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CREDIT AVAILABILITY AND INVESTMENT IN ITALY: LESSONS FROM THE "GREAT RECESSION"

by Eugenio Gaiotti*

Abstract

The paper argues that the traditional difficulty encountered in finding evidence on the effects of credit availability on economic activity depends on the fact that these effects are powerful but rare and vary with the cycle. The global financial crisis offers an opportunity to test this assumption. The paper exploits a unique dataset, including direct information on credit rationing for 1,200 Italian firms over the last twenty years. We find that the elasticity of a firm's investment to the availability of bank credit has been significant in periods of economic contraction, but not in other periods; that the ability to tap alternative sources of finance is crucial to this result; that during the global crisis the impact of credit constraints on Italian investment in manufacturing was significant.

JEL Classification: E51, E44, E22.
Keywords: credit availability, credit channel, *Great Recession*.

Contents

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1. Introduction[1]

How much did credit market distress, and in particular the reduction in the availability of bank loans, contribute to the transmission of the 2008-09 global crisis to the Italian economy? The answer to this question remains surprisingly controversial. A substantial empirical literature finds support for the role of supply restrictions in explaining the dramatic deceleration in credit flows that took place immediately after the collapse of Lehman Brothers in mid-September 2008;[2] so far, however, attempts to estimate directly the effects of credit restrictions on the real economy are more limited.

The question has roots in the long-standing debate on the respective roles of bank interest rates and credit quantities in explaining variations in investment and economic activity. In most mainstream models, real interest rates are the only transmission channel from the financial sector to the real economy; there is a huge amount of empirical evidence on their effects. However, since the contribution by Stiglitz and Weiss (1981), it has been argued that it is the quantity of loans, not just the interest rate charged, that is critical in explaining economic fluctuations at certain times. Stiglitz and Greenwald (2003) draw major implications from this conjecture for both monetary and regulatory policy, calling for a shift in focus from money to credit and for a renewed attention to regulatory instruments and tools for liquidity support.

The issue, however, has remained controversial and the empirical evidence has proven to be elusive. In euro-area countries, the extensive study on monetary transmission conducted by the Eurosystem (Angeloni, Kahsyap and Mojon, 2003) finds strong support for the role of bank interest rates, but reaches mixed conclusions on an active role of bank balance-sheet aggregates.

There are at least two serious obstacles to a satisfactory empirical assessment of the effect of credit availability on activity. The first, and better known, is the difficultly of

[1] I thank Paolo Angelini, Giuseppe Fiori, Domenico Marchetti, Fabio Panetta, Giuseppe Parigi, Carmelo Salleo, Stefano Siviero and two anonymous referees for comments on earlier versions of this paper. The usual disclaimer applies.

[2] For Italy, Albertazzi and Marchetti (2010); Del Giovane, Eramo and Nobili (2009); De Mitri, Gobbi and Sette (2009); Panetta and Signoretti (2010); for the euro area, Ciccarelli, Maddaloni and Peydrò (2009); for Germany, Puri, Rocholl and Steffen (2009).

identifying the role of credit supply and credit demand in explaining the behaviour of credit, and particularly in interpreting the positive correlation between bank lending and economic activity: while a substantial amount of evidence indicates that banking crises are closely correlated to a sharp drop in economic activity, the causal direction remains uncertain.[3]

The empirical literature on the "credit channel" has tried to address the "supply-versus-demand" puzzle underlying the timing patterns of output and bank loans by seeking suitable instruments in several ways: looking at the behaviour of non-bank forms of credit; comparing the behaviour of small and large firms; looking at yield spreads on loans or loan substitutes (Bernanke, 1993); looking at the effect of cash flow on investment (Fazzari, Hubbard and Petersen, 1998). Many of these approaches remain controversial.[4] A possibly more robust way to proceed is to exploit direct information on the identification of credit supply versus credit demand, based on qualitative measures of limits to credit availability obtained either from surveys among banks[5] or from surveys among firms.[6] Still, the effect of these proxies is often found to be non significant (for Italy, Guiso and Parigi, 1999 and Bontempi, Golinelli and Parigi, 2010).

A second obstacle, however, less frequently addressed by the empirical literature, is that the effects of credit quantity restrictions on the economy are likely to be variable over time. This is a central, although often overlooked, tenet both of historical narratives and of the literature on the credit channel. Bordo and Haubrich (2009), taking a historical perspective, argue that credit market distress has its most extreme effects in a business cycle downturn. In their seminal contribution, Bernanke, Gertler and Gilchrist (1996) stress that the dynamics of the credit cycle are essentially non-linear: financial accelerator effects are stronger, the deeper in recession is the economy.

This may be due to a number of reasons. The real effects of bank lending depend on the agency costs of investment faced by a firm, which are negligible at times when profits and the share of internal finance are large, when uncertainty about the future – and therefore information asymmetries – is perceived to be low, when alternative sources of financing

[3] For a recent survey of the evidence on the effects of bank crises, see Carpinelli (2009).

[4] E.g. the interpretation of the cash-flow sensitivity of investment was questioned by Kaplan and Zingales (2000).

[5] E.g. see Lown and Morgan (2006).

[6] E.g. Duca and Rosenthal, 1993; Angelini and Generale, 2008; Bontempi, Golinelli and Parigi, 2010.

(other banks, non-bank intermediaries, bond markets or heavier recourse to commercial credit) are easier to find; [7] by contrast, the premium on bank finance can increase rapidly when cash flows dry up, uncertainty increases, and non-bank financial flows fall, as is typically the case during a contraction.

The assumption that the credit channel operates in a non-linear way, depending on the state of the economy, has not frequently been tested; however, the existence of non-linearities may easily explain why both time series estimates and short panels are a poor tool to make a robust empirical assessment of the effects of credit restrictions on economic activity. Since credit distress is a rare, if powerful, event, the full effect of the financial accelerator can only be gauged by comparing relatively rare recession episodes with normal behaviour.

The global financial crisis offers an opportunity to test the assumption that the effects of credit availability on the economy are state-dependent and to get a better estimate of their quantitative importance.

This paper addresses the issue from the vantage point of a unique dataset: a panel which includes individual information on planned and actual investment for about 1,200 Italian manufacturing firms, covering twenty years of data and including direct information on whether firms are credit rationed.

Two features of our data are important for our purposes. First, the dataset includes a firm-specific direct measure of credit restrictions, which makes it possible to distinguish between credit demand and credit supply factors (the sample also contains information on the determinants of investment decisions that can be used as control variables, minimising the risk of spurious correlations). Second, its panel dimension, which covers a large number of firms but also a long period of time, makes it possible to test the hypothesis that the impact of credit constraints on investment behaviour is time-varying and that the estimated effect depends on the phase of the economic cycle (the cross-section dimension is large enough to estimate time-varying parameters, while the time dimension is also long enough to include four episodes of recession).

[7] De Blasio (2005) finds evidence that Italian firms substitute trade credit for bank credit in inventory financing during periods of monetary tightening.

Our analysis is divided into three parts. First, we test the effects of credit rationing on investment using our panel; we ask whether these effects are time-varying; we ask how they depend on the state of the economy, measured by the official contraction periods identified by ISAE. We compare the results with those from the existing studies that do not allow the effects to vary with the cycle.

Then, we ask whether the variations in a firm's investment sensitivity to the availability of bank credit may be explained by the ability to tap alternative sources of finance, which dry up during recessions. To this end, we replicate the previous analysis separately for firms that do or do not have access to non-bank sources of finance, using membership of an industrial group as a proxy: we expect investment sensitivity to credit to be always large for the latter, but to show a more pronounced cyclical pattern for the former.

Finally, we turn to a more specific assessment of the role of credit availability in the global recession, concentrating on the years 2008-09, exploiting additional specific information that is available for that episode. As mentioned, although there is broad evidence for the existence of credit supply restrictions in the global crisis, their contribution to the slowdown is still open to discussion. For Italy, a few estimates have been conducted at the macro level, but they are still tentative and rest on strong assumptions. The benchmark macroeconomic result – to our knowledge, so far the only one – is provided by Caivano, Rodano and Siviero (2010). On the basis of the simulations of the Bank of Italy Quarterly Model (BIQM), they argue that in Italy the Great Recession was transmitted mostly through the effect of the sudden stop in international trade on export activity, rather than through financial factors, but also that the latter made a non-negligible contribution.

The paper is organised as follows. Section 2 presents the basic regressions. Section 3 discusses the data definitions and their sources. Section 4.1 presents the main results of the panel estimation. Section 4.2 extends the analysis, studying the different sensitivity to bank credit availability in firms that have easier access to other sources of finance. Then, as an additional piece of analysis, Section 4.3 concentrates on the global crisis. Section 5 concludes.

2. Empirical strategy

There is a large literature on the effect of credit constraints on investment, following Jaffe and Modigliani (1969), Jaffee and Russell (1976), Stiglitz and Weiss (1981).[8] In a frictionless, full information world, notional investment plans should only depend on the cost of capital and expected profits, and not on the firm's liquidity or access to credit. However, in the real world the actual implementation of investment plans can be hindered by liquidity and credit constraints, due to the pervasiveness of information asymmetries, market incompleteness and market segmentations.

As mentioned in the introduction, the empirical research on the link between credit quantities and investment suffers from substantial identification problems. The approach we follow here is to exploit direct qualitative information, on the firm's side, on whether their credit applications have been turned down, and to introduce this measure in an investment equation.

Direct measures of financial constraints obtained from surveys of firms have been widely used as a dependent variable in the literature studying the determinants of credit rationing (Angelini, Di Salvo and Ferri, 1998; Guiso, 1998; Duca and Rosenthal, 1993), as well as in the "finance and growth" literature (Beck, Demirgüç-Kunt and Maksimovic, 2002; Angelini and Generale, 2008); they have been used less frequently as an explanatory variable to assess the impact of credit availability on investment. As mentioned, exceptions, in the Italian case, are Guiso and Parigi (1999) and Bontempi, Golinelli and Parigi (2010), who explicitly consider a survey-based measure of credit availability among investment determinants. Nonetheless, they fail to find a statistically significant effect.

