University of Catania

University of Messina

PhD Course in Economics, Management and Statistics – XXXI cycle

Banking system and economic resilience:

an analysis of the Italian case

Dott. Elio Criscione

Supervisor: Ch.mo Prof. Sebastiano Mazzù

Co-supervisor: Ch.mo Prof. Roberto Cellini

Summary

INTRODUCTION

In 2007-08, the impact of one of the most severe crises of the last decades, the so called “Great Recession”, led to increased interest in the study of functioning of the newest financial instruments adopted in those years. They seem to be the major cause of the diffusion of the crisis. In pair with the analysis of banking and financial systems, the interest has been increasing in evaluating the reason why some regions result to be more resilient than others.

The increased interconnections among markets and the phenomenon of the globalization could represent ways to improve stability of economics systems and, they should be the cause of a fast diffusion of shocks that hit one of the elements of the entire system. From this point of view, it is important to identify the different nature of Italian banks. The Italian banking system is characterized by the presence of SPAs (*società per azioni*, i.e., investment and commercial banks), banks with a relevant presence of internationalization, BCCs (*banche di credito cooperativo*, i.e., cooperative banks) and POPs (*banche popolari*, i.e., people’s banks), banks that operate mainly in local markets.

The concept of resilience, was previously applied to biological and engineering science subjects and subsequently to social science and economics in order to understand if certain characteristics could be representative of the ability of subjects or systems, such as regions, to resist to external shocks. Following this line of studies, my thesis tries to provide an overview of the existent literature on resilience and its different applications in order to evaluate if and how Italian banking system can influence resilience of regions. The analysis moves from some different indices of resilience and it evaluates how banks characteristics influence their own ability to overcome periods of crisis. The existing differences among “types” of banks make them react in different ways to external shocks and influence resilience of regions and provinces. Furthermore, SPAs have a different structure that gives them more interconnections with foreign banks and operate in different markets compared to BCCs and POPs.

Anyway, although results confirm a higher level of resilience for BCCs and POPs, it is undeniable that the maintenance of a certain level of "biodiversity" could be the best way to reach a higher level of resilience.

The analysis is centred on banks' resilience in Italy and takes into consideration their different nature. It evaluates how the presence of different banks "types" influences the ability to resist of local economies.

The outline of the thesis is as follows. Chapter 1 provides a critical review of existent literature on resilience focusing on the importance of banking system during various periods of crisis. Chapter 2 studies indices of resilience and presents an OLS estimation in order to evaluate which one of their features influences their own resilience. Chapter 3 analyses the role of banks' population in influencing regional and provincial resilience in Italy.

Chapter 1: *Concepts of resilience: a critical review of the economic literature*

1.1 INTRODUCTION

The aim of this chapter is to provide a critical review of the concepts of resilience in economic studies, and the role played by financial intermediation in providing economic resilience to regions.

The growing interest in applying the concept of resilience to economic sciences (e.g. Martin, 2012), especially during the last "Great Recession", and the role that the banking system had in such crisis (e.g. Marczyk, 2013), brings interest in verifying if some types of banks contribute or not in increasing regional resilience.

In this chapter, the different concepts of resilience will be analyzed, starting from the original application in fields other than economics and putting then attention on its economics applications, with a particular focus on regional economic resilience and its link with the banking sector.

Definitions of the term resilience can be found in dictionaries. The word comes from the Latin "resalio" and its original meaning is "to jump". It was associated to the ability of jumping on a ship, even if it was overturned by the power of waves. Resilience means the power or ability to return to the original form, position, etc., after being bent, compressed or stretched; it can also means the ability to recover readily from illness, depression, adversity.

The concept of resilience was used in many subjects and sometimes it assumed different meanings in relation with the field of study in which it was applied.

Today there are many different definitions of resilience; it is the buffer capacity or the ability of a system to absorb perturbations, or the magnitude of disturbance that can be absorbed before a system changes its structure by changing the variables and processes that control behaviour (Holling et al. 1995). It would be also explored as the speed of recovery from a disturbance, or as the time elapsing between two shocks.

The increasing interest in studying “resilience” is strictly linked to the relevance it has during a period in which everyone tries to find a way to respond to a shock; indeed, a comparison among different regions, firms, can help in explaining the relevant factors that influence such capacity of recovering. Lots of studies suggest that the ways in which a country or a firm respond to a shock, are important in defining the future trends.

The original content of the review is represented by its attention to the role of the banking system in providing economic resilience to local economy trying to not neglect the role of international context. In particular the fact that analyses developed in different field of economics can provide useful insights in understanding the relation between financial intermediation and economic regional resilience will be underlined. Moreover, compared to the existing literature, the analysis presents an evaluation based on micro data referred to individual banking units.

The structure of the Chapter is as follows. Section 2 analyses the origin of the concept of resilience with its emergence in the fields of physics and engineering and its following application, with different connotations, to economics. Section 3 deals with the economic concept of resilience and in particular with the analysis conducted on the role of firms and internationalization. Section 4 concerns to the related existent literature on the resilience of banking sector with a particular focus on Italian framework.

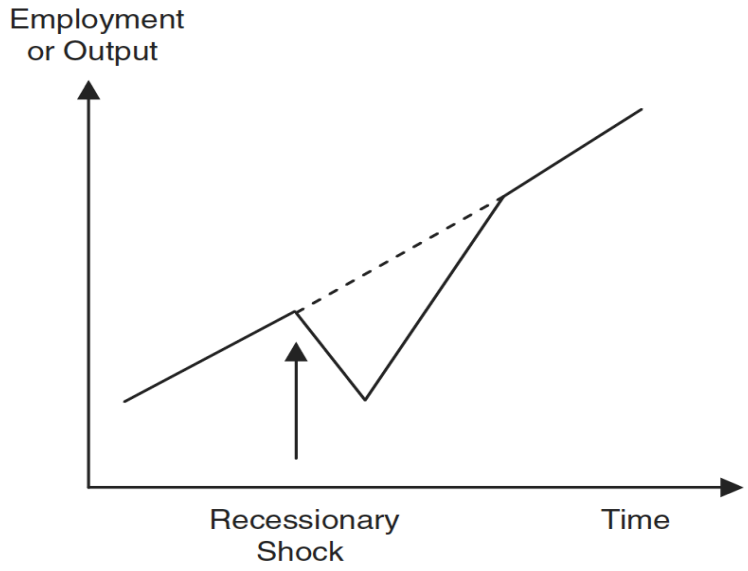
1.2 THE ORIGIN OF THE NOTIONS OF RESILIENCE

Resilience is a concept born in the fields of physics, engineering and ecological sciences as a way to understand how an entity or a system is able to react to and recover from shocks (Martin et al, 2011). From the engineering point of view, resilience is described as the immediate reaction a system have to a shock and its subsequent recovery so, engineering resilience tends to give relevance to the state of equilibrium (steady state). In such a way, a system is considered resilient if it resists to a shock and it is able to return quickly to its pre-shock state. Using this definition of resilience, economists focus their attention on self-equilibrating systems which have the capacity to return back to

its steady state after a shock, compensating automatically the forces that have caused their imbalance. As suggested by Martin (2010), differently from engineering and physics, economy is not necessary in balance, and in fact it is generally characterized by a growth trend.

The interpretation of resilience that comes out from engineering gives support to the idea of the "plucking model" (Friedman, 1993), in which economies follow a growing path and shocks cause transitory downturns; in such a model, it is simple to quantify the size of recovery because it is predicted by the size of the downturn. Engineering resilience, and so the "plucking model" avoid to consider any kind of influence that a shock can cause on economy's variables, indeed it is clear that occur some changes in the economic structure. Every change in economic structure is itself a change in the ability of recovery and obviously in its resilience. Martin (2012) shows economic trend and the capacity of being resilient, as in the engineering definition, in the way represented in the following figure (figure 1).

Figure 1: Impact of a Recessionary Shock on a Region's Growth Path: Region Returns to Pre-Shock Growth Trend

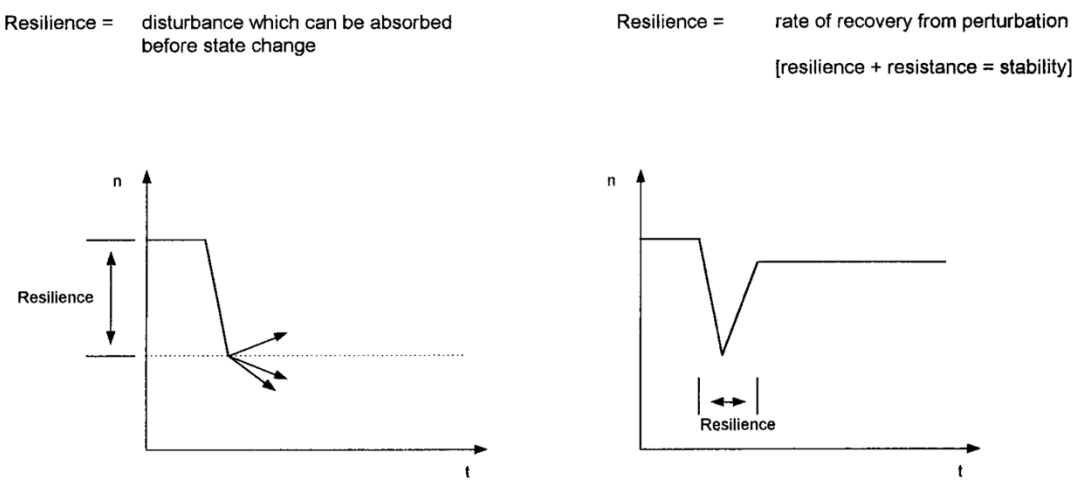


Source: Martin, 2012

Looking at the definition related to ecological science, the concept looks at the functioning of the system rather than at the stability of its component

(Adger et al, 2000). As it happens in other sectors, even for the ecological notion of resilience, there exist different definitions. Adger et al (2000) suggest a notion which takes into consideration the disturbance that a system is able to absorb before undergoing a change and an alternative one in which resilience represents the rate of recovery after an event; the authors show these two different notions using the representation in figure 2. On the left the level of disturbance which the system is able to absorb before state change is represented, and, on the right, its recovery ability is represented as the rate of recovery from perturbation.

Figure 2: Ecological resilience



Source: Adger et al (2000)

Adger et al (2000) make an analysis of ecological resilience correlating it to the concept of social resilience, in which social stability is linked to resources' dependence. Social resilience represents the ability of a society, and then of an institution, to overcome shocks by avoiding deep changes in its ecosystem. Indeed, if a community depends only on a single resource, it is so difficult for it to find a way to go beyond a crisis that hits such resource because it doesn't have the ability to adapt to a new environment. Even if a resource can be considered as the source of development in a community, it could be at the same time the source of its problems when a shock strikes it; some social indicators can help in understanding how much a society depends on a single resource, and then how less resilient it is.

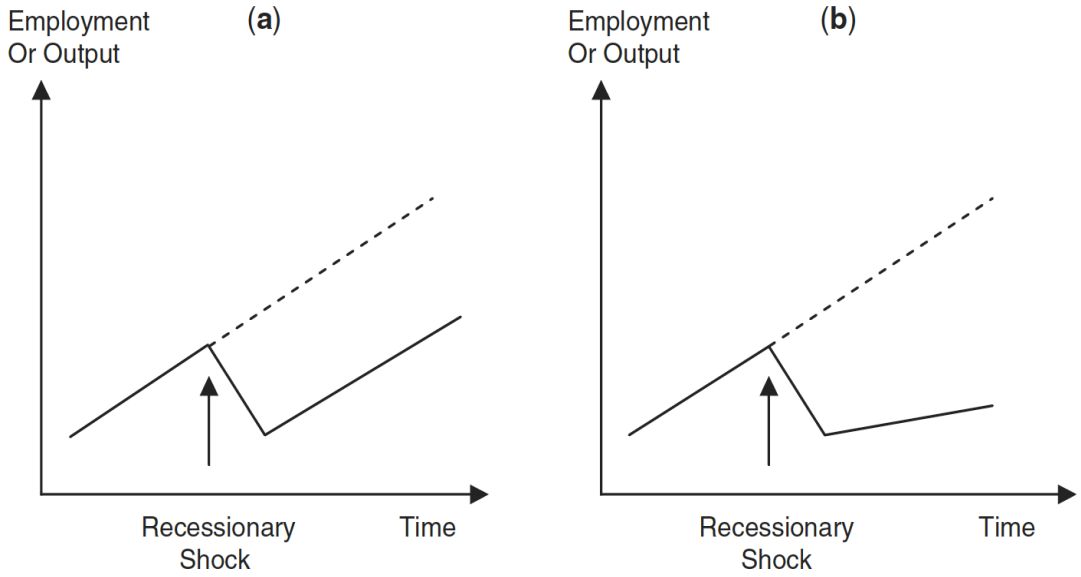
Variance in income and population displacement are two useful indicators to measure social instability, in fact a movement of workers from a region to another could be a sign of the presence of difficulties in the region of emigration or sign of a higher resilience of the region of immigration.

Ecological notion of resilience is relevant considering also the relationship with the concept of economic hysteresis. Economists use the term hysteresis referring to the admitted possibility of having multiple equilibria; so, after having a disturbance, a system can reach a new growth pathway, and then a new equilibrium, in which there would be changes on some elements of the system. As suggested by Romer (2001), hysteresis is a situation in which "one-time disturbances permanently affect the path of the economy", and so, if an event is severe enough to modify the structure of an economy, it would change definitely agents' behaviours and economies composition. About the importance of past events in influencing future development, Setterfield (2010) suggests that hysteresis is "a process of selective memory path dependence", in which recent and extreme events are more relevant in modifying existent economic pathways. Therefore, it is evident the existence of a link between the notion of ecological resilience, referring to the ability of an organism to reach a new equilibrium, and the concept of hysteresis.

