RESTRICTION OF CREDIT AFTER THE CRISIS OR A DIFFERENT ALLOCATION OF RESOURCES? THE ITALIAN CASE

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Abstract: *The granting of credit, whose excessive diffusion was one of the causes of the economic and financial crisis of 2007, has suffered profound changes during the following period of economic recession. The granting of credit to households and businesses has been strongly influenced by the effects of the economic downturn, the banks' choices and the intervention of the supervisory authorities. The credit, however, is also an instrument of monetary policy through which governments and central banks try to stimulate the economic growth. There are, nevertheless, several and complex limitations to the actions of banks and other financial intermediaries, information asymmetries and structural limits of the credit market. Should also be considered that in many Countries the economic recession had a strong influence on the choices and opportunities for all economic agents, making it difficult to lay the foundations for economic recovery. In the previous years, the lowering of standards of borrowers and the presence of low interest rates, setting the conditions for the so-called housing bubble. The subsequent reactions, the general worsening of the economy, the lack of funding and liquidity, in addition to the strict rules imposed by the supervisory authorities, have led banks to tighten securely controls on the characteristics of borrowers, being also obliged to put more attention on the composition of the balance sheet. Under these conditions, have risen subjects that do not meet the requirements to receive funding, and at the same time increased the difficulty to repay loans and interest. In this paper a multidimensional scaling analysis is used to observe the situation of credit in the Italian regions before and after the outbreak of the crisis, considering the average values for nine variables and for two different period, before and after 2007. Searching for dissimilarity between areas of the Country, is highlighted a clear separation before the crisis and remained essentially unchanged between northern and southern regions. Furthermore the analysis of time series showed that the granting of credit has declined slightly, but above all has changed destination, from productive purposes and investments, to support consumption.*

Keywords: Credit; Monetary policy; Multidimensional scaling.

JEL classification: E51; E52; E58.

1. Introduction

The rationing of credit by banks is a phenomenon that occurs when some characteristics of the business cycle interfere on the work of financial intermediaries. There are several reasons that limit the grant of credit, but in general it can be stated that it can find its origin in the so-called information asymmetries and limits to the action of lending institutions. The greater rigidity in the granting of credit to households and businesses characterize recession periods and is due to many causes which in some cases are mutually reinforcing. Authorities' actions in the regulation of the financial sector, in addition to the difficulties which have arisen in the balance sheets of the banks, and the lack of liquidity, may induce the so-called marginal borrowers to be unable to restructure their debts or obtain new financing. This is a case where there is a risk of still more defaults, as well as those caused by the general economic slowdown.

The credit is seen as a channel of transmission of monetary policy and makes it possible to amplify the effects of although small shocks as a result of the macroeconomic policy, also due to the imperfections of the credit market. As well as an instrument of monetary policy transmission to real economy, the credit plays a fundamental role in supporting economic growth with obvious links on the levels of investment and consumption. Among the leading causes of the so-called credit crunch there is the increase in the perception of the risk of insolvency, the latter that has been one of the reasons of the financial crisis of 2007.

The restriction, at certain levels, would be detached from the consideration of the rates charged, at least for specific types of borrowers. This discrimination and the banks' choices have been explained with information asymmetries, in particular through the process of adverse selection, considering an increase of the risk of default associated with the increase of the interest rate. In this condition, the banks establish a maximum limit of convenience of the rate at which make loans.

Many factors affected the market of loans from the banks side: the scarce availability of loanable funds, the decrease in the equity capital, the expectations of financial intermediaries, the securitization of some assets present in the banks' balance sheet. Furthermore, the worsens general economic situation obviously influences the conditions of many borrowers and potential ones. The economic recession leads to a decrease in the demand of credit, but also in the markets of investments and durable goods (Bernanke et al., 1991).

The explanation of the triggering causes of the economic and financial crisis of 2007 is illustrated, among others, by Brunnermeier (2009). As known, the so-called "housing bubble" has grown in a context of low interest rate influenced both by the decisions of the *Federal Reserve* and from capital inflows, in particular from Asian Countries to try to control the depreciation of national currencies to the dollar. In the same years was developing a model of behaviour of banks which did not involve more the traditional cycle of the loan. This was not to wait for the expiry of loans, but to split and to incorporate them into structured products (with different levels of risk) offered to financial investors.