To improve upon this literature, we exploit the availability of separate information on investment plans for the future and on actual investment carried out by the firm. Such a distinction may help to improve the precision of the estimates vis-à-vis the previous literature: comparing current investment to previous plans may be a better benchmark to pin down the effect of liquidity constraints on actual expenditure.

[8] For a review of the various motivations and definitions of credit rationing, see Jaffee and Stiglitz (1990).

The empirical strategy is therefore based on two base regressions (*ex-ante* and *ex-post*):[9]

$$(1)\quad \frac{I^{Plan}_{i,t+1|t}}{S_{i,t-1}} = \alpha_0 + \alpha_1 \frac{CF_{i,t+1|t}}{S_{i,t-1}} + \alpha_2 \dot{y}_{i,t+1|t} + \alpha_3 CU_{i,t} + \alpha_4 \sigma_{i,t} + \alpha_5 \pi_{i,t} + \alpha_6 RAT_{i,t} + d_t + s_i + \varepsilon_{i,t}$$

$$(2)\quad \frac{I_{i,t} - I^{Plan}_{i,t|t-1}}{I^{Plan}_{i,t|t-1}} = \beta_0 + \beta_1 \frac{CF_{i,t}}{S_{i,t-1}} + \beta_2 \dot{y}_{i,t} + \beta_3 CU_{i,t} + \beta_4 \pi_{i,t} + \beta_5 RAT_{i,t} + \sum_{j=1}^{k} \gamma_j X_{j;i,t} + d_t + s_i + v_{i,t}$$

where i stands for the firm, $I_{i,t}$ is investment in year t, $I^{Plan}_{i,t+1|t}$ is investment plans for year $t+1$ formulated in year t, $CF_{i,t}$ is cash-flow, $S_{i,t}$ is a firm's nominal sales, $\dot{y}_{i,t+1|t}$ is a firm's expected change in sales in real terms, $\sigma_{i,t}$ is a measure of a firm's uncertainty about its sales prospects, $\pi_{i,t}$ is an index of the firm's current profits, $CU_{i,t}$ is the current degree of the firm's capacity utilisation, X_j are additional qualitative variables on the motives for revising investment, and $RAT_{i,t}$ is a dummy which takes value 1 when the firm is credit rationed; the latter is the key variable in the exercise. Individual fixed effects s_i and time fixed effects d_t are included. Some specifications also include sector-specific (either 2- or 3-digit) and province-specific time effects as controls.

The foundations of (1) are fairly standard.[10] Cash flow and profits enter as either a measure of the expected return to investment or as a measure of the firm's available internal resources. Expected growth in real sales and capacity utilisation are alternative indicators of demand. Guiso and Parigi (1999) and Bontempi, Golinelli and Parigi (2010) discuss the inclusion of a measure of uncertainty in the investment equation, whose sign is uncertain *a priori* but found by them to be negative. We use sales S_{t-1}, as a scaling variable.[11]

In equation (2), the dependent variable is instead the percentage deviation of current investment from the previous year's plans. We assume that the extent of the divergence between planned and actual investment depends on realisations of variables that were not known at the time ($t-1$) when the expectations entering equation (1) were set: cash flow, real sales growth, the current degree of capacity utilisation, profits. The proposed formulation

[9] For an early approach along these lines, see Eisner (1978), who separately estimates regressions for anticipated capital expenditures and actual realisations.

[10] E.g., see the references in Gaiotti and Generale, 2002.

[11] The capital stock is not available in our dataset. Implicitly, the level of capital stock still affects

includes actual realisations, rather than the difference between actual realisations and previous expectations; the reason is that expectations are either not available or (as in the case of $CF_{i,t+1|t}$ and $\dot{y}_{i,t+1|t}$) are only available for a short sub-sample. As Eisner (1978) notes, it is often the case that empirically, in investment equations like (2), actual realisations are a good proxy for – or perform better than – surprises.[12] A set of qualitative dummies (X_j) controls for additional motives for investment revisions (a description is in the next section).

The variable *RAT* takes the value 1 in a period when the firm is credit rationed, *0* otherwise. In equation (1) the current value of RAT_t may be considered a proxy for the unobservable expectation of being rationed in the next period ($RAT_{t+1|t}$), when the investment outlays are due.

Our exercise focuses, first, on the estimation of coefficients α_6 and β_5; they are expected to be negative under the hypothesis that credit constraints affect investment. Then, to test whether the effects of *RAT* on investment realisations are time-varying and whether they depend on the state of the economic cycle, *RAT* is then interacted with time dummies or with variables indicating the position of the economy in the cycle based on the ISAE-ISCO dating, as discussed below. The specification for equation (2) is modified as follows:

(3)

$$\frac{I_{i,t} - I^{Plan}_{i,t|t-1}}{I^{Plan}_{i,t|t-1}} = \beta_0 + \beta_1 \frac{CF_{i,t}}{S_{i,t-1}} + \beta_2 \dot{y}_{i,t} + \beta_3 CU_{i,t} + \beta_4 \pi_{i,t}$$
$$+ \beta_{5a} RAT_{i,t} * CONTRACTION + \beta_{5b} RAT_{i,t} * (1 - CONTRACTION) + \sum_{j=1}^{k} \gamma_j X_{j;i,t} + d_t + s_i + \varepsilon_{i,t}$$

where *CONTRACTION* is a dummy taking the value 1 in the years of contraction. Coefficient β_{5a} is expected to be negative and larger in absolute value than β_{5b}.

3. Data

The *Survey of Italian Manufacturing Firms* (SIM), run annually by the Bank of Italy, is an open panel of about 1,200 firms per year, which since 1978 collects specific

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investment in the equation via the degree of capacity utilisation $CU_{i,t}$.

[12] As an explanation, Eisner (1978) quotes possible inaccuracy in the expectation variables measured and a tendency for agents to expect that tomorrow will be like today.

information on individual Italian manufacturing firms with at least 50 employees.[13] It includes firm-level information on investment and qualitative information on the difficulties in obtaining credit. The sample is broadly representative of the industry composition of the Italian economy, although it tends to be biased towards larger firms. If anything, this feature of the sample should reinforce any result finding a significant effect of credit rationing on investment.[14]

Data are collected at the beginning of each year, relative to the previous year, by interviewing a sample of firms, stratified according to sector (two-digit classification of the Italian National Institute of Statistics), size (number of employees), and geographical location (region). Data revision is carried out by officials of the Bank of Italy. A special effort is made to keep information as closely comparable as possible in subsequent years.

The SIM includes annual information on the investment planned by the firm in year t for year $t+1$ and on current investment plans (both in euros), as well as on current and past nominal sales. This information is used to construct the variables $\frac{I^{Plan}_{i,t+1|t}}{S_{i,t-1}}$ and $\frac{I_{i,t} - I^{Plan}_{i,t|t-1}}{I^{Plan}_{i,t|t-1}}$ in (1) and (2) above.[15]

The SIM includes also the past, current and – for a small sub-sample – expected degree of capacity utilisation (CU_{t-1}, CU_t, $CU_{t+1|t}$). Since 1996 the survey also includes: the expected change in real sales ($\dot{y}_{i,t+1|t}$); an index of the current profitability of the firm (π_t);[16] a minimum and a maximum value around the expected change in sales, which we use to derive

[13] Service firms and smaller industrial firms were only recently included in the survey, currently known as the *Survey of Industrial and Service Firms*. See http://www.bancaditalia.it/statistiche/indcamp/indimpser; they are not considered in this paper. Each year about 15-20% of firms are dropped from the sample due to attrition, and are replaced by firms with comparable characteristics (the average stay of a firm in the sample is around five years).

[14] The under-representation of small firms introduces a bias against finding a strong impact of lending constraints on investment, since the smaller firms are those for which the bank credit restrictions should be more binding in terms of investment plans, along the lines of the financial accelerator hypothesis.

[15] In both cases, observations below the 5th and above the 95th percentile were discarded. For the second variable, we also discard responses in which $I_{i,t}$ is not consistent across two successive surveys (each year firms are asked to report the current and the previous year's investment).

[16] Firms may define the situation of their current profits in five ways (large loss, small loss, no extra profit, small extra profit, large extra profit), which we rank from 1 to 5 to construct the index.

the measure of uncertainty as the width of this range (σ_t).[17] Moreover, since 2003 the survey includes the value of the firm's past, current and expected cash flow (CF_{t-1}, CF_t, $CF_{t+1|t}$).

When investment is different from the plans that were communicated in the previous survey, the firms are asked to indicate the reasons. Among the admissible answers, they may indicate a change in the cost of production of investment goods; a change in the delivery time of the investment goods; a change in cash flow; or an internal reorganisation of the firm. We use these answers to construct the control variables $X_{j;i,t}$ in equation (2). For each possible motive, we include two dummies, the first taking the value 1 when that motive contributes to an upward revision of investment, the second taking the value 1 when that motive contributes to a downward revision of investment.

Measuring quantity credit restrictions is key to our exercise. Following a standard approach in the literature,[18] we consider a firm to be credit rationed, depending on the answers to three questions included in the SIM since 1988: *i)* if the firm would like to receive more credit at current conditions; *ii)* if it approached an intermediary but was denied credit; and *iii)* if it would be ready to accept tighter conditions. Our preferred definition (*RAT*) includes the firms that answered "yes" to questions *i)* and *ii)*, a definition which we consider to be a reasonable compromise between being tight enough, but also covering a sufficiently large portion of firms in the sample. As a robustness check, we also consider a looser definition (*RAT_LOOSE*), including the firms who answered "yes" to question *i)*, and a stricter definition (*RAT_STRICT*), including the firms who answered "yes" to all three questions.

Our complete sample covers the period 1988-2009; it includes around 22,000 observations for the *ex post* definition of investment in equation (2) and 27,000 observations for the *ex ante* definition in equation (1).[19]

The sample includes four contractions, defined as the period from peak to trough reported in the ISAE-ISCO dating. The contraction periods are 1992-93, 1995-96, 2000-03,

[17] Bontempi, Golinelli and Parigi (2010) follow a similar approach. Guiso and Parigi (1999), in a cross section, exploit detailed information on the probability distribution, only included in the SIM in 1993.

