Firm Size and Credit in Argentina

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Abstract

The goal of this paper is to study the link between bank credit (and internal funding) and average firm size in Argentina. Besides the fact that economic growth tends to go hand in hand with larger firm size, the topic is of particular interest because of the severe credit crunch in Argentina in the aftermath of the 2001-2002 financial crisis. To this end, a novel three-digit industry-level dataset spanning the 2000-2010 period was constructed. The results confirm the expected positive impact of credit supply on average firm size. Furthermore, the study expands on common knowledge by testing the sensitivity of firm size to internal funding and the differential financing behavior of the primary and the manufacturing sector. The results do not seem to be driven by endogeneity bias.

1. Introduction

Economic growth is more a function of firm size expansion in existing firms than of the creation of new firms (Kumar, Rajan, and Zingales, 1999). This statement, based on international evidence, is also true for Argentina: according to official statistics, existing firms account for 83 percent of gross and 88 percent of net job creation between 2002 and 2011 (Ministry of Labor, 2012). In the same vein, considering the 1996-2011 period, the 70.3 percent increase in total employment was accompanied by an increase in average firm size from 7.5 workers to 10.1 workers.

In light of the central role of firm size in employment and economic growth, the goal of this paper is to determine whether the availability of bank credit, among other determinants, explains the variation in average firm size across industries and over time in Argentina. As long as the ability of firms to grow rests on their ability to obtain external and internal financing to take advantage of good investment opportunities, these financial aspects should be front and center in the analysis of firm size drivers. To this end, we have compiled a novel three-digit industry-level dataset spanning the 2000-2010 period with annual data.

The particularly low degree of credit expansion in Argentina underscores the significance of this country case study. As a result of chronic inflation and recurring systemic crises, financial intermediation in the Argentine banking system has been declining since the 1970s. Private credit to GDP was a mere 24 percent in 1979; currently, it is 14 percent. Business credit represents just 55 percent of private credit, with consumer loans comprising the rest. Most business loans are short-term: 77 percent have a maturity of six months or less, and only 12 percent have terms of one year or more (Central Bank, 2012).[1]

This anemic lending activity is all the more puzzling considering Argentina's impressive economic recovery since 2003. Argentina was able to resume economic growth (growing at an annual rate of over 7 percent in 2003-2011) after the 2001-2002 systemic financial crisis despite the pronounced contraction of the credit-to-GDP ratio, one of the lowest in the world. Argentina is undoubtedly a case of recovery without credit or, for that matter, any other external source of funding: bank credit financed a meager 8.5 percent of gross business investment and stock and

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[1] These trends also emerge from business surveys such as the World Bank's Enterprise Survey, conducted in 2010. When asked if access to finance was a major constraint, 43.5 percent responded in the affirmative, compared to 30.8 percent in other Latin American economies and 31.7 percent worldwide.

bond issues an additional 4.3 percent in the 2004-2009 period (see Bebczuk, 2011, on these figures, and Calvo, Izquierdo, and Talvi, 2006, on so-called Phoenix miracles).[2] Therefore, the influence of credit (and internal financing sources) on productive decisions stands out as an appealing and little-researched investigated topic in a low-credit economy such as Argentina's. The crisis of 2001-2002—an exogenous shock on the business sector with differential effects across industries—will be used for econometric identification purposes.

The paper is divided as follows. Section 2 reviews the literature and explains the methodological approach. Section 3 describes the database, and Section 4 discusses the econometric results. Section 5 closes with some conclusions.

2. Literature Review and Methodological Approach

2.1 Literature Review

A burgeoning literature aims to uncover the determinants of firm size. One of the most influential contributions in recent years is the study by Kumar, Rajan, and Zingales (1999). This paper contributes to the empirical literature by linking financial constraints and firm size. Research in this area faces two main empirical challenges: the *observability of financial constraints* (financial constraints are not directly observable by the researcher) and the potential *endogeneity of the financial constraint/firm size link*. Reverse causality may occur if firm size enhances the ability to tap credit markets, as emphasized in the corporate finance literature (Eckbo, 2008).

Regarding the first issue, two empirical approaches have been applied: The first is that *an industry (not a particular firm) is financially constrained if it deviates from a frictionless degree of financial dependence for this particular industry*. The seminal paper advancing this approach is Rajan and Zingales (1998), which takes the United States as the frictionless benchmark. Subsequent empirical applications include, among many others, Beck et al. (2008) and Catão, Pagés, and Rosales (2009). Second, *a firm is financially constrained if it describes itself as such*. In this case, the essential informational input is a survey asking individual firms whether access to finance acts as a major obstacle to business growth, or whether their loan applications were

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[2] Recalling that Argentina has a bank-centered financial system and thus a shallow capital market, these numbers also attest to the importance of internal funds. Bebczuk (2011) finds that, in the aggregate, 64 percent of gross business investment is internally financed. The World Bank (2011), in its Enterprise Survey on about 1,000 firms, reaches a similar value (64 percent).

rejected by the banking system. Meisenzahl (2011), Angelini, and Generale (2008) and Kuntchev et al. (2012) are among the studies that take this approach. Even though the response by the firm is not directly verifiable by the research, one should expect it to be, on average, a good, first-hand proxy for financial constraints.

In terms of endogeneity bias, the industry financial dependence approach delivers a more dependable response than the self-reported financial constraint approach. After all, the financing structure in the United States is exogenous to other countries, a quality that cannot be claimed under the second approach. However, where the first approach distinctly fails in our view is in the identification of who is financially constrained. In a nutshell, the pitfall of this measure lies in the fact that financial constraints are assumed rather than observed, with the additional disadvantage that the assumptions are not especially plausible from an empirical point of view. This is particularly true when the chosen measure of financial dependence is extrapolated to study country experiences other than that of the United States.

Elaborating on the argument, our reservations about this popular index rest on three factors. The first is the doubtful characterization of the United States as the frictionless financial market. As a matter of fact, the argument does not require the U.S. financial system to be imperfection-free, but just the least imperfect in comparison to other nations. However, this contention is also controversial. For instance, despite its high stock of credit to GDP (193 percent in 2011), other indicators are less compelling. For example, Fan, Titman, and Twite (2010) look at the leverage ratio (financial debt to assets) of listed firms in 39 countries over 1991-2006 and find that, for a whole sample average of 29 percent, U.S. firms are at the low end, with a ratio of 15 percent, ranking 36 out of 39 developed and emerging economies. Furthermore, listed firms in the United States (the ones used to calculate the index) represent a negligible fraction of total firms, which adds to the questionable sample representativeness—out of more than 28 million firms in the country, only 4,200 list their shares in 2011 (World Federation of Exchanges, 2012).

A second problem is the stability of the financial dependence index across countries and over time. Industries may vary their capital-labor mix or adopt different productive technologies in different countries in response to real or financial structural conditions.[3] Financial structure is

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[3] If countries were technologically identical or largely similar, capital intensity should be accordingly similar. However, as an example of how productive technologies can vary across countries, Coremberg (2009) reports the capital-to-output ratio in different countries and industries. For the manufacturing sector, the U.S. ratio is 1.1, but it

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both a technological and a managerial choice. In striving to maximize shareholder wealth, managers look for the financial structure that minimizes the overall cost of capital. Thus, the domestic cost and availability of capital will endogenously influence the mix of debt and other sources across the board, over and beyond the technological features of each industry. As for the time variation, external financing needs (defined by investment expenditures minus internally generated cash flow) may also substantially vary over the business cycle and, perhaps more importantly, cannot be constant over a company's lifetime: to meet its intertemporal financial constraint, a firm may need to tap the financial market in its initial growth stages, but eventually must generate positive net cash flows to repay its debts and compensate its shareholders.

A final and equally important caveat is that the studies focusing on industry financial dependence do not present any evidence on how private credit is actually allocated ex post or whether the allegedly constrained sectors were able to access it. Typically, in explaining industry growth, these papers interact the industry's financial dependence index with a stock measure of credit (e.g., private credit to GDP) assuming, but not checking, whether these prima facie constrained sectors managed to obtain a higher inflow of bank credit in the face of an increase in private credit deepening.

2.2 Empirical Approach

The approach taken in this study is akin to the methodology used by Rajan and Zingales (1998). Despite our objections to the empirical proxies typically used in most applications, we believe that this strategy provides a simple, not overly data-demanding, and technically sound way to address the endogeneity that plagues the link between finance and economic activity. A local financial dependence benchmark is presented to address some of the financial dependence measurement issues mentioned above. Our industry-level dataset does not contain any self-reported measure of financial constraint. This prevents us from applying the second, survey-based methodology presented earlier. In turn, the omission of actual borrowing patterns will be dealt with by way of some robustness exercises, in which the actual association between average business size and debt and internal financing will be explored.