Hysteresis can bring positive or negative effects on economies depending on the new growth path; indeed, negative hysteretic impact can lead to a permanent decline with the maintenance of the pre-crisis growth rate, or to a permanent decline with also a different and negative growth rate with respect to the previous one. The first case, in which to a lower level of outcomes corresponds the same growth rate, represents an economy that suffers a lost in its productivity capacity with a subsequent different equilibrium and an unchanged growth rate; such situation clearly implies a different employ of productive factors that, for example, could bring to an increasing of unemployment with a necessary migration of workers or a withdrew from the local workforce. The second case represents the worst situation which can affect an economy, and an example of this situation is given by a deep deindustrialisation of a region and its subsequent effect on local activities that reduce permanently its growth's ability. These two different impacts of a shock on an economy can be represented as in figure 3, where panel (a) shows a

permanent decline in level with a resumption of the pre-recession growth rate, and panel (b) shows the same permanent decline in level with a lowered growth rate.

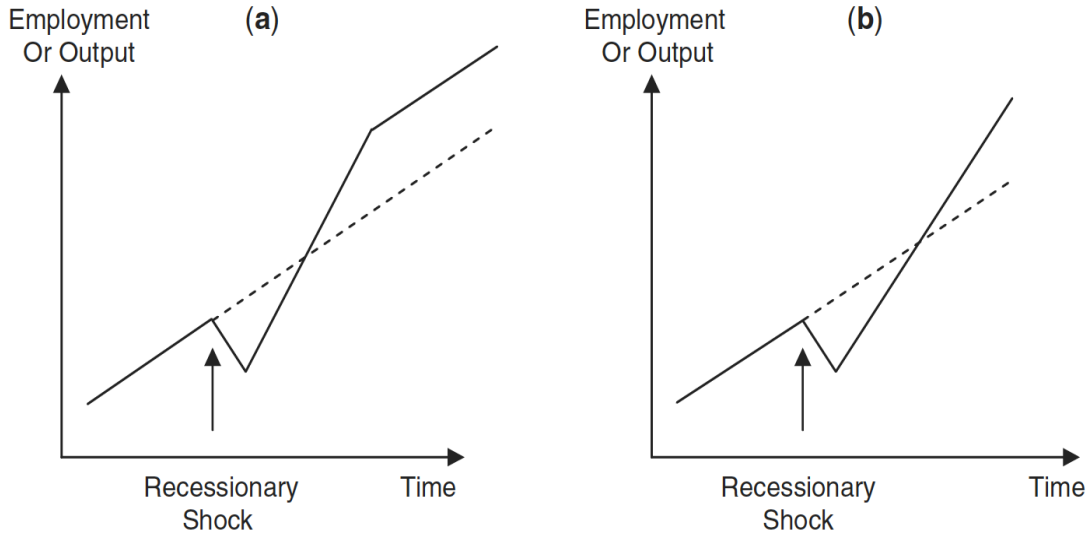
Figure 3: Negative Hysteretic Impacts of a Recessionary Shock on a Region's Growth Path



Source: Martin, 2011

Even if the most discussed case of hysteresis refers to a negative effect of a shock on economies, there could be the opposite case in which after an event, the local economy reaches a higher level of growth; therefore, a positive hysteretic reaction is associated with a resilient region. Such an event could bring a growth on region's productivity and have a linked positive effect on its development through the establishment of new firms and the creation of new jobs. After such a change, the economy could be able to maintain the new growth rate permanently, or at least for a limited period, after which it returns back to its previous rate. These two kinds of development can be simply summarised as in the graphs (figure 4), in which panel (a) shows a recovery to higher level with a resumption of the pre-recession growth rate, and panel (b) shows the same level of recovery with a sustained higher growth rate.

Figure 4: Positive Hysteretic Impacts of a Recessionary Shock on a Region's Growth Path



Source: Martin, 2011

A third way to describe the concept of resilience is that of using the notion of adaptive resilience; this notion takes into account the ability of an economy, and of a firm, to rearrange its internal abilities and then to adapt to changes occurred after an external or internal shock. It clearly depends on the adaptability of structures and willingness to change. In this way, resilience could be seen as a dynamic process in which a necessary moment of destruction followed by a growing phase exists, according to Schumpeterian notion of "creative destruction"; indeed, just a preliminary phase of destruction can cut out obsolete elements that hinder growth.

Looking at the different ways used to describe the concept of resilience, Martin (2011) outlines four useful dimensions to give a complete description of the notion, namely resistance, recovery, re-orientation and renewal. Resistance represents the ability to resist and avoid the effects of a recession period; recovery concerns to the speed at which a region is able to recover after shocks; re-orientation is the way to look at changes in the structure of economies, necessary to contrast crisis effects; renewal guarantees to a region the possibility to restore its pre-recession path or to identify its new growth path.

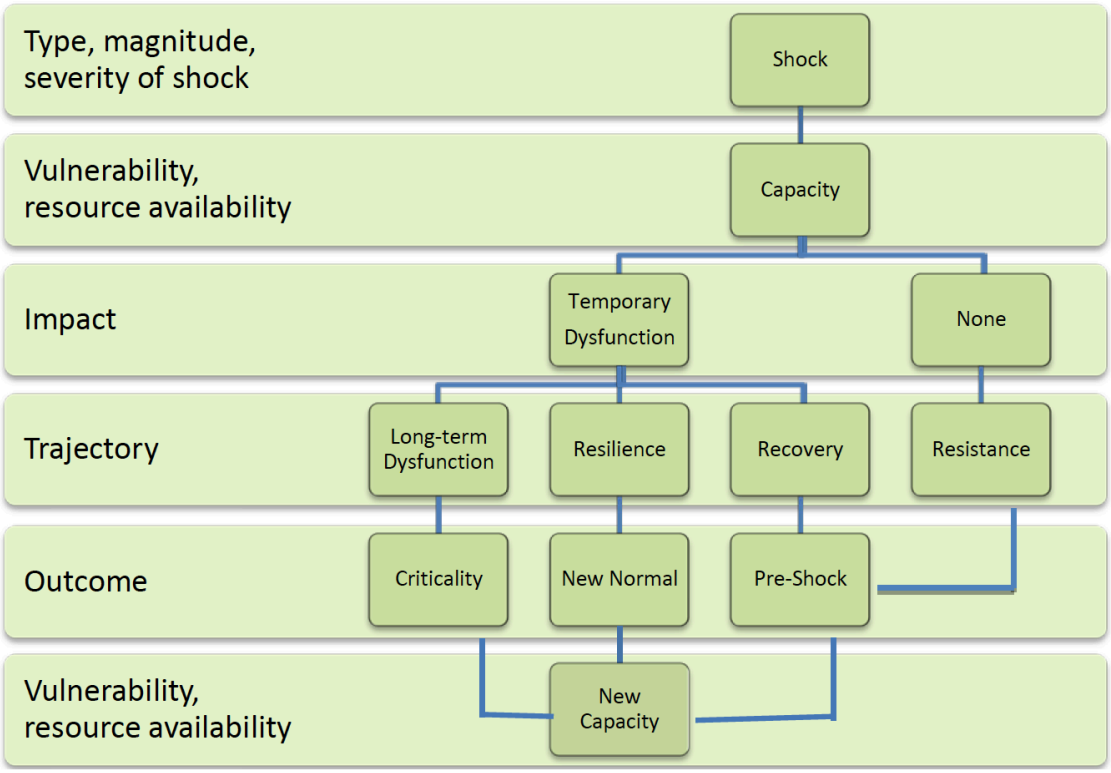
The interaction between the four dimensions described, represents the way through which a region is able to overcome a shock; each dimension influences in different ways the degree of resilience of a region, and so, it seems really important to evaluate the structure of the economy in the perspective of understanding which of the four dimensions have greater influence on region's ability to resist to a shock. For example, to consider the existence of inter-relations among firms that can exist even in a diversified economy does not necessarily mean a higher level of resilience; rather, there are studies by Conroy (1975) which show how such inter-relations can mean a quick spread of shocks on different sectors.

In this analysis the perspective outlined by Martin will be employed, in order to understand what the relevant factors are, and which of these dimensions are influenced in the Italian contest looking at the degree of resilience of banks situated in different Italian regions. In particular, the concept of resistance will be used to explore the degree of vulnerability of banks, the concept of recovery and renewal will be used to explain the ability and the speed at which the system reaches back the pre-crisis level.

Ultimately, regions resilience depends on different factors (knowledge, innovation, networks, workers' skills, policy response), and a region characterized by a higher rate of growth seems to be more resilient and so able to recover and adapt itself to the new environment. Another factor which plays an important role on resilience is the level of interconnections among different agents; if on one hand the existence of interconnections is a positive factor, due to the different opportunities a region can have to recover from a shock, on the other hand, a relevant interconnection could produce a wave effect and bring instability to sectors otherwise not affected. Therefore, there isn't a unique opinion on the degree of diversification, and some fields, like manufacturing, seem to be more resilient than others, such as the public one.

Studying the concept of resilience, it is important to consider what is the trajectory followed by a community after a negative event, and hence it is possible to match the severity and the magnitude of the event with the significant or not significant outcome of such event. Norris et al (2008) developed a framework to describe the different steps of which the way followed by a region after a shock is composed. Its representation is in figure 5.

Figure 5: A Resilience Framework



Source: Dabson et al 2012

As described in figure 5 borrowed from Dabson et al (2012), the framework starting from the shock which can be of different magnitude and severity, passes through different steps since it reaches the final one that is represented by the outcome in which it is possible to build a new normal, to restore the previous situation or to assist to some level of criticality. The ability to resist to a disruptive event considers the magnitude and the severity of the shock, in fact it is important to understand what are the limits that a system is able to support before it collapses; on this point an interesting analysis was conducted by Tierney (2009) who outlined three different levels of magnitude of an event: emergencies, disasters and catastrophes. He underlines the consequences of such events on the future development of the territories and summarises his theoretical framework using the following table (table 1) - which is also considered by the mentioned analysis of Dabson et al (2012).

Table 1: Typology of Emergencies, Disasters, and Catastrophes

	Emergencies	Disasters	Catastrophes
Impacts	Localized	Widespread, severe	Extreme, physical and social
Response	Mainly local	Multiple-jurisdictional, intergovernmental but bottom-up	Federal initiative and proactive mobilization
Procedures	Standard operating procedures	Disaster plans into effect, but likely changes	Massive challenges beyond pre-existing plans
Resources	Within response resources	Extensive damage to emergency services	Emergency response system paralyzed
Recovery	No significant challenges	Major recovery challenges	Cascading long-term effects, massive recovery challenges

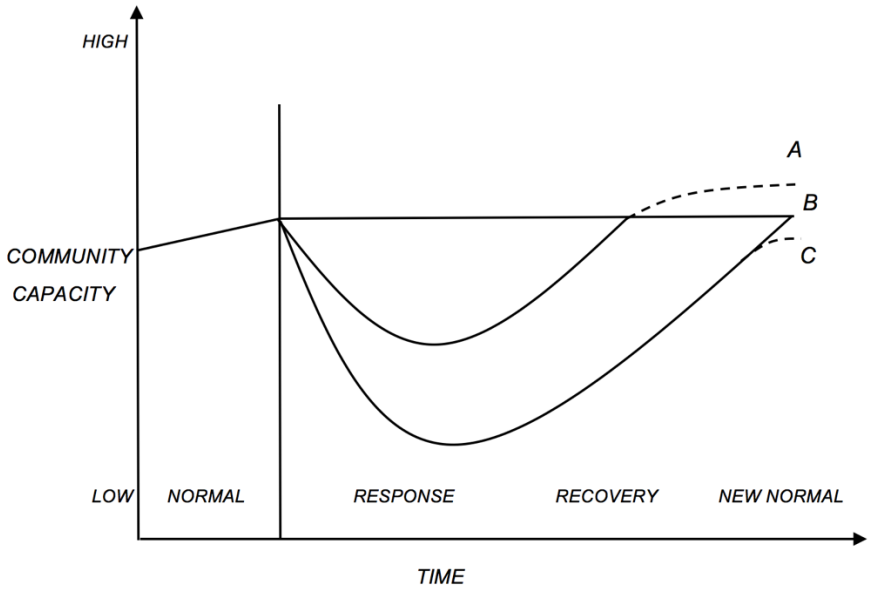
Source: Tierney (2009)

Studying the framework of a resilient community, a further element that influence recovering's ability is the "impact", which takes into account the abilities of the community, finding if they match the magnitude and severity of the shock. A representation of the way in which the process that determine the impact of a shock on a community and its subsequent recovery can be described is offered by Carri (2013) who uses also a figure, labelled "Resilience Loss Recovery Curve", which is re-proposed here with some modifications (figure 6).

The three different levels reached after recovery illustrated in the figure above and indicated with "A", "B" an "C", represent three different ways of recovering after an event and so three different levels of resilience; the "A" line, is the "new normal" reached by a very resilient community which is able to anticipate, mitigate and take advance from the negative event even reaching a better level, higher than the previous one. The "B" line is the one reached by a community less resilient than the "A", which lets the community to restore the

pre-shock level of functionality; hence the “C” line represents the less resilient kind of community, which is linked with an event of high magnitude able to hit strongly the functionalities of the community, or with lots of difficulties in counteract against the crisis.

Figure 6: Resilience loss recovery curve



Source: adapted from Carri (2013)

Anyway, even if there is not a shared definition of resilience across different sciences, it is possible to discern five core characteristics in common with all of these definitions (Carri, 2013). Resilience is an “attribute” of the community, an inherent and dynamic part of it (“continuing”), which allows a “comparability” among communities in terms of their ability to positively adapt to adversity; a community which can adapt (“adaptation”) itself to adversity following a “trajectory” (adaptation leads to a positive outcome for the community relative to its state after the crisis, especially in terms of its functionality).