[18] See Angelini, Di Salvo and Ferri (1998) and Angelini and Generale (2008).

[19] Available data for the *ex post* definition start in 1989.

2008-09;[20] out of 22 years included in the sample, 9 are therefore classified as contraction years.

The main statistics are reported in Table 1. The dynamics of investment and financial constraints are reported in Fig. 1 and Fig. 2.

Over the sample, in terms of median values, investment revisions are slightly negative (-3% of planned investment), while planned investment is around 2.9% of a firm's sales. As shown in Fig. 1 (where contraction periods are indicated with shaded areas), both planned and actual investment (relative to total sales) fall deeply during the "Great Recession", in 2008-09. In the first year of the recession, the planned investment/sales ratio (dotted line) falls from 2.6% in 2007 to 1.7%; actual investment is somewhat below the previous year's plans (2.3% of sales, against a plan of 3.5% the previous year). In the second year of the recession, the drop in actual investment is much worse (to 1.6%, the lowest value ever recorded in the sample), while investment plans remain on the very low levels reached the previous year. Over the whole period, the turning points in plans typically lead those in realisations.

As for capacity utilisation (*CAP_UTIL*), firms on average report that they are using 80% of their capacity, but the dispersion of this variable across time and firms is large (top panel of Table 1); considering the top and bottom decile, it ranges from 95% to 60%. On average, expected sales grow by 2.4% per year (*EXP_Δ_OUTPUT*); the range of uncertainty around this value (*UNCERT*) is on average equal to 6 percentage points, but in extreme cases it can rise to 20 (9^{th} decile). Both expected and current cash flow (*EXP_C_FLOW*, *C_FLOW*) represent, on average, slightly more than 6% of total sales, with values across firms ranging from 0% to 15% (9^{th} decile). The mean and median values of the index for firms' profitability (*PROFIT)* correspond to "no extra profits". During recessions (data not shown) typically the rate of capacity utilisation, sales growth and profit fall, while uncertainty rises.[21]

[20] See ISAE, 2009, p. 54. The year 2009 was not yet taken into consideration there, but its interpretation as a contraction year is uncontroversial.

[21] In the 2008-09 episode, in the sample average capacity utilisation drops by almost 10 points, expected sales drops to -7.5% in 2008 , to recover the following year, the profit index moves into the "loss" region; the average uncertainty range increases to 11.5%.

The fraction of credit-constrained firms (the share of firms for which, alternatively, *RAT*, *RAT_LOOSE* and *RAT_STRICT* is equal to 1) is reported in the lower panel of Table 1 and in Fig. 2. In normal times, only a relatively small fraction of firms declares itself to be credit-constrained: on average, around 4% according to the *RAT* definition, 3% according to the *RAT_STRICT* definition, and 11% according to the *RAT_LOOSE* definition. Figure 2 presents the time-series pattern of these variables. They all reach a peak in the two main recessions. *RAT* touches 11% in 1992-93, during the EMS crisis, and 8-9% in 2008-09, during the global recession. Not all contractions, however, look alike from this perspective: in the two other cases (1995-96 and 2000-03) the share of credit-constrained firms remains on relatively low levels (about 4%) and no clear peaks are apparent.

A fully-fledged study of the determinants of credit constraints is beyond the purpose of this paper (on this, see Guiso, 1998; Angelini, Di Salvo and Ferri, 1998; Bianco, Ferri and Finaldi Russo, 1999). However, Table 1b compares the characteristics of the firms whose loan applications are turned down compared with the rest of the sample. They are typically smaller (the average number of employees is 340, compared with 570 for the whole sample); the expected growth of their sales is stronger (5.4% versus 3.9% for the whole sample), but the uncertainty surrounding their prospects is also greater (the min-max range for expected sales growth is 11.8%, versus 9% for the whole sample. Credit-constrained firms are also (slightly) less likely to be part of an industrial group and have lower profits and more idle capacity. By contrast, there are no appreciable differences in current and expected cash flow. These features may point to a role of information asymmetries or greater opaqueness in contributing to the refusal of a loan, but other explanations are also possible. [22]

For the purposes of this paper, it is important that proper controls for profits, cash flow, capacity utilisation, growth and uncertainty, as well as firm-specific effects be included on the right-hand side of (1) and (2), to rule out the possibility of spurious correlations.

[22] Some of these variables (size, uncertainty, group membership) clearly identify the classes of borrowers across which informational frictions are greatest (Guiso, 1998) and which are therefore more likely to be credit-constrained *à la* Stiglitz and Weiss (1981). Others types of variables may be more consistent with other definitions of credit rationing, e.g. *à la* Jaffee and Modigliani (1969), where banks classify borrowing firms into small groups based on objective factors. A discussion of the different motives for credit rationing goes beyond the scope of this paper.

4. Results

4.1 The effects of credit rationing on investment

We first turn to the estimation of equation 2.

Table 2 presents our base regression results. In the first three columns we show estimates with individual fixed effects, time fixed effects and with various combinations of the explanatory variables.[23] In comparing the results, one needs to consider that the sample period varies through the different specifications; while our preferred panel covers twenty years, due to availability constraints the inclusion of some of the explanatory variables (namely profit and cash flow) in the specification implies a substantial shortening of the sample length (down to sixteen, or even five, years).

In the following two columns, sector-specific time effects (twenty-one 2-digit NACE sector dummies interacted with the time dummies) and province-specific time effects (95 province dummies interacted with the time dummies) are also included, in order to control better for effects not captured by the right-hand-side variables. This is important to avoid the estimate of the coefficient on *RAT* being distorted by omitted variables which may affect both firms' investment and banks' credit supply. Finally, in the last two columns, *RAT* is replaced with the two alternative definitions of quantity credit restrictions (*RAT_LOOSE*, *RAT_STRICT*).

Overall, revisions in investment plans (*INV_REV*) are significantly and positively affected by the degree of capacity utilisation (*CAP_UTIL*) and by current profits (*PROFIT*). The qualitative dummies on the determinants of investment revisions are also always significant with the expected sign and explain a large proportion of the variability of investment. By contrast, the coefficient on cash flow (*CFLOW*) is not significantly different from zero.[24]

Quantity credit restrictions (*RAT*) turn out to have the expected, negative and usually

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[23] The expected change in sales ($\dot{y}$), which enters equation (2) above, was never statistically significant, possibly due in part to collinearity with capacity utilisation, and it is therefore not included in the regressions reported in the table.

[24] This may be a result either of the collinearity between cash flow and profits, or of the much shorter time horizon of the sample over which actual cash flow data are available.

statistically significant effect on investment, although not a very large one; on average, rationed firms cut their investment plans by 5%-10%. The stricter definitions of quantity restrictions (*RAT_STRICT*) also perform well in the regression (seventh column), while the coefficient on the looser definition, *RAT_LOOSE*, is not significant (sixth column). However, the significance level of *RAT* drops when either the sample is shortened (third column) or when controls for province- or sector-specific time effects are included (fourth column). The finding only marginally improves upon the results by Guiso and Parigi (1999) and Bontempi, Golinelli and Parigi (2010).

In a second set of regressions, we let the effect of *RAT* on investment vary through time by interacting it with the time dummies. The results are presented in Table 3. The first two columns report, respectively, the regression on the full sample and a regression on a shorter sample including the profit index among the explanatory variables; in the last two columns controls for province- and sector- specific time effects are added.

Overall, the results strongly confirm the hypothesis that quantity credit restrictions affect investment in an economically significant way, but also that these effects are time-varying. The assumption that all the coefficients on the interactions between *RAT* and the time dummies are the same is rejected.[25] In some periods, the coefficient on the *RAT* variable is largely negative and significant, as during the EMS exchange rate crisis (1992-93) and, more recently, during the global financial crisis in 2008-09 (although with a somewhat smaller point estimate). In other years, however, the coefficients are small and not significant. The variability of the coefficient on *RAT* across time may explain why, in the previous set of regressions the estimate of the average coefficient is small, only weakly significant, and not robust to the sample length.

A more specific test that the effects of quantity credit restrictions are stronger when the economy is in a recession is conducted in Table 4. We interact the *RAT* variable with a dummy indicating a contraction period as in equation (3) above. Two alternative interaction variables are considered: the first is a dummy taking the value 1 in the years of contraction (period from peak to trough: *CONTRACTION)*; the second is a dummy that identifies only the first year after the peak (*CONTRACTION_FIRST_YEAR*), the latter under the hypothesis

[25] For the regression in the first column of the table, the null hypothesis that all coefficients on *RAT* are equal is rejected with P-value=0.03 (not shown).

that the effects of credit constraints on the revisions of investment plans are milder in the years following a recession than in the initial year.[26] As discussed above in commenting Figure 2, we consider the contraction years identified in the ISAE-ISCO dating, to which we add 2008-09.

The first two columns in Table 4 present estimates of equation (3) using, alternatively, *CONTRACTION* or *CONTRACTION_FIRST_YEAR* in the interaction term; in the last two columns, as in previous tables, the two regressions are re-estimated adding controls for sector-specific and province-specific time effects.

All in all, during contractions the elasticity of investment realisations to the *RAT* variable is large and very significant; a rationed firm reduces investment realisations by around 20% — up to 30% if one considers the first year of the contraction only. By contrast, the effect of credit restrictions is nil in the other periods. The results are remarkably robust to sector and province controls.

By contrast, credit restrictions seem to have less effect on ex-ante investment plans. The results of the estimation of equation (1) are shown in Table 5. As in the previous table, the first three columns show estimates with individual fixed effects and time fixed effects; in the fourth and fifth column, sector-specific time effects are included; in the sixth column, province-specific time effects are included.

Overall, the fit of the equation and the sign of the various coefficients is relatively good. The various regressors all have the expected sign and are significant. Investment plans (*INV_PLAN*) respond positively to capacity utilisation, to expected sales growth (*EXP_Δ_OUTPUT*), to expected cash flow (*EXP_Δ_CFLOW*), and to the profit index. They also respond negatively to our measure of sales uncertainty (*UNCERT*), but in this case the coefficient is not significantly different from zero. The coefficients retain their significance even when sector- and province-specific time effects are included.

