

BUSINESS INVESTMENT DURING THE GLOBAL CRISIS: SOME EVIDENCE FROM THE ITALIAN EXPERIENCE

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REGIONI E SISTEMA CREDITIZIO: OSSERVATORIO SUL MERCATO CREDITIZIO REGIONALE
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The aim of this paper

- A traditional question about every financial crisis is:
“Has the economic recession caused the credit crunch or the other way round?”
- There are many theoretical reasons and empirical evidences supporting both the hypotheses
 - Reinhart&Rogoff (2009) argued that the typical sequence of facts proceeds from risky lending that blows up speculative bubbles (from the tulip bulbs to the toxic assets), to the bubble burst and finally to credit crunch
 - Kashyp&Stein (2000) claimed that the economic crisis reduces bank deposits and causes the credit crunch
- **In this paper we exploited a new database on Italian firms to better understand the relationships between business investment and credit availability**

Business investment and bank credit: some recent evidence

Investment is strongly constrained by credit availability	Credit supply almost matches credit demand
Kashyp and Stein (2000): financial crisis reduces funds for both banks and firms	Panetta et al. (2009): the crisis reduces both bank deposits and investment plans
Colombo et al. (2013): credit availability matters when self-financing is the major investment funding source (in Italy 1994-2008)	Kahle and Stulz (2013): almost the same investment decrease in bank dependent and other firms in USA in 2008-2009
Ivashina and Schafstein (2010): US banks more involved in the crisis reduced credit supply also to high rated firms planning investment	Shoder (2013): the same as above for 1977-2011
Cingano et al. (2013): the same as above for Italian banks	D'Elia et al. (2014): investment plans depend mainly on demand expectations and utilization ratio of existing plants. Investment is a strongly discontinuous process, hardly related to credit market conditions
Amiti and Weinstein (2013): use SVAR to show that credit supply shocks explain 20-40% of investment fluctuations in Japan between 1990 and 2010	
Holmberg (2013): Swedish firm less funded by banks invest less, but investment decline is not related to credit supply	

Some stylised facts on the global crisis

2007 the first signs	Heavy losses on subprime lending and derivate finance (Bear&Stearns, etc.) in USA Hardship in some big European banks (IKB in Germany, BNP Paribas in France, Northern Rock and Barclays in UK)
2008 the Apocalypse	Bail out of Fannie Mae, Freddie Mac, Merrill Lynch, AIG, etc. Bankruptcy of Lehman Brothers NYSE closed on the Black Monday (September, 9, 2008): the DJ fell down by about 20% at the next opening Goldman Sachs and Morgan Stanley reverted in commercial banks In Europe bail out of Fortis and Dexia (Belgium), Hypo RE (Germany), Bradford & Bingley (UK) Bankruptcy of Iceland The TARP plan launched in USA
2009 the quiet after the storm	The “fair value” principle introduced by the FASB (govies are considered risky assets) The PIPP plan launched in USA The German government launched an austerity plan
2010 the sovereign debt crisis	The Greek crisis; the government commissioned by the Troika Portugal, Spain and Ireland follow Fiscal Austerity against the financial instability in Europe, quantitative easing and fiscal stimulus in USA, UK, Japan EFSF and EMS approved Basel III regulation approved (larger reserves required to banks)
2011 fiscal austerity and easy money in Europe	The LTRO launched by the EBC Fiscal Austerity against the financial instability in Europe; the Euro Plus Pact and the Fiscal Compact approved; The Cyprus crisis
2012 world recovery and European stagnation	The OMT launched by the EBC Agreement to avoid the Fiscal Cliff in USA Abenomics in Japan
2013 -2014 world recovery loses momentum	The TLTRO launched by the EBC Self critique of IMF on austerity policies; doubts cast on the European strategy The QE stops in USA Growth slow down and deflation risks in Europe