1.3 ECONOMIC CONCEPTS OF RESILIENCE

An analysis of the meaning of “resilience” from an economic perspective has been recently conducted by Hallegatte (2014), who examined first the consequences of a natural disaster on human system, and then verified how natural hazards can affect the stability of economies. Indeed, natural disasters have economic consequences, and by affecting the functioning of systems can impact on welfare with important effects on assets, employment, production and consumption. So, the resilience of an economy represents its ability to minimize welfare losses after a negative event. The definition of economic resilience given by the author, considers the two different levels of macro and micro economics resilience; considering the existing differences in vulnerability among different economies, macro-economic resilience is divided into instantaneous and dynamic. Instantaneous resilience concerns the immediate ability of limiting income losses when a negative event occurs, differently from the dynamic resilience that represents the speed in recovering and reconstructing. Every negative event has direct and indirect losses as consequences; Rose et al (2007), using a different terminology, distinguish between “losses of assets” and “losses of output”, indeed any disaster has, at first, effects on inputs and so, on outputs. A given example of this process is the damage suffered by a factory and the negative effects on its ability of production; the effects on output are diversified and they affect even supply chain and long-term growth. Taking into account a simple production function which depends on labour and capital, a natural disaster brings to an instantaneous reduction in productive capital. The immediate consequence of such a reduction is the presence of externalities and distortions on other businesses linked with the one hit by the negative event; the diffusion of the shock is indicated as a “ripple effect”, and it can go backward, if it impacts clients and then spreads to suppliers, or forward, if the effect goes from suppliers to clients.

The result of a disastrous event is the consequent reconstruction of the dynamics that the economy follows to reach the previous, or a new growth pathway. What really matter for householders are consumption and the possibility of losing their jobs, then the negative effects of a shock reach them

after output losses translate into losses of job and consequent reduction in possibilities of spending in consumption. So, the definition of macroeconomic resilience given by the authors, is taken into account by putting in relation output and consumption losses, in a way in which resilience is measured as the ability to minimize consumption losses for a given loss in output; in this case, the definition keeps resilience independent from other determinants as vulnerability, exposure and hazard.

In measuring the total effects of a shock on economies it is important to take into account, after considering the consequence on macro elements, what are the related consequences on micro ones, and to analyse what they imply in terms of welfare losses.

At a microeconomics level, the definition of resilience is linked to the correlation between the level of aggregate consumption and welfare losses, considering it as the ability to cope with a minimization in welfare loss after a reduction in consumption. Such a definition lets to a measure of microeconomics resilience independent from macroeconomics even if both of them could have common determinants. Parameters that have relevant impact on measuring resilience at a microeconomics level, as identified by Hallegatte et al (2014), are represented by the level of income of the country and its level of inequality, the exposure of the poor and the non-poor, the diversification of the economic system, the ability of households in smoothing losses and the maximum level of loss that they could suffer from.

This approach, which differentiates the effects of shocks at macroeconomics and microeconomics level, could be a good measure in evaluating the different measures used to face the crisis; on one side at a macroeconomics level there are different policies adopted at international and national level, for example to sustain consumption, on the other side, at a microeconomics level the ability of smoothing losses and react against difficulties. Using this approach, an analysis at regional level will be conducted to evaluate if the crisis of the banking sector could be linked with factors such as consumption or level of losses suffered during the considered period.

The way suggested by the authors to improve the resilience of a country and so, to reduce the probability of losses in welfare, implies firstly a reduction in macroeconomics risks, reducing the direct impacts on economies through

prevention's tools able to counteract even negative effects that come from outside. A complementary action to be followed in improving resilience at a microeconomics level is represented by the ability to reduce the impact of events on population; this second action depends on the distribution of losses across households with different levels of wealth, and also on their ability to smooth losses over time, even using social protectionism tools which let to a lower impact on consumption.

Lots of studies (for instance, Cellini, Di Caro, Torrisi, 2014) confirm that resilience depends on both "micro" and "macro" factors; Cellini, Di Caro and Torrisi (2014), analysing the period of the "Great Recession" from 2007 to 2010, found that some regions, in Italy, showed a higher level of resilience than others. The determinants of such results have to be searched in historical factors that affect the growth of each region and also in the structure of the respective markets. Certainly, the crisis hit in different ways each economic sector, influencing in different ways the ability of regions to resist the shock. The variables as used in this latter study, represents the starting point of the analysis conducted in the third chapter of this thesis in order to point out the role of banks in regional resilience.

1.3.1 Firms resilience

Considering the degree of resilience at a microeconomics level, there are lots of studies that focus the attention on different degrees of resilience of a firm; such studies received a considerable increase since the economic crisis of 2007 that lets to datasets to compare the period before and after the financial shock.

A study conducted by Kamen and Behrer (2012) puts the attention on what are the primary factors which influence firms resilience; so, they administered a test based on different managerial variables, and used the level of employment in different areas as a proxy in measuring the degree of resilience. As a way to split "more" and "less" resilient firms, they consider "more" resilient the ones which show a constant or increasing level of employment even if they are located in areas in which there is higher level of

unemployment. Looking at this proxy of the degree of resilience, the authors tried to find a causality link between the variation in the level of employment and the values of the managerial technics data that comes from the administered test. In testing their hypothesis, they used a difference in meaning test and a regression analysis on the difference between the variation in percentage of the level of employment of firms and the level of employment of the areas in which they are located. As a result, Kamen and Behrer (2012) obtained some positive and negative elements that influence firms' resilience and summarised them as follows:

- *Managerial strengths positively linked to resilience*: trust on leadership; value of the contract with governments; permanent use of financial data and subsequent analysis;
- *Managerial strengths negatively linked to resilience*: maintenance of customers and trust on applying for government contracts;
- *Managerial strengths with mixed significant results*: using well thought out in order to understand human resource needs; implementing sales strategy and marketing.

As shown above, on one side, an important factor which influences the resilience of a firm in a positive way is the ability of monitoring and analysing the financial situation and exposition; on the other side, a variable negatively linked with resilience is the so called "confidence in retaining existing customers" that could be a response of the managers to the crisis by which they shift their attention on factors needed to overwhelm the negative period.

Some authors move their studies from other data in order to measure how the presence of certain elements can influence a proxy of resilience based on the number of days needed by a firm to recover its productive capacity.

An empirical research conducted by Blundel et al (2014) by dispensing a test to a group of managers, explains the aspects that they consider relevant in overcoming adverse shocks. The majority of them agree in considering the restricted possibility to access the credit and the threat represented by natural disasters that could hit their businesses negative factors for their firms, mostly for the firms localized in rural areas which encounter more difficulties in restore their pre-shock production. The most interesting aspects of the conducted

research are the relevance attributed by the interviewed managers to the reinforcement that follows the stress period, the importance of the diversification of the products and of the markets, and also the role of the employees with specialized skills able to respond immediately to exogenous shocks. As highlighted by Blundel et al (2014), managers and their abilities play an important role in addressing the future on firms so, their number and choices is considered as a variable in the model presented in chapter 2.

Another research by Todo et al (2013) focuses the attention on the presence of networks among firms that influence their degree of resilience; the case study of the authors is the Japanese situation after the earthquake of 2011. Observing the difficulties of the firms hit by the event and the consequences of their losses in production on other firms directly linked to them, even in the case in which those firms are localized far away from the event. On this point a previous study by Henriet et al (2011) states that indirect effects deriving from shocks, could be mitigate by the possibility of replacing affected firms with others, even if the maintenance of relationships could be a way to bear the recovery and restore the productive chain.

Thinking to the relation between networks and resilience, the existence of links with customers and suppliers that suffer from the same event appears to be something negative, and it is important to consider that every shock which hits one of the components of the value chain, have impacts on other components, determining this way a fast spread of the perturbation.

The relevance of the presence of networks is shown in different studies, with different results. On this point, there are the studies by Martin (2012) and Conroy (1975), as mentioned above, and obviously the one by Todo et al (2013); the presence of linkages could be intended as inter-connection among firms of the same area or among firms of the same sector. Also internationalisation, as treated in the following paragraph, could be a way to consider the presence of linkages; banks represent one of the main actors of economies, in fact they keep in touch with a relevant number of actors, and the presence of interactions among banks of different areas represent a quick way for shocks to spread across different sectors and territories.

Considering the relationships between a firm and its suppliers and customers, the study proposed by Todo et al (2013) estimates what are the

variables that could impact on resilience, measuring it as the time they need to restore the pre-shock production. The authors, considering a homogeneous group of firms, compare the same dataset before and after the Japanese earthquake of 2011, and provide an econometric model which takes as dependent variable the log of the number of days without operation after the disaster +1; the model gives as results the same level of significance for each considered control variable before and after the earthquake.

The consequence of such results is that empirically, the presence of networks in the affected area does not have a significant impact on the recovery abilities, although it is possible that the negative effect of the damages suffered by suppliers and customers, is balanced by the positive effect deriving from the help received for example by the government. The presence of a productive chain which includes customers and suppliers localized away from the areas hit by the shock, represents a positive element looking at the speed of recovering. Finally, another important result is the negative effect that comes from the indirect connections with firms which suffer from the same event.

1.3.2 Internationalisation

The major difficulties in analysing economic resilience concern the different ways that can be followed to understand whether or not a region or a firm is more resilient than others. At a microeconomics level, there are lots of studies and different indices that give a measure of resilience; firstly, it is important to take into account what are the real elements that makes it possible to compare different performances among the firms hit by the event.

Some studies focus on the relevance of internationalisation as a variable that could influence the degree of resilience of firms; however, there isn't a unique result on this argument and if someone find a positive relation between resilience and internationalisation (Delios e Beamish, 1999; Hitt et al, 2006), others find no relationship (Dess et al, 1995) or more, a negative one (Geringer, Tallman and Olsen, 2000).

Moreover, the existence of such a relationship, makes it difficult to identify a shared vision among different authors on the shape of its

representation. Someone (Singh et al, 2010) finds an inverted U-shaped curve supporting that an increasing geographical diversification implies a growth on the costs of coordination. Some others (Lu et Beamish, 2001) find, on the contrary, a U-shaped curve in which the smallest firms find lots of difficulties during the first phases of the process of internationalisation. Further studies (Garrafo et al, 2014) have also found an S-shaped curve, in which internationalisation has a positive effect on resilience since it reaches a level, after which more geographical diversification puts a decrease in firms' performances.

These studies underline that internationalisation, as other variables, could have at the same time positive and negative effects so, the final effect on resilience depends on a number of factors among which transaction and coordination costs on one side, and risk diversification, economies of scale and scope on the other one can be mentioned.

1.3.3 Pivot firms

A difference could be done between organisational resilience and territorial resilience (Gilly et al, 2013).

a) Organisational resilience: the main factors leading to resilience, from an organisational point of view, can be linked (Meyer et al, 1982 and 1990) to the setting up of systems of centralisation of authority, to the rationalization of the management of financial and human resources, to the development of new marketing strategies and to innovation or to the diversification of the range of activities of the company (Gilly et al, 2013). Hence, resilience is the capacity of an organisation to resist and overcome an external shock, but in a turbulent age, as last years, it is really important to foresee future economic conditions and reinvesting personal businesses before circumstances force you doing it (Hamel & Välikangas, 2003).

Organisational resilience consists on one hand in the capacity to resist a shock, and on the other hand in the ability to anticipate and adapt to this shock by creating new systems and innovations. Event represents the key notion to

analyse the concept of resilience, indeed it can be seen as a discontinuity with the past and a way to break with the existing situation; it seems to be also realistic, if an event is considered as a form of continuous process of change in the environment of an organisation that receive a repeated pressure from external factors and adapt continuously itself to them (Gilly et al, 2013). The results of these two ways of considering an event, make an organisation react to the shock in the first case, and anticipates it in the second one; that is the double capacity of organisational resilience.

The double capacity of an organisation is strictly linked with its skills; in order to best survive a crisis, it is important for an organisation having both skills related to the ability of managing an external event and skills related to technical and organisational innovations able to go beyond the crisis. Therefore, there are lots of studies centred on the quality of the skills available within organisations that find relevant the role of the knowledge and know-how of every single member of the organisations (Gilly et al, 2013); these skills refer to those of the firms and clearly to those of the workforce. A given example of the ability and quality of the workforce to give up an external event was offered by Hill, Wial and Wolman (2008), when they showed that, after the recession in 2000, centres specialized on computer services produced better results than those specialized on the manufacturing industry because of their highly-specialized workforce. Individual and collective learning are the origin of organisational resilience; indeed, it represents the way with which an organisation can find a technical and organisational response when facing an event which potentially disturb its activity (Gilly et al, 2013).

Organisational resilience is strongly influenced by the nature of learning, but it is also important to consider the role of the methods of coordination. Interactions between individuals are relevant in implementing knowledge and know-how, in letting organisation to better resist shocks and survive the crisis. Thus, when an organisation faces with an external event, it develops two types of response depending on its internal skills and on its coordination's arrangements; finally, an organisation can absorb the impact, by anticipating and resisting the shock, or generates new technical skills and organisational solutions.

b) Territorial resilience: territorial resilience can be seen as an “adaptive capacity” specific for a territory (Simmie and Martin, 2010) and then, it represents the ability of a territory to get back to its former state or to find a new pathway after a perturbation of its environment (Gilly et al, 2013); this kind of resilience depends obviously on the ability of actors to give a response or to absorb such a perturbation, and so organisations resilience give an important contribute to territorial one.