However, although the sign on the *RAT* variable is negative as expected, the confidence interval is large. The coefficient also remains poorly estimated when it is allowed

[26] A rationale is that at the onset of a recession plans are already set and the entire burden of adjustment is on actual investment ($I_{i,t}$), while later plans ($I^{Plan}_{i,t|t-1}$) may also be revised, thus mitigating the impact on the left-hand-side variable in (3).

to be time-varying or when *RAT* is interacted with the contraction dummy (not shown in the tables).

One possible explanation of this finding is that the investment plans in the survey are formulated before the financial constraints relevant to their implementation arise, and that the probability of future credit restrictions - $RAT_{t+1|t,}$ for which RAT_t is a proxy in equation (1) - mostly depends on firm-specific and time-invariant characteristics, and is therefore already captured by the firm individual fixed effects.[27] In favour of this conjecture, when fixed effects are excluded, the coefficient on RAT_t becomes once more mildly significant, as shown in the random effects estimate in the last column of Table 5.

4.2 Group membership and the effects of credit availability

The results reported in the previous section show that quantitative credit constraints have a large effect on the realisation of individual investment decisions when the economy is in contraction, but a much less significant impact in other periods. As mentioned in the introduction, there is a straightforward interpretation of this finding: during contractions, when the agency cost of external finance is large, it becomes more difficult for a firm to find substitutes for bank lending: alternative sources of finance, such as internal funds, recourse to financial markets, use of intra-industrial group liquidity, recourse to commercial credit lines, which are available to some firms in normal times, dry up when the economy enters a recession.

If this interpretation is correct, one can expect that *i)* on average, the response of investment realisations to changes in the availability of bank credit is weaker for those firms that have easier access to non-bank funding, and *ii)* the previous conclusion is, however, attenuated during recessions, when most non-bank sources of funding are also likely to dry up.

We then construct a further test, splitting the sample according to a measure of a firm's access to non-bank finance, to see how this affects our results both on average and across the cycle. For this purpose, we consider whether the firm belongs to an industrial group or not.

[27] In the sample, the probability of current rationing is only weakly correlated to past rationing. Based on simple correlations, rationing in *t* increases the probability of rationing in *t+1* by 30%; however, this estimate is reduced to 4% if controls for individual fixed effects are included.

This measure has been widely used in the literature as a measure of bank-dependence; it has the important advantage of being largely exogenous and not giving rise to the severe identification problems that plague the research on the credit channel. Alternative measures of credit constraints that could be derived from the balance sheet (liquidity ratios, cash flows, dividend policy, interest payments over operating margins, recourse to commercial credit, to name a few) have generally been shown to be problematic and potentially affected by inverse causality.

As argued in the literature, participation in a group would normally allow the firm to access inter-company funds through the holding company, which in turn has easy access to capital markets. Hoshi, Kashyap and Scharfstein (1991) show that in Japan firms affiliated to a group do a significant fraction of their borrowing from the banks in their group, which reduces their cost of capital. The literature has also shown that this advantage may be less relevant during an economic crisis. Lee, Park and Shin (2009) also find that active internal capital markets within Korean business groups (*chaebols*) attenuated the financial constraints of the group-affiliated firms during the early 1990s, but also that the functioning of internal capital markets was impaired by the financial crisis of 1997.

In Italy, industrial groups represent an important phenomenon. The holding companies typically have access to reliable funding through large banks and operate an internal capital market for their group members. Bianco et al. (1999) find that investment by firms belonging to a group is less sensitive to cash flow than non-member firms. Guiso, Kashyap, Panetta and Terlizzese (1999) and Angelini and Generale (2008) argue that group membership is a proxy for firms that are less susceptible to a bank credit crunch.

In the SIM, group membership can be identified directly since 1994, and indirectly in the previous years. In our sample, a quite large share of firms, around 55% on average, declares affiliation to a group. This figure is upward biased due to the under-representation of small firms; if we correct for the latter, using appropriate sample weights, the proportion of firms belonging to a group is 31%, a figure is broadly in line with those reported by other authors who use samples that include very small firms.[28]

[28] Bianco, Ferri and Finaldi Russo (1999) report that 29% of firms in their dataset belong to a group. Angelini and Generale (2008) report a figure of over 20%.

We split the sample between group members and non-members and re-estimate equation (2). A priori, we expect that the (negative) coefficient β_5 in equation (2) is low for members but large (in absolute value) for non-members; but also that during contraction periods β_5 also becomes large (in absolute value) for group members, since the availability of within-group liquidity shrinks when the economy enters a recession.

The results are shown in Table 6. For each regression, the sample is split between group members and non-members, with coefficients reported respectively in the first and in the second column. Four regressions are reported.

The first two regressions replicate the benchmark equation shown in Table 3 above, with quantity credit restrictions measured alternatively by our preferred measure (*RAT*, first regression) or by the stricter definition (*RAT_STRICT*, second regression). The results lend some support to our conjecture. On average only for non-group members the point estimates of coefficient β_5 are statistically significant and around -0.12 and -0.24 (respectively, when *RAT* and *RAT_STRICT* is used). By contrast, the point estimates of the same coefficient for group members are about half that size (-0.07 and -0.10) and either not statistically significant (in the first regression) or very weakly so (in the second regression).

The third and fourth regressions include an interaction of the *RAT* (alternatively *RAT_STRICT*) variable with the dummy identifying the first year of a contraction period (*CONTRACTION_FIRST_YEAR*), similarly to what was done in Table 4 above. The results are also consistent with our conjecture. During contractions, the coefficient β_5 is large and strongly significant both for group members (-0.24 and -0.30) and for non-members (-0.20 and -0.16). By contrast, in non-contraction years, only the coefficient for non-group members remains large and, at least when the *RAT_STRICT* definition is used, strongly significant; for group members, it reaches low and non-significant values.[29]

According to these results, it is mostly the behaviour of group members (who normally have access to alternative sources of finance) that drives the cyclical pattern of the effect of bank credit constraints found in the previous section: they are only sensitive to the availability of bank credit in bad times, when alternative sources of finance dry up. In

[29] For group members the difference in the estimates for coefficient β_5 between contraction and non-contraction periods is significantly different from zero (test not shown in the table).

contrast, the investment of firms not belonging to a group always responds to bank credit restrictions.

4.3 The global crisis in 2008-09

Having concluded that credit restrictions have a large effect on the implementation of individual investment decisions when the economy is in contraction, and that this outcome may depend on the changing availability of alternative sources of finance, we now turn to a more specific assessment of the role of credit availability in the global recession, concentrating on the years 2008-09. In addition to the results already included in the previous section, we exploit a set of specific pieces of information on the financial crisis which was included in the 2008 edition of the SIM.

In addition to the standard question on credit restrictions, in 2008 the firms were asked whether in the last part of the year, namely since October 2008, the banks recalled their existing credit lines; 13% of the respondents answered affirmatively.[30] This variable offers a different dimension of credit tightening than *RAT*: a recall of outstanding credit lines is a relatively less common, and potentially more disruptive, event for a firm than the denial of a new loan application.[31] In addition, the timing of the question (i.e. 'since October 2008') links the tightening to the Lehman collapse and to the sudden freeze in international financial markets in the last quarter of the year, supplying a measure of the credit restrictions that can be directly attributed to an exogenous and unexpected credit event, specific to the global crisis.

Table 7a shows the characteristics of the firms whose bank loans were recalled in the last quarter of 2008, compared with the whole sample. On average, these firms were slightly smaller, less profitable, had a lower current and expected cash flow, more idle capacity and more uncertain prospects on their future sales growth: i.e. they were either firms in worse current conditions or firms more affected by uncertainty and asymmetric information.

In 2008 the SIM also included additional qualitative questions on the impact of the global crisis on individual firms. These are important controls in our regression, in order to

[30] In the following year's survey, a similar question on credit line recalls in 2009 was repeated; 11% of the respondents still answered affirmatively.

[31] In fact, the responses to the two questions are also only very imperfectly correlated in the sample.

avoid a spurious correlation between strictly financial factors and the broader impact of the global crisis on the firm that could produce biased estimates. Firms were asked how much they were affected by the crisis (admissible answers were: not at all, a little, considerably, very much) and for how long they expected to remain affected (as a maximum duration in months).[32]

We estimate two augmented versions of equations (2) and (1). In addition to the regressors already discussed, the specifications include a dummy equal to 1 for firms whose credit lines were recalled after the collapse of Lehman (*CREDIT_LINE_RECALL*), an index measuring the depth of the crisis, as perceived by the firm (*CRISIS_IMPACT*), and the maximum expected crisis duration in months (*MAX_CRISIS_DURATION*). The equations are estimated over the years 2008 and 2009 only, with a random-effects estimator;[33] the results are shown, respectively, in Tables 7 and 8.

On investment realisations (equation 2), the main conclusion of the previous section still applies: firms which, according to *RAT*, were credit-constrained reduced their annual investment relative to plans by about 15%-17% (Table 7). The result is also robust to the simultaneous introduction of 339 dummies for (3-digit) sector and 95 province dummies (last two columns).

As for the other variables, realised investment was negatively affected by the impact of the crisis on the firm (a unit increase of the *CRISIS_IMPACT* index, e.g. from "not at all" to "a little", decreased the firm's investment by 10%). Firms' size seems also to have been a factor contributing to the investment slowdown in 2008-09: larger firms reduced their investment more than smaller firms.

By contrast, the post-Lehman recall of loans by banks (*CREDIT_LINE_RECALL*) did not impact on investment realisations, as shown by the statistically insignificant coefficient in the first row of the second and the fifth columns. A possible explanation is the following. Since the reported recall of credit lines by the banks occurred in the last quarter of 2008, it is unlikely that it could have affected the difference between investment realisations and plans (the dependent variable in Table 7), either in 2008 (at that time most investment decisions

[32] For a discussion, see Bugamelli, Cristadoro and Zevi (2009).

[33] Since the crisis dummies are firm-specific, fixed effects cannot be included.

for the year had probably already been implemented) or in 2009 (in that case, there was time to revise both plans and actual investment).