Since employing the United States as a benchmark for industry financial dependence may cause severe distortions, in implementing Rajan and Zingales (1998) to study the Argentine case,

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is 3.0 in Italy, 2.6 in Japan, and 1.6 in Germany. Similar discrepancies are observed for the agriculture sector, with the ratio ranging from 1.9 in the United States to 3.7 in Germany and 10.4 in Japan.

we use a more sensitive local financial dependence benchmark. This has the added advantage of being computed not on a sample but rather on the universe of formal firms in each industry. Our measure of financial dependence will be the leverage ratio (loans to sales) prevalent in 2000 in each industry just before the start of the 2001-2002 crisis. On empirical grounds, this measure overcomes the caveat regarding the doubtful international and time stability of the standard financial dependence index.[4]

It does not follow from here, though, that loans to sales is technically superior to the fraction of investment not financed from cash flow—neither theory nor empirics have yet compared and ranked financial dependence indicators.[5] Nevertheless, when it comes to benchmarking financial dependence in Argentina, this ratio is expected to perform well because, aside from wide dispersion across industries, the degree of credit market imperfection in Argentina was palpably larger after than before the crisis. To reinforce this argument, let us recall that in 2000 the private credit-to-GDP ratio reached 23.9 percent, almost double the average of 12.1 percent in 2001-2010. We expect industries more credit-dependent before the crisis to be hit harder by lower overall bank lending after the crisis.[6]

Specifically, our core formulation is as follows:

$$S_{i,t} = \alpha + \eta \, (FD_{2000} * PC_t) + \theta \, D_i + \lambda \, D_{t} + \varepsilon_{i,t} \qquad (1)$$

where $S_{i,t}$ is the average firm size of industry i at year t (measured by either sales or employees to the number of establishments), FD_{2000} stands for financial dependence (measured by loans to sales) in the year 2000, PC is private credit to GDP each year, and D_i and D_t denote industry and time dummies, respectively. All monetary variables are measured in pesos at 2010 prices. As in Rajan and Zingales (1998), we use private credit to proxy for exogenous variation in loan

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[4] This concern is shared by other scholars applying the same framework. Dell'Ariccia, Detragiache, and Rajan (2004), for example, assert "An important assumption underlying our approach is that external dependence reflects technological characteristics of the industry that are relatively stable across space and time."

[5] This stock measure of leverage is the only measure of financial dependence that can be constructed with our dataset. Data permitting, we would have recalculated the Rajan-Zingales index for our set of Argentine firms. An alternative would be computing it for listed firms, but the small number and sectoral coverage of those firms in Argentina (about 80 companies, against the 93,000 in our database) prevents us from using that proxy. Ideally, since there is no theoretical clarity as to which one is the most accurate, it would be preferable to gather different measures of financial dependence (both flow and stock) for different countries and periods, and check how they compare and perform within this econometric setup. In any case, in defense of the proposed measure, it must be said that stock measures of financial dependence (debt to assets, for instance) are much more stable over time than flow measures.

[6] Apart from the variation across all sectors, we also find and discuss statistical evidence that leverage significantly differs between the primary and the manufacturing sectors, and we use this evidence later on to test whether our empirical model works within each of these two sectors.

availability before and after the crisis, but we will later try other proxies for robustness. This, coupled with the wide variation in financial dependence across industries, allows the identification of the effect of changes in credit on firm size. A positive and significant η would indicate that the financial crisis, via the credit crunch, took a larger toll on those industries that were ex ante more dependent on bank credit. Dell'Ariccia, Detragiache, and Rajan (2004) follow the same approach in testing the impact of banking crises on real economic activity in 41 countries from 1980 to 2000.

Finally, other relevant drivers of firm size, including overall demand and supply characteristics and shocks, are captured by industry and time dummies—the former intended to control for time-invariant, industry-specific features and the latter for any common, time-varying national or international effects. Our dataset contains a limited number of variables and our time series dimension covers just one pre-crisis year (2000), which impairs our ability to control for other factors that might influence average firm size. The dummies are intended to rectify this deficiency. A standard and widely accepted procedure when dealing with this sort of data structure, this is in fact the same strategy followed by Rajan and Zingales (1998), among many related studies.

The procedure crucially hinges on the assumption that the credit crunch in Argentina represented an exogenous credit supply shock. There are two arguments favoring that hypothesis. First, the crisis was the result of macroeconomic (namely, real exchange rate overvaluation) and fiscal disturbances (growing external indebtedness, assessed as unsustainable by the consensus of market players).[7] As banks were heavily exposed to government debt and dollar-denominated loans to peso-generating local borrowers, the sovereign default and the steep devaluation in 2002 brought about the technical bankruptcy of the banking system. Thus, the origin of the crisis was unrelated to any technological shock to the productive sector, although production was subsequently hit by the financial and economic collapse. A second argument is that, in principle, it can be argued that weaker firm balance sheets and the economic downturn caused a shift in credit demand.[8] But if the drop in industry leverage had been caused solely by the retraction in the demand for funding, then the strong post-crisis economic recovery would have largely

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[7] According to Martin Feldstein (2002): "An overvalued fixed exchange rate (locked at one peso per dollar since 1991) and an excessive amount of foreign debt were the two proximate causes of the Argentine crisis."
[8] In this regard, the outstanding credit for the sectors under study accounts for about one third of total private credit, so it is unlikely that movements in the latter are largely explained by changes in the credit demand of those sectors.

restored the leverage levels observed before the crisis. Suffice it to say that real GDP dropped by 15 percent between 2000 and 2002, but then grew by 79 percent from 2003 through 2010. Simultaneously, the credit crunch was accompanied by a brutal and permanent contraction in industry leverage, from an average 13.6 percent in 2000 to a minimum of 3 percent in 2003 and a meager rebound to 6 percent in 2010.[9]

Even so, the procedure still falls short of being bullet-proof. Private credit is an equilibrium outcome between supply and demand. Since supply and demand are not directly observable, private credit alone says nothing about which one is the binding constraint. Some econometric strategies to disentangle demand and supply are presented by Catão (1997), Allain and Oulidi (2009), Dell'Ariccia, Detragiache, and Rajan (2004), and Almeida et al. (2009). In turn, some central banks (e.g., the Federal Reserve and the European Central Bank) employ a survey methodology to assess separately the strength of the supply and the demand for credit by conducting bank questionnaires.

To address this issue, we will adopt loan loss provisioning (as a ratio of private credit), rather than private credit to GDP, as a measure of tighter credit supply standards.[10] Loan loss provisioning is designed to absorb future expected credit losses. When banks envisage deterioration in the borrower's ability and willingness to repay, lending policies become more conservative, especially in times of financial distress and dire economic conditions.[11] Although regulatory provisioning rules exist in all countries, banks may also apply voluntary provisioning as a risk management tool. Beatty and Liao (2009) and Packer and Zhu (2012) support this hypothesis with evidence for a large sample of U.S. and Asian banks, respectively. Thus, loan loss provisioning appears to accurately track credit standards and, as a result of being determined by regulation and by internal bank decisions, is entirely independent of credit demand. This will provide a first robustness check for the baseline regression. The expected sign in this case is

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[9] Calvo (2010) advances the idea that some of the recent financial crises, such as the subprime crisis in the United States as well as the Argentine crisis, were credit supply-driven. Almeida et al. (2009) discuss the difficulty of establishing whether credit crunches are a consequence of supply or demand shifts, concluding, based on a careful microdata analysis, that the U.S. crisis was triggered by a contraction in the supply of loans.

[10] A crisis dummy variable is another option. But since a crisis dummy may capture a number of shocks taking place at the same time on both the financial and the real fronts, the estimated coefficient would lack a clear economic interpretation.

[11] For the Argentine banking system, the loan loss provisioning ratio escalated from 7.2 percent in 2000 and 10.7 percent in 2001 to a peak of 31 percent in 2002. From then on, it dropped every year to reach a value of 3.1 percent in 2010.

negative: tighter credit standards (proxied by higher loan loss provisioning) should be more harmful to those industries that are more financially dependent.

An additional adjustment in our estimation has to do with the omission of internal funding as a crucial source of financing fueling firm growth. Business saving is by far the main source of financing in Argentina (Bebczuk, 2011a) and around the world (Ayyagari, Demirgüç-Kunt, and Maksimovic, 2008; Bebczuk, 2003). [12] With respect to Argentina, the apparent evidence of a recovery-without-credit process in the aftermath of the 2001-2002 crisis warrants the treatment of self-financing as a major driver of firm size.

There is a large body of theoretical and empirical literature proving this point beyond question. Nevertheless, internal funding is open to the same qualification as credit in terms of endogeneity concerns, as firm size can influence the capacity of businesses to generate greater cash flows. To account for this alternative to bank credit while avoiding any potential endogeneity bias, GDP growth rate will be used as a proxy for the availability of internal funds. Cash flows are expected to be procyclical, and aggregate growth should be expected to be largely unrelated to firm size, at least in the short run. To fit this additional variable into the Rajan-Zingales model, it must be determined whether internal funds bear any link to financial dependence. To this end, economic growth will be interacted with the difference between loans to sales in 2000 and loans to sales in each subsequent year. The expected sign is positive: the larger the fall in leverage with respect to the "frictionless" level in 2000, the more valuable the access to reinvested earnings (proxied by GDP growth) to make up for the scarcity of external financing. [13]

Finally, we examine the lack of actual borrowing patterns, which are absent in the context of Rajan and Zingales (1998). If this model is empirically correct, we should expect bank credit (and now internal funds) to display an observable link to firm size, a feature that cannot be tested directly in equation (1). To that end, we will run this modified version:

$$S_{i,t} = \alpha + \beta\, L_{i,t-1} + \gamma\, P_{i,t-1} + \theta\, D_i + \lambda\, D_t + \varepsilon_{i,t} \qquad (2)$$

[12] For more than 100 economies, and using information from the World Bank's Enterprise Surveys, Ayyagary, Demirgüç-Kunt, and Maksimovic (2008) describe financing patterns around the world, finding that internal funds represent 67 percent of total financing needs in low-income countries, 68 percent in middle-income countries, and 60 percent in high-income countries. Bank debt contributes 17 percent, 18 percent and 21 percent in each country group, respectively. For Argentina, in the period 2001-2009, Bebczuk (2011a) estimates from aggregate figures that internal funding covered 64 percent of those needs and bank debt a mere 5 percent.