The concept of territory, taken into account by the notion of territorial resilience as suggested by Gilly et al (2013), consists of the coexistence of organisational, institutional and geographical proximity. Institutional proximity is represented by the rules of a territorial governance accepted by the actors; it reveals the complementarity of skills which are the base for the cooperation inherent to organisational proximity so, cooperation opens the way for technical productive relationships among actors within a value chain. Geographical proximity can exist even in the case in which actors are remote one another and can be a source of conflict among actors close together.

Authors, considering the different forms in which a territory can be described, distinguish the specification territory in which, starting from common problems, actors are able to reach a compromise and then to organise collective learning creating a response to external changes and shocks; such formulation describe well what are the conditions in which territorial resilience grows up. However, in a specification territory coexist asymmetrical positions between key factors, such as pivot firms, and others. Pivot firms represent the way in which a territory can improve its resilience, indeed, they play an important role in coordinating a network and develop knowledge and technologies to resist a shock. Then pivot firms have the possibility to implement organisational resilience on one hand, and territorial resilience on the other hand at the same time, being territorial resilience a way to improve linkages among firms and knowledge able to withstand a crisis.

The importance of the difference between internal and external factors is a common topic in different studies, and the one strictly related to the bank sector is the study by Mazzù et al (2002) that will be examined in the following paragraph.

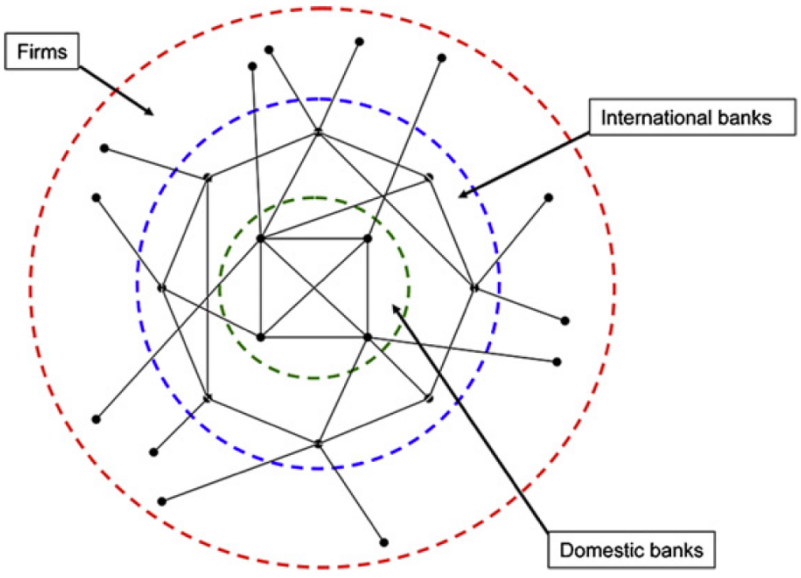
1.4 BANKS RESILIENCE

The persistent period of crisis lasting from 2007, brought the attention on the role of the banking sector and gave an input to analyse the way in which this sector can influence people behaviours.

What seems really interesting is to understand how, and how quickly, banks are able to recover after a shock. The concept of resilience lets to analyse better which are the most relevant variables that influence a recovery period.

Considering financial and banking fields, lots of authors deal with the concept of resilience measuring the stability of a system and its exposure to systemic risk. Firstly, it is important to understand the complex linkages among firms, domestic and international banks; a stylized model of financial systems is represented by Anard et al (2013). In these models, domestic banks occupy the core, and through a network of links, it reaches first, overseas banks, and so firms.

Figure 7: A stylized financial system



Source: Anard et al, 2013

As shown in the graph (figure 7), the interrelations among different actors seems to be simplified, and it doesn't take into account interlinkages among firms. The figure (figure 7) shows a financial system where the filled circles – nodes – represent banks/firms, and the links between nodes depict credit or equity relationships; there are three distinct layers: (i) a core of domestic banks, (ii) a peripheral layer of overseas banks and (iii) an outer layer of firms.

The problem of considering the stability and the complexity of banking system is taken into account by Vallascas (2012) and Marczyk (2013). They consider the problem of the complexity of the modern financial systems, and in particular Vallascas (2012) finds that, contrary to the current trend towards concentration and birth of banks getting bigger and bigger, small is "beautiful". In his studies, the author shows that banks size is one of the key determinants of the exposure to risk, and reducing size, systems seem to be less exposed to default risk. Furthermore, he analyses the correlation between economies size and banks, finding that smaller economies require smaller banks.

The approach to systemic risk considered by Marczyk (2013), starts from the concept of "too big to fail", an idea founded on the need of describing the importance of concentration; the concentration of the power that comes out from the creation of international groups has two different effects on global economy, in fact, if on one hand it is a way to better use the potential of new financial instruments and also a way to reduce financial risks by having bigger funds to face any case of crisis, on the other hand the same concentration makes the system more exposed to risks because of its interconnections that could bring the entire system to failure.

On the consequences deriving from a concentration of the banking sector, there are empirical studies by Beck et al (2006) in which, using a logit probability model, the authors find that concentration brings to a reduction in the probability of experimenting banking crisis, and also that an increasing in competition reduces banks risks. Exploring the relevant market for each bank, empirically, it seems that only multinational banks compete directly with all others, while the same assumption seems that does not hold for those banks which operate only at a regional level.

As suggested by Marczyk (2013), recent crisis has changed the perspective of seeing such concentration as mentioned above using the new

idea of “too complex to survive”; this concept is based on the application of a systematic approach on modern economies that explain how complexity can be considered as an important source of vulnerability of systems, and lots of studies show that there is a link between complexity and fragility. Conventional systems of valuation for risks’ rating and evaluation seem to be obsolete because they are based on the assumption of an economy without any kind of turbulence. Marczyk (2013) based his studies on the possibility of evaluate systems’ complexity by using innovative approaches and using data like cash flows or balance sheets; resilience is measured by considering the complexity of systems and describing it as a function of the structure and of entropy, where entropy is a measure of chaos. In the study of systems, it is important to have a measure of correlation by using entropy, and also a measure of the “critical complexity” that represents the upper threshold of complexity for a system. The lower threshold, on the other side, represents the limit in which a system works in a deterministic way. So, resilience is represented as a function of complexity, and the system is the more resilient the smaller is the degree of complexity. Moreover, another important element in measuring the stability of a system is the speed of change in complexity of the system itself, and fast changes on this variable are generally considered as a bad prediction. As a result of the analysis conducted by Marczyk (2013), the degree of interconnection among European banks is really high, and such an interdependence could bring a rapid diffusion of financial shocks. An increased level of complexity of the system implies an increased number of ways through which economies could experiment a crisis, and so, Marczyk (2013) supports that a way to avoid future financial crisis is not just a reduction in size of banks but rather a reduction in their degree of complexity.

Dealing with the importance of Cooperatives’ banks in Italy, it is important to take into account the study conducted by Aiello and Bonanno (2016) on the efficiency of this type of banks. The latter authors make an estimation of the profits and costs’ frontiers employing the stochastic frontier analysis (SFA). In the existent literature, there are lots of studies on banks efficiency conducted by applying the method of frontiers; some of these analysis use Data Envelopment Analysis (DEA), others use SFA analysis. The SFA analysis has lots of advantages thanks to the possibility that it gives to

banks to be distant from the frontier due to randomness; in the DEA analysis on the contrary, the distance from the frontier is entirely due to inefficiency.

The analysis conducted by Aiello and Bonanno (2016) considers both cost and profit functions and so, by constructing an index of efficiency respectively as the ratio of the minimum cost and the maximum profit of an efficient bank and the values observed, they find a higher level of efficiency for "*Banche di Credito Cooperativo*" (Cooperative banks), (BCCs). From their analysis emerge some important factors which influence BCCs efficiency; BCCs efficiency is positive influenced by the size, demand density and market concentration, while it is negative influence by the increasing in numbers of branches and local development.

Another relevant result (Aiello and Bonanno, 2016) is given by the analysis of the influence of diversification on efficiency; banks with lower level of loans diversification show to be more efficient, on the contrary the efficiency increases as the income diversification increases. So, BCCs with their lower level of loans diversification, by offering their traditional services to their member-customers, seem to be more efficient than other banks.

A way that could be used to evaluate banks resilience is the use of a measure of credit risk. A way to measure credit risk and analyse the stability of a bank is offered by the study conducted by Mazzù et al (2002), that takes into consideration Sicilian banking system analysing what are the main factors which have impacts on the level of credit risk of each bank; in particular, looking at banks dimensions, they put their attention on the difficulties of smaller ones to diversify risks, considering also the local production structure which is extremely sensitive to negative trends.

The problem of the increase of banks credit risk received lot of attention and lots of studies tried to identify the origin of such problem on the way to find a way to stem it. The study conducted by Mazzù et al (2002) is centered on the characteristics of the Sicilian banking system, considering the particular contest in which they operate. The origin of the problem lays on both external and internal factors; the majority of studies on this topic put their attention on macroeconomics components leaving out the importance of management and internal characteristics such as the problem of the “unfaithful banker”.

The importance of external factors is a common element for lots of the analysed studies and, as identified previously, even in the latter mentioned study the existence of networks which ensures greater stability at organizational, economic and financial level is relevant. An evidence on this point is given by Mazzù in his analysis on the relevance of industrial districts on banks stability in Sicily, which finds the presence of a positive influence of the petrochemical, agro-food and hi-tech districts, respectively in the province of Siracusa, Ragusa and Catania, on the percentage of non-performing loans.

Using the following index to have a measure of credit quality, and distinguishing between regional and extra-regional banks, the authors find a permanent greater credit quality for extra-regional ones. The reason of such result seems to lay in the different target of customers of these banks which have more narrow parameters in evaluating their customers' information in order to reduce adverse selection and moral hazard.

$$Q_{is} = \frac{\sum_{i=a_1}^{a_n} \frac{\Delta IS_i}{I_i}}{a_n - a_1 + 1} * 100$$

where:

$a_1 = initial\ year$

$a_n = final\ year$

$S_i = non - performing\ loans\ in\ the\ year\ i$

$I_i = loans\ in\ the\ year\ i$

$\Delta IS_i = (I_i - S_i)$

This index could be considered as a measure of resilience as it evaluates significant differences among different kinds of banks in Italy and differences between Italian regions. It identifies if some regions are more affected by credit risks than others. This index is used in chapter three in order to evaluate the credit quality of banks during the period taken into consideration and highlights differences among types of banks.

1.5 BANKS' BEHAVIOR AND ECONOMIC RESILIENCE

The approach to the concept of resilience and the relevance of the banking system, is treated in this thesis to analyse more closely the importance of banks in the Italian contest.

As analysed, lots of authors focalize the attention on the relationships between specific markets and resilience or on financial systems and their complexity and role during the last “Great Recession”. Marczyk (2013) takes into account a quantitative approach to measure systemic risk, evaluating resilience from the degree of complexity of the system, while Aiello and Bonanno (2016) treat the different degree of efficiency of Italian banks; starting from the conducted analysis, the present research goes towards an analysis of different types of banks and their links with regional resilience as studied by Cellini, Di Caro and Torrisi (2014). Hence, starting from the analysis conducted by Mazzù et al (2002) the same index they used in Sicily will be apply to verify if somehow the typology of a bank in period of crisis can influence credit quality, and so resilience of banks.

1.6 CONCLUSIONS

This chapter has tried to give an overview of the different use of the concept of resilience, focusing on the analysis conducted on territorial and banking sector. This is the starting point to analyse the role of the banks in Italy during the last “Great Recession”; this period of crisis and the availability of data of banks balance sheets, could give the opportunity to verify if some of them experienced a greater ability to face the threats that comes from a market increasingly interconnected, characterized by an evolution of the instruments used to increase profits and tested by a period of recession. Furthermore, it is interesting to understand policy implications of the presence of BCCs and POPs in Italian contest, considering the growing interest on actual debate on the role of “Banche Popolari” in Italy.

REFERENCES

Adger W.N. (2000), Social and ecological resilience: are they related?, *Progress in Human Geography 24,3, pp. 347-364.*

Aiello F. and Bonanno G. (2016), Looking at the determinants of efficiency in banking: evidence from Italian mutual-cooperatives, *International Review of Applied Economics, pp. 507-526.*

Aiello F. and Bonanno G. (2016), Bank efficiency and local market conditions. Evidence from Italy, *Journal of Economics and Business 83, pp. 70-90.*

Anard K., Gai P., Kapadia S., Brennan S. and Willison M. (2013), A network model of financial system resilience, *Journal of Economic Behavior & Organization, Elsevier, vol. 85, pp. 219-235.*

Bavarelli M., Feliciotto P. and Mazzù S. (2002), Banche e rischio di credito in Sicilia, Milano: Egea.

Blundel R., Baldock R., Dadd D., Schaefer A. and Williams S. (2014), Resilience and recovery: SME experiences of extreme weather events and other external threats, Manchester: Institute of Small Business and Entrepreneurship.

Bongini P. and Ferri P. (2007), Governance, Diversification and Performance: The case of Italy's Banche Popolari, *paper presented at "Corporate Governance in Financial Institutions" SUERF and Central Bank of Cyprus,* Nicosia.

Borio C., Cohen B., Domanski D., Shin H.S. and Turner P. (2016), International banking and financial market developments, *Bank for International Settlements.*

Carri (2013), Definitions of Community Resilience: An analysis, *Report for Community & Regional Resilience Institute*.

Cellini R., Di Caro P. and Torrisi G. (2014), Regional resilience in Italy: do employment and income tell the same story?, *Handbook of regions and Competitiveness, UK.*

Cellini R. and Torrisi G. (2014), Regional Resilience in Italy: A very long-run analysis, *Regional Studies*.

Chrisman J., Chua J. and Kellemanns F. (2009), Priorities, Reosurce Sotck, and Performance in Family and Nonfamily firms, *E T&P*.

Conroy M. (1975), Regional Economic Diversification, New York: Praeger.