However, the recall of credit lines showed up in a large downward revision of investment plans in equation (1). As the regressions in Table 8 show, the coefficient on *CREDIT_LINE_RECALL* is negative and statistically significant. The effect is also economically significant: the size of the coefficient implies that firms whose credit lines were recalled cut their investment/sales ratio by around 0.5% in each of the two years covered by the regression. This broadly corresponds to a cut of 18% in plans each year by these firms.[34]

The estimates of the other coefficients in Table 8 are consistent with the hypotheses underlying the specification of the equation: plans responded positively and significantly to projected cash flow and projected sales, and negatively and significantly to uncertainty (as in Guiso and Parigi, 1999), to crisis and (at least in some regressions) to its expected duration.

Based on these estimates, it is possible to quantify the magnitude of the effects of credit constraints on investment during the global crisis and to assess whether they were economically relevant. This is done in two steps.

First, we consider the effect on investment plans for 2009 and for 2010. We run a counterfactual simulation of equation (1), assuming that *CREDIT_LINE_RECALL* is equal to 0 for all firms; for each firm, we obtain the deviation from this counterfactual profile as $I_{i,t|t-1}^{Plan} - I_{i,t|t-1}^{Plan*}$ (an asterisk indicates counterfactual values). Then, we consider the effect of credit restrictions on investment realisations in 2008 and 2009, based on the estimates of equation (2) in Table 7, running a counterfactual simulation of equation (2) under the assumption that *RAT* is equal to 0 for all firms and obtaining for each firm the deviation from the counterfactual profile, $(I_{i,t} - I_{i,t|t-1}^{Plan} - I_{i,t}^{*} + I_{i,t|t-1}^{Plan*})$.

Adding the two expressions, we obtain $(I_{i,t} - I_{i,t}^{*})$, i.e. the effect of credit restrictions on firm *i*'s investment. Aggregating across firms, the total impact on investment turns out to be around 3.0% in each of the three years 2008- 2010, corresponding to a cumulate investment loss of 9.0% over the entire period. This estimated effect, which is in line with

[34] In the sample investment plans by these firms were on average 2.8% of previous period's sales,

the assessment by Caivano, Rodano and Siviero (2010), is not negligible, although it only explains part of the downside pressure on investment over this period.[35]

5. Conclusions

The evidence we have presented, covering around 1,200 Italian firms over the last twenty years, robustly supports the conjecture that, in addition to bank interest rates, credit quantities have a significant effect on investment. Our conclusion contrasts with the usually weak results found in much of the previous empirical literature. In particular, it improves on the existing results from studies at the Italian firm-level, such as Guiso and Parigi (1999) and Bontempi, Golinelli and Parigi (2010), which typically have difficulty in finding statistical significance of the effects. We are able to reach more precise estimates thanks to two features of our approach.

First, we concentrate on investment realisations, i.e. deviations from previous plans. It turns out that quantitative credit restrictions significantly and robustly affect the *ex post* realisation of investment plans; by contrast, it remains more difficult to identify a sizeable effect of credit availability on *ex ante* plans. As we argue in the paper, the latter difficulty may reflect some still unsolved problems of identification.

Second, thanks to the features of our dataset, we test the conjecture that the effect of credit availability on investment is not constant over time, but depends on the state of the economy.

We find that the impact of bank credit quantities on a firm's investment is time-varying and is concentrated in periods of contraction of economic activity, particularly at the beginning of a recession, when alternative sources of finance also dry up. The latter finding confirms a conjecture often advanced in the literature, but not systematically tested before. Based on specific information on the behaviour of firms that are members of an industrial group, we also find evidence supporting the conjecture that the availability of alternative non-bank sources of finance and its variations across the cycle are crucial to the results.

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[35] This may amount to between one fourth and one fifth of total pressure on investment (excluding construction), measuring the latter as the decrease in investment that would have taken place assuming no compensating policy interventions. See the counterfactual simulations of the Bank of Italy Quarterly Model by Caivano, Rodano and Siviero (2010).

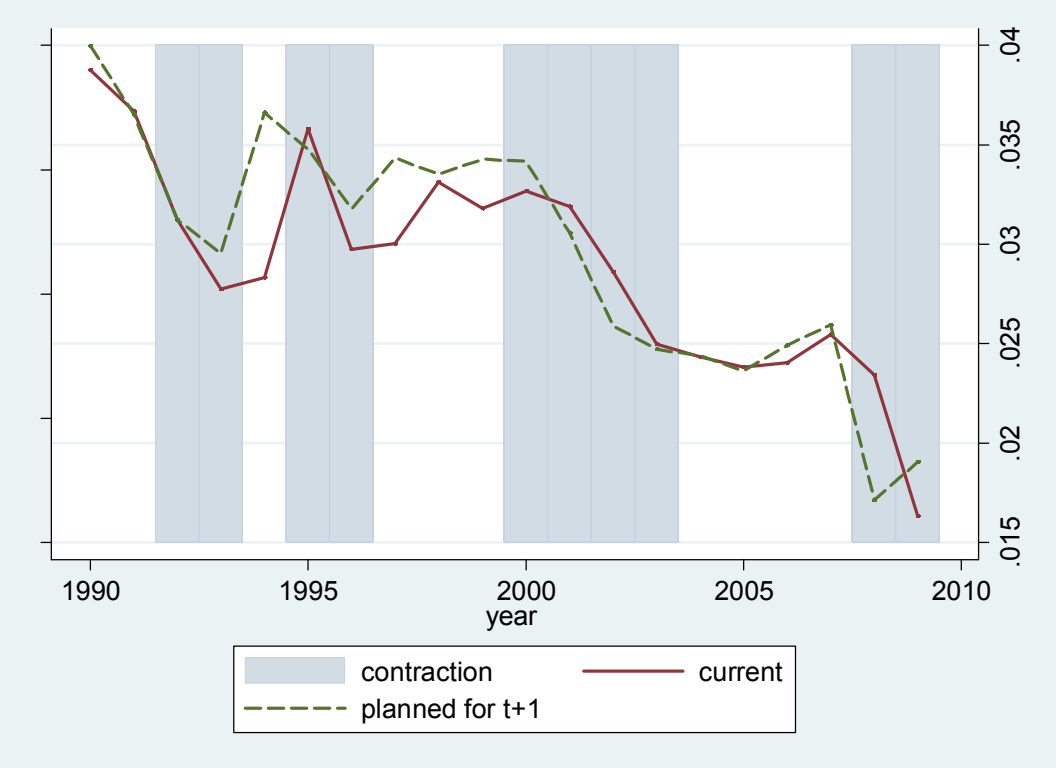
The evidence presented also suggests that reduced credit availability played a non-negligible role in contributing to the Great Recession in Italy, although the results do not suggest that it was the main driving force behind it. As in previous recessions, the increased share of firms that saw their applications for new loans turned down affected their ability to implement investment plans already decided. Moreover, a sudden recall of existing bank loans for a portion of firms, directly prompted by the market freeze soon after the collapse of Lehman Brothers, resulted in substantial and long-lasting revisions of investment plans, extending to 2010.

Tables and figures

FIGURE 1

INVESTMENT IN THE SIM

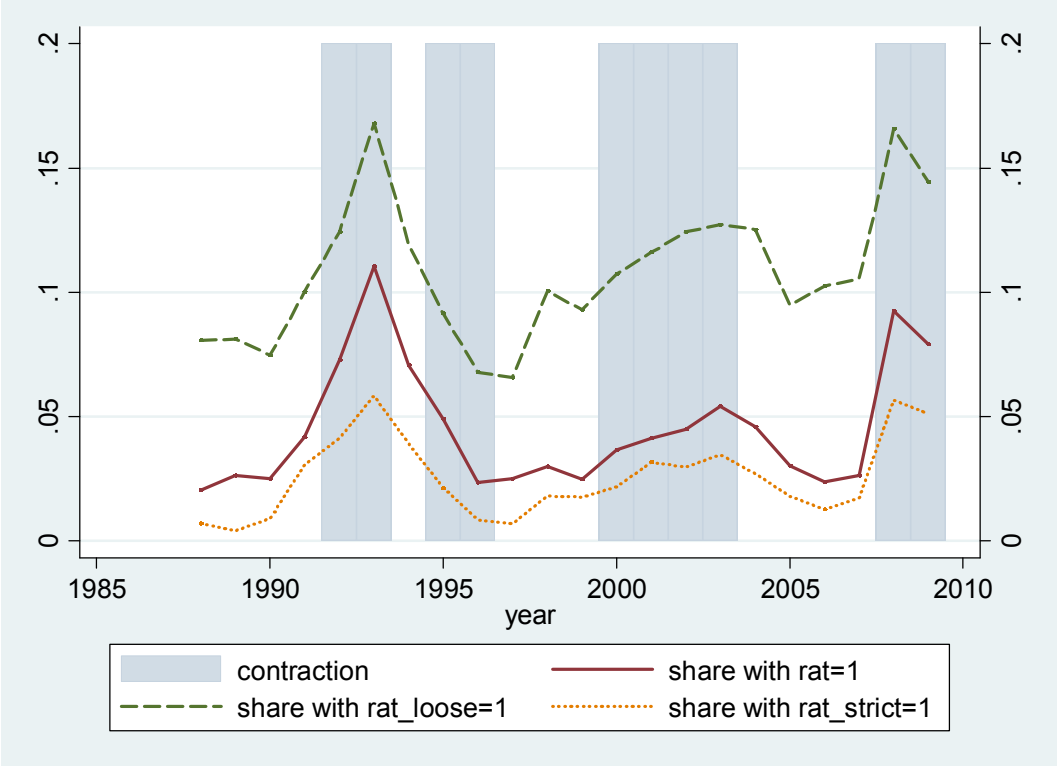
Current and planned investment (% of sales)



Source: SIM. Ratios of planned investment in *t for t+1* and of actual investment in *t* to nominal sales in *t-1;* sample median. Shaded areas mark periods of economic contraction, based on the ISAE-ISCO dating.