This of course allowed to rebalance the composition and the risk of the balance sheet of banks. Obviously this involved the move out of the direct responsibility of the banks of large part of the risk, and therefore the same banks could lend more easily to borrowers.

So even subjects without personal guarantees could obtain funding for the purchase of properties, which were guaranteed by the fact that the value of the real estates

steadily increased (and therefore often mortgages were higher than the actual value of the properties). This growth in turn was influenced by the demand made possible by the low rates and the minimum quality standards for granting mortgages. The collapse of values because of what happened during the 2007, after bubble burst, became a reason not to compensate the creditors.

The generalized deterioration of the economy may even threaten the existence of weaker banks, due to the composition of the ratio of capital owned and assets hold, and of course different level of risk involved in the same assets. The greatest risk is for the banks that have a large amount of assets characterized by the possibility of losing their value, such as loans granted to companies, but also equities and bonds. In the case of economic recession, to prevent these complications, the authorities may intervene to regulate the financial market, imposing different and more stringent limits to the work of banks, new rules that involve a more careful selection of the composition of their capital and assets. These interventions serve to protect the system by intervening especially towards the banks at greater risk, as mentioned because hold a lower share of capital of property and a high proportion of assets at risk of losing value. Bernauer and Koubi (2002) analyse the dilemma of the two possibilities, restriction of credit or bank default, searching for the best solution to limit these two possible problems for the economy. So the dilemma arises from the point of view taken in the regulation. It is possible to pay attention to the short term, avoiding the credit crunch, to prevent a worse financial and economic situation. Moreover the authorities can't risk the so-called banking panic caused by the failure of weaker banks, or even the risk, and decide to intervene with stronger prudential requirements. In this situation, banks should limit the granting of credit to meet the more stringent rules. This would tend to intensify the already difficult economic situation by creating more problem for the activities and needs of companies (Bernauer and Koubi, 2002). Furthermore, the fact that the restriction does not allow the marginal borrowers to refinance their debts, risking bankruptcy, in turn induces an additional problem for the banks to which they can't refund loans (Woo, 2003). In addition, banks may fear for the future hoarding of capital, and then push to accumulate funds immediately. Another reason is the need to hold additional funds and the difficulties that are created by network effects, when banks are both creditors and debtors to other institutions and this shall create worries about the credit risk of the counterparty and this doesn't allow to erase positions of opposite sign (Brunnermeier, 2009). Of course, the uncertainty and the scarcity of private savings also make more difficult for the banks to find new resources, for example through the issue of bonds.

The paper, after this introduction, presents a paragraph on the scientific literature regarding performance and problems related to credit during economic recession and post-crisis periods, followed by a description of the European context and the observation of time series data on the Italian credit to analyse the evolution of various categories. The differences between the regions, in terms of average credit concessions to households and companies, before and after the crisis, are subsequently examined, by using a multidimensional scaling analysis at regional level.

2. Monetary policies and effects on credit

The issues that led to the credit crunch have various sources. The trend in the flow of credit, expansions and contractions, suffers changes connected with the

economic cycle and for Dell'Ariccia and Garibaldi (2005) the behaviour of changes is asymmetric, resulting in the higher volatility of credit contraction than credit growth.

This lead to define the credit crunch as a typical characteristic of cyclical downturn, as observed by the Authors after the 1991 recession. In addition, the net changes of the credit are composed by different types of operations that are credit contraction and expansion, for the banks a commitment on at least two fronts: efforts to recover risky loans and the need to select new debtors (trying to reduce informational asymmetries). The fact that contraction is more volatile than expansion and takes place during periods of recession of the cycle, and the observation that excess credit reallocation is negatively correlated with the fluctuations of *GDP*, suggests that the strengthening of the credit crunch in negative periods of the economic cycle has dissimilar explanations compared to expansion, that happens in the case of cyclical upturns (Dell'Ariccia and Garibaldi, 2005). On the role of the credit channel as a propagator of initial shocks also Balke (2000) in an analysis of the credit conditions as a nonlinear propagator of shocks. The Author proves that shocks are more effective in the tight-credit regime, furthermore there is a different effect of monetary variations, whereby the contractionary ones have a higher effect on output than expansionary shocks.