[13] Using the change in leverage vis-à-vis the 2000 benchmark rather than just the latter has the added advantage of preventing multicolinearity with the original variable of interest.

where *L* is the average bank debt size (loan balance divided by number of establishments) and *P* represents profitability (measured by sales minus wages and interest payments, divided by sales).[14] All monetary variables are measured in pesos at 2010 prices.[15] The model seeks to explain average firm size in terms of: i) *financial factors*, such as access to credit (the main variable of interest) and the availability of internal funding (represented by the profitability variable);[16] and ii) *non-financial factors*, embedded in the industry and year dummies. In particular, more credit and internal funding are expected to be engines of a larger average firm size whenever growth opportunities are constrained by the lack of financing. No effect would arise in the context of an economy with perfect capital markets à la Modigliani-Miller.

A major advantage of equation (2) is that it transparently traces the link between firm size and the actual use of financing. However, a positive loading on the debt and internal funding variables do not necessarily imply that supply-driven financial constraints are present. Furthermore, a crucial pitfall is that a correlation between the real and the financial side does not inform causality. It may well be the other way around, as financiers—both insiders and outsiders—may be more prone to provide resources to big companies, as emphasized in the corporate finance literature.

We work with lagged explanatory variables as an elementary control for endogeneity: in addition to the technological fact that there may be a delay between credit disbursement and industry growth, it may be the case that credit granted this year bears a higher correlation to current industry and economy-wide conditions than last year's credit.

The answer is that banks may correctly anticipate future growth and thus support it via further lending. At any rate, this leading reaction defies not only anecdotal evidence but also

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[14] We do not have access to any balance sheet information, but only a handful of aggregate industry variables published by the national tax revenue agency. In light of this limitation, our measure of operating profitability aims to be the closest indicator of cash flow, normalized by sales, that can be computed based on available information. Since we do not have information on interest payments, we estimated them by multiplying the average loan balance at year *t*-1 by the average interest rate on commercial loans at year *t*.

[15] In unreported regressions, we included other controls likely to be associated with firm size, such as the average wage (as a ratio of aggregate wage for all sectors) and exports (either in volume and through a dummy taking value 1 if the sector exports at all, or otherwise 0). These were the only relevant extra variables on which data were available. However, none of these variables displays a statistically significant coefficient. The remaining coefficients were not noticeably affected by these additional controls.

[16] Even though cash flow is proxied rather than accurately measured due to data availability constraints, cash flow rather than retained earnings (equal in turn to cash flows net of dividends) is the relevant measure of internal funding. As forcefully affirmed in the financial constraints literature (Galindo and Schiantarelli, 2003), the investment decision depends on the total internal funding at the disposal of the financially constrained firm, with the dividend payment decision being a residual variable once good investment opportunities have been acted on.

hard evidence for Argentina and other countries. For Argentina, Bebczuk and Sangiacomo (2007) found no relationship between sectoral allocation of business bank credit and current or past sectoral growth and volatility. In turn, Bebczuk et al. (2011b) examine credit procyclicality in 144 countries in the period 1990-2009 and find, based on different state-of-the-art techniques, that GDP growth leads credit growth. However, more research is needed to confidently rule out endogeneity. In other words, this methodology is not well-suited to address the observability and endogeneity of financial constraints, but it fills the conspicuous gap in Rajan and Zingales (1998) relating to the actual financial behavior of the industries under consideration.

3. Data

In order to tackle the empirical relationship between average firm size and credit in Argentina, we assembled a panel dataset that combines information from the Central Bank and the national tax revenue agency (*Administración Federal de Ingresos Públicos*-AFIP). Our sample covers 33 activities from the primary and manufacturing sectors—nine primary and 24 manufacturing industries. Three-digit ISIC divisions were employed, but some activities had to be aggregated to match AFIP and Central Bank data, as the latter merge together some of those divisions.[17] For each division, we obtained information on: i) number of establishments, ii) number of employees, iii) sales, iv) wages, and v) outstanding loan balance.[18] Except for the last variable, whose source is the Central Bank, all statistics come from AFIP. The annual time series spans the 2000-2010 period, which means that the information spans the year before the unleashing of the crisis (2000), the crisis peak years (2001 and 2002), and a longer, post-crisis period (2003-2010).

Two data constraints must be mentioned from the outset. The first is that the list of control variables is rather short, a problem shared by a number of papers in this literature and tackled by the inclusion of time and industry dummies. The second is that, due to confidentiality clauses, no individual business information is disclosed by the relevant government entities. This is a clear limitation of the research design, making it impossible to explore, among other issues, the link between financing and other moments of the firm size distribution beyond the mean. Nonetheless, the industry-level unit of analysis is not uncommon in many studies in this field,

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[17] In addition, some industries displaying zero or unreliable sales, employment, or credit figures were excluded from the analysis.

[18] Data on exports by sector were also available and are used in some robustness checks later on.

starting with the pioneering research by Rajan and Zingales (1998). Additionally, our dataset has the major advantage of encompassing the universe of registered firms in these industries rather than just a sample. Our usable sample contains information on about 93,000 firms and over a million workers in 2010.[19]

For the activities under study, the dataset includes all formal transactions but no unregistered operations that these or other businesses may carry out. The widespread prevalence of informality in Argentina may be an important but unavoidable statistical constraint. However, this does not compromise the validity of our analysis as, when filing tax returns, businesses tend to maintain some consistency between reported sales and employment figures to make it harder for tax authorities to detect evasion and elusion accounting strategies. In turn, formal financial intermediaries lend mostly on the basis of those very accounting records.[20]

Our description of the dataset and the econometric analysis presents results for the whole sample as well as separate figures for industries pertaining to the primary and the manufacturing sectors. This split is justified by the observation that the leverage (loans-to-sales ratio) of these two sectors is visibly different, both before and after the 2001-2002 financial crisis.

Unfortunately, there are no prior studies comparing the financial or productive structure of primary vis-à-vis manufacturing activities. The seminal paper by Rajan and Zingales (1998) on industry dependence on external financing focuses on the manufacturing sector, as do most subsequent contributions in this area. Furthermore, little is known about the idiosyncratic features of primary sector (as opposed to manufacturing) activities, specifically product life cycles and cash harvest periods. However, the available evidence points to the fact that the agricultural sector is highly intensive in physical capital and also displays a high total factor productivity (TFP) growth rate, two technological characteristics likely to be associated with a

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[19] Alternative data sources have a much narrower scope. For instance, the Enterprise Survey administered by the World Bank (www.enterprisesurveys.org) polled just 1,054 firms in its last edition in 2010, and it does not allow us to construct a panel and thus distinguish firm behavior before and after the crisis. The previous survey was conducted in 2006. Furthermore, the survey excludes primary sector activities—a core element in our analysis—and informal firms. As another option, listed firms constitute a small and hardly representative set of firms in Argentina. The extremely modest activity in Argentine primary capital markets should come as no surprise in view of the size of its banking system. As of 2011, according to the World Federation of Exchanges (www.world-exchanges.org), only 99 (1,092) domestic firms list their shares (bonds). The short time period—most of them went public in the aftermath of the 2001-2002 crisis—and the large size of most of the firms are limiting factors for a comprehensive analysis. Compounding these data constraints, the government does not properly collect and disclose updated balance sheet information on firms operating in the country, regardless of the legal (but not enforced) obligation of these firms to present annual accounting statements to the *Inspección General de Justicia*.

[20] On the other hand, our industry-level figures may be driven by the largest firms, which are the most closely monitored by tax authorities, and thus those in which evasion is least pervasive.

larger demand for external funding. In the case of Argentina, Coremberg (2009) calculates for 2006 that the capital-output ratio in the agricultural sector (including livestock) is 4.1 and just 1.8 in the manufacturing sector. Total factor productivity grew 22.3 percent in the former and 5.4 percent in the latter between 1990 and 2006.[21] The agricultural sector has made significant improvements in irrigation systems and the use of fertilizers and machinery since 1980 in Argentina and Latin America as a whole (ECLAC, 2007). Confirming these figures, Ball, Coremberg, and Costa (2012) compute the sources of growth in the agricultural and livestock sector in Argentina for the 1993-2010 period and find that, of the total average annual growth of 3.5 percent, the use of intermediate input explains 46 percent, TPF explains 40 percent, physical capital 11 percent, and labor a negligible 3 percent.[22] The Inter-American Development Bank (2012) documents that the agricultural sector has experienced comparatively high rates of labor and TFP in Argentina and Latin America in general over the last few decades. Together, these features imply that the agricultural sector has been remarkably dynamic in Argentina, and much of this dynamism is rooted in a quest for increased productivity through heavy investments in intermediate inputs, research and development, and, to a lesser extent, physical capital, also of which call for fluid access to external and internal financing.

Some of the salient statistical features of the database can be seen in Table 1. As of 2010, the industries under analysis report sales amounting to 70.9 percent of GDP, with manufacturing contributing 50.8 percent of GDP and primary activities contributing the remaining 20.1 percent. These figures are noticeably higher than in 2000-2001 (42.2 percent of GDP), a change likely connected to the boost in the tradable sector triggered by the mega-devaluation of 2002. Table 1 also confirms the low penetration of bank credit: the ratio of outstanding loans to GDP for these major productive sectors stands at 4.2 percent of GDP in 2010 (1.9 percent for the primary sector and 2.3 percent for manufacturing). This number rose to a minimum of 2.1 percent in 2003 and a maximum of 5.6 percent in 2000, suggesting that the 2001-2002 financial crisis exerted a non-trivial impact on credit access, within a well-known structural shallowness of financial markets throughout the country's recent history.