FIGURE 2

CREDIT AVAILABILITY IN THE SIM



Source: SIM. *RAT_LOOSE=1:* firms that would like more credit. *RAT=1:* firms that would like more credit and have been denied credit by banks; *RAT_STRICT=1:* firms that would like more credit, would be ready to pay a higher interest rate and have been denied credit by banks. Shaded areas mark periods of economic contraction, based on the ISAE-ISCO dating.

TABLE 1

MAIN STATISTICS

STATS	INV_REV	INV_PLAN	CAP_UTIL	PROFIT	EXP_D_OUTPUT	UNCERT	C_FLOW	EXP_C_FLOW
MEAN	.1827424	.0396465	79.60158	2.608943	3.934921	8.996397	.0659967	.0634163
P10	-.6387097	.0063588	63	1	-9	2	0	0
P50	-.0372222	.0289284	80	3	2.4	6	.0461066	.0426692
P90	1.136	.0895522	95	4	16.6	20	.1583211	.1515152
SD	1.026373	.0350891	13.13478	1.148666	18.2247	16.36858	.0833819	.0789405
N	21921	27098	30112	21135	17048	12694	12921	12932

Definitions: *INV_REV*: ratio of actual investment in *t* to investment plans (formulated in *t-1*), minus 1. *INV_PLAN*: investment plans (for *t+1*, formulated in *t*) as a ratio to nominal sales in *t-1*; *CAP_UTIL*: degree of capacity utilisation, as %; *PROFIT*: index for firm's profitability (ranging from 1 to 5, see text); *EXP_Δ_OUTPUT*: expected % change in sales, in real terms, *in t* for year *t+1*; *UNCERT*: min-max range of the firm's expectations for the previous variable; C_FLOW: current cash flow, as a ratio to nominal sales in *t-1*; *EXP_C_FLOW*: expected cash flow for the following year, as a ratio to nominal sales in *t-1*.

year	RAT_LOOSE	RAT	RAT_STRICT
1988	.0805687	.0203874	.0071356
1989	.0812721	.0263425	.0040527
1990	.0746606	.0250501	.009018
1991	.1003168	.0418367	.0306122
1992	.1244344	.0730159	.0412698
1993	.167982	.1104034	.0583864
1994	.1196172	.0707291	.039173
1995	.0915254	.0489362	.0212766
1996	.0678643	.0235849	.0084906
1997	.065723	.0249501	.006986
1998	.1005076	.0300601	.0180361
1999	.0929603	.0246696	.0176211
2000	.1073919	.0366102	.0216949
2001	.116061	.0412663	.0316563
2002	.1242906	.0448164	.0296976
2003	.1273637	.0540682	.0346457
2004	.1252796	.0458095	.0270692
2005	.0948787	.0302564	.0179487
2006	.1024636	.0236842	.0126316
2007	.1055363	.0264579	.0172786
2008	.1658031	.0924092	.0566557
2009	.1444632	.0790802	.0510376
Total	.1118017	.0453972	.0265675

Source: SIM. Sample mean. *RAT_LOOSE:* share of firms that would like more credit; *RAT*: share of firms that would like more credit and have been denied credit by banks; *RAT_STRICT:* share of firms that would like more credit, would be ready to pay a higher interest rate and have been denied credit by banks.

TABLE 1A

CHARACTERISTICS OF CREDIT-CONSTRAINED FIRMS

	RAT=0	RAT=1	total sample
no. of employees	576.8	338.1	566
profit index	2.64	1.79	2.61
cash flow/sales	0.066	0.061	0.066
expected cashflow/sales	0.64	0.061	0.063
capacity utilisation (%)	79.8	74.5	79.6
expected sales growth (%)	3.86	5.42	3.93
uncertainty	8.86	11.75	8.99
share belonging to a group (%)	55.5	49.9	55.3
# of firms	28745	1367	30112

Source: SIM. The profit index may range from 0 to 5. The uncertainty index is the min-max range of expected growth in sales (in percentage points).

TABLE 2

INVESTMENT AND CREDIT CONSTRAINTS / I

	INV_REV		INV_REV		INV_REV		INV_REV		INV_REV		INV_REV		INV_REV	
RAT	-0.09	(**)	-0.10	(*)	-0.08		-0.06		-0.11	(**)				
	2.43		*2.28*		*1.28*		*1.40*		*2.28*					
RAT_LOOSE											0.02			
											0.84			
RAT_STRICT													-0.16	(**)
													3.95	
CAP_UTIL	0.26	(**)	0.27	(**)	0.15		0.28	(**)	0.23	(**)	0.33	(**)	0.26	(**)
	3.38		*2.66*		*1.02*		*3.32*		*2.16*		*4.40*		*3.34*	
CFLOW					-0.05									
					0.25									
PROFIT			0.02	(*)	0.03	(**)			0.02	(*)				
			1.74		*2.35*				*1.75*					
dummy delivery times (+)	0.11	(**)	0.09		-0.02		0.10	(*)	0.07		0.10	(*)	0.11	(*)
	1.92		*1.20*		*0.26*		*1.84*		*0.96*		*1.72*		*1.95*	
dummy delivery times (-)	-0.15	(**)	-0.16	(**)	-0.16	(**)	-0.13	(**)	-0.14	(**)	-0.15	(**)	-0.15	(**)
	7.35		*5.50*		*3.35*		*5.09*		*4.22*		*7.14*		*7.34*	
dummy capital goods prices (+)	0.13	(**)	0.12	(*)	0.06	(**)	0.11	(*)	0.08		0.12	(**)	0.13	(**)
	2.55		*1.79*		*0.81*		*1.89*		*1.21*		*2.28*		*2.55*	
dummy capital goods prices (-)	-0.21	(**)	-0.22	(**)	-0.24	(**)	-0.19	(**)	-0.21	(**)	-0.22	(**)	-0.21	(**)
	5.31		*4.41*		*3.16*		*4.10*		*3.56*		*5.43*		*5.36*	
dummy cash flow (+)	0.36	(**)	0.31	(**)	0.12		0.37	(**)	0.31	(**)	0.37	(**)	0.36	(**)
	5.50		*3.47*		*1.09*		*5.30*		*3.22*		*5.54*		*5.53*	
dummy cash flow (-)	-0.30	(**)	-0.27	(**)	-0.27	(**)	-0.29	(**)	-0.28	(**)	-0.29	(**)	-0.30	(**)
	11.58		*8.45*		*5.53*		*9.64*		*7.12*		*11.27*		*11.52*	
dummy reorganisation (+)	0.68	(**)	0.70	(**)	0.70	(**)	0.68	(**)	0.70	(**)	0.69	(**)	0.68	(**)
	29.61		*24.54*		*18.14*		*28.51*		*23.53*		*29.63*		*29.63*	
dummy reorganisation (-)	-0.45	(**)	-0.48	(**)	-0.54	(**)	-0.45	(**)	-0.48	(**)	-0.45	(**)	-0.45	(**)
	34.75		*28.43*		*21-16*		*29,91*		*25.08*		*33.54*		*34.78*	
2-digit sector *time	no		no		no		yes		yes		no		no	
Province *time	no		no		no		yes		yes		no		no	
time fixed effects	yes		yes		yes		yes		yes		yes		yes	
individual fixed effects	yes		yes		yes		yes		yes		yes		yes	
obs	*21921*		*15441*		*8892*		*21915*		*15435*		*20859*		*21921*	
R2 within	*0.1775*		*0.1858*		*0.1788*		*0.2813*		*0.2815*		*0.1837*		*0.1778*	
period	*1989-2009*		*1996-2009*		*2003-2009*		*1989-2009*		*1996-2009*		*1989-2009*		*1989-2009*	

Fixed effects estimator. (**): significance at 5%; (*): significance at 10%. For the definition of the main variables, see footnote to Table 1.

TABLE 3

INVESTMENT AND CREDIT CONSTRAINTS / II

	INV_REV		INV_REV		INV_REV		INV_REV	
RAT*1989	0.17				0.30			
	0.71				*1.37*			
RAT*1990	-0.16				-0.10			
	0.78				*0.53*			
RAT*1991	0.29				0.56	(**)		
	1.10				*2.07*			
RAT*1992	-0.25	(**)			-0.24	(**)		
	2.45				*1.91*			
RAT*1993	-0.26	(**)			-0.17	(*)		
	3.64				*1.86*			
RAT*1994	0.03				0.10			
	0.13				*0.36*			
RAT*1995	-0.33	(*)			-0.28			
	1.88				*1.45*			
RAT*1996	-0.11		-0.40	(**)	-0.10		-0.36	(*)
	0.71		*2.19*		*0.54*		*1.69*	
RAT*1997	0.17		0.21		0.23		0.26	
	0.88		*0.98*		*1.02*		*1.13*	
RAT*1998	0.17		0.09		0.25		0.14	
	0.64		*0.36*		*0.96*		*0.63*	
RAT*1999	-0.34	(*)	-0.34	(**)	-0.16		-0.21	
	2.41		*2.50*		*1.20*		*1.54*	
RAT*2000	-0.30	(**)	-0.30	(**)	-0.38	(**)	-0.34	(**)
	2.97		*2.88*		*2.69*		*2.13*	
RAT*2001	0.17		0.11		0.09		0.06	
	0.72		*0.47*		*0.40*		*0.26*	
RAT*2002	-0.18		-0.18		-0.14		-0.13	
	1.30		*1.22*		*0.87*		*0.78*	
RAT*2003	-0.15		-0.17		-0.21		-0.24	
	1.18		*1.19*		*1.42*		*1.58*	
RAT*2004	0.12		0.15		0.12		0.13	
	0.62		*0.75*		*0.68*		*0.64*	
RAT*2005	-0.17		-0.17		-0.06		-0.10	
	1.10		*1.02*		*0.32*		*0.50*	
RAT*2006	0.06		-0.04		0.05		-0.02	
	0.37		*0.25*		*0.34*		*0.10*	
RAT*2007	0.03		0.01		0.16		0.12	
	0.21		*0.06*		*0.87*		*0.68*	
RAT*2008	-0.14	(**)	-0.17	(**)	-0.20	(**)	-0.27	(**)
	2.19		*2.45*		*2.38*		*3.14*	
RAT*2009	-0.16	(*)	-0.17	(*)	-0.14		-0.16	
	1.75		*1.69*		*1.35*		*1.47*	
CAP_UTIL	0.25	(**)	0.26	(**)	0.27	(**)	0.23	(**)
	3.33		*2.64*		*3.27*		*2.18*	
PROFIT			0.02	(*)			0.02	(*)
			1.80				*1.81*	
dummy delivery times (+)	0.11	(**)	0.09		0.11	(**)	0.07	
	3.33		*1.28*		*3.27*		*1.00*	
dummy delivery times (-)	-0.15	(**)	-0.15	(**)	-0.13	(**)	-0.15	(**)
	7.37		*5.43*		*5.08*		*4.14*	
dummy capital goods prices (+)	0.13	(**)	0.12	(*)	0.11	(*)	0.08	
	2.56		*1.80*		*1.88*		*1.21*	
dummy capital goods prices (-)	-0.21	(**)	-0.23	(**)	-0.19	(**)	-0.21	(**)
	5.24		*4.41*		*4.03*		*3.55*	
dummy cash flow (+)	0.36	(**)	0.31	(**)	0.37	(**)	0.31	(**)
	5.50		*3.47*		*5.28*		*3.23*	
dummy cash flow (-)	-0.30	(**)	-0.27	(**)	-0.29	(**)	-0.27	(**)
	11.49		*8.45*		*9,61*		*7.08*	
dummy reorganisation (+)	0.68	(**)	0.70	(**)	0.68	(**)	0.70	(**)
	29.54		*24.54*		*28.50*		*23.55*	
dummy reorganisation (-)	-0.45	(**)	-0.47	(**)	-0.45	(**)	-0.48	(**)
	34.78		*28.41*		*29.97*		*25.10*	
2-digit sector *time	no		no		yes		yes	
Province *time	no		no		yes		yes	
time fixed effects	yes		yes		yes		yes	
individual fixed effects	yes		yes		yes		yes	
obs	*21921*		*15441*		*21915*		*15435*	
R2 within	*0.1778*		*0.1866*		*0.2827*		*0.2824*	
period	*1989-2009*		*1996-2009*		*1989-2009*		*1989-2009*	