As mentioned before, we must consider the presence of the imperfections in financial markets in the two main channels of transmission of monetary shocks. The two channels used by monetary policy are the bank-lending channel and the broad credit channel (or balance sheet) (Bernanke et al., 1996). The first one considers the imperfections caused by informational asymmetries between the lenders and the borrowers. The principal role is played by the premiums that are required for the funding, furthermore the operations of open market of the central bank, modifying the lending possibilities of banks, have direct consequences on the customers' necessities of renovate or ask for new funds. The second channel, of the broad credit, is instead founded on the dissimilar characteristics of debtors, usually considered as firms. The balance sheet plays a determinant role on the fixation of premiums and a contractionary monetary policy usually induce a worsening condition for the same balance sheets. This situations produce an increase of the original shock.

The ineffectiveness of monetary policy can derive at least from a couple of reasons, the liquidity trap hypothesis and the credit crunch hypothesis. Woo (2003) observed the two hypotheses on the case of recession in Japan. The first one is due to the simultaneous presence of high real interest rates and nominal interest rates near zero, making it impossible for the central bank to further act.

The increase in the money supply and the decrease in interest rates should stimulate the demand, which in this case is braked by negative expectation about the future, that induce an increase in savings, with negative consequences on investment and consumption. Furthermore, the intervention on reserves and the above mentioned reasons about credit crunch can lighten the real effects through the credit channel, which should translate the original expansionary monetary policy. The credit crunch hypothesis consider instead the lack of capital available to banks to grant more loans, despite low interest rates, slowing therefore transfer channels of monetary policy.

Of course, in the performance of credit must also be considered that each bank independently determines the requirements that a subject must possess in order to

be eligible to receive loans. Gorton and He (2008) note that such competition between banks induces endogenous periodic cycles of credit restrictions. The Authors observe the phenomenon as a repeated bank lending game, based on publicly available information and on the assumptions of the behaviour of other banks. Consequently the models used by banks to take decisions and then the changes in the amount of loans granted are an autonomous source of macroeconomic fluctuations.

3. The condition of credit in Europe and the Italian case
The first complications, caused by the inability to collect ranked subprime mortgages, occurred since 2007, and then the first signs of illiquidity on the interbank market. Liquidity decreases when it becomes more difficult to share the risk and hard to raise funds, or sell assets on the market (Brunnermeier, 2009). The *European Central Bank* and the *Federal Reserve* did intervene by lowering interest rates and injecting billions of euros and dollars into the interbank market credit to lessen the liquidity crunch. Monetary injections in the system may generate an effect of liquidity resulting in a positive effect on the availability of credit to households and in general on real activities (Li, 2000). The cost of financing in cases of necessity by banks is a key factor on the choices of liquidity. In Europe, the intervention of the *ECB* was intense especially in Italy and Spain, two Countries hardest hit by the recession and where the granting of credit to households and businesses was greatly diminished. The European situation has been worsened by the general undercapitalization of banks, as well as difficult circumstances for companies and households. All of these economic agents in difficulty must focus their attention to repay debts rather than borrow to invest and consume. In this study we use data on credit from *Banca d'Italia* (*Bollettino Statistico*, 2002-12), at regional level and covering the period 2002-2012. As said, Italy was one of the Countries most affected by a series of negative conditions, which have imposed a severe recession and a general slowdown of economic activities. The absence of growth prospects simultaneously caused the postponement of productive investments and decreased business profitability.

With the details of the data used we can see differences and specificities of different areas and observe the influence of the economic crisis on the different variables of the credit. In the following two graphs we observe the time series of nine variables related to credit granted in Italy (2002-2012).