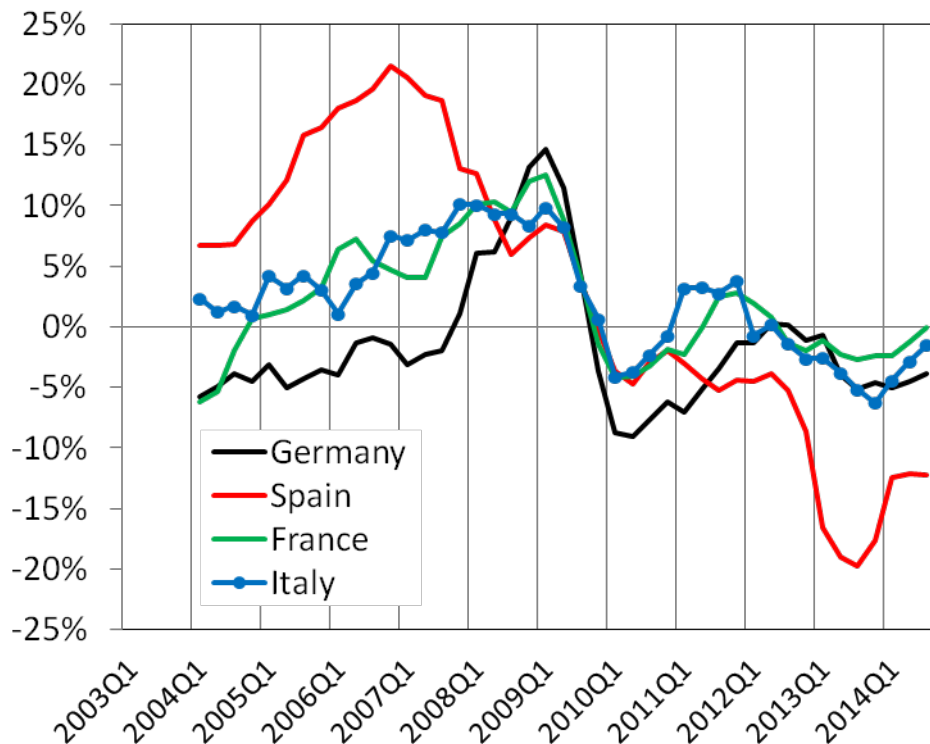
The global crisis in a nutshell

- The **private debt** bubble burst in the USA (subprime, derivative finance, etc.) in 2007-2008
- The **real estate** and the **toxic assets** bubbles followed
- **Bankruptcy** or **bail out** of many commercial and investment banks in the USA and Europe
- **Credit crunch** and hardship for households and firms in USA
- The **financial crisis** spread out world wide
- The **sovereign debt** involved (mainly because of the burden for banks bailout and unemployment)
- Fiscal **austerity** & Structural reforms in Europe vs. Fiscal **stimulus** in USA, Japan, UK
- Easy money (but ECB very cautious)
- **Deflation** risks in Europe

- **More than 1,000 bln. euro to save banks in Europe; less than 5 bln. in Italy (0.3% of Gdp; 1.8% in Germany; 4-6% in most European countries; 40% in Ireland)**

The credit crunch in the Eurozone

Loans to GDP ratio
(annual changes)



Source: Elaborations on ECB and Eurostat data

- Only moderate easy lending in Italy before the crisis
- Credit slowed down at the same pace in 2009 all over the Eurozone
- Stronger recovery of credit in Italy in 2011
- **Signs of credit crunch in Italy since 2012 (much weaker than in Spain)**
- An upturn by the end of 2013

The OBI survey: the 2013 edition

The Survey on Enterprises and Competitiveness (SEC) is carried out every year by the Banks&Enterprises Regional Observatory on Economics and Finance (OBI).

A representative sample of about 5,000 enterprises located in Italy (not necessarily Italian owned), at least at their second year of activity.

	Manufacturing	ICT	Tourism	Construction	Total
North West	610	49	46	430	1,135
North East	660	45	137	409	1,251
Centre	645	39	87	470	1,241
South	677	86	99	325	1,187
Total	2,592	219	369	1,634	4,818

The questionnaire consists of six sections: enterprises structure, economic variables, investment, international activity, financial and credit system and special topics.

Sixty questions, a large number of qualitative variables (judgements and expectations of entrepreneurs).