Fixed effects estimator. (**): significance at 5%; (*): significance at 10%. For the definition of variables, see footnote to Table 1.

TABLE 4

INVESTMENT AND CREDIT CONSTRAINTS / III

	INV_REV		INV_REV		INV_REV		INV_REV	
RAT*contraction	-0.18	(**)			-0.18	(**)		
	4.76				*3.98*			
RAT*contraction_first_year			-0.19	(**)			-0.28	(**)
			3.20				*3.69*	
RAT*nocontraction	0.05		-0.07		0.14	(*)	-0.06	
	0.70		*1.31*		*1.88*		*0.95*	
CAP_UTIL	0.26	(**)	0.27	(**)	0.27	(**)	0.23	(**)
	3.35		*2.67*		*3.29*		*2.18*	
PROFIT			0.02	(*)			0.02	(*)
			1.75				*1.77*	
dummy delivery times (+)	0.11	(**)	0.09		0.11	(*)	0.07	
	1.94		*1.20*		*1.86*		*0.95*	
dummy delivery times (-)	-0.15	(**)	-0.16	(**)	-0.13	(**)	-0.15	(**)
	7.34		*5.48*		*5.11*		*4.21*	
dummy capital goods prices (+)	0.13	(**)	0.12	(*)	0.10	(*)	0.08	
	2.50		*1.79*		*1.83*		*1.22*	
dummy capital goods prices (-)	-0.21	(**)	-0.22	(**)	-0.19	(**)	-0.21	(**)
	5.29		*4.41*		*4.07*		*3.54*	
dummy cash flow (+)	0.36	(**)	0.32	(**)	0.37	(**)	0.32	(**)
	5,51		*3.50*		*5.30*		*3.26*	
dummy cash flow (-)	-0.29	(**)	-0.27	(**)	-0.29	(**)	-0.27	(**)
	11.53		*8.43*		*9.58*		*7.06*	
dummy reorganisation (+)	0.68	(**)	0.70	(**)	0.68	(**)	0.70	(**)
	29.66		*24.54*		*28.56*		*23.53*	
dummy reorganisation (-)	-0.45	(**)	-0.47	(**)	-0.45	(**)	-0.48	(**)
	34.76		*28.41*		*29.94*		*25.09*	
2-digit sector *time	no		no		yes		yes	
Province *time	no		no		yes		yes	
time fixed effects	yes		yes		yes		yes	
individual fixed effects	yes		yes		yes		yes	
obs	*21921*		*15441*		*21915*		*15435*	
R2 within	*0.178*		*0.1859*		*0.2821*		*0.2818*	
period	*1989-2009*		*1996-2009*		*1989-2009*		*1989-2009*	

Fixed effects estimator. (**): significance at 5%; (*): significance at 10%. For the definition of the main variables, see footnote to Table 1.*Contraction:* dummy taking the value 1 in contraction years, according to the ISAE-ISCO dating. *Contraction_first_year*: dummy taking value 1 in the first year of a contraction, according to the ISAE-ISCO dating. *Nocontraction:* dummy taking alternatively the value *1-contraction* (in the 1st and 3rd columns) and *1-contraction_first_year* (in the 2nd and 4th columns).

TABLE 5

PLANNED INVESTMENT AND CREDIT CONSTRAINTS

	INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN (1)	
RAT	-0.001		-0.002		-0.002		-0.001		-0.002		-0.001		-0.002	(*)
	0.75		*1.29*		*0.75*		*0.71*		*1.16*		*0.95*		*1.86*	
CAP_UTIL	0.015	(**)	0.007	(*)			0.015	(**)					0.012	(**)
	6.30		*1.71*				*5.84*						*5.95*	
EXP_Δ OUTPUT			0.01	(**)	0.01	(**)			0.01	(**)	0.01	(**)		
			5.16		*3.75*				*4.71*		*4.16*			
EXP_CFLOW			0.02	(**)	0.04	(**)			0.02	(**)	0.02	(**)		
			2.74		*3.81*				*2.64*		*2.82*			
PROFIT			0.003	(**)	0.003	(**)			0.002	(**)	0.002	(**)		
			6.60		*5.28*				*6.09*		*5.48*			
UNCERTAINTY					-0.14									
					1.33									
2-digit sector *time	no		no		no		yes		yes		yes		no	
Province * time	no		no		no		no		no		yes		no	
time fixed effects	yes		yes		yes		yes		yes		yes		yes	
individual fixed effects	yes		yes		yes		yes		yes		yes		random effects	
individual random effects	no		no		no		no		no		no		yes	
obs	*27098*		*7509*		*5438*		*25490*		*7509*		*7504*		*27098*	
R2	*0.0739*		*0.0629*		*0.0607*		*0.088*		*0.0889*		*0.188*		*0.0736*	
period	*1988-2009*		*2003-2009*		*2003-2009*		*1988-2008*		*2003-2009*		*2003-2009*		*1988-2009*	

Fixed effects estimator, unless otherwise indicated. (1): Random effects estimator. (**): significance at 5%; (*): significance at 10%. For the definition of the main variables, see footnote to Table 1.

TABLE 6

SAMPLE SPLIT: GROUP MEMBERSHIP

	INV_REV		INV_REV		INV_REV		INV_REV	
	non-member	member	non-member	member	non-member	member	non-member	member
RAT	-0.12 (**)	-0.07						
	2.10	*1.36*						
RAT_STRICT			-0.24 (**)	-0.10 (*)				
			4.11	*1.77*				
RAT*contraction_first_year					-0.24 (**)	-0.20 (**)		
					2.86	*2.86*		
RAT*nocontraction					-0.09	-0.01		
					1.36	*0.12*		
RAT_STRICT*contraction_first_year							-0.30 (**)	-0.16 (**)
							2.89	*2.30*
RAT_STRICT*nocontraction							-0.22 (**)	-0.07
							3.16	*0.97*
CAP_UTIL	0.38 (**)	0.21 (**)	0.37 (**)	0.21 (**)	0.38 (**)	0.21 (**)	0.37 (**)	0.21 (**)
	3.23	*2.31*	*3.17*	*2.29*	*3.25*	*2.30*	*3.17*	*2.30*
dummy delivery times (+)	0.13	0.11	0.14	0.11	0.13	0.11	0.14	0.11
	1.27	*1.59*	*1.35*	*1.58*	*1.26*	*1.60*	*1.35*	*1.59*
dummy delivery times (-)	-0.21 (**)	-0.11 (**)	-0.22 (**)	-0.11 (**)	-0.22 (**)	-0.11 (**)	-0.21 (**)	-0.11 (**)
	5.69	*5.18*	*5.69*	*5.18*	*5.70*	*5.21*	*5.69*	*5.19*
dummy capital goods prices (+)	0.22 (**)	0.05	0.22 (**)	0.05	0.22 (**)	0.05	0.22 (**)	0.05
	2.31	*1.02*	*2.30*	*1.01*	*2.30*	*1.04*	*2.30*	*1.02*
dummy capital goods prices (-)	-0.35 (**)	-0.13 (**)	-0.35 (**)	-0.13 (**)	-0.35 (**)	-0.13 (**)	-0.35 (**)	-0.13 (**)
	5.04	*2.95*	*5.11*	*2.98*	*4.98*	*2.95*	*5,10*	*2.97*
dummy cash flow (+)	0.40 (**)	0.33 (**)	0.40 (**)	0.33 (**)	0.40 (**)	0.33 (**)	0.40 (**)	0.33 (**)
	3.73	*4.17*	*3.72*	*4.18*	*3.73*	*4.22*	*3.71*	*4.20*
dummy cash flow (-)	-0.33 (**)	-0.27 (**)	-0.33 (**)	-0.27 (**)	-0.33 (**)	-0.27 (**)	-0.33 (**)	-0.26 (**)
	6.93	*9.65*	*6.88*	*9,63*	*6.90*	*9.64*	*6.88*	*9.64*
dummy reorganisation (+)	0.75 (**)	0.62 (**)	0.75 (**)	0.62 (**)	0.75 (**)	0.62 (**)	0.75 (**)	0.62 (**)
	20.56	*22.02*	*20.57*	*22.04*	*20.57*	*22.01*	*20.57*	*22.05*
dummy reorganisation (-)	-0.53 (**)	-0.42 (**)	-0.53 (**)	-0.42 (**)	-0.53 (**)	-0.42 (**)	-0.53 (**)	-0.42 (**)
	24.49	*26.00*	*24.31*	*26.03*	*24.31*	*26.01*	*24.30*	*26.00*
time fixed effects	yes		yes		yes		yes	
individual fixed effects	yes		yes		yes		yes	
obs	*21835*		*21835*		*21835*		*21835*	
R2 within	*0.1815*		*0.1819*		*0.1818*		*0.1819*	
period	*1989-2009*		*1989-2009*		*1989-2009*		*1989-2009*	

Fixed effects estimator. (**): significance at 5%; (*): significance at 10%. For the definition of the main variables, see footnote to Table 1. *Contraction_first_year*: dummy taking the value 1 in the first year of a contraction, according to the ISAE-ISCO dating. *Group* indicates the sub-sample of firms who are member of an industrial group. *Nocontraction:* dummy taking the value *1-contraction_first_year*.