As can be seen in Table 2, the sample includes about 93,000 establishments and 1 million workers in 2010. As the number of workers grew by 38 percent over 2000-2010 and the number

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[21] Mining also displays a high capital-output ratio (6.4), but TFP growth has been negative over 1990-2006. In fishing industry, TPF growth is also negative, and its capital intensity is below average.
[22] For the economy as a whole, annual TFP contribution over 1990-2006 was negative (-0.5 percent).

of establishments by 21 percent, the average number of workers per establishment—one of our variables of interest—increased from 10 to 11.4 between the initial and the final year. This small average firm size is particularly evident in the primary sector (6.1 workers in 2010) as compared to manufacturing (22.7). As seen in Table 3, average sales per establishment—the other variable of interest in our study—doubled from US$5.7 million in 2000 to US$11 million in 2010. For the latter year, the average manufacturing firm had sales 5.3 times higher than those in the primary sector, against a factor of 3.7 times in terms of average employment. This asymmetry is also reflected in average productivity (as measured by sales per worker) and average wages (wages per worker), which are 42 percent and 99 percent higher in manufacturing vis-à-vis primary activities.

In line with previous ratios, Table 4 shows that average bank debt per establishment in 2010 is US$430,000 in the primary sector and US$1.1 million in the manufacturing sector, down from US$506,000 and US$1.38 million, respectively, in 2000. In light of the limited scope of the available data, leverage is proxied by the bank debt-to-sales ratio. In this regard, Table 4 shows an apparent difference in leverage between the two sectors, both before and after the crisis of the early 2000s: the loans-to-sales ratio was 25.4 percent in the primary sector and 9.8 percent in the manufacturing sectors in 2000, dropping to a minimum of 4.4 percent and 2.4 percent, respectively, in 2003, before gradually rebounding to 9.4 percent and 4.6 percent in 2010. Since these figures suggest that firms, regardless of their idiosyncratic fundamentals, seem to have faced much tighter financial conditions in the aftermath of the systemic financial crisis, we will exploit this largely exogenous shock in the subsequent econometric work.

Finally, Table 5 reports operating profits. We did not have access to accounting records, but a feasible proxy is gross sales net of total wage payroll and interest payments.[23] Operating profits are of particular relevance for the analysis, as there is abundant evidence of the dominant role of internal funding in the financing structure of Argentine firms, and thus the ability to self-finance business growth.[24] In dollar terms, average operating profits jumped from US$5 to

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[23] No data were available on interest payments. They were computed by multiplying the average loan interest rate on commercial loans (source: Central Bank) in year *t* times the outstanding loan balance in year (*t*-1).

[24] In the Introduction we commented upon this issue on the basis of actual figures for Argentina and other economies. Corporate finance studies usually measure internal funding as net revenues plus depreciation minus dividends. Operating profits is a ballpark measure of the potential ability of firms to self-finance their asset purchases. The lack of information about dividends actually paid does not affect the results, as dividends are a variable under the firm's control. If the firm has good investment opportunities and self-financing minimizes the overall cost of capital, it will refrain from paying out dividends in order to finance those projects. Hence, what

US$10 million between 2000 and 2010, but as of 2010 they were five times higher in the manufacturing sector than in the primary sector. Sales fluctuated between 88 and 97 percent for both sectors.

4. Econometric Results

The estimation of Equation (1) appears in the first column of Tables 6 and 7. The use of two different size measures (sales and workers) provides a first robustness test. The most remarkable finding is the confirmation that the financial crisis and the associated credit contraction had the greatest adverse effect on the industries that were more financially dependent on the eve of the crisis.

The role of internal funds was tested by adding the proposed regressor, with supporting evidence in the sales regression (Table 8) but not in the workers regression (Table 9), where the estimate for the whole sample (but not for the primary sector) ceases to be significant for both the financial dependence and the internal funding variables.

The estimates suggest that an economically significant effect of these financing channels is explained by differences in financial dependence. The data indicate that in 2000, financial dependence (loans to sales) was 0.37 in industries above the median financial dependence (0.10) and 0.07 in industries below the median. Now we can measure the relative effect of the decline of private credit to GDP from 15.9 percent in 2000 to 12 percent in 2010.

Table 8 focuses on the fuller sales specification for the whole sample. According to our estimates, this credit crunch caused a contraction in firm sales 5.3 times larger in the highly dependent industries than in remaining industries.[25] A similar exercise implies that the higher GDP growth rate in 2010 (8.5 percent) vis-à-vis 2000 (-0.8 percent) enabled the more financially dependent industries to grow 8.7 times faster than the rest because the economic expansion provided badly needed internal resources to make up for the abrupt reduction in leverage (loans to sales declined from 0.37 in 2000 to 0.11 in 2010 for highly dependent industries, and from 0.07 to 0.04 in the other industries).

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matters for business growth is the maximum volume of cash flows available for reinvestment, independently of how much is paid out ex post as dividends.
[25] This figure is the ratio between the change in predicted sales in highly dependent industries due to the credit contraction (that is, predicted sales in 2010 minus predicted sales in 2000) and the same change in the remaining industries.

Tables 10 and 11 confirm the robustness of an alternative proxy for the supply-driven credit crunch. When replacing private credit to GDP with loan loss provisions in the sales regression, the coefficient for the whole sample yields the expected negative and significant estimate for both the sales and the workers regressions. Additionally, within this new specification, Tables 12 and 13 support the positive role of internal funding as a catalyst for firm size growth, when measured by both sales and workers (in the latter case, at a 10 percent confidence level).

Splitting the primary from the manufacturing sectors delivers ambiguous results. Tables 6 and 7 show that the results are significant only for the primary sector, which a priori appears to be consistent with its higher financial dependence over the entire period. Credit contraction can be expected to take a heavier toll on the primary sector than on the manufacturing sector. These results are generally maintained after including the internal funding variable in Tables 8 and 9 (although in the former the manufacturing sector coefficient is significant at 5 percent and smaller than in the manufacturing sector). When loan loss provisions substitute private credit as a measure of credit supply changes, the estimation renders similar loadings on both sectors, with and without the internal funding variable (see Tables 10 through 13). In sum, no solid lesson can be drawn from the distinction between the primary and the manufacturing sectors.

Equation (2) estimations appear in Tables 14 and 15. The first column of Table 12 indicates that lagged loans per establishment seem to be associated with average sales, and the same goes for operating profits. Interestingly, the credit result appears to be driven by the primary sector only. The credit coefficient is not significant for manufacturing. Also worth noting is that firm size seems to be more sensitive to internal rather than external funding: operating profit elasticity amounts to 0.54 for the primary sector and 0.58 for the manufacturing sector, while credit elasticity is 0.09 in the former sector. This evidence remains mostly unchanged after replacing sales by workers in Table 13. In this case, internal finding sensitivity is twice as large in the manufacturing sector (0.32 against 0.15), and credit is only significant in the primary sector, with a coefficient of 0.07. This basic regression strongly suggests that the actual behavior of firm size and credit (as well as internal funding) supports the mechanism underlying the Rajan and Zingales (1998) model.

5. Conclusions and Policy Implications

This paper aimed to estimate the causal effect of bank credit (and internal funding) on average firm size by activity in Argentina in 2000-2010 by exploiting a newly constructed dataset for 33 industries. The financial dependence benchmark used was the leverage (loans to sales) of each industry in 2000, just before the financial crisis of 2001-2002. The econometric estimation indicates that the credit crunch since 2001 had a larger effect on those industries that were more dependent on credit before the crisis. In addition, the analysis uncovered a significant sensitivity of average firm size to the availability of internal funding. The results do not seem to be driven by endogeneity bias, as tested by several econometric tests and compelling economic arguments, all supporting the supply-driven credit crunch view.

Industries in the primary sector were found to have greater financial dependence than those in the manufacturing sector. However, a battery of econometric exercises delivered fragile and ambiguous results regarding the relative sectoral sensitivity to changes in bank lending. The availability of internal funding had a positive effect on the primary but not on the manufacturing sector, suggesting that the highly financially dependent primary sector benefitted more from access to internal funding in the post-crisis period. Internal funds act as a much-needed substitute for the scarcer bank lending.

These results suggest some policy implications worthy of consideration. First, they underscore the fact that the average small firm size in Argentina is significantly explained by supply-driven financing barriers. The Inter-American Development Bank (2012) finds that small firm size is a common feature to most LAC countries. Since firm size may be associated with overall productive efficiency and labor informality, policies aimed at improving access to finance are bound to have a positive impact on long-run economic growth and social well-being. Second, the results highlight the critical role of internal funding as an engine of firm expansion in Argentina. In an economy with a structurally low level of credit deepening, the capacity to generate cash flow is fundamental for financing firm expansion. This explains why firms were able to grow in the aftermath of the financial crisis. This finding has particular relevance for the primary sector, which led the post-crisis recovery despite having to struggle simultaneously with high financial dependence and a credit crunch. Given the demanding institutional conditions required tobring about a deeper financial system, a more fruitful and realistic policy goal that

would favor expansion of firm size is preventing macroeconomic shocks that affect the level and stability of sales and the generation of larger business cash flows.

Regrettably, the lack of a rich panel database of Argentine firms precludes a more thorough analysis of firm behavior around the crisis. Further work is needed to isolate credit supply from credit demand shifts. With respect to the distinction between the primary and the manufacturing sector, our findings deliver inconclusive lessons, despite the observed differences in the degree of financial dependence. The differential business response via sales and via workers to changes in the financing environment also warrants further research. Detailed balance sheet data on productive and financial performance would help refine the analysis by adding additional controls in firm size regressions.