Detailed survey results also for 2014 are available at www.bancheimprese.it

Some strong and weak points of the SEC

- The SEC is carried by an association of banks and enterprises, rather than by an official statistical office
 - The participation ratio and the commitment of respondents is higher (since the top management is directly involved)
 - The wording of the questionnaire is intentionally adapted to the management jargon
- Some questions may change every year to better address to the hottest issues
- Occasional oversampling to analyze in depth any emergent or local issue
- Unfortunately , data are perfectly comparable only since 2012

Pros and cons of qualitative surveys

- The SEC questionnaire includes most questions requiring only a qualitative assessment (e.g.: “How was the financial situation of your firm? Improved, Unchanged, Worsened”)
- Qualitative surveys (QS) are faster and simpler, but do not provide a direct measure of the facts under examination
- The main advantage is that QS dramatically reduce misreporting and missing data. D’Elia and Martelli (2000) showed that there is a trade-off between the accuracy of aggregate survey results and the accuracy of required answers, particularly for sensible questions (e.g.: on income)
- The main drawback of QS is that the results cannot be exploited directly within the usual quantitative analytical frameworks
- Sometimes a proper “quantification procedure” helps bypassing this problem
- Otherwise, limited dependent variables models can be estimated

The key results of the 2013 survey

Firms that invested in 2012	25.3%	
Firms that planned investment in 2013	14.6%	
Firms facing an improvement of financial situation	6.9%	
Firms facing an unchanged financial situation	50.2%	
Firms facing a deterioration of financial situation	39.1%	
Causes of deterioration:	decreasing demand	28.2%
	increasing short term debts	2.3%
	increasing fixed costs	4.1%
Expected improvement in financial situation	5.8%	
Expected constancy in financial situation	58.8%	
Expected deterioration in financial situation	23.5%	
Improvement in term of access to credit	1.8%	
Constancy in access to credit condition	43.8%	
Deterioration in access to credit condition	46.8%	

Unexpectedly, amid one of the worst economic crisis since the WWII:

- 1/4 firms invested and 1/7 plan to invest too
- although the financial situation of about 40% firms deteriorated
- and about 1/2 firms suffers credit rationing

It is apparent that aggregate results are puzzling (and possibly misleading)

A microeconomic approach: the statistical mechanics vs. the classical mechanics

Strong heterogeneity among firms (e.g.: investing firms are possibly not those facing credit constraints)

Aggregate results largely depend on the interaction among firms (whose individual behavior systematically differs from that of a single “representative agent”)

To analyze discrete qualitative responses the usual tools are based on Probit or Logit models:

$$Prob(I_i = 1) = \beta X_i + \gamma E_i + \delta C_i + \alpha S_i + \varepsilon_i$$

Here I_i is a dummy variable that is 1 if the i -th firm invested (or planned to invest);

X_i is a vector of indicators on the structural characteristics of the firm;

E_i is a vector of entrepreneurs judgments on firms situation and perspectives;

C_i is a vector of indicators on capital market conditions (including entrepreneurs opinions);

S_i is a vector of “environmental” factors;

ε_i is a stochastic disturbance.

The baseline model

A Probit model taking into account only the structural characteristics of firms confirms some expected results:

- Investment is positively related to firm's size
- Firms based in the North – West of Italy invest more than the average
- Exporting firms have a larger propensity to invest
- Firms belonging to a network invest more
- Artisan firms have a smaller propensity to invest
- Manufacturing firms and those working in the tourism sector invest more than firms in constructions (only indefinite evidence for ITC firms)

Thus the portrait of the typical investing firm is a large exporting firm, based in the North Western regions and working in manufacturing or tourism sector

Probit regression for investment in 2012

The baseline model

Variation of sales volume (%)	0.0117*** (9.24)
Medium companies (50 - 249 employees)	0.365*** (6.22)
Large companies (250 or more employees)	0.588*** (4.86)
North West	0.115* (1.89)
North East	0.0919 (1.54)
Centre	-0.0142 (-0.23)
Enterprises that export their products	0.174*** (2.78)
Enterprises involved in networks	0.506*** (11.70)
Observations	4495
<i>t statistics in parentheses; * p<0.10, ** p<0.05, *** p<0.01</i>	

The role of business cycle and credit market

- Investment decisions are strongly pro-cyclical (firms that improved their financial situation tend to invest more)
- Turnover increase fosters investment (in accordance with the classic acceleration principle)
- Decreasing demand and increasing short term debts are the main factors hampering investment (other factors, such as production costs, are less influential)
- Surprisingly, the access to credit is not statistically significant (one other factors are considered)
- Only the request of further guarantees hampers investment decisions (is it an outcome of Basel rules? Or Italian banks are less focused on pure project financing?)