Dabson B., Helfin C. and Miller K. (2012), Regional Resilience, *Rupri Rural Futures Lab Research and Policy Brief*.

Delios A., Beamish P.W. (1999), Geographic scope, product diversification and the corporate performance of Japanese firms, *Strategic Management Journal, pp.711-727.*

Dess G.D., Gupta A., Hennart J., Hill C. (1995), Conducting and integrating strategy research at the international, corporate and business level: issue and directions, *Journal of management 21, pp. 357-393.*

Di Caro P. (2014), Recessions, recoveries and regional resilience: Evidence on Italy, *MPRA Paper no. 60297.*

Di Caro P. (2014), An exploratory analysis on the determinants of regional resilience in Italy, *https://www.aisre.it.*

Ferri G. (2008), Why cooperative banks are particularly important at a time of credit crunch, *Mimeographed, University of Bari.*

Ferri G., Masciandaro D. and Messori M. (2000), Governo societario ed efficienza delle banche locali di fronte all'unificazione dei mercati finanziari, *in P. Alessandrini (a cura di), Il sistema finanziario italiano tra globalizzazione e localismo,* Bologna: il Mulino.

Fingleton B., Garretsen H. and Martin R. (2011), Recessionary shocks and regional employment: evidence on the resilience of UK regions; *Journal of Regional Science.*

Garmestani A., Allen Craig R., Mittelstaedt J., Stow Craig A. and Ward W. (2006), Firm size diversity, functional richness, and resilience, *Nebraska Cooperative Fish and Wildlife Research Unit-Staff Publications, paper 32*.

Garraffo F., Giaccone S. and Longo M.C. (2012), Performance delle imprese internazionalizzate e crisi dei mercati: capacità di resistenza alla crisi o "resilienza strategica"?, *IX Convegno annuale SIM Società Italiana di Marketing.*

Geringer J.M., Tallman S., Olsen D.M. (2000), Product and international diversification among Japanese multinational firms, *Strategic Management Journal 21, pp.51-80.*

Gilly J., Kechidi M. and Talbot D. (2013), Resilience of organisations and territories: The role of pivot firms, *European Management Journal*.

Hallegatte S. (2014), Economic resilience – definition and measurement, *Policy research working paper 6852, The World Bank Climate Change Group.*

Henriet F., Hallegatte S. and Tabourier L. (2011), Firm-network characteristics and economic robustness to natural disasters, *Journal of Economic Dynamics and Control 36.*

Hitt M., Bierman L., Uhlenbruck K. and Shimizu K. (2006), The importance of resources in the internationalization of professional service firms: the good, the bad and the ugly, *Academy of Management Journal 49, pp. 1137-1157.*

Holling C.S., Schindler D.W., Walker B.W. and Roughgarden J. (1995), Biodiversity in the functioning of ecosystem: an ecological synthesis, *Biodiversity loss: economic and ecological issues,* Cambridge: Cambridge University Press*, pp. 44-83.*

Kamen C. and Behrer C. (2012), Navigating uncertainty and growing jobs: Considering small employers firm resilience during challenging economic times, *Federal Reserve Bank of San Francisco.*

Kick T. and Prieto E. (2015), Bank Risk and Competition: Evidence from Regional Banking Markets, *Review of Finance 19: pp. 1185-1222*.

Lu J.W. and Beamish P.W. (2001), The internalization and performance of SMEs, *Strategic Management Journal 22, pp. 565-586.*

Marczyk J. (2013), Resilience, stability and complexity of banks: a quantitative approach to systemic risks, *Bancaria no. 9/2013.*

Martin R. (2012), Regional economic resilience, hysteresis and recessionary shocks, *Journal of Economic Geography 12, pp. 1-32.*

Martin R. and Sunley P. (2014), On the notion of regional economic resilience: conceptualization and explanation, *Journal of Economic Geography, pp. 1-42.*

Masciandaro D., Pansini R.V. and Quintyn M. (2013), The economic crisis: Did supervision architecture and governance matter?, *Journal of financial stability 9, pp. 578-596.*

Minichilli A., Brogi M., Calabrò A. (2015), Weathering the Storn: Family Ownership, Governance, and Performance through the Financial and Economic Crisis, *Corporate Governance: An International Review*.

Moser S.C. (2008), Resilience in the Face of Global Environmental Change, *Oak Ridge, TN: Community & Regional Resilience Initiative.*

Ratnovski L. and Huang R. (2009), Why are Canadian banks more resilient?, *IMF Working Paper.*

Romer R. (2001), Advanced Macroeconomics, New York: McGraw Hill.

Rose A. (2007), Economic resilience to natural and man-made disasters: multidisciplinary origins and contextual dimensions, *Environmental Hazard 7, pp. 383-398.*

Setterfield M. (2010), Hysteresis, *Working Paper 10-04,* Hartford, Connecticut: Department of Economics, Trinity College.

Singh D.A., Gaur A.S., Schmid F.P. (2010), Corporate diversification, TMT experience and performance. Evidence from German SMEs, *Management International Review 50, pp. 35-36.*

Tierney K. (2009), Disaster response: Research findings and their implications for resilience measures, *Oak Ridge, TN: Community & Regional Resiliency Initiative.*

Todo Y., Nakajima K., Matous P. (2013), How do supply chain networks affect the resilience of firms to natural disaster? Evidence from the Great East Japan earthquake, *RIETI discussion paper series 13-E-028*.

Vallascas F. and Keasy K. (2012), Bank resilience to systemic shocks and the stability of banking system: Small in beautiful, *Journal of International Money and Finance 31, pp. 1745-1776.*

Chapter 2: *A measure of Italian banking system's resilience*

2.1 INTRODUCTION

The importance of the role of Cooperative banks (BCCs) and of Banche Popolari (POPs) in Italy has always received particular attention (e.g. Ferri). Both kinds of banks have a cooperative nature that distinguishes them from others; furthermore, POPs have their own features, different even from BCCs, such as the one vote per capita regardless of the number of shares held by the shareholders. This feature makes them similar to cooperative banks with a lower propensity to mutuality, and it would be the core feature that makes them have lower volatility of profits.

The presence of cooperative banks in Europe varies through different countries, with the highest presence in France and Austria and the lowest one in Spain and Greece (see Ferri and Bongini, 2007). In Italy, the number of POPs increased in the last century thanks to Luzzati who suggested to follow the German model proposed by Schulze-Delitzsch (see Luzzati, 1863; McKillop et al, 2011); such a model was considered the best way to make artisans, small entrepreneurs and merchants have access to loans.

Cooperative banks and POPs have always had a prominent position in the Italian contest, for many reasons; several studies conducted on Cooperative banks and POPs (Ferri and Bongini, 2007) in Italy confirm a higher stability and a lower volatility of their profits rather than those of other types of banks; their stability seems to be linked to the stability of their board directors.

The aim of this chapter is to investigate if bank's nature has relevance on its resilience during periods of crisis. Firstly, moving from the analysis of data, the year(s) in which bank was impacted by the crisis of last years over the last decade have been analyzed. Secondly an eligible index has been described, in order to verify if BCCs and POPs have had an advantage from their nature during the crisis. This index has been used to assess the resilience characteristics of the bank sector.

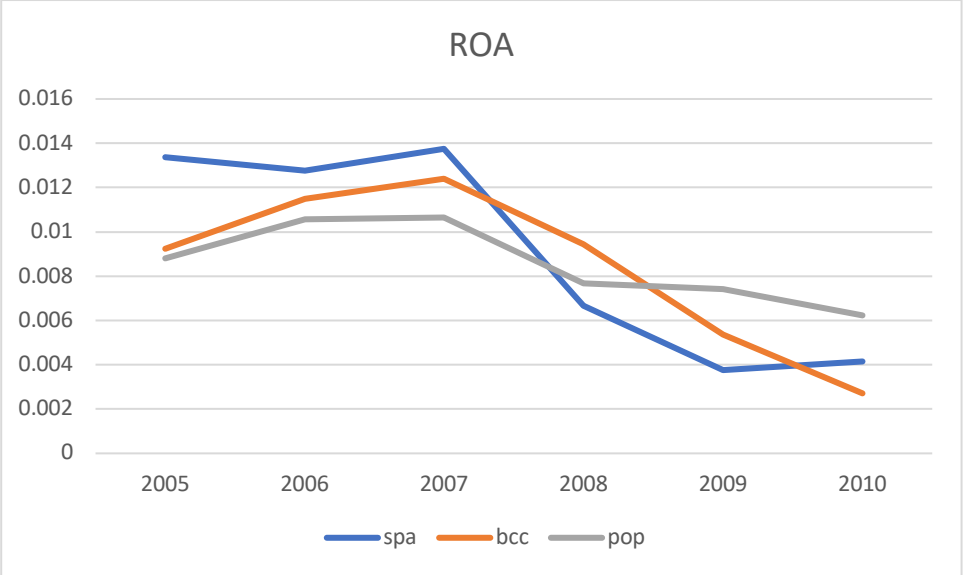
2.2 DATA

In order to investigate the characteristics of resilience in Italian banks, data from "ABI bank data" (ABI stays for *Associazione Bancaria Italiana*, the Association of Italian Banks) has been used, as containing information on 542 banks. Banks are differentiated according to their nature with a major number of "spa" (SPAs in what follows) that are banks with a different nature compared to BCCs and POPs, and they are present in Italy as single banks or as a part of group of banks. From the original sample, data of banks which have incomplete information from 2005 to 2010 haven't been included in the present research. From these data, Roa indicator and the percentage of directors have been calculated and compared to the total number of employers.

Starting from a descriptive analysis of data, Roa indicator is used to understand the situation of the year in which Italian banks suffered the effects of the crisis. Firstly, banks are divided into "spa", "bcc" and "pop" and secondly, calculating the arithmetic mean of Roa for each type and for each year, the following graph (figure 1) has been realized. It is clear in the figure the change in the trend in 2008. The figure shows that Italian banks suffered the crisis from 2008, and also that there are differences in the level of impact across different types. If SPAs had the highest Roa until 2007, after the impact in 2008 they had the worst result in terms of Roa; so, POPs and BCCs seem to be more resilient. A further consideration can be done considering the trend of Roa after the impact, in fact POPs banks had lower Roa until 2008, but it was steady after the impact, being higher than other banks in 2009 and 2010.

The trend seems to be different for BCCs, which on one hand had a slower decline than SPAs, and on the other hand suffered the impact for a longer period since they had lower Roa even in 2010.

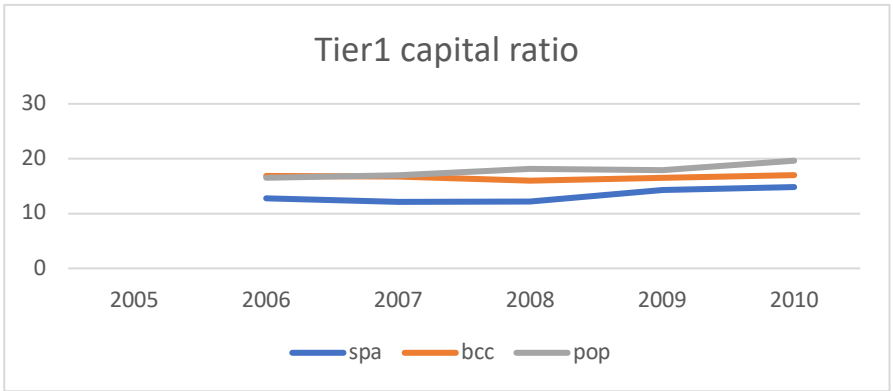
Figure 1: Roa trend 2005-2010



Source: Author elaboration on available data

Conducting the same analysis on Tier1 capital ratio (data available since 2006 to 2010), it is possible to see that POPs and BCCs have always had a higher level of the index, and so these types of banks have an amount of capital that allows them to absorb losses, without affecting the interest of depositors, better than SPAs; considering the ratio on their total risk-weighted assets, they are more able to operate under solvency conditions resisting to external shocks.

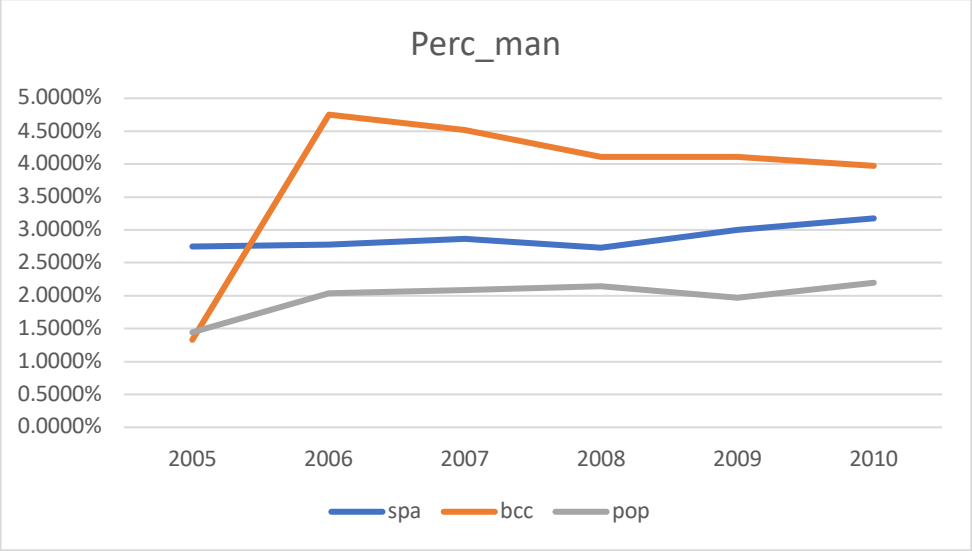
Figure 2: Tier1 Capital Ratio trend 2006-2010



Source: Author elaboration on available data

Another variable employed in econometric analysis is “perc_man” which describes the percentage of managers. From the following graph (figure 3), omitting to consider data for 2005 because they are not available for some banks in the original database, it is possible to discern that POPs have ever had a lower percentage of managers.