All values are in euro per capita, using data for population from ISTAT. In the first chart there are five types of financing over the short term, new disbursements for each quarter; in the second chart other four variables regarding the performance of the credit.
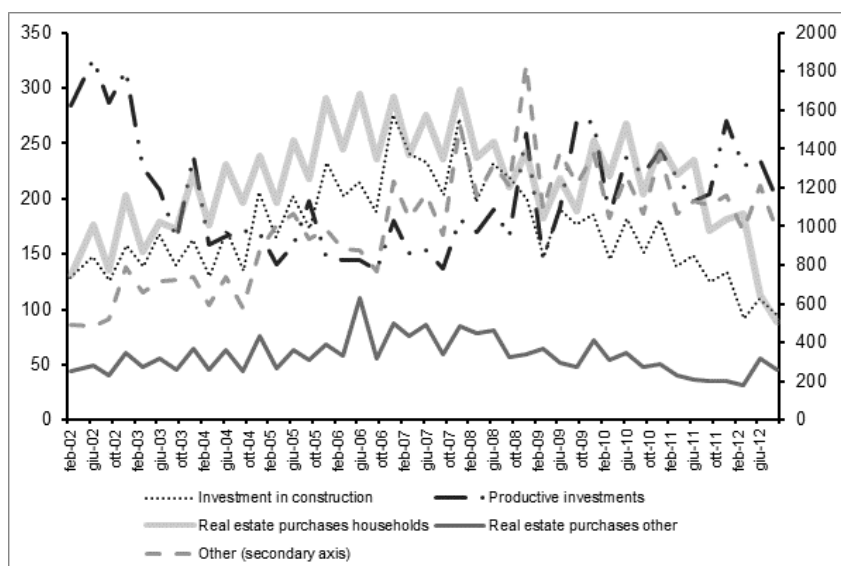
Figure 1: Different types of funding over the short term in Italy, per capita values in euros (2002-2012)
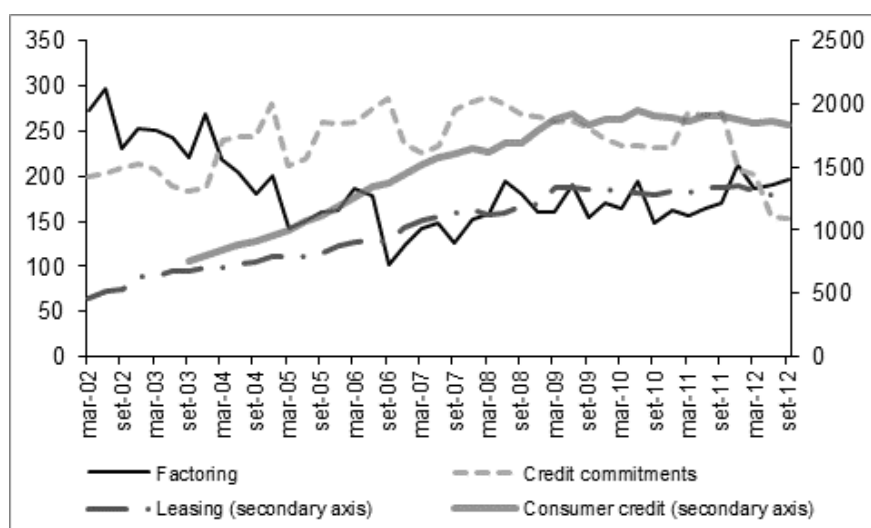Source: Our elaborations on *Banca d'Italia* data

Figure 2: Four types of credit and collateral in Italy, per capita values in euros (2002-2012)
Source: Our elaborations on *Banca d'Italia* data