Thus the portrait of the typical investing firm becomes a little bit sharper: a well capitalized firm, with a good financial situation, facing decent demand perspectives

The role of economic environment

- The presence of local banks close to the firms' location is crucial (possibly because this factor reduces informational asymmetries and the risk of moral hazard)
- Also the presence of universities and other research center foster investment (possibly because of the larger availability of skilled staff)
- Surprisingly, investment decisions seem not as much reactive to fiscal incentives and profit taxation. More precisely: other explanatory factors tend to “absorb” the contribution of fiscal incentives (e.g.: no incentive can persuade an entrepreneur to invest if demand is declining and banks require too much guarantees)
- Only a public support for guarantees is appreciated

Now the portrait of the investing firm includes a landscape with local banks and research centers.

Probit regression for investment in 2012

The augmented model

Variation of sales volume (%)	0.0077*** (5.35)	Improvement in term of access to credit	0.0138 (0.09)
Medium companies (50 - 249 employees)	0.377*** (6.32)	Causes of deterioration: more guarantees required	-0.169*** (-2.90)
Large companies (250 or more employees)	0.463*** (3.61)	Causes of deterioration: high credit costs	-0.0001 (-0.00)
North West	0.0941 (1.50)	Causes of deterioration: delay of response time	-0.0486 (-0.69)
North East	0.0754 (1.23)	Strategic external factor: financial system	0.107** (2.34)
Centre	-0.0334 (-0.53)	Strategic external factor: fiscal system	0.00472 (0.10)
Enterprises that export their products	0.153** (2.37)	Strategic external factor: universities and research centres	0.309*** (3.27)
Enterprises involved in networks	0.477*** (10.60)	Desirable public support for banking guarantees	1.863*** (10.76)
Improvement in financial situation	0.459*** (5.65)		
Causes of deterioration: decreasing demand	-0.0839 (-1.50)		
Causes of deterioration: increasing in short term debts	-0.298* (-1.68)		
Causes of deterioration: increasing in fixed costs	-0.140 (-1.13)		
<i>t statistics in parentheses; * p<0.10, ** p<0.05, *** p<0.01</i>			

Investment and innovation

- The factors that explain investment in innovation are only partly the same as traditional investment (i.e.: innovation is hardly separable from other investment plans)
- Exporting activity and the size of firm are less important
- Improving financial conditions seem less crucial for investing in innovation
- Improved access to credit is appreciated, but the role of guarantees reduces
- Of course, the presence of universities and other research center gains importance
- Investment decisions are very reactive to specific fiscal incentives, although public support for guarantees is less relevant

The portrait of the typical innovative investing firm is similar to other investing firms but access to credit and public support are more important.

Probit regression for investment in innovation in 2012

Medium companies (50 - 249 employees)	-0.167 (-1.59)	Causes of deterioration: high credit costs	-0.0906 (-0.75)
Large companies (250 or more employees)	0.254 (1.42)	Strategic external factor: financial system	0.114 (1.33)
North West	0.231* (1.90)	Strategic external factor: fiscal system	0.0229 (0.26)
North East	0.365*** (3.01)	Strategic external factor: universities and research centres	0.814*** (4.93)
Centre	0.254** (2.01)	Financial resources for investments: self-financing	0.104 (1.00)
Enterprises involved in networks	0.256** (2.23)	Financial resources for investments: equity	0.499 (1.50)
Enterprises that export their products	0.145 (1.62)	Financial resources for investments: short term debts	0.220** (2.11)
Improvement in financial situation	0.0310 (0.26)	Public support to investments: grant funding	0.365* (1.81)
Causes of deterioration: decreasing demand	0.0196 (0.18)	Public support to investments: subsidized funding	0.505*** (3.84)
Causes of deterioration: increasing in short term debts	-0.0763 (-0.18)	Public support to investments: guarantees	-0.117 (-0.35)
Improvement in term of access to credit	0.916*** (3.55)	Public support to investments: tax credit	1.224*** (4.08)
Causes of deterioration: more guarantees required	-0.0685 (-0.63)		