Figure 3: Trend of the variable “percentage of managers” 2005-2010



Source: Author elaboration on available data

2.3 ECONOMETRIC MODEL

2.3.1 The choice of the dependent variable

The dependent variable used in the final econometric model to discover if the type of bank is relevant in a period of crisis, is “Tier1 Capital ratio” which represents the comparison between banking firm core equity capital and its total risk-weighted assets. I find it the most representative variable of banks health because it gives a measure of a bank financial strength based on the sum of its

equity capital and disclosed reserves, and it includes all the assets held by the firm systematically weighted for credit risk. It is used to measure the grade of a firm's capital adequacy, so, its ability to face a crisis with its own strengths.

Before computing the model (1) using Tier1 capital ratio, this variable has been compared to Roa index and Tier 2 in order to verify if it would really be a good measure considering the variable available in dataset. Putting as control variables "particip", "emp_pro", "perc_man", the delay of the dependent variable and the dummy variables for "bcc" and "pop", the same model has been used for each dependent variable obtaining the results summarized in the following table 1.

The model used for the comparison is the following:

$$(1) ROA/TIER1/TIER2_{i,t} = f\left(var\_del_{i,t-1}; perc_{man_{i,t}}; particip_{i,t};; emp\_pro_{i,t}; DU_{bcc}; DU_{pop}\right)$$

In this first computation, some control variables showing some level of statistical significance have been used. The variable "particip" is used as a measure of the degree of interconnection of each bank with others and so it could be relevant in explaining if such connections can improve the stability of the system; the variable "emp_pro" is used as a measure of the productivity of employers and it is linked to the variable "perc_man" in order to understand if the internal organization of the bank, and the presence of a higher or lower number of managers, can influence the performance of bank itself. In the model, it is also included the variable "var_del" that is the one-year delay of each dependent variable.

The final choice of "Tier1 capital ratio" as dependent variable is driven first by the importance of the index as a tool to evaluate with which of its "primary" resources the bank can guarantee the loans it makes to the customers and the risks that may result from sufferings, bad debts and others impaired loans; the ratio, indeed, takes into account all the assets of the bank weighted for the risks. The importance of such index is confirmed by the Basel

standards that increased the target percentage of the ratio during the last financial crisis, contributing to the straightness of the system.

Table 1: Explain different indexes: ROA vs TIER1 vs TIER2

	ROA	TIER1 CAPITAL RATIO	TIER2 CAPITAL
const	0.0018*** (2.78)	2.658*** (4.43)	7081.77 (1.04)
bcc	0.0011** (2.57)	0.914** (2.34)	-14805.5*** (-3.20)
pop	0.0011 (1.34)	2.235*** (2.84)	-6755.27 (-0.74)
particip	-9.28e-11 (-1.08)	1.799e-07 *** (2.64)	0.0332*** (37.34)
emp_pro	9.78e-06 *** (6.18)	0.0023* (1.66)	38.679** (2.37)
perc_man	-0.0179*** (-3.76)	11.992*** (2.74)	-55354.8 (-1.10)
var_del	0.34*** (19.42)	0.712*** (49.13)	0.936*** (57.32)
R2	0.141175	0.564314	0.81484
R2corr	0.13922	0.563072	0.81431
Mean var dep	0.008286	15.7359	37597.17
SSR	0.211522	105303.2	1.42E+13
SE Regression	0.00895	7.07453	82153.04
F	$F_{6,2636}$=72.22	$F_{6,2104}$=454.19	$F_{6,2104}$=1543.25
p	1.35E-83	0	0
LogL	8715.585	-7122.049	-26880.67
AIC	-17417.17	14258.1	53775.33
SC	-17376.01	14297.68	53814.91
# of obs	2643	2111	2076

Note: t-ration in parenthesis; ***/**/* denote significance at the 1/5/10% level

Source: Author elaboration

2.3.2 Running the model

In this section a regression model has been used putting in it the Tier1 Capital Ratio as dependent variable, and some independent variables. The hypothesis to be checked is that “pop” and “bcc” banks are more resilient than other banks in front of a period of crisis. Hence, starting from a number of independent variables I remove not significant variables in order to reach the final model in which I include a dummy variable for “type” of banks, the variables “perc_man” and “particip”, the latter as a variable to verify if interconnections among banks, even as participation, could influence resilience and the one-year delay of the dependent variable.

The general model (2) used for the computation is the following:

$$(2)\ TIER1_{i,t} = f\left(TIER1_{i,t-1}; perc_{man_{i,t}}; particip_{i,t}; oper\_res_{i,t};\ branches_{i,t}; equity_{i,t}; empl_{i,t}; DU_{bcc}; DU_{pop}\right)$$

Before running the model, an evaluation of the level of correlation among variables through the correlation matrix has been made. It is reported in table 2 which shows the highest level of significance, clearly as expected, between the variables “empl” (employees) and “branches” and some level of significance among “particip” (participations), “branches” and “empl”. In any case, the variables “empl” and “branches” are not used in the final model as shown in table 2b so any problem of multicollinearity is avoided.

In the first computation are put as control variables, in addition to those used in the final model, “oper_res”, that represents operating result, “branches”, which indicates the number of banks branches, “equity” as a measure of the dimension of banks and “empl” which indicates the number of employees, finding that they are not significant as shown in table 2a. The use of those additional variables with respect to those used to find the best index (table 1) is driven by the willingness to show the preliminary model ran using such further not significant variables; although not reported, even in that previous test the same variables have been used, without finding any significant results.

Proceeding by omitting not significant variables (that is, following a specification strategy from the general to the particular), in the final model, the significance of the independent variables “particip” and “perc_man” can be detected. Within the considered period, from 2006 to 2010, the model shows the significance of the considered variables as can be seen below (table 2b), and in particular it seems that those variables give to “pop” banks an advantage from their corporate form, influencing their Tier1 Capital Ratio. The analysis, proceeding from the general to the particular, provided the erasing of some variables due to their not being significant, maintaining however constant the number of observations.

The model, as constructed above, does not give information on the changes which occurred over the considered period of time, so in order to understand if there were relevant changes for each year, a dummy variable for each year from 2007 to 2010, has been used. As before, the model includes the delayed variable of Tier1 Capital Ratio “del_tier”. Considering the delayed variable of the dependent one and the absence of data for Tier1 Capital Ratio for the year 2006 that doesn’t let to consider the model for the dummy variable 2006, the same method has been applied to years from 2007 to 2010.

Applying the process described above, for each year the results provided are represented in Table 3 and 4; Table 3 refers to the year before and to the year of impact, while Table 4 refers to the years of potential recovery.

Using 2007 as a dummy, as can be seen in table 3, no variable is significant except for the delayed one, and so, it seems there are not differences among different typologies of banks. This result is coherent with the initial hypothesis, in fact 2007 belongs to the period before the impact of the crisis.

Continuing with the same analysis for the year 2008, the result is different; for both “pop” and “bcc” there is a positive and significant result, and the same for the variable “perc_man”.

Considering that “particip” is not significant, the previous model has been applied, obtaining the same result (see column 4 of table 3) which confirms that both “pop” and “bcc” have had an advantage in 2008.

Proceeding with the experiment and using 2009 (table 4) as dummy variable, “particip” and “perc_man” are significant, but with no differences changing banking typology.

The last experiment has been done running the dummy variable for 2010 (table 4) obtaining, even in this case, a result coherent with the hypothesis that “pop” and “bcc” show to be more resilient in the year of the impact.

In the following section there are some considerations about the variable used in the first computation and how they changed across the considered years.

Table 2: Correlation matrix

oper_res	equity	emp_pro	perc_man	particip	empl	branches	
1	0.0234	0.0294	-0.0624	0.0673	0.0747	0.0661	oper_res
	1	0.0004	-0.0111	0.0933	0.1982	0.2816	equity
		1	0.4088	0.0129	0.0048	-0.002	emp_pro
			1	-0.0306	-0.1083	-0.131	perc_man
				1	0.7865*	0.7223*	particip
					1	0.9627**	empl
						1	branches

Source: Author elaboration

Table 2a: Explaining TIER1: preliminary model

	Coeff.	*Std.Err.*	*t ratio*	*p-value*	*significance*
const	2.87762	0.644658	4.4638	<0.0001	***
bcc	0.787675	0.415168	1.8972	0.0579	*
pop	1.98675	0.795849	2.4964	0.0126	**
particip	3.05E-07	1.28E-07	2.3888	0.017	**
empl	−0.000229459	0.00033638	−0.6821	0.4952	
oper_res	6.72E-08	1.57E-06	0.0429	0.9658	
equity	2.51E-10	5.58E-10	0.4494	0.6532	
emp_pro	0.00235	0.00142544	1.6486	0.0994	*
branches	0.000888437	0.00317873	0.2795	0.7799	
perc_man	11.5654	4.39341	2.6324	0.0085	***
del_tier	0.708317	0.0145882	48.5541	<0.0001	***

Mean var dep	15.73879		SC	14239.24
SSR	104304.7		SE regression	7.067840
R2	0.562477		R2corr	0.560382
F(10, 2088)	268.4325		P-value(F)	0.000000
Log-likelihood	−7077.547		AIC	14177.09
# of obs	2111			

Source: Author elaboration

Table 2b: Explaining TIER1: the final model

	Coeff	*Std. Err.*	*t ratio*	*p-value*	*significance*
const	3.44	0.371327	9.27	<0.0001	***
bcc	0.71	0.369777	1.92	0.0545	*
pop	2.09	0.783985	2.67	0.0077	***
particip	0.00	6.83E-08	2.65	0.0082	***
perc_man	14.38	4.13529	3.48	0.0005	***
del_tier	0.71	0.0145099	49.14	<0.0001	***

Mean var dep	15.73594		SC	14292.8
SSR	105441.7		SE regression	7.077504
R2	0.563741		R2corr	0.562705
F(5, 2105)	544.0233		P-value(F)	0
Log-likelihood	−7123.436		AIC	14258.87
# of obs	2111			

Source: Author elaboration

Table 3: Econometric model using the variable “year” as a dummy (before the impact)

	2007	2008	2008
const	2.60*** (2.88)	4.31*** (7.62)	4.35*** (7.75)
bcc	1.55* (1.67)	1.43** (2.49)	1.40** (2.44)
pop	2.10 (1.09)	4.08*** (3.46)	4.07*** (3.46)
particip	0.00 (0.32)	0.00 (0.60)	
perc_man	0.05 (0.01)	34.01*** (4.24)	33.92*** (4.24)
del_tier	0.74*** (23.29)	0.53*** (27.72)	0.53*** (27.73)
R2	0.525876	0.642305	0.642058
R2corr	0.521369	0.638852	0.639299
Mean var dep	15.61519	15.01517	15.01517
SSR	41479.57	15390.88	15401.5
SE Regression	8.880231	5.450883	5.447507
F	$F_{5,526}$=116.68	$F_{5,518}$=186.03	$F_{4,519}$=232.73
p	7.12E-83	3.7E-113	2.7E-114
LogL	−1913.655	−1629.094	−1629.275
AIC	3839.309	3270.188	3268.549
SC	3864.969	3295.757	3289.857
# of obs	532	524	524

Note: t-ration in parenthesis; ***/**/* denote significance at the 1/5/10% level.

Source: Author elaboration.

Table 4: Econometric model using the variable “year” as a dummy (after the impact)

	2009	2010
const	2.99*** (5.52)	1.32 (1.57)
bcc	- 0.097 (- 0.1883)	−0.540824 (-0.6951)
pop	0.61 (0.54)	0.98 (0.57)
particip	0.00** (2.01)	0.00** (2.01)
perc_man	21.36*** (3.19)	12.65 (1.23)
del_tier	0.80*** (31.83)	0.95*** (24.74)
R2	0.696518	0.572679
R2corr	0.693606	0.568586
Mean var dep	15.8274	16.48163
SSR	12836.72	29187.91
SE Regression	4.963731	7.47767
F	$F_{5,521}$=239.14	$F_{5,522}$=139.91
p	2.3E-132	5.89E-94
LogL	−1589.100	−1808.477
AIC	3190.201	3628.954
SC	3215.804	3654.568
# of obs	527	528

Note: t-ration in parenthesis; ***/**/* denote significance at the 1/5/10% level

Source: Author elaboration

2.3.3 Comments

Using Tier1 Capital Ratio as dependent variable there exists the possibility to control the level of banks own capital which gives a measure of the ability to absorb losses without impacting on deposits. Furthermore, the ratio, that takes into consideration even the total risk-weighted assets gives information about the presence on banks' balance sheets of assets that could be cause of bankruptcies along periods of crisis.

The outcome of the model is double; on one hand, it shows the importance of participations and percentage of managers to contrast problems that come from shocks, and on the other hand it shows how both of these variables have a positive influence on the ability to resist shocks of BCCs and in particular of POPs.

The starting model, as represented in table 2b, using dummy variables for "type" of banks, shows that both "particip" and "perc_man" are positive and significant. Furthermore, for both dummy variables, "pop" and "bcc", it is confirmed the hypothesis of a higher resilience. The importance of the role of these types of banks, and the significance of the control's variables let to denote the main features which make them more resilient than "spa".

As shown in the first part, the variable "perc_man" has different trends among different kind of banks; this characteristic represents an important element in the regression analysis, in fact in the year of the impact of the crisis, 2008, the lower values for "pop" banks make them more resilient than "spa" ones. Hence, why is "perc_man" a relevant variable for banks' resilience? Lots of studies focused on the role of management in periods of crisis because their abilities and skills, if there are necessaries conditions to operate, can influence the resilience of banks. There are lots of ways in which the percentage of managers can influence the trend of a bank; there are factors that can be measured and can be seen directly in a balance sheet, such as the administrative costs for management or the number of head positions, and other factors that cannot be measured directly, such as the skills of managers in facing critical events or even their abilities in keeping in contact with others

employees in order to create personal relationships and support them in their daily contact with customers.

