, $aF\left(\theta^{FB}\right)$, is lower than the cost of creating that unit, $c'\left(k^{FB}\right) = a$. Second, it also leads to a reduction in the expected costs coming from destruction as more units can be saved with the extra resources freed in stage 0. Consequently, even if the entrepreneur can afford to invest the first best, it will never be the optimum in our setup to invest up to that level. This implies that $k^* < k^{BC} = k^{FB}$, for $w \geq w^{FB}$. ■

Proof of Proposition 2. To establish that optimal investment is increasing in w_0, we differentiate both sides of equation (16) with respect to w_0 and rearrange terms to obtain

$$\begin{aligned}\frac{dk^*}{dw_0} &= \frac{1}{k^*}\frac{f\left(\widehat{\theta}\right)\left(a+\eta\right)\left(1+\frac{c'(k^*)}{\widehat{\theta}}\right)}{c''\left(k^*\right)\left[1+\int_{\widehat{\theta}}^{\infty}\frac{a+\eta}{\theta}f\left(\theta\right)d\theta\right] - f\left(\widehat{\theta}\right)\left(a+\eta\right)\left(1+\frac{c'(k^*)}{\widehat{\theta}}\right)\left.\frac{d\theta^*}{dk}\right|_{k^*}} \\ &= \frac{\Pi}{c'\left(k^*\right)+\widehat{\theta}} > 0,\end{aligned}$$

where

$$\Pi = \left[1 - \frac{c''\left(k^*\right)\left[1+\int_{\widehat{\theta}}^{\infty}\frac{a+\eta}{\theta}f\left(\theta\right)d\theta\right]}{f\left(\widehat{\theta}\right)\left(a+\eta\right)\left(1+\frac{c'(k^*)}{\widehat{\theta}}\right)\left.\frac{d\theta^*}{dk}\right|_{k^*}}\right]^{-1} < 1,$$

and $\widehat{\theta}$ is given by equation (9). The sign of Π follows from our assumptions about $c\left(\cdot\right)$ and the fact that $\frac{d\theta^*}{dk} = -\frac{c'(k)+\theta^*}{k} < 0$. If the solution is in the region where $k^* = c^{-1}\left(w_0\right)$, then it is clear that creation is also increasing on w_0. A similar argument is true for the case of changes in m, except when in the region where $k^* = c^{-1}\left(w_0\right)$, in which case creation is independent of m.

The effect of η on creation, k^*, is established differentiating both sides of equation (16) with respect to η to obtain

$$\frac{dk^*}{d\eta} = -\frac{1-F\left(\widehat{\theta}\right)}{\Phi} < 0,$$

where

$$\Phi = c''(k^*)\left[1+\int_{\widehat{\theta}}^{\infty}\frac{a+\eta}{\theta}f(\theta)\,d\theta\right]+1+\int_{\widehat{\theta}}^{\infty}\frac{c'(k^*)}{\theta}f(\theta)\,d\theta-f\left(\widehat{\theta}\right)(a+\eta)\left(1+\frac{c'(k^*)}{\widehat{\theta}}\right)\frac{d\theta^*}{dk}\bigg|_{k^*}>0.$$

To derive the effect of w_0 on destruction, differentiate equation (8) with respect to w_0,

$$\frac{d\widehat{D}}{dw_0}=\left(1-F\left(\widehat{\theta}\right)\right)\frac{dk^*}{dw_0}-\left(1-c'(k^*)\frac{dk^*}{dw}\right)\int_{\widehat{\theta}}^{\infty}\frac{1}{\theta}f(\theta)\,d\theta.$$

This expression cannot be signed. A similar result arises if we consider the derivative with respect to m for $m<\widehat{m}$. If we are in the case where k^* is pinned down by w_0, then a fall in m leads to an increase in destruction while a fall in w_0 leads to a fall in destruction.