*t statistics in parentheses; * p<0.10, ** p<0.05, *** p<0.01*

Investment plans for 2013

Expectedly, future investment plans react to factors similar to realized investment, but with some important difference

- The geographic differences seem to disappear (i.e.: social and economic environment affect the realization of investment plans)
- The local financial system is less relevant (i.e.: it matters for the realization of plans)
- Having invested in the past increases the propensity to invest also in the future (i.e.: investment is a lifelong process, rather than a one shot decision)
- Fiscal incentives have some influence only on the plans of firms that have already engaged in an investment process

The actuation of investment plans may be hampered or eased by some external factors.

Probit regression for investment planned in 2013

Investment realized in 2012	1.523*** (26.86)	Causes of deterioration: high credit costs	-0.0738 (-0.89)
Medium companies (50 - 249 employees)	0.225*** (3.10)	Causes of deterioration: delay of response time	0.0295 (0.32)
Large companies (250 or more employees)	0.296** (2.06)	Strategic external factor: financial system	-0.00538 (-0.09)
North West	-0.139* (-1.74)	Strategic external factor: fiscal system	0.0850* (1.48)
North East	-0.0776 (-1.00)	Strategic external factor: universities and research centres	0.326*** (2.97)
Centre	-0.113 (-1.42)	Desirable public support for banking guarantees	1.012*** (7.33)
Enterprises involved in networks	0.183** (2.36)		
Enterprises that export their products	0.296*** (5.08)		
Prevision of improvement in financial situation in 2013	0.636*** (6.67)		
Prevision of deterioration in financial situation in 2013	-0.0515 (-0.71)		
Improvement in term of access to credit	0.0243 (0.13)		
Causes of deterioration: more guarantees required	-0.199*** (-2.63)		
<i>t statistics in parentheses; * p<0.10, ** p<0.05, *** p<0.01</i>			

A multinomial generalization

The results of the Probit models show that firms' propensity to invest changes if firms belong to one or another of the following groups:

- 1) The fence sitters: firms that had not invested in 2012 but planned to invest in 2013
- 2) The former investors: firms that invested only in 2012
- 3) The constant investors: firms that invested in 2012 and planned to invest in 2013

Estimating a simultaneous model for the three dummy variables identifying each group confirms the results of the univariate models with few noticeable differences:

- The propensity to invest seems higher for medium firms (for the largest only among the constant investors)
- The localization is relevant only among the former investors
- Of course, constant investors have an anti-cyclical behavior
- Fiscal incentives are relevant only for the fence sitters
- The firms belonging to the last two groups benefit from the efficiency of local banks

Multinomial Probit

Firms that did not invest in 2012 but plan to invest in 2013

Medium companies (50 - 249 employees)	0.541*** (4.06)	Deterioration in 2012 constancy in 2013	-0.121 (-0.71)
Large companies (250 or more employees)	-0.134 (-0.36)	Constancy in 2012 improvement in 2013	0.963*** (3.05)
North West	0.0306 (0.22)	Constancy in 2012 deterioration in 2013	-0.0646 (-0.18)
North East	0.0227 (0.16)	Improvement in term of access to credit	-0.440 (-1.02)
Centre	-0.221 (-1.48)	Causes of deterioration: more guarantees required	-0.545*** (-3.73)
Enterprises involved in networks	0.408*** (2.96)	Causes of deterioration: high credit costs	0.140 (0.93)
Enterprises that export their products	0.479*** (4.57)	Causes of deterioration: delay of response time	0.00991 (0.06)
Improvement in 2012 improvement in 2013	0.490 (1.48)	Strategic external factors: financial system	0.148 (1.41)
Improvement in 2012 deterioration in 2013	0.782 (1.27)	Strategic external factors: fiscal system	0.190* (1.79)
Improvement in 2012 constancy in 2013	0.642*** (2.78)	Strategic external factors: universities and research centres	0.629*** (3.25)
Deterioration in 2012 improvement in 2013	1.250*** (5.04)		
Deterioration in 2012 deterioration in 2013	-0.525*** (-3.19)		
<i>t statistics in parentheses; * p<0.10, ** p<0.05, *** p<0.01</i>			