The increase of the percentage of managers in the years of crisis is linked with an increase of Tier1 Capital Ratio. In such periods, the increase of the number of managers, could be the result of an internal revision of the organization of banks; new managers have the possibility to put their knowledges and their abilities to contrast the negative effects that come from the crisis. New managers could be new employers with more abilities than the previous ones, or simply old employers that put their managerial capacities and their experience but bringing innovations. An increased number of managers, in periods of crisis, can be the way to improve the presence of directors in local banks and to construct a network with the headquarter which lets to manage and adopt corrective measures if necessary. Furthermore, the presence of managers leads investments' choices towards new and, at the same time, less risky assets. Meanwhile, during a period of crisis, the banks need to select with more accuracy their potential customers in order to avoid credit insolvency; so, more managers represent a better ability of the banks to evaluate the solvency and the characteristics of potential customers reducing risky assets and letting an increase of Tier1 capital ratio.

The variable "particip" can be seen as a way to measure the interconnections of banking system. In this model, a positive relationship between the increase of participations and the increase of the Tier1 Capital Ratio has been founded; so, the presence of interconnections can guarantee a reduction of the risks and a major stability of the system. Although this variable, shows an important level of significance in the general computation, it is not significant considering every single year; so, the level of participations seems to be relevant for the resilience of banks, but at the same time it does not show to be relevant for a particular "type" of bank.

2.4 ROBUSTNESS CHECK

In order to test the robustness of the model, the “Test on different group mean”, the “Breush Pagan” test and the “Hausman” test have been used obtaining the results reported Table 5.

Table 5: Robustness check

Test on different group mean	$F_{536,1569}$=4.95***
Breush Pagan test	LM=3.57*
Hausman test	H=635.23***

Note: ***/**/* denote significance at the 1/5/10% level

Source: Author elaboration

In the “Test on different group mean” a low p-value is against the null of pooled OLS is adequate, in favor of fixed-effects.

In the “Breusch Pagan” test a low p-value is against the null of pooled OLS is adequate, in favor of random effects.

In the “Hausman” test a low p-value is against the random effect estimation, in favor of fixed effects.

From the tests specified above it is possible to discern that the pooled OLS seems to be not adequate to describe the model, and in particular the results are in favor of a fixed effects model; hence, I run a fixed effects model obtaining the results summarized in table 6.

As it is possible to see, the result of this regression does not consider the dummy variable “bcc”; this variable is omitted because of collinearity: it coincides with the sum of individual effects, due to the fact that all the subjects in this group maintain the “bcc” feature over the whole time period under

consideration. Hence the values of the constants for each bank have been computed with the subsequent finding of the average values for each “type” that are equal to 12,28 for SPAs, 15,83 for BCCs and 22,12 for POPs. A clear advantage of being POPs or BCCs over SPAs does emerge.

Table 6: OLS with fixed effects

	Coeff.	*Std. Err.*	*t ratio*	*p-value*	*significance*
const	15.2229	0.444174	34.2724	<0.0001	***
pop	−4.75731	2.89417	−1.6438	0.1004	
particip	3.60E-07	9.34E-08	3.8533	0.0001	***
perc_man	5.14	6.09174	0.8438	0.3989	
del_tier	0.030989	0.0210646	1.4711	0.1415	

Mean var dep	15.73594		SC	16304.38
SSR	39150.60		SE regression	4.995256
R2 LSDV	0.838017		R2corr	0.013359
LSDV F(541, 1569)	15.00403		P-value(F)	0.000000
Log-likelihood	−6077.707		AIC	13239.41
# of obs	2111			

Note: ***/**/* denote significance at the 1/5/10% level

Source: Author elaboration

In order to check if extreme values have had an influence on the results obtained in the OLS model, running again the model by eliminating some outlier observations from the original sample has been the following step (table 7).

Firstly the observed values of Tier1 capital ratio lower than 40 have been omitted, obtaining the exclusion of 38 observations from the original sample; secondly the same model has been useful to omit the observed values of the dependent variable higher than 3, with the consequent exclusion of 47 observations. Thirdly, the omission concerned both extremes of the distributions running the regression for values of Tier1 capital ratio included in the range higher than 3 and lower than 40, with an exclusion of 85 observations.

Table 7: Econometric model omitting outlier observations

	TIER1<40	TIER1>3	3<TIER1<40
const	4.49*** (16.80)	3.289*** (8.66)	4.668*** (19.21)
bcc	1.687*** (6.29)	1.121*** (2.89)	2.031*** (8.34)
pop	0.647 (1.19)	1.178 (1.48)	0.626 (1.27)
particip	2.174E-07*** (4.14)	1.955e-07** (2.49)	2.160e-07*** (4.58)
perc_man	12.989*** (4.51)	18.01*** (4.21)	15.52*** (5.97)
del_tier	0.576*** (42.02)	0.718*** (49.08)	0.562*** (44.13)
R2	0.558504	0.599924	0.605685
R2corr	0.55732	0.598846	0.6046
Mean var dep	14.79502	16.21758	15.17181
SSR	37659.96	83491.85	29574.03
SE Regression	4.494868	6.708881	4.034389
F	$F_{5,1864}$=471.60	$F_{5,1855}$=556.32	$F_{4,1817}$=558.19
p	0	0	0
LogL	-5460.9	-6179.927	-5126.54
AIC	10933.8	12371.85	10265.08
SC	10967	12405.03	10298.13
# of obs	1838	1834	1797

Note: ***/**/* denote significance at the 1/5/10% level

Source: Author elaboration

The results of this latter estimation, as summarized in table 7, show a change in the level of significance for both dummy variables “pop” and “bcc”.

This result shows that the dependent variable for “pop” banks, in the considered sample, takes extreme values; tier1 capital ratio for “pop” banks assumes higher values than other banks, so they seem to be more resilient

thanks to their ability to improve the amount of Tier1 capital or to reduce risky assets.

Omitting extreme values, there is an improvement in the level of significance for “bcc”. Thanks to this latter computation of the model it is possible to give evidence of the ability to resist of BCCs. Both “particip” and “perc_man” are relevant in influencing Tier1 capital ratio and so, the resilience of these banks. BCCs, for their nature, are characterized by a cooperative system in which it is relevant their mutual purpose that let managers not to invest in risky assets and so, to maintain a major stability of the bank.

2.5 CONCLUSIONS

The main contribution of this Chapter to the available literature is to show that Italian cooperative and popular banks (BCCs and POPs) have an advantage over profit-oriented banks (SPAs) in terms of resilience ability, as measured during the years of the recent Great Recession. Certainly, it would be interesting a more complete analysis including a longer period after the year of the shock, till 2014 and beyond, embracing the whole period of the Recession, but it cannot be done in this thesis due to unavailability of data.

This chapter has tried first to identify an adequate index to capture the effects of the “Great Recession” on Italian banking system finding in “Tier1 Capital Ratio” the best index able to explain the difference that occur among different types of banks and a good index in analyzing the influence of banking features on the stability of the system. The correct evaluation of the number of managers and their distribution on territories, in order to make branches more efficient, represents a strength for BCCs and POPs; furthermore, the presence of participations, as supposed, represents a double-edged sword that makes banks vulnerable to a possible spread of shocks. Hence, after finding a way to measure banks resilience, it could be interesting an analysis on the importance of territorial features which help system stability.

REFERENCES

Adger W.N. (2000), Social and ecological resilience: are they related?, *Progress in Human Geography 24,3, pp. 347-364.*

Aiello F. and Bonanno G. (2016), Looking at the determinants of efficiency in banking: evidence from Italian mutual-cooperatives, *International Review of Applied Economics.*

Aiello F. and Bonanno G. (2016), Bank efficiency and local market conditions. Evidence from Italy, *Journal of Economics and Business 83, pp. 70-90.*

Anard K., Gai P., Kapadia S., Brennan S. and Willison M. (2013), A network model of financial system resilience, *Journal of Economic Behavior & Organization, Elsevier, vol. 85, pp. 219-235.*

Bavarelli M., Feliciotto P. and Mazzù S. (2002), Banche e rischio di credito in Sicilia, Milano: Egea.

Blundel R., Baldock R., Dadd D., Schaefer A. and Williams S. (2014), Resilience and recovery: SME experiences of extreme weather events and other external threats, Manchester: Institute of Small Business and Entrepreneurship.

Bongini P. and Ferri P. (2007), Governance, Diversification and Performance: The case of Italy's Banche Popolari, *paper presented at "Corporate Governance in Financial Institutions" SUERF and Central Bank of Cyprus*, Nicosia.

Borio C., Cohen B., Domanski D., Shin H.S. and Turner P. (2016), International banking and financial market developments, *Bank for International Settlements.*

Carri (2013), Definitions of Community Resilience: An analysis, *Report for Community & Regional Resilience Institute*.

Cellini R., Di Caro P. and Torrisi G. (2014), Regional resilience in Italy: do employment and income tell the same story?, *Handbook of regions and Competitiveness, UK.*

Cellini R. and Torrisi G. (2014), Regional Resilience in Italy: A very long-run analysis, *Regional Studies*.

Chrisman J., Chua J. and Kellemanns F. (2009), Priorities, Reosurce Sotck, and Performance in Family and Nonfamily firms, *E T&P*.

Conroy M. (1975), Regional Economic Diversification, *Praeger New York.*

Dabson B., Helfin C. and Miller K. (2012), Regional Resilience, *Rupri Rural Futures Lab Research and Policy Brief*.

Delios A., Beamish P.W. (1999), Geographic scope, product diversification and the corporate performance of Japanese firms, *Strategic Management Journal, pp.711-727.*

Dess G.D., Gupta A., Hennart J., Hill C. (1995), Conducting and integrating strategy research at the international, corporate and business level: issue and directions, *Journal of management 21, pp. 357-393.*

Di Caro P. (2014), Recessions, recoveries and regional resilience: Evidence on Italy, *MPRA Paper no. 60297.*

Di Caro P. (2014), An exploratory analysis on the determinants of regional resilience in Italy, *https://www.aisre.it.*

Ferri G. (2008), Why cooperative banks are particularly important at a time of credit crunch, *Mimeographed, University of Bari.*

Ferri G., Bongini P. (2007), Governance, Diversification and Performance: The Case of Italy's Banche Popolari, *SUERF.*

Ferri G., Masciandaro D. and Messori M. (2000), Governo societario ed efficienza delle banche locali di fronte all'unificazione dei mercati finanziari, *in P. Alessandrini (a cura di), Il sistema finanziario italiano tra globalizzazione e localismo,* Bologna: il Mulino.

Fingleton B., Garretsen H. and Martin R. (2011), Recessionary shocks and regional employment: evidence on the resilience of UK regions; *Journal of Regional Science.*

Garmestani A., Allen Craig R., Mittelstaedt J., Stow Craig A. and Ward W. (2006), Firm size diversity, functional richness, and resilience, *Nebraska Cooperative Fish and Wildlife Research Unit-Staff Publications, paper 32*.

Garraffo F., Giaccone S. and Longo M.C. (2012), Performance delle imprese internazionalizzate e crisi dei mercati: capacità di resistenza alla crisi o "resilienza strategica"?, *IX Convegno annuale SIM Società Italiana di Marketing.*

Geringer J.M., Tallman S., Olsen D.M. (2000), Product and international diversification among Japanese multinational firms, *Strategic Management Journal 21, pp.51-80.*

Gilly J., Kechidi M. and Talbot D. (2013), Resilience of organisations and territories: The role of pivot firms, *European Management Journal*.

Hallegatte S. (2014), Economic resilience – definition and measurement, *Policy research working paper 6852, The World Bank Climate Change Group.*

Henriet F., Hallegatte S. and Tabourier L. (2011), Firm-network characteristics and economic robustness to natural disasters, *Journal of Economic Dynamics and Control 36.*

Hitt M., Bierman L., Uhlenbruck K. and Shimizu K. (2006), The importance of resources in the internationalization of professional service firms: the good, the bad and the ugly, *Academy of Management Journal 49, pp. 1137-1157.*

Holling C.S., Schindler D.W., Walker B.W. and Roughgarden J. (1995), Biodiversity in the functioning of ecosystem: an ecological synthesis, *Biodiversity loss: economic and ecological issues,* Cambridge: Cambridge University Press*, pp. 44-83.*

Kamen C. and Behrer C. (2012), Navigating uncertainty and growing jobs: Considering small employers firm resilience during challenging economic times, *Federal Reserve Bank of San Francisco.*

Kick T. and Prieto E. (2015), Bank Risk and Competition: Evidence from Regional Banking Markets, *Review of Finance 19: pp. 1185-1222*.

Lu J.W. and Beamish P.W. (2001), The internalization and performance of SMEs, *Strategic Management Journal 22, pp. 565-586.*

Luzzati L. (1863), La diffusione del credito e le banche popolari, Padova: Libreria Sacchetto.

Marczyk J. (2013), Resilience, stability and complexity of banks: a quantitative approach to systemic risks, *Bancaria no. 9/2013.*

Martin R. (2012), Regional economic resilience, hysteresis and recessionary shocks, *Journal of Economic Geography 12, pp. 1-32.*

Martin R. and Sunley P. (2014), On the notion of regional economic resilience: conceptualization and explanation, *Journal of Economic Geography, pp. 1-42.*

Masciandaro D., Pansini R.V. and Quintyn M. (2013), The economic crisis: Did supervision architecture and governance matter?, *Journal of financial stability 9, pp. 578-596.*

McKillop D. and Wilson J. (2011), Credit unions: a theoretical and empirical overview, *Financial markets, institutions & Instruments, Vol. 20, Is. 3, pp. 79-123.*

Minichilli A., Brogi M., Calabrò A. (2015), Weathering the Storn: Family Ownership, Governance, and Performance through the Financial and Economic Crisis, *Corporate Governance: An International Review*.