Finally, the effect of η on destruction is simpler to obtain. First notice that under the assumption of the shock being a pure liquidity shock the firm always wants to save as many units as possible, irrespective of the destruction cost. Hence, any effect of η on destruction must come from the creation side, k^*, and we know that $\frac{dk^*}{d\eta}\leq 0$, implying then that destruction in non-increasing on η. If the investment decision has already been taken, the effect then disappears. ■

Proof of Lemma 2. It follows from differentiating equation (7) with respect to m holding $k=k^*$:

$$\frac{dD}{dm}=-\int_{\widehat{\theta}}^{\infty}\frac{1}{\theta}f(\theta)\,d\theta<0.$$

■

A.2 The Entrepreneur's Problem with Short-run Revenue

Consider the same model outlined in section 3, but assume now that the entrepreneur obtains some revenue from each production unit in stage 1, before the liquidity shock is realized. In particular, a production units is now characterized by a vector (a_1,a_2), where a_1 is the flow generated in stage 1, or short-run revenue, and a_2 is the revenue generated in stage 2. We can think of a_1 as revenue coming from sales paid for in cash, and a_2 as revenue coming from sales paid for using other method of payment that do not immediately generate liquid resources for the entrepreneur.

In this case the entrepreneur problem's at stage 0 is

$$\max_{0\leq k\leq \overline{k}}\; w_0-c(k)+a_1k+\int\left[(a_2+\eta)\lambda(\theta,k)-\eta k\right]f(\theta)\,d\theta,$$

subject to

$$\lambda(\theta,k)\equiv\min\left\{k,\frac{w_0-c(k)+a_1k}{\theta}\right\},$$

and

$$\theta^* (w_0, k) \equiv \frac{w_0 - c(k) + a_1 k}{k}.$$

Now total productivity of the unit equals $(a_1 + a_2)$. In particular, for a given value of (a_1, a_2), there exists a level of w_0 such that the optimal investment uses up all the resources in stage 0, and the firm uses the short-run revenue to cope with the liquidity shock. Outside this region, the solution is qualitatively the same as in the case with all the revenue coming in stage 2. The first best is never achieved, and total investment is increasing in w_0.

Notice also that a higher value of a_1 has two effects. First, it increases total investment by increasing total productivity, an effect that is present in the first best and the second best with a financial constraint in stage 0 only. Second, it alleviates the liquidity constraint in stage 1, hence there is an extra effect on investment because of the shadow value of liquid resources in stage 1.

In the empirical section, our proxy variables for liquidity needs can also be interpreted as mapping sector specific variations in the composition of a_1 and a_2.

B Appendix Tables

Table Appendix A.1. Description of the main variables used in the paper.

Variable	**Source**	**Description**
Destruction	from Haltiwanger et al (2004)	Job destruction by firms in a given sector, country and year; see (13).
Creation	from Haltiwanger et al (2004)	Job creation by firms in a given sector, country and year; see equation (12).
SS	own construction, based on Gallego and Jones (2005)	Fraction of the year that the country is in a sudden stop.
Fin1	own construction based on RZ (1998) data	Mean across subsectors of the original Rajan-Zingales measure of financial dependence.
Fin2	own construction based on Micco and Pages (2006) data	Mean across subsectors of the Micco and Pages (2006) computation of the Rajan-Zingales measure of financial dependence.
Fin3	from Raddatz (2006)	Computation of the original RZ (1998) measure of (long-run) external finance dependence. Unlike our previous two measures, this corresponds to the median firm for the 2-digit sector, and not to the mean of the median firm of each subsector.
I/S	from Raddatz (2006)	Median ratio of inventories to sales in 1980-1989 in the US, using Compustat data.
CCC	from Raddatz (2006)	Median across firms of the cash conversion cycle variable. It estimates the length in days between a firm pays for its raw materials and it receives the payment for the final sales. We express this variable in hundreds of days.
Labor	own construction using data from La Porta et al (2004)	We consider the sum of *firing* and *dismiss*.
LR	from Micco and Pages (2006)	It measures labor reallocation in US industries as the sum of job creation and job destruction as fraction of total employment.
firing	from La Porta et al (2004)	It measures how expensive it is for a firm to fire 20% of the workers; it includes all the compensations and penalties needed to pay in this case.
dismiss	from La Porta et al (2004)	It counts the number of measures a firm must undertake in order to be able to dismiss a worker; the variable used is the ratio of procedures required as a fraction of the total number of procedures considered (seven).
RER	from IFS and local central banks	Effective real exchange rate, year average, 1995=1.