The observation of the time series of the various types of credit over the short term (Fig. 1) show that the total level has suffered a decline from 2010. Absolute values were affected by the sharp fall of investments in construction at the end of 2007, while the productive ones showed a slightly positive trend. The purchase of real estate by households and other property, had, considering the absolute values, a

stable trend, adversely affected just during the 2011-12 period. The last and largest category, all the other destinations of funding over the short term, show an upward trend until the end of 2008, and then stabilized. In the second graph (Fig. 2) are shown the growth trend of consumer credit and leasing, typically two types of credit to support consumption. Factoring showed a reversal of the trend, that was negative before 2007, probably to try to get anticipations on credits by businesses. Finally, the credit commitments, then a type of collateral by banks, it is observed in stable trend, with a sharp decrease after the third quarter of 2011. The performance of the four variables just described (Fig. 2) indicates a stop to all increments after 2007, and the emergence of a stability in 2010-11 in the values of credit specifically aimed to businesses and productive investment, due to economic recession. In summary, the proportions of credit to productive activities and investment have changed, particularly to credit addressed to maintain previous levels of consumption, otherwise in decline also for the level of unemployment. This has made possible that consumption not collapsed, with a support on GDP, but of course lacking the foundations for economic recovery.

4. Data, methodology and results

To reach our purpose, which consists in identifying the trend of granting of credit in Italian regions before and after the outbreak of the financial and economic crisis and the implicit consequences set forth in the preceding three paragraphs, we use a multidimensional scaling analysis. It is a useful tool through which it is possible to produce a graphical representation of a pattern of objects, in this case the 20 Italian regions, based on the degree of similarity/dissimilarity between them. The goal is to provide a representative map that best approximates the distances observed between the same regions, concerning the availability and the granting of credit in its various forms and purposes. This statistical method attempts to build a configuration of the various entities, merged in a small number of dimensions (two in our case). This is done by defining relations between regions in terms of proximity/distance with respect to the considered indicators. The resulting positioning map has the property to partition the regions into homogeneous groups, so as that the degree of association between two regions is maximal if they belong to the same group and minimal otherwise. We considered a matrix of 20 regions (plus the aggregated data for Italy) and indicators, representing 2 sets of variables: various types of credit extended over the short term, other important types of credit to households and businesses (see Table 1). In particular, we have selected the following indicators (source: *Banca d'Italia*): new credit disbursements over the short term (investment in construction, productive investments, real estate purchases households, real estate purchase, others), leasing, factoring, credit commitments, consumer credit. Data refer to the periods 2002-2004 and 2009-2012 (mean value for the two considered periods). Data were rescaled between 0 and 1 within each considered variable, in order to avoid possible distortions due to different ranges and magnitudes.

The model's goodness of fit was assessed via the RSQ (0,96 both for the first and the second considered periods), that indicates the proportion of variability explained by the corresponding dissimilarity distances, and the Stress Index (0,10 both for the first and the second considered periods). As a general rule, results are found to be robust when the size k achieves an Stress Index value lower than 0,15. A two-

dimensional model was judged to be acceptable according to the values of the previous indexes. The correlations between dimensions and variables for the two considered periods (see Table 1) were useful for naming the axes. The resulting two-dimensional images are shown in Figure 3 and 4. The horizontal axis, the most significant and representative, represents for both graphs the variables concerning the credit over the short term and the households; the vertical one is related to investment and managing of the corporate credit in the first graph, and to consumer credit in the second one.

Table 1: Correlations between variables and dimensions (r > |0,6|)

| Variables	2002-2004 configuration		2009-2012 configuration	
	Dimension 1	Dimension 2	Dimension 1	Dimension 2
Invest. in construction	0,80		0,80	
Productive investments	0,62	0,70	0,79	
Real est. purc. househ.	0,92		0,93	
Real est. purchase other	0,87			
Other (over short term)	0,95		0,95	
Leasing	0,88		0,89	
Factoring		0,75	0,69	
Credit commitments	0,89		0,89	
Consumer credit	0,80			0,63