Moser S.C. (2008), Resilience in the Face of Global Environmental Change, *Oak Ridge, TN: Community & Regional Resilience Initiative.*

Ratnovski L. and Huang R. (2009), Why are Canadian banks more resilient?, *IMF Working Paper.*

Romer R. (2001), Advanced Macroeconomics, *McGraw Hill: New York.*

Rose A. (2007), Economic resilience to natural and man-made disasters: multidisciplinary origins and contextual dimensions, *Environmental Hazard 7, pp. 383-398.*

Setterfield M. (2010), Hysteresis, *Working Paper 10-04, Department of Economics, Trinity College, Hartford, Connecticut.*

Singh D.A., Gaur A.S., Schmid F.P. (2010), Corporate diversification, TMT experience and performance. Evidence from German SMEs, *Management International Review 50, pp. 35-36.*

Tierney K. (2009), Disaster response: Research findings and their implications for resilience measures, *Oak Ridge, TN: Community & Regional Resiliency Initiative.*

Todo Y., Nakajima K., Matous P. (2013), How do supply chain networks affect the resilience of firms to natural disaster? Evidence from the Great East Japan earthquake, *RIETI discussion paper series 13-E-028*.

Vallascas F. and Keasy K. (2012), Bank resilience to systemic shocks and the stability of banking system: Small in beautiful, *Journal of International Money and Finance 31, pp. 1745-1776.*

APPENDIX

List of used variables:

Variable name	*Description*	*Mean*	*Median*
Roa	Return on assets	0.86	0.87
Tier1 capital ratio	Comparison between banking firm's core equity capital and its total risk-weighted assets	15.83	13.49
Tier 2	Tier 2 capital is designated as supplementary capital, and is composed of items such as revaluation reserves	6.36	0.44
perc_man	Percentage of managers	3.81	2.76
particip	Participation in other banks	1,388.00	0,0000
emp_pro	Operating results on number of employees	314.35	289.76
oper_res	Operating result	17,525.00	2,081.50
branches	Number of banks' branches	51.16	9.00
equity	Equity as dimension of bank	5,834,362.38	39,057.00
empl	Number of employees	485.52	74.00

Chapter 3: *Is there a link between banking presence and Regional and Provincial resilience in Italy?*

3.1 INTRODUCTION

As confirmed by several studies (e.g., Cellini, Di Caro and Torrisi, 2014, Di Caro, 2015a, 2015b, Lagravinese, 2014), during the period of the "Great Recession" from 2007 to 2010, some Italian regions showed a higher level of resilience than others. The determinants of such a result have to be searched in historical factors that affect the growth of each region and also in the structure of the respective markets. Certainly, the crisis hits each economic sector in different ways, influencing the ability of regions to resist the shock.

In such a context, banks may play an important role in helping firms overcoming their difficulties; so, the aim of this Chapter is to analyse if the presence of BCCs and POPs could be a determinant factor in improving the resilience of the regions. In order to evaluate the role of BCCs and POPs, indices already used in the available literature on regional resilience have been used.

In the available body of economic literature, it is possible to find several different indices to measure economic resilience based on both parametric and non-parametric analysis. Even if the indices used to verify the existence of resilience are usually macroeconomic variables such as the percentage variation of employment or the per-capita income index, the way suggested for the empirical analysis is double. On the one hand, one can consider an indicator based on a specific area comparing it with the average value of the same indicator at national level as proposed for instance, by Lagravinese (2014, 2015) or Evans and Karecha (2014); on the other hand, someone proceeded to compute a specific resilience indicator using a regression analysis in order to understand if specific determinants play their role during the crisis event (impact effect) or in the years following the event (recovery effect) – see, for instance, Fingleton et al, 2012, Di Caro, 2015 a,b.

Using the first approach, it is possible to consider as a measure of resilience of a region i, an index based on descriptive statistics as the following one:

$$r_i = \frac{g_i}{|g_N|} \quad (1)$$

where g_i denotes the growth rate of total employment or real per-capita income of the region *I*, and g_N is the same variable at national level (national average level). The higher is the value of r_i, the more resilient is the region, the lower is r_i, the less resilient is the region.

Using the second approach in measuring resilience, it is possible to follow the procedure firstly proposed by Fingleton et al (2012), taking into consideration a regression model of this type:

$$g_i(t) = \alpha_i + \sum_{h=1}^{H} \beta_{i,(h)} D_h(t) + \sum_{k=1}^{K} \gamma_{i,(k)} S_k(t) + \varepsilon_i(t) \quad (2)$$

where $g_i(t)$, with $t \in [1,T]$, is the time series variable for any region $i \in [1,N]$, D_h, with $h \in [1,H]$, is a dummy variable for the shock with its coefficient that is a measure of the impact of the shock, and S_k, with $k \in [1,K]$, is a dummy variable associated with the recovery effect and its coefficient gives a measure of the recovery ability.

In order to evaluate the impact effect of the Great recession, and the role of the presence of BCCs, it is important to use some series of r_i and β_i indices referred to the years of the Great recession, as available in the existent literature (see Cellini, Di Caro, Torrisi, 2014).

It is important to note that r_i and β_i are different kind of indices; while r_i are unconditional and relative indices which explain the performance of a region in a period of crisis – if it has been good or bad with respect to the average national one - the β_i are conditional indices and they look at the performance of the region in a period of crisis, comparing it to itself over a long period of time.

So, an index could show a higher resilience of a region if compared to the same index of another region, and at the same time explains a lower level of resilience if compared with its variation over time.

The structure of the Chapter is as follows. Section 2 deals with the analysis of regional data on number of branches and proceeds using a correlation test in order to evaluate the influence of Italian banking system on regional resilience indices; Section 3 concerns with the correlation analysis in provincial base which is considered (see Aiello and Bonanno, 2016) the best level to conduct analysis on BBCs and POPs. Section 4 deals with the logit model specification, used in order to have a confirm of the results obtained in the previous sections. Section 5 proceeds with the analysis of the trend of the quality index as constructed by Mazzù et al (2002) for each type of bank across the period of the "Great Recession". Section 6 treats the opportunity of maintaining banks "biodiversity" and policy implications and finally Section 7 highlights the results of the analysis.

3.2 REGIONAL DATA

The analysis of the resilience at a regional level, and its correlation with the presence of a particular kind of banks, is conducted using some measures of regional resilience already available in the literature. In particular, "Var%y", "Var%N", "Impshock3y", "Impshock3N", reported by Cellini, Di Caro and Torrisi (2014), provide a review of available studies; the first two variables represent the percentage annual variation rate of per capita real GDP and employment for each region in Italy during the Great Recession, while the third and fourth ones come from a SURE estimation of both income and employment during the same period. Truly, several indices are available to measure regional resilience; a still alive debate is in course on the use of employment *versus* GDP as a measure of resilience. Someone (Fingleton et al, 2012) finds that most of the effects of the recession come directly from the labour market and that the impact on employment is higher than on income; others (Cecchetti et al, 2002) argue that the use of employment as measure makes it possible to avoid

disturbances that come from prices and inflation. Others again (Blanchard and Katz, 1992, Hallegatte, 2014) point out that income could be better due to its ability to catch a higher number of variables which could be affected during a period of crisis. So, there is not a shared opinion on this, and in order to give evidence of their ability to catch resilience, in the present chapter both measures will be used.

From the analysis by Cellini, Di Caro and Torrisi (2014), who consider the income as a measure of resilience (in order to do a comparison among regions – Carri, 2013), Piemonte and Umbria on one side and Calabria and Trentino AA on the other side, showed respectively the lowest and the highest levels of resilience; taking into consideration employment as a measure of resilience (Kamen et al, 2012). The lowest resilience is that of Umbria and Basilicata, while the highest one is that of Val d'Aosta and Toscana.

If these measures of regional economic resilience's ability are related or not to the number and characteristics of banks' branches located in the region, is object of this chapter, using the database of the Bank of Italy.

3.2.1 Analysis on regional scale

Before proceeding with the preliminary statistic correlation analysis, to check the importance of the presence of BCCs (Ferri et al, 2000, 2007, Ferri, 2008) as a potential determinant of the resilience of a region, it has been important to analyse if it is possible to find some kind of specific trend of the considered data. Comparing data on the number of banks branches present in each region, it is possible to see that over the considered period there was an opposite trend between SPAs on the one side, and BCCs and POPs banks on the other.

Looking at table 1, leaving out any kind of analysis upon a single region, it is possible to discern that, over the years 2008-2010, there was a reduction in the number of branches for SPAs and at the same time an increase for both

BCCs and POPs. It is already possible to say that there are some characteristics which make BCCs and POPs banks different from SPAs; if some regions show a positive trend even for SPAs, there are no region with a negative sign for BCCs and POPs across those years.

Table 1: Difference in number of branches for type of banks.

Region	diff # 2010-2008 spa	diff # 2010-2008 pop	diff # 2010-2008 bcc
PIE	-22	7	7
VDA	0	0	2
LOM	-166	32	75
TAA	2	14	3
VEN	-72	33	40
FVG	-12	-2	11
LIG	-26	0	2
EMR	-88	20	33
TOS	-14	2	35
UMB	5	3	1
MAR	-29	2	11
LAZ	-74	44	32
ABR	-6	0	7
MOL	-11	7	2
CAM	-27	6	4
PUG	-46	6	11
BAS	-9	0	6
CAL	-17	1	2
SIC	-60	13	13
SAR	-25	0	0
TOTAL	**-697**	**188**	**297**

Source: Author elaboration on data from Bank of Italy.

Going beyond this rough analysis of data and considering that the channels through which income and employment react to shocks are in large part different, it is necessary to verify if the presence of BCCs and POPs shows some effects on regional resilience, and if it affects income, employment or both of them.

The indices under consideration, borrowed by different analyses mentioned by Cellini, Di Caro and Torrisi (2014), are of both types as described in the introduction section of this chapter. “Var%y” and “Var%N”, are variables based on descriptive statistics; they represent the percentage annual variation rate of per capita real GDP and employment, as they are considered respectively in Cellini and Torrisi (2014) and Di Caro (2015). “Impshock3y” and “Impshock3N” are, on the other side, variables based on a regression analysis as they are respectively estimated by Cellini and Torrisi (2014) and Di Caro (2015).

Starting from data collected from Bank of Italy on the number of branches of each type of banks in Italy across the interested period, some variation rates which occurred on these variables have been studied; after that a statistic correlation has been done finding that some of those variables show certain levels of significance as reported in Table 2.

The descriptions reported on the left side of the table 2, describe the number of the “type” of bank (#) for each year, the percentage for each “type” (%) and the variation in number (#) and percentage (%) of the numerousness of branches for each “type”. On the first row the indices are indicated, with respect to which the existence of correlation has been analysed.

Results with asterisks show some level of significance; significance at 10% is denoted by one asterisk, while the one at 5% is highlighted through double asterisks.

From the results specified in table 2, it is possible to note that the variable which caught better the effects due to the presence of BCCs and POPs is “Var%N”. This index, as considered by Di Caro (2015) represents, in percentage terms, the variation of employment occurred in the years 2009-2011.

A preliminary observation on the results obtained from the table 2 can be done considering that at the same time, a reduction in the percentage of employment is positively correlated with a reduction in percentage of SPAs; hence, even if the number of BCCs branches is positively linked, the percentage of BCCs does not show correlation and so, the reduction of SPAs

with respect to the total number of branches, means an increase, at least for some regions, in the percentage of BCCs and POPs.

Anyway, the most important result obtained from this analysis is that the difference, in percentage, of the number of branches for SPAs is negatively related to the variation in income and positively related to the variation in employment; it means that this type of banks was hit by the crisis more than others and it is not possible to identify the same correlation with the difference in percentage of other banks' branches.

A further evaluation has been conducted, taking into account the variation in percentage of the number of employers across some of the years interested by the crisis obtaining the results reported in table 3. This analysis, differently from the previous one, considers some variation rates of employment as comparison variables. Results show higher correlation considering the variation of the variables after 2008, confirming that the impact of the crisis hit banking system in that year.

Even in this case, it is possible to denote a relevance, in terms of correlation, between the variable "diff%2010-2008spa" and each difference of the number of employers. In addition to the previous results, last analysis demonstrates another significant correlation between the variance in employment and the variable "diff#2010-2008pop", which represents the variation of the number of POPs branches. As highlighted in table 2, even in this case variations in percentage of the number of branches of SPAs, follow the trend of the employment showing that the effects of the crisis influenced the resistance of this type of banks. Furthermore, the significance showed by the variable "diff#2010-2008pop" could represent the fact that the number of branches for POPs is linked somehow with the reduction of the percentage of SPAs with a supposed conversion of SPAs in POPs.

One of the most important results that can be read as an effect of the higher resilience of BCCs comes out from the correlation between the analysed variables and the percentage of BCCs.

The effects of the "Great Recession" come out from a series of elements such as the reduction of external demand and also weak internal public and

private demand, together with the reduction of credit availability. The reduction of credit availability combined with the reduction of the demand hit small and medium enterprises and their solvency ability; in those difficult moments SMEs, which are those who suffer more from the difficulties to have access to credit (Blundel et al, 2014), asked for help to banks in order to obtain enough liquidity to overcome the crisis. So, the increase of the number of branches for BCCs combined with a lower reduction in percentage of employment could be the result of a support received by enterprises from this type of banks.

The trend of employment over