Note: The series *Inv/Sales*, *CCC* and *Fin3* were generously provided by Claudio Raddatz.

Table Appendix A.2. Descriptive Statistics: Job Creation and Destruction. Additional countries are Argentina and Uruguay.

Argentina						
Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	99	0.053	0.023	0.014	0.136
Creation	All	.	.	.	.	.
Destruction	Cont	99	0.089	0.032	0.023	0.208
Destruction	All	.	.	.	.	.

Uruguay						
Variable	Type	Obs	Mean	Std. Dev.	Min	Max
Creation	Cont	63	0.050	0.026	0.006	0.150
Creation	All	.	.	.	.	.
Destruction	Cont	63	0.088	0.043	0.033	0.234
Destruction	All	.	.	.	.	.

Table Appendix A.3. Dataset Characteristics by Country

Country	Argentina	Brazil	Chile	Colombia	Mexico	Uruguay
Type data	Job	Job + Workers	Job	Job	Job + Workers	Job
Source	INDEC	RAI	ENIA	EAM DANE	IMSS	INE
Period	91-01	92-00	80-99	77-91 and 93-99	94-00	89-95
Coverage	Manuf	Private (Formal)	Manuf	Manuf	Private	Manuf
Unit	Firms	Plants	Plants	Plants	Firms	Plants

Table Appendix A.4. Job Creation, continuing plants and all countries. Same as Panel (b), Table 3 but including observations for Argentina and Uruguay. All explanatory variables, except SS, are expressed as deviation with respect to their sample means.
Country, time and sector fixed effects are included, we also control for Rule of law.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	-0.006	-0.006	-0.006	-0.003	-0.006	-0.006	-0.006
	[0.004]	[0.004]*	[0.004]*	[0.004]	[0.004]*	[0.004]	[0.004]*
Labor*SS	-0.051	-0.052	-0.051	-0.052	-0.052	-0.051	-0.051
	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.013]***
Fin1*SS		-0.045					-0.055
		[0.019]**					[0.028]**
CCC*SS			-0.009				0.007
			[0.008]				[0.012]
Fin3*SS				-0.028			
				[0.010]***			
Fin2*SS					-0.028		
					[0.010]***		
(I/S)*SS						-0.021	
						[0.064]	
N. Obs	646	646	646	646	646	646	646
R-squared	0.55	0.55	0.55	0.55	0.55	0.55	0.55

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%

Table Appendix A.5. Job Destruction, continuing plants and all countries. Same as Panel (b) in Table 4 but including observations for Argentina and Uruguay. All explanatory variables, except SS, are expressed as deviation with respect to their sample means.
Country, time and sector fixed effects are included, we also control for Rule of law.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SS	0.035	0.035	0.035	0.031	0.035	0.035	0.035
	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.006]***
Labor*SS	0.05	0.051	0.052	0.051	0.051	0.051	0.052
	[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.018]***
Fin1*SS		0.054					-0.01
		[0.034]					[0.046]
CCC*SS			0.039				0.042
			[0.012]***				[0.017]**
Fin3*SS				0.038			
				[0.018]**			
Fin2*SS					0.027		
					[0.018]		
(I/S)*SS						0.255	
						[0.091]***	
N. Obs	646	646	646	646	646	646	646
R-squared	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Robust standard errors in brackets.
* significant at 10%, ** significant at 5%, *** significant at 1%