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Table 1.
Gross Sales and Outstanding Loans to GDP
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Year	Gross Sales/GDP (in %)			Outstanding Loans/GDP (in %)		
	Total	*Primary Sector*	*Manufacturing Sector*	*Total*	*Primary Sector*	*Manufacturing Sector*
2000	*41.2*	9.9	31.2	5.6	2.5	3.1
2001	43.2	11.0	32.1	4.6	2.2	2.4
2002	67.2	20.3	47.0	2.7	1.2	1.5
2003	72.1	21.4	50.7	2.1	0.9	1.2
2004	74.6	21.6	52.9	2.6	1.0	1.6
2005	75.5	22.1	53.4	3.3	1.4	1.9
2006	75.2	21.6	53.6	3.7	1.5	2.2
2007	75.6	21.2	54.4	4.0	1.7	2.3
2008	72.6	20.2	52.4	3.8	1.7	2.1
2009	65.0	18.5	46.5	3.9	1.8	2.1
2010	70.9	20.1	50.8	4.2	1.9	2.4

Table 2.
Number of Establishments and Workers
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Year	Number of Establishments (in thousands)			Number of workers (in thousands)			Average Number of Workers per Establishment		
	Total	*Primary Sector*	*Manuf. Sector*	*Total*	*Primary Sector*	*Manuf. Sector*	*Total*	*Primary Sector*	*Manuf. Sector*
2000	*77.0*	53.2	23.8	769.0	273.2	495.8	10.0	5.1	20.8
2001	76.5	53.6	22.8	750.7	269.3	481.4	9.8	5.0	21.1
2002	69.7	49.4	20.3	698.5	256.5	442.0	10.0	5.2	21.8
2003	72.6	51.5	21.1	745.5	277.1	468.4	10.3	5.4	22.2
2004	77.8	54.7	23.1	823.8	305.7	518.1	10.6	5.6	22.4
2005	82.9	58.0	24.9	896.0	335.1	560.9	10.8	5.8	22.5
2006	87.2	60.9	26.4	955.7	356.0	599.7	11.0	5.9	22.7
2007	89.8	62.2	27.6	1,007.0	370.3	636.7	11.2	5.9	23.1
2008	92.7	63.9	28.8	1,059.8	388.3	671.4	11.4	6.1	23.3
2009	93.5	63.7	29.8	1,050.0	380.6	669.3	11.2	6.0	22.5
2010	92.9	63.0	29.9	1,062.8	382.0	680.8	11.4	6.1	22.7

Table 3.
Average Sales, Workers, and Wages
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Year	Average Sales per Establishment (in thousand US$)			Average Sales per Worker (in thousand US$)			Average Wage per Worker (in thousand US$)		
	Total	Primary Sector	Manuf. Sector	Total	Primary Sector	Manuf. Sector	Total	Primary Sector	Manuf. Sector
2000	5,702	1,991	13,982	571	388	672	63.4	30.8	81.4
2001	5,782	2,104	14,418	589	419	684	57.6	28.3	74.0
2002	8,161	3,472	19,552	814	668	899	41.4	22.5	52.4
2003	9,749	4,072	23,612	949	756	1,063	56.3	32.4	70.4
2004	10,551	4,356	25,202	997	780	1,125	62.1	35.7	77.7
2005	10,606	4,437	24,958	982	768	1,110	65.3	37.5	81.9
2006	11,166	4,605	26,305	1,019	787	1,157	71.4	42.2	88.7
2007	12,029	4,877	28,183	1,073	820	1,220	77.4	46.5	95.4
2008	11,622	4,696	26,986	1,016	772	1,157	73.6	44.4	90.5
2009	10,005	4,181	22,452	891	700	1,000	78.3	48.7	95.2
2010	10,999	4,597	24,465	962	758	1,076	79.5	48.7	96.7

Table 4.
Average Loan per Establishment and Loans-to-Sales Ratio
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Year	Average Loan per Establishment (in thousand US$)			Loans to Sales (in %)		
	Total	*Primary Sector*	*Manufacturing Sector*	*Total*	*Primary Sector*	*Manufacturing Sector*
2000	776	506	1,377	13.6	25.4	9.8
2001	617	428	1,060	10.7	20.3	7.4
2002	331	207	632	4.1	6.0	3.2
2003	290	180	560	3.0	4.4	2.4
2004	373	209	763	3.5	4.8	3.0
2005	465	275	908	4.4	6.2	3.6
2006	552	324	1,080	4.9	7.0	4.1
2007	636	391	1,188	5.3	8.0	4.2
2008	611	398	1,084	5.3	8.5	4.0
2009	595	409	994	5.9	9.8	4.4
2010	657	430	1,136	6.0	9.4	4.6

Table 5.
Operating Profits per Establishment and to Sales
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Year	Operating Profits per Establishment (in thousand US$)			Operating Profits to Sales (in %)		
	Total	*Primary Sector*	*Manuf. Sector*	*Total*	*Primary Sector*	*Manuf. Sector*
2000	5,069	1,833	12,289	88.9	92.0	87.9
2001	5,217	1,962	12,859	90.2	93.3	89.2
2002	7,746	3,355	18,412	94.9	96.6	94.2
2003	9,171	3,897	22,048	94.1	95.7	93.4
2004	9,894	4,157	23,463	93.8	95.4	93.1
2005	9,901	4,220	23,116	93.3	95.1	92.6
2006	10,384	4,359	24,288	93.0	94.6	92.3
2007	11,161	4,600	25,979	92.8	94.3	92.2
2008	10,781	4,426	24,876	92.8	94.3	92.2
2009	9,126	3,890	20,315	91.2	93.0	90.5
2010	10,090	4,301	22,266	91.7	93.6	91.0

Table 6.
Firm Size (Sales per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Sales per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
(Loans to Sales in 2000) * Private Credit to GDP	0.0305*	0.113***	-0.0000947
	[0.0164]	[0.0372]	[0.0189]
Observations	352	99	253
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.368	0.328	0.545

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 7.
Firm Size (Workers per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Workers per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
(Loans to Sales in 2000) * Private Credit to GDP	0.0139**	0.0530***	-0.000592
	[0.00662]	[0.0122]	[0.00927]
Observations	352	99	253
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.207	0.313	0.287

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 8.
Robustness Check (I)
Firm Size (Sales per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Sales per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
(Loans to Sales in 2000) * Private Credit to GDP	0.0542** [0.0254]	0.0988** [0.0492]	0.0565* [0.0341]
[(Loans to Sales in 2000) - (Loans to Sales in year t)] * GDP Growth in year t	0.0462*** [0.0135]	0.0639*** [0.0230]	0.0557*** [0.0195]
Observations	316	86	230
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.396	0.325	0.526

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 9
Robustness Check (II)
Firm Size (Workers per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Workers per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
(Loans to Sales in 2000) * Private Credit to GDP	0.00946	0.0409**	0.0133
	[0.0113]	[0.0181]	[0.0173]
[(Loans to Sales in 2000) - (Loans to Sales in year t)] * GDP Growth in year t	0.00696	0.0145*	0.00663
	[0.00601]	[0.00847]	[0.00987]
Observations	316	86	230
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.239	0.297	0.292

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in brackets.

Table 10.
Robustness Check (III)
Firm Size (Sales per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Sales per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
(Loans to Sales in 2000) * (Provisions/Private Credit)	-0.474***	-0.470***	-0.475***
	[0.0621]	[0.159]	[0.0584]
Observations	320	90	230
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.339	0.205	0.507

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 11.
Robustness Check (IV)
Firm Size (Workers per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Workers per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
(Loans to Sales in 2000) * (Provisions/Private Credit)	-0.140*** [0.0261]	-0.149*** [0.0541]	-0.137*** [0.0291]
Observations	320	90	230
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.368	0.328	0.545

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 12.
Robustness Check (V)
Firm Size (Sales per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Sales per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
ln[(Loans to Sales $_{2000}$) * (Provisions/Private Credit)$_t$]	-0.395***	-0.331**	-0.525***
	[0.0642]	[0.137]	[0.0649]
ln[(Loans to Sales$_{2000}$) - (Loans to Sales$_t$)] * GDP Growth$_t$	0.0101***	0.0241***	-0.00572*
	[0.00267]	[0.00446]	[0.00334]
Observations	320	90	230
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.371	0.436	0.514

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in brackets.

Table 13.
Robustness Check (VI)
Firm Size (Workers per Establishment) and Bank Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Workers per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
$\ln[(\text{Loans to Sales}_{2000}) * (\text{Provisions/Private Credit})_t]$	-0.124*** [0.0275]	-0.121** [0.0525]	-0.158*** [0.0324]
$\ln[(\text{Loans to Sales}_{2000}) - (\text{Loans to Sales}_t)] * \text{GDP Growth}_t$	0.00208* [0.00115]	0.00495*** [0.00171]	-0.00250 [0.00167]
Observations	320	90	230
Number of industries	32	9	23
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.371	0.436	0.514

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 14.
Robustness Check (VII)
Firm Size (Sales per Establishment) and Bank and Internal Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Sales per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
ln(Loans per Establishment), lagged	0.0802***	0.0937**	0.00553
	[0.0241]	[0.0432]	[0.0324]
ln(Operating Profits per Establishment), lagged	0.535***	0.545***	0.580***
	[0.0441]	[0.0877]	[0.0522]
Observations	297	81	216
Number of industries	33	9	24
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.535	0.501	0.653

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in brackets.