TABLE 7A

CHARACTERISTICS OF FIRMS WHOSE LINES WERE RECALLED IN 2008 Q4

	LINE_RECALL=0	LINE_RECALL=1	total sample
no. of employees	407.14	279.6	391.2
profit index	2.57	1.69	2.46
cash flow/sales	0.066	0.045	0.063
expected cashflow/sales	0.053	0.038	0.051
capacity utilisation (%)	80.3	77.6	79.9
expected sales growth (%)	-6.74	-6.42	-6.7
uncertainty	11.23	12.88	11.44
share belonging to a group (%)	58.3	58.7	58.4
# firms	1459	208	1667

Source: SIM. The profit index may range from 0 to 5. The uncertainty index is the min-max range of expected growth in sales (in percentage points).

TABLE 7

INVESTMENT AND CREDIT CONSTRAINTS IN 2008-09

	INV_REV		INV_REV		INV_REV		INV_REV		INV_REV		INV_REV		INV_REV		INV_REV		INV_REV	
RAT	-0.15	(**)	-0.14	(*)	-0.13	(**)	-0.16	(**)	-0.16	(**)	-0.17	(**)	-0.14	(**)	-0.14	(**)	-0.15	(**)	-0.14	(**)
	2.29		*1.85*		*1.93*		*2.91*		*2.66*		*3.23*		*2.40*		*2.43*		*1.88*		*1.99*	
CREDIT_LINE_RECALL			0.05						0.026											
			0.61						*0.34*											
CAP_UTIL	0.04		0.07		-0.15		-0.11		-0.10		-0.09		-0.29	(*)	-0.29	(*)	0.28		0.00	
	0.24		*0.38*		*0.80*		*0.68*		*0.60*		*0.54*		*1.69*		*1.71*		*0.01*		*1.56*	
CFLOW	-0.16		-0.10				-0.30		-0.20								0.14			
	0.50		*0.29*				*1.02*		*0.63*								*0.35*			
PROFIT	0.051	(**)	0.049	(**)	0.035	(**)	0.027	(*)	0.029	(*)			0.012		0.013		0.048	(**)	0.081	
	2.97		*2.75*		*2.07*		*1.78*		*1.87*				*0.81*		*0.83*		*2.43*		*1.05*	
SIZE	-42.90	(**)	-66.10	(**)	-47.70	(**)	-30.06	(**)	-47.50	(**)	-22.80	(**)	-34.90	(*)	-35.10	(**)	-37.50	(**)	-27.90	(**)
	2.84		*5.18*		*2.73*		*2.77*		*4.64*		*2.74*		*2.75*		*2.81*		*2.64*		*2.06*	
CRISIS_IMPACT					-0.12	(**)							-0.10	(**)	-0.09	(**)			-0.08	(**)
					3.98								*3.78*		*3.68*				*2.68*	
MAX_CRISIS_DURATION					0.00								0.00	(*)						
					1.06								*1.11*							
dummy delivery times (+)							-0.08		-0.06		-0.13		-0.06		-0.06				-0.04	(*)
							0.45		*0.33*		*0.71*		*0.31*		*0.30*				*0.23*	
dummy delivery times (-)							-0.21	(**)	-0.21	(**)	-0.18	(**)	-0.19	(**)	-0.19	(**)			-0.18	(**)
							3.56		*3.48*		*3.31*		*3.19*		*3.18*				*2.09*	
dummy capital goods prices (+)							0.15		0.10		0.20		0.17		0.17				0.12	
							1.03		*0.67*		*1.31*		*1.16*		*1.16*				*0.77*	
dummy capital goods prices (-)							-0.10		-0.08		-0.09		-0.11		-0.10				-0.11	
							1.50		*1.08*		*1.42*		*1.58*		*1.54*				*1.22*	
dummy cash flow (+)							0.84	(**)	0.84	(**)	0.85	(**)	0.83	(**)	0.84	(**)			0.82	(**)
							12.12		*11.82*		*12.83*		*12.05*		*12.07*				*11.37*	
dummy cash flow (-)							-0.54	(**)	-0.54	(**)	-0.53	(**)	-0.54	(**)	-0.53	(**)			-0.55	(**)
							17.80		*17.46*		*19.00*		*17.59*		*17.72*				*13.41*	
dummy reorganisation (+)							0.24		0.22		0.25	(*)	0.26	(*)	0.26	(*)			0.26	(*)
							1.59		*1.43*		*1.70*		*1.74*		*1.74*				*1.74*	
dummy reorganisation (-)							-0.28	(**)	-0.29	(**)	-0.29	(**)	-0.27	(**)	-0.27	(**)			-0.28	(**)
							6.32		*6.20*		*7.17*		*6.19*		*6.22*				*4.30*	
Random fixed effects	yes		yes		yes		yes		yes		yes		yes		yes		yes		yes	
3-digit sector dummy	no		no		no		no		no		no		no		no		yes		yes	
Province dummy	no		no		no		no		no		no		no		no		yes		yes	
obs	*2473*		*2327*		*2458*		*2473*		*2327*		*2667*		*2458*		*2458*		*2472*		*2457*	
R2	*0.0081*		*0.0093*		*0.0155*		*0.2037*		*0.2085*		*0.2011*		*0.2125*		*0.2121*		*0.1242*		*0.3041*	

(**): significance at 5%; (*): significance at 10%. For the definition of the main variables, see footnote to Table 1.

TABLE 8

PLANNED INVESTMENT AND CREDIT CONSTRAINTS IN 2008-09

	INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN		INV_PLAN	
RAT	-0.0008																							
	0.36																							
CREDIT_LINE_RECALL			-0.0046	(**)	-0.0051	(*)	-0.0045	(**)	-0.0046	(**)	-0.0050	(**)	-0.0046	(**)	-0.0043	(*)	-0.0053	(**)	-0.0050	(**)	-0.0040	(**)	-0.0044	(**)
			2.36		*2.41*		*2.11*		*2.45*		*2.50*		*2.06*		*1.95*		*2.64*		*2.25*		*1.98*		*2.32*	
CAP_UTIL																								
EXP_Δ_OUTPUT	0.79	(**)	0.80	(**)																	0.76	(**)	0.78	(**)
	2.65		*2.61*																		*2.43*		*2.59*	
EXP_CFLOW	0.06	(**)	0.06	(**)	0.08	(**)	0.05	(**)	0.06	(**)	0.06	(**)	0.08	(**)	0.06	(**)	0.06	(**)	0.08	(**)	0.06	(**)	0.05	(**)
	4.79		*4.68*		*4.75*		*4.26*		*5.10*		*4.11*		*4.76*		*4.04*		*4.28*		*5.01*		*4.69*		*4.05*	
PROFIT	0.22	(**)	0.20	(**)	0.14	(**)	0.21	(**)	0.06	(**)	0.14	(**)	0.15	(**)	0.16	(**)	0.19	(**)	0.20	(**)	0.21	(**)	0.20	(**)
	4.19		*3.68*		*2.52*		*4.54*		*5.10*		*2.61*		*2.54*		*2.64*		*3.25*		*3.32*		*3.85*		*3.59*	
INCERT					-1.43						-1.28	(**)	-1.81	(**)	-1.70	(**)	-1.39	(**)	-2.00	(**)				
					2.30						*2.07*		*2.87*		*2.73*		*2.25*		*3.20*					
CRISI_IMPACT	-0.19	(**)	-20.18	(**)	-25.29	(**)					-24.89	(**)	-31.17	(**)	-30.45	(**)					-20.14	(**)	-19.03	(**)
	2.11		*2.18*		*2.44*						*2.55*		*2.82*		*2.89*						*2.10*		*2.14*	
MAX_ CRISIS_DURATION	0.00		0.20		-1.50		-1.21		-1.57	(**)	-0.94		-0.78		-0.35		-1.98	(*)	2.14	(**)	-1.31		-0.13	
	0.12		*1.03*		*1.33*		*1.60*		*2.00*		*0.85*		*0.67*		*0.30*		*1.91*		*1.98*		*0.01*		*0.14*	
SIZE					1.60		1.29		1.98	(**)														
					1.09		*1.54*		*2.17*															
Firm random effect	yes		yes		yes		yes		yes		yes		yes		yes		yes		yes		yes		yes	
2-digit sector dummy	no		no		no		yes		no		yes		no		yes		no		yes		no		yes	
Province dummy	no		no		no		no		yes		no		yes		yes		yes		no		yes		no	
obs	*2154*		*2086*		*1487*		*2501*		*2494*		*1487*		*1482*		*1482*		*1487*		*1482*		*2081*		*2086*	
R2	*0.0484*		*0.0521*		*0.0648*		*0.0927*		*0.1053*		*0.11*		*0.1491*		*0.1902*		*0.1053*		*0.1424*		*0.1148*		*0.0997*	

(**): significance at 5%; (*): significance at 10%. For the definition of the main variables, see footnote to Table 1.

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