Source: Our elaborations on *Banca d'Italia* data
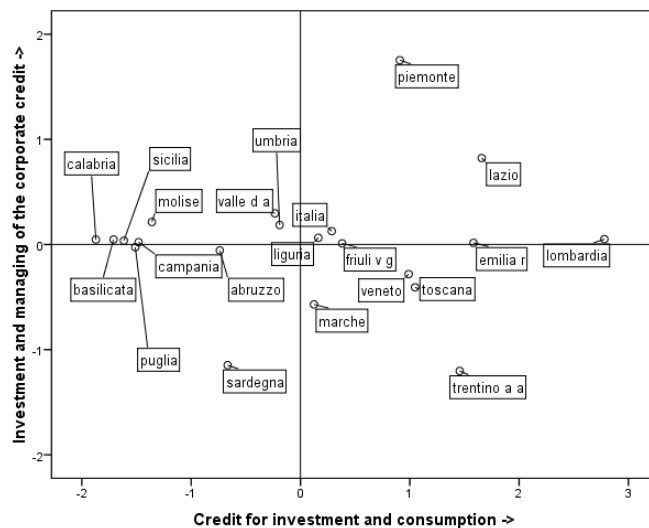
Figure 3: Cluster of regions in a two-dimensional space (2002-2004)
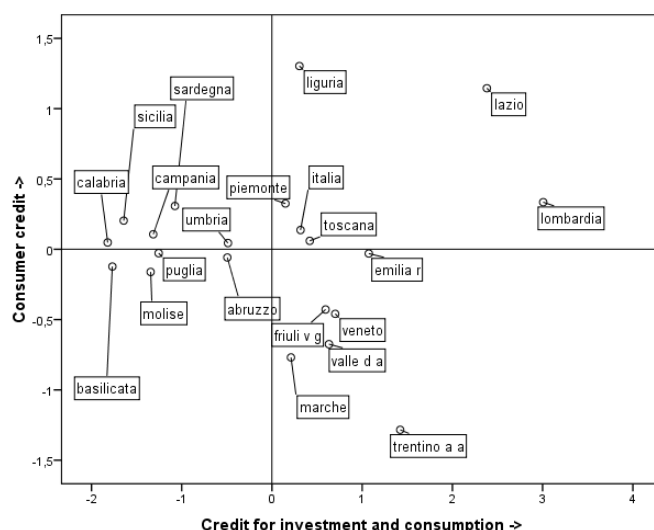Source: Our elaborations on *Banca d'Italia* data

Figure 4: Cluster of regions in a two-dimensional space (2009-2012)
Source: Our elaborations on *Banca d'Italia* data

The two graphs above show the situation remained almost unchanged before (2002-2004) and after (2009-2012) the advent of the economic downturn. Observing the first dimension in both graphs, significant to understand the average values of credit to households and businesses, it shows a clear distinction between the northern and southern Italy, remained stable over time. The group of the northern regions has higher values for all types of credit, indicating a greater entrepreneurial vitality and possibility of consumption for households. Between these regions there are also outlier cases for the second dimension. In the period 2002-2004, Piemonte region has in fact high values for both the two variables considered (see Tab. 1), productive investment by firms, much higher than the national average, and factoring, also related to businesses and to the possibility to receive advances on credits. The second graph shows in particular the low use of consumer credit to finance purchases by households in some northern regions, as Trentino, Valle d'Aosta and Veneto, on average higher in the centre and south of the Country.

5. Conclusions

The economic crisis, emerged following the bursting of the speculative bubble in the U.S., was largely caused by previous alterations in the procedures for managing of credit by the banks.

There have been several causes, related to each other, which affected the possibility to provide credit and then to be the basis for economic recovery: interventions of the supervisory authorities, monetary policies, problems of banks' balance sheets and the general deterioration in economic activity of households and firms.

Our analysis, based on data on several types of credit concerning the Italian regions, for the period 2002-2012, has shown that there has been a contraction of credit, as expected by the theoretical and empirical studies, at least for certain types of loans,

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such as those of the relevant construction sector. This restriction is due both to banks' choices, such as increasing requirements of borrowers given the increased risk of default, and also for the lack of liquidity and the stringent rules in order to avoid the risks of failures.

Other forms of credit to businesses, and even more for households, are increased after the crisis, or remained unchanged, thus marking a shift of these resources to support consumption, which would otherwise have been adversely affected by the crisis. Moreover, in Italy, before and after the outbreak of the crisis, remained a strong distinction between the southern and the northern regions, the latter with higher mean values for all the nine types of credit considered, with more possibility to receive funding, that for companies means more opportunities to invest and improve the local economy.

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