Table 15.
Robustness Check (VIII)
Firm Size (Workers per Establishment) and Bank and Internal Financing
Two-way Fixed Effects Regression
Formal Firms in the Primary and Manufacturing Sectors
Annual Data, 2000-2010

Dependent Variable: *ln(Workers per Establishment)*	All Industries	Primary Sector	Manufacturing Sector
ln(Loans per Establishment), lagged	0.0457*** [0.00947]	0.0667*** [0.0134]	0.0151 [0.0146]
ln(Operating Profits per Establishment), lagged	0.231*** [0.0173]	0.146*** [0.0271]	0.320*** [0.0236]
Observations	297	81	216
Number of industries	33	9	24
Annual period	2000-2010	2000-2010	2000-2010
Method	Two-way FE	Two-way FE	Two-way FE
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R-squared	0.570	0.549	0.659

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in brackets

Annex: Statistics by Activity

Table A1 Number of Establishments (in thousands)

Activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	24.53	24.97	22.77	23.71	25.42	27.22	28.84	29.84	31.07	31.33	31.02
Livestock	24.17	24.24	22.57	23.32	24.14	24.95	25.56	25.41	25.38	25.05	24.50
Agricultural and livestock services	2.87	2.83	2.61	3.01	3.57	4.10	4.58	5.01	5.37	5.25	5.42
Hunting and trapping alive	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
Forestry, logging	0.88	0.91	0.76	0.77	0.83	0.91	0.98	1.05	1.08	1.09	1.06
Fishing and related services	0.26	0.30	0.29	0.30	0.33	0.35	0.36	0.35	0.36	0.36	0.35
Extraction of crude petroleum and natural gas	0.10	0.11	0.10	0.10	0.11	0.13	0.14	0.16	0.17	0.17	0.18
Mining of metal ores	0.18	0.13	0.11	0.11	0.13	0.14	0.15	0.16	0.17	0.17	0.18
Other mining and quarrying	0.20	0.16	0.14	0.14	0.18	0.21	0.24	0.25	0.26	0.27	0.28
Production and processing of meat, fish, fruit, etc.	1.60	1.63	1.54	1.58	1.65	1.71	1.77	1.85	1.89	1.93	1.96
Manufacture of dairy products	0.78	0.80	0.74	0.82	0.89	0.92	0.95	0.98	1.01	1.02	1.00
Manufacture of grain mill products and starches	0.36	0.38	0.36	0.39	0.43	0.47	0.50	0.50	0.53	0.57	0.58
Manufacture of beverages	1.52	1.46	1.33	1.33	1.40	1.44	1.48	1.49	1.49	1.53	1.54
Manufacture of other food products	6.10	5.92	5.28	5.33	5.76	6.14	6.37	6.64	7.27	8.11	8.35
Manufacture of tobacco products	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Manufacture of textiles	0.80	0.78	0.68	0.72	0.79	0.85	0.91	0.96	0.98	0.98	0.97
Manufacture of wearing apparel; dressing and dyeing of fur	1.36	1.27	1.06	1.19	1.40	1.58	1.75	1.92	1.98	1.95	1.90
Tanning and dressing of leather, manufacture of luggage	0.63	0.59	0.51	0.57	0.67	0.75	0.81	0.86	0.88	0.88	0.88
Manufacture of wood and of products of wood and cork	1.12	1.11	1.03	1.09	1.27	1.40	1.53	1.62	1.69	1.67	1.62
Manufacture of paper and paper products	0.70	0.71	0.67	0.71	0.78	0.84	0.89	0.90	0.91	0.92	0.93
Publishing, printing, reproduction of recorded media	1.85	1.20	1.00	0.99	1.06	1.14	1.21	1.26	1.31	1.32	1.31
Manufacture of chemicals and chemical products	0.71	0.69	0.65	0.68	0.74	0.78	0.81	0.83	0.82	0.82	0.82
Manufacture of rubber and plastic products	1.25	1.27	1.16	1.20	1.29	1.39	1.46	1.51	1.53	1.54	1.54
Manufacture of non-metallic mineral products	0.81	0.75	0.64	0.66	0.70	0.77	0.82	0.86	0.91	0.94	0.93
Manufacture of basic metals	0.00	0.32	0.29	0.30	0.34	0.37	0.39	0.40	0.41	0.40	0.40
Manufacture of office and computing machinery	0.11	0.10	0.08	0.09	0.11	0.12	0.14	0.16	0.16	0.16	0.17
Manufacture of radio, television and comm. equipment	0.08	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
Manufacture of medical, precision and optical instruments	0.13	0.13	0.12	0.12	0.14	0.15	0.16	0.17	0.18	0.19	0.19
Manufacture of motor vehicles, trailers and semi-trailers	0.42	0.43	0.39	0.41	0.44	0.47	0.50	0.52	0.53	0.53	0.52
Manufacture of transport equipment	0.09	0.08	0.07	0.08	0.09	0.10	0.11	0.12	0.12	0.12	0.13
Manufacture of furniture and mattresses	1.52	1.33	1.06	1.09	1.22	1.39	1.51	1.59	1.66	1.67	1.66
Machinery and electrical appliances	0.16	0.15	0.13	0.13	0.15	0.16	0.16	0.17	0.18	0.18	0.18
Manufacture of motor vehicles, trailers and semi-trailers	1.74	1.66	1.45	1.53	1.73	1.92	2.07	2.19	2.28	2.30	2.30

Table A2: Average Number of Workers per Establishment

Activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	5.2	5.0	5.2	5.4	5.6	5.7	5.7	5.8	5.9	5.7	5.8
Livestock	3.7	3.7	3.7	3.8	3.9	3.9	4.0	4.0	4.1	4.0	4.1
Agricultural and livestock services	6.7	6.8	7.0	7.1	7.1	7.5	7.5	7.4	7.7	7.7	7.4
Hunting and trapping alive	5.0	4.0	6.3	5.2	5.3	3.7	3.2	4.3	3.4	3.5	3.5
Forestry, logging	12.2	11.3	10.8	11.5	11.7	11.5	11.8	11.7	11.7	11.0	10.4
Fishing and related services	36.1	33.4	44.9	49.9	49.2	48.7	50.8	51.0	48.1	44.1	44.7
Extraction of crude petroleum and natural gas	87.5	85.3	105.2	106.8	116.6	120.5	123.2	123.8	124.8	125.8	126.2
Mining of metal ores	12.8	17.3	19.3	20.4	21.4	24.6	27.0	28.4	29.6	29.9	30.7
Other mining and quarrying	32.1	20.2	21.1	22.4	22.0	22.3	21.9	22.1	21.6	19.1	20.0
Production and processing of meat, fish, fruit, etc.	49.1	46.0	49.5	52.1	55.1	56.4	56.9	58.4	62.2	63.4	62.6
Manufacture of dairy products	32.7	38.1	38.3	34.5	32.7	31.2	31.8	32.2	32.0	31.7	32.7
Manufacture of grain mill products and starches	31.5	32.2	32.5	32.1	31.5	29.7	27.8	28.8	28.6	27.4	27.7
Manufacture of beverages	30.5	30.5	30.8	30.8	30.8	31.5	32.2	33.2	34.2	33.2	33.1
Manufacture of other food products	16.0	15.5	16.0	16.6	16.5	16.4	16.6	16.7	16.1	14.8	14.9
Manufacture of tobacco products	283.3	206.4	276.2	248.2	239.8	246.5	253.9	247.5	239.1	259.2	234.2
Manufacture of textiles	20.9	20.7	20.5	22.1	23.0	23.6	23.8	23.7	23.3	22.2	22.8
Manufacture of wearing apparel; dressing and dyeing of fur	11.5	11.9	11.8	12.1	12.5	12.7	12.9	12.9	12.9	12.6	13.0
Tanning and dressing of leather; manufacture of luggage	25.7	26.5	27.2	27.8	24.6	23.9	23.8	23.3	23.4	23.7	24.3
Manufacture of wood and of products of wood and cork	9.2	9.4	9.3	10.0	10.3	10.3	10.3	10.2	10.0	9.3	9.5
Manufacture of paper and paper products	33.5	34.9	35.3	35.1	35.4	35.7	36.0	37.1	38.1	37.8	37.8
Publishing, printing, reproduction of recorded media	12.2	12.0	12.3	12.3	12.6	12.9	12.9	12.9	13.0	12.6	12.5
Manufacture of chemicals and chemical products	38.0	36.8	36.1	35.2	35.2	35.6	36.8	38.5	40.0	39.7	40.6
Manufacture of rubber and plastic products	16.0	16.4	16.2	17.0	18.2	19.0	19.6	20.4	20.7	19.7	20.4
Manufacture of non-metallic mineral products	20.6	19.3	18.2	19.4	20.9	21.9	22.7	23.7	24.2	22.6	23.2
Manufacture of basic metals	0.0	30.6	31.8	32.2	32.5	32.3	33.1	33.5	34.2	32.2	33.6
Manufacture of office and computing machinery	14.6	13.8	10.5	10.7	12.7	14.0	14.4	15.6	18.5	18.4	18.9
Manufacture of radio, television and comm. equipment	29.1	27.7	22.3	21.7	27.5	37.2	47.9	49.0	44.7	38.9	55.9
Manufacture of medical, precision and optical instruments	14.2	14.1	13.4	13.5	13.7	13.7	13.9	14.2	14.3	13.9	14.4
Manufacture of motor vehicles, trailers and semi-trailers	36.1	35.3	33.1	32.2	35.1	38.7	42.2	46.2	51.6	49.3	52.0
Manufacture of transport equipment	18.8	18.5	18.3	18.1	18.0	19.7	21.4	22.0	23.6	22.8	23.2
Manufacture of furniture and mattresses	11.5	10.1	9.9	10.2	10.8	11.2	11.5	11.7	11.9	11.5	11.4
Machinery and electrical appliances	13.6	13.4	12.5	12.9	14.1	16.1	17.3	18.1	19.1	18.4	19.3
Manufacture of motor vehicles, trailers and semi-trailers	12.0	11.5	11.0	11.7	12.4	12.8	13.2	13.6	14.0	13.3	13.7

Table A5: Average Sales per Establishment (in thousand US$)

Activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	275	282	210	303	324	341	366	480	529	490	649
Livestock	278	264	163	245	265	301	311	382	422	389	569
Agricultural and livestock services	481	451	243	347	347	325	323	371	397	355	471
Hunting and trapping alive	402	495	468	340	269	174	109	180	173	111	135
Forestry, logging	229	198	87	166	212	242	240	267	310	278	353
Fishing and related services	1,985	2,504	1,597	2,536	1,950	1,969	2,945	2,532	2,585	2,378	3,536
Extraction of crude petroleum and natural gas	112,057	113,470	91,250	113,213	133,013	143,586	157,787	158,635	160,385	144,246	163,400
Mining of metal ores	1,328	8,612	2,645	6,821	6,923	9,245	19,143	16,944	14,342	16,943	26,326
Other mining and quarrying	3,475	1,387	690	1,106	1,093	1,408	1,270	1,396	1,506	1,247	4,640
Production and processing of meat, fish, fruit, etc.	8,677	8,551	6,609	9,190	9,811	10,324	11,329	14,357	16,614	13,965	17,878
Manufacture of dairy products	6,205	5,387	2,830	3,725	4,188	4,528	5,047	6,506	6,491	6,235	8,234
Manufacture of grain mill products and starches	4,523	4,790	3,369	4,037	3,628	3,340	3,673	4,527	5,641	5,032	5,752
Manufacture of beverages	3,384	3,397	1,303	2,120	2,487	2,591	2,993	3,567	4,276	4,459	5,312
Manufacture of other food products	1,022	1,042	489	692	703	781	900	1,001	1,058	992	1,134
Manufacture of tobacco products	41,491	42,005	17,041	20,363	21,470	23,170	23,978	29,102	30,579	35,978	34,843
Manufacture of textiles	3,854	3,497	1,795	3,064	3,366	3,584	3,866	4,318	4,326	4,029	5,223
Manufacture of wearing apparel, dressing and dyeing of fur	1,347	1,276	427	768	829	889	975	1,078	1,180	1,131	1,461
Tanning and dressing of leather, manufacture of luggage	3,857	3,563	2,362	2,856	2,755	2,509	2,713	2,872	2,731	2,485	3,486
Manufacture of wood and of products of wood and cork	819	736	319	604	659	718	770	885	917	790	986
Manufacture of paper and paper products	4,241	4,168	2,307	3,094	3,431	3,629	3,876	4,685	5,299	4,807	6,221
Publishing, printing, reproduction of recorded media	2,719	2,551	892	1,385	1,590	1,786	2,029	2,235	2,355	2,250	2,750
Manufacture of chemicals and chemical products	19,467	19,741	11,138	14,395	15,354	16,486	19,689	21,378	24,009	22,622	27,843
Manufacture of rubber and plastic products	2,732	2,792	1,599	2,361	2,712	3,193	3,571	4,255	4,396	3,941	5,187
Manufacture of non-metallic mineral products	3,027	2,847	1,242	2,250	2,724	3,151	3,728	4,352	4,559	4,170	5,257
Manufacture of basic metals	0	11,346	9,261	11,632	14,834	16,225	19,497	21,661	23,494	17,401	23,481
Manufacture of office and computing machinery	3,657	3,274	800	1,689	2,279	3,243	3,510	4,353	4,972	5,130	5,102
Manufacture of radio, television and comm. equipment	13,531	13,396	2,442	5,410	10,188	19,357	29,935	30,070	23,887	25,101	52,210
Manufacture of medical, precision and optical instruments	2,960	2,866	944	1,557	1,823	2,017	2,299	2,724	2,985	2,704	3,118
Manufacture of motor vehicles, trailers and semi-trailers	17,078	16,129	8,615	12,611	17,357	22,134	28,635	36,321	38,476	31,852	50,549
Manufacture of transport equipment	4,776	4,019	1,254	2,468	3,097	4,154	5,244	7,168	8,144	7,229	10,467
Manufacture of furniture and mattresses	1,367	1,130	422	762	939	1,048	1,220	1,468	1,615	1,409	1,884
Machinery and electrical appliances	7,480	6,672	2,588	4,240	5,205	6,300	8,105	10,471	11,918	10,262	13,309
Manufacture of motor vehicles, trailers and semi-trailers	4,688	4,123	1,906	3,191	3,806	4,155	4,885	5,576	5,858	4,837	6,645

39

Table A6. Average Loan per Establishment (in thousand US$)

Activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	156	135	30	29	34	49	59	79	88	90	116
Livestock	59	60	11	10	14	20	30	45	45	46	59
Agricultural and livestock services	374	162	26	24	33	46	60	75	77	88	118
Hunting and trapping alive	197	468	383	8	5	3	32	18	101	605	1,326
Forestry, logging	128	78	8	9	5	5	6	8	9	8	12
Fishing and related services	232	176	46	32	53	83	126	174	143	142	274
Extraction of crude petroleum and natural gas	1,609	2,570	473	750	1,171	1,102	1,893	1,477	2,425	1,743	2,896
Mining of metal ores	114	110	23	62	43	97	142	321	879	1,414	1,019
Other mining and quarrying	2,479	1,903	379	723	372	891	738	704	831	1,545	1,120
Production and processing of meat, fish, fruit etc.	778	553	195	229	262	393	509	657	574	703	958
Manufacture of dairy products	162	123	22	73	79	122	118	127	120	111	152
Manufacture of grain mill products and starches	350	28	11	19	27	34	27	55	49	45	77
Manufacture of beverages	323	294	60	56	128	248	218	278	282	274	330
Manufacture of other food products	68	74	12	19	28	23	34	31	36	36	41
Manufacture of tobacco products	2875	5,205	535	719	1,222	749	789	1,327	1,011	1,270	1,600
Manufacture of textiles	740	437	97	106	121	131	226	244	244	209	352
Manufacture of wearing apparel; dressing and dyeing of fur	169	199	42	39	37	20	24	29	36	65	75
Tanning and dressing of leather, manufacture of luggage	417	303	86	63	72	127	148	166	111	88	179
Manufacture of wood and of products of wood and cork	106	95	18	19	23	23	27	25	27	37	42
Manufacture of paper and paper products	438	281	66	103	158	176	280	449	378	376	435
Publishing, printing, reproduction of recorded media	220	249	96	66	41	42	65	75	68	74	96
Manufacture of chemicals and chemical products	1,457	931	200	247	431	601	878	1,082	1,221	1,400	1,813
Manufacture of rubber and plastic products	248	138	21	23	54	115	122	129	200	164	251
Manufacture of non-metallic mineral products	313	358	140	69	138	268	154	176	125	113	115
Manufacture of basic metals	0	1,234	331	291	363	340	596	914	1,391	875	1,359
Manufacture of office and computing machinery	1,268	1,093	100	108	367	226	419	879	644	468	905
Manufacture of radio, television and comm. equipment	1,200	1,182	334	447	639	867	1,907	1,904	2,747	1,974	3,499
Manufacture of medical, precision and optical instruments	838	571	155	123	123	178	211	206	289	221	400
Manufacture of motor vehicles, trailers and semi-trailers	1,906	1,196	170	164	427	473	795	785	858	712	1,079
Manufacture of transport equipment	4,077	1,948	284	413	764	808	1,008	1,628	1,684	1,304	2,103
Manufacture of furniture and mattresses	114	108	22	19	18	16	25	24	41	38	38
Machinery and electrical appliances	2,426	1,592	652	329	323	588	792	1,020	1,133	763	1,211
Manufacture of motor vehicles, trailers and semi-trailers	157	122	28	38	60	78	94	101	108	106	145

Table A4: Loans to Sales (in %)

Activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	0.57	0.48	0.14	0.10	0.11	0.14	0.16	0.16	0.17	0.18	0.18
Livestock	0.21	0.23	0.07	0.04	0.05	0.07	0.10	0.12	0.11	0.12	0.10
Agricultural and livestock services	0.78	0.36	0.11	0.07	0.10	0.14	0.19	0.20	0.19	0.25	0.25
Hunting and trapping alive	0.49	0.95	0.82	0.02	0.02	0.02	0.29	0.10	0.58	5.47	9.85
Forestry, logging	0.56	0.39	0.09	0.05	0.03	0.02	0.03	0.03	0.03	0.03	0.03
Fishing and related services	0.12	0.07	0.03	0.01	0.03	0.04	0.04	0.07	0.06	0.06	0.06
Extraction of crude petroleum and natural gas	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02
Mining of metal ores	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.06	0.08	0.04
Other mining and quarrying	0.71	1.37	0.55	0.65	0.34	0.63	0.58	0.50	0.55	1.24	0.24
Production and processing of meat, fish, fruit etc.	0.09	0.06	0.03	0.02	0.03	0.04	0.04	0.05	0.03	0.05	0.05
Manufacture of dairy products	0.03	0.02	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Manufacture of grain mill products and starches	0.08	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Manufacture of beverages	0.10	0.09	0.05	0.03	0.05	0.09	0.07	0.08	0.07	0.06	0.06
Manufacture of other food products	0.07	0.07	0.02	0.03	0.04	0.03	0.04	0.03	0.03	0.04	0.04
Manufacture of tobacco products	0.07	0.12	0.03	0.04	0.06	0.03	0.03	0.05	0.03	0.04	0.05
Manufacture of textiles	0.19	0.13	0.05	0.03	0.04	0.04	0.06	0.06	0.06	0.05	0.07
Manufacture of wearing apparel, dressing and dyeing of fur	0.13	0.16	0.10	0.05	0.04	0.02	0.02	0.03	0.03	0.06	0.05
Tanning and dressing of leather, manufacture of luggage	0.11	0.09	0.04	0.02	0.03	0.05	0.05	0.06	0.04	0.04	0.05
Manufacture of wood and of products of wood and cork	0.13	0.13	0.06	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.04
Manufacture of paper and paper products	0.10	0.07	0.03	0.03	0.05	0.05	0.07	0.10	0.07	0.08	0.07
Publishing, printing, reproduction of recorded media	0.08	0.10	0.11	0.05	0.03	0.02	0.03	0.03	0.03	0.03	0.04
Manufacture of chemicals and chemical products	0.07	0.05	0.02	0.02	0.03	0.04	0.04	0.05	0.05	0.06	0.07
Manufacture of rubber and plastic products	0.09	0.05	0.01	0.01	0.02	0.04	0.03	0.03	0.05	0.04	0.05
Manufacture of non-metallic mineral products	0.10	0.13	0.11	0.03	0.05	0.08	0.04	0.04	0.03	0.03	0.02
Manufacture of basic metals	0.00	0.11	0.04	0.03	0.02	0.02	0.03	0.04	0.06	0.05	0.06
Manufacture of office and computing machinery	0.35	0.33	0.12	0.06	0.16	0.07	0.12	0.20	0.13	0.09	0.18
Manufacture of radio, television and comm. equipment	0.09	0.09	0.14	0.08	0.06	0.04	0.06	0.06	0.11	0.08	0.07
Manufacture of medical, precision and optical instruments	0.28	0.20	0.16	0.08	0.07	0.09	0.09	0.08	0.10	0.08	0.13
Manufacture of motorvehicles, trailers and semi-trailers	0.11	0.07	0.02	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.02
Manufacture of transport equipment	0.85	0.48	0.23	0.17	0.25	0.19	0.31	0.23	0.21	0.18	0.20
Manufacture of furniture and mattresses	0.08	0.10	0.05	0.03	0.02	0.01	0.02	0.02	0.03	0.03	0.02
Machinery and electrical appliances	0.33	0.24	0.25	0.08	0.06	0.09	0.10	0.10	0.10	0.07	0.09
Manufacture of motorvehicles, trailers and semi-trailers	0.04	0.03	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Table A6: Operating Profits per Establishment (in thousand USD)