Multinomial Probit

Firms that invested in 2012 but not in 2013

Medium companies (50 - 249 employees)	0.481*** (5.32)	Deterioration in 2012 constancy in 2013	-0.125 (-1.18)
Large companies (250 or more employees)	0.198 (1.00)	Constancy in 2012 improvement in 2013	0.0177 (0.06)
North West	0.313*** (3.32)	Constancy in 2012 deterioration in 2013	0.228 (1.13)
North East	0.182* (1.95)	Improvement in term of access to credit	-0.159 (-0.64)
Centre	-0.000591 (-0.01)	Causes of deterioration: more guarantees required	-0.295*** (-3.40)
Enterprises involved in networks	0.205** (2.11)	Causes of deterioration: high credit costs	0.157* (1.65)
Enterprises that export their products	0.553*** (8.16)	Causes of deterioration: delay of response time	-0.130 (-1.23)
Improvement in 2012 improvement in 2013	0.794*** (3.99)	Strategic external factors: financial system	0.223*** (3.26)
Improvement in 2012 deterioration in 2013	1.579*** (4.32)	Strategic external factors: fiscal system	0.0213 (0.31)
Improvement in 2012 constancy in 2013	0.495*** (2.94)	Strategic external factors: universities and research centres	0.340** (2.35)
Deterioration in 2012 improvement in 2013	0.325 (1.37)		
Deterioration in 2012 deterioration in 2013	-0.442*** (-4.73)		
<i>t statistics in parentheses; * p<0.10, ** p<0.05, *** p<0.01</i>			

Multinomial Probit

Firms that invested in 2012 and plan to invest in 2013

Medium companies (50 - 249 employees)	0.616*** (6.64)	Deterioration in 2012 constancy in 2013	0.0967 (0.86)
Large companies (250 or more employees)	0.854*** (4.85)	Constancy in 2012 improvement in 2013	0.850*** (3.17)
North West	0.00588 (0.06)	Constancy in 2012 deterioration in 2013	0.642*** (3.13)
North East	0.0387 (0.40)	Improvement in term of access to credit	0.255 (1.14)
Centre	-0.0179 (-0.18)	Causes of deterioration: more guarantees required	-0.301*** (-3.27)
Enterprises involved in networks	0.254** (2.54)	Causes of deterioration: high credit costs	-0.0679 (-0.67)
Enterprises that export their products	0.878*** (12.12)	Causes of deterioration: delay of response time	-0.0475 (-0.42)
Improvement in 2012 improvement in 2013	1.501*** (8.15)	Strategic external factors: financial system	0.165** (2.27)
Improvement in 2012 deterioration in 2013	0.612 (1.33)	Strategic external factors: fiscal system	0.0808 (1.12)
Improvement in 2012 constancy in 2013	0.782*** (4.53)	Strategic external factors: universities and research centres	0.658*** (4.66)
Deterioration in 2012 improvement in 2013	1.281*** (6.27)		
Deterioration in 2012 deterioration in 2013	-0.0720 (-0.75)		

*t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Conclusive remarks

- Even during the worst economic crisis since the WWII some Italian firms have continued to invest
- They differ from the “typical” firm under several respects: they are larger; more export oriented; involved in networks; located in a favorable economic environment, where local banks are efficient and also research centers exist; capitalized enough to provide proper guarantees
- Local banks have an essential role in boosting up investment and growth
- The typical investing firm needs public support mainly to provide guarantees to banks and to fund innovation (that is a very risky investment with long term return)
- Favorable demand perspectives are essential to invest. In other words: private investment are strongly pro-cyclical. Thus there is a scope for public expenditure to dampen the economic fluctuations
- Some lessons for better industrial policies follow straightforward:
 - Strengthening aggregate demand always fosters investment
 - Contrarily, fiscal incentives should be well focused on firms that are potentially more reactive, such as innovative firms (a precision bombing, rather than a carpet bombing)
 - Providing state guarantees to investing firms is very effective (and less costly)