Activity	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	214	186	284	306	320	339	446	484	446	600
Livestock	226	149	232	251	284	291	356	387	355	530
Agricultural and livestock services	311	214	328	328	303	296	337	354	314	425
Hunting and trapping alive	396	384	276	252	161	96	156	150	73	9
Forestry, logging	119	64	141	183	211	201	218	257	223	285
Fishing and related services	1,892	1,317	2,060	1,480	1,455	2,163	1,667	1,617	1,437	2,394
Extraction of crude petroleum and natural gas	108,009	88,962	109,633	128,728	138,196	151,411	150,942	152,430	134,774	152,648
Mining of metal ores	7,966	2,395	6,378	6,413	8,549	18,248	15,795	13,107	15,506	24,545
Other mining and quarrying	227	362	912	903	1,214	974	1,059	1,109	868	4,117
Production and processing of meat, fish, fruit, etc.	7,910	6,399	8,917	9,502	9,946	10,866	13,778	15,912	13,279	17,035
Manufacture of dairy products	4,851	2,664	3,500	3,936	4,245	4,694	6,091	6,031	5,736	7,685
Manufacture of grain mill products and starches	4,288	3,238	3,845	3,428	3,126	3,438	4,239	5,327	4,722	5,382
Manufacture of beverages	2,932	1,155	1,929	2,287	2,340	2,677	3,180	3,815	3,958	4,739
Manufacture of other food products	887	437	619	620	682	786	865	918	857	972
Manufacture of tobacco products	37,741	14,992	17,875	18,868	20,359	20,862	25,761	26,927	31,577	29,718
Manufacture of textiles	2,792	1,600	2,801	3,042	3,146	3,402	3,765	3,700	3,383	4,439
Manufacture of wearing apparel, dressing and dyeing of fur	1,081	359	691	740	782	849	931	1,018	967	1,247
Tanning and dressing of leather; manufacture of luggage	3,021	2,192	2,633	2,527	2,245	2,409	2,523	2,334	2,084	2,983
Manufacture of wood and of products of wood and cork	597	276	547	589	635	670	770	792	662	827
Manufacture of paper and paper products	3,598	2,138	2,873	3,181	3,330	3,526	4,245	4,755	4,270	5,581
Publishing, printing, reproduction of recorded media	1,969	708	1,137	1,318	1,486	1,685	1,833	1,913	1,771	2,149
Manufacture of chemicals and chemical products	16,998	10,331	13,258	14,150	15,148	18,090	19,429	21,717	20,172	24,920
Manufacture of rubber and plastic products	2,387	1,483	2,190	2,503	2,929	3,244	3,847	3,937	3,444	4,592
Manufacture of non-metallic mineral products	2,296	1,064	2,008	2,459	2,822	3,322	3,874	4,039	3,651	4,612
Manufacture of basic metals	9,506	8,635	10,797	13,898	15,112	18,181	20,079	21,638	15,402	21,060
Manufacture of office and computing machinery	2,642	606	1,608	2,192	3,109	3,382	4,166	4,617	4,870	4,853
Manufacture of radio, television and comm. equipment	11,540	1,990	4,795	9,305	17,862	27,799	27,572	21,020	21,841	48,052
Manufacture of medical, precision and optical instruments	2,120	737	1,326	1,574	1,734	1,956	2,302	2,527	2,236	2,588
Manufacture of motor vehicles, trailers and semi-trailers	14,028	8,037	11,902	16,514	21,007	27,165	34,357	36,300	29,639	47,661
Manufacture of transport equipment	1,950	768	2,064	2,659	3,547	4,471	6,089	6,889	5,989	9,076
Manufacture of furniture and mattresses	931	361	681	842	929	1,076	1,291	1,425	1,205	1,638
Machinery and electrical appliances	5,066	2,146	3,743	4,722	5,637	7,233	9,369	10,630	8,955	11,765
Manufacture of motor vehicles, trailers and semi-trailers	3,524	1,734	2,929	3,490	3,780	4,420	4,998	5,231	4,173	5,810

Table A7: Operating Profits to Sales (in %)

Activity	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Agricultural crops	0.76	0.88	0.94	0.94	0.94	0.93	0.93	0.91	0.91	0.92
Livestock	0.85	0.91	0.95	0.95	0.95	0.93	0.93	0.92	0.91	0.93
Agricultural and livestock services	0.69	0.88	0.95	0.95	0.93	0.92	0.91	0.89	0.88	0.90
Hunting and trapping alive	0.80	0.82	0.81	0.94	0.93	0.89	0.87	0.86	0.66	0.06
Forestry, logging	0.60	0.74	0.85	0.86	0.87	0.84	0.82	0.83	0.80	0.81
Fishing and related services	0.76	0.83	0.81	0.76	0.74	0.73	0.66	0.63	0.60	0.68
Extraction of crude petroleum and natural gas	0.95	0.97	0.97	0.97	0.96	0.96	0.95	0.95	0.93	0.93
Mining of metal ores	0.92	0.91	0.94	0.93	0.92	0.95	0.93	0.91	0.92	0.93
Other mining and quarrying	0.16	0.53	0.82	0.83	0.86	0.77	0.76	0.74	0.70	0.89
Production and processing of meat, fish, fruit, etc.	0.93	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.95	0.95
Manufacture of dairy products	0.90	0.94	0.94	0.94	0.94	0.93	0.94	0.93	0.92	0.93
Manufacture of grain mill products and starches	0.90	0.96	0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Manufacture of beverages	0.86	0.89	0.91	0.92	0.90	0.89	0.89	0.89	0.89	0.89
Manufacture of other food products	0.85	0.89	0.89	0.88	0.87	0.87	0.86	0.87	0.86	0.86
Manufacture of tobacco products	0.90	0.88	0.88	0.88	0.88	0.87	0.89	0.88	0.88	0.85
Manufacture of textiles	0.80	0.89	0.91	0.90	0.89	0.88	0.87	0.86	0.84	0.85
Manufacture of wearing apparel; dressing and dyeing of fur	0.85	0.84	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.85
Tanning and dressing of leather; manufacture of luggage	0.85	0.93	0.92	0.92	0.89	0.89	0.88	0.85	0.84	0.86
Manufacture of wood and of products of wood and cork	0.81	0.87	0.91	0.89	0.88	0.87	0.87	0.86	0.84	0.84
Manufacture of paper and paper products	0.86	0.93	0.93	0.93	0.92	0.91	0.91	0.90	0.89	0.90
Publishing, printing, reproduction of recorded media	0.77	0.79	0.82	0.83	0.83	0.83	0.82	0.81	0.79	0.78
Manufacture of chemicals and chemical products	0.86	0.93	0.92	0.92	0.92	0.92	0.91	0.90	0.89	0.90
Manufacture of rubber and plastic products	0.86	0.93	0.93	0.92	0.92	0.91	0.90	0.90	0.87	0.89
Manufacture of non-metallic mineral products	0.81	0.86	0.89	0.90	0.90	0.89	0.89	0.89	0.88	0.88
Manufacture of basic metals	0.84	0.93	0.93	0.94	0.93	0.93	0.93	0.92	0.89	0.90
Manufacture of office and computing machinery	0.81	0.76	0.95	0.96	0.96	0.96	0.96	0.93	0.95	0.95
Manufacture of radio, television and comm. equipment	0.86	0.82	0.89	0.91	0.92	0.93	0.92	0.88	0.87	0.92
Manufacture of medical, precision and optical instruments	0.74	0.78	0.85	0.86	0.86	0.85	0.85	0.85	0.83	0.83
Manufacture of motor vehicles, trailers and semi-trailers	0.87	0.93	0.94	0.95	0.95	0.95	0.95	0.94	0.93	0.94
Manufacture of transport equipment	0.49	0.61	0.84	0.86	0.85	0.85	0.85	0.85	0.83	0.87
Manufacture of furniture and mattresses	0.82	0.85	0.89	0.90	0.89	0.88	0.88	0.88	0.86	0.87
Machinery and electrical appliances	0.76	0.83	0.88	0.91	0.89	0.89	0.89	0.89	0.87	0.88
Manufacture of motor vehicles, trailers and semi-trailers	0.85	0.91	0.92	0.92	0.91	0.90	0.90	0.89	0.86	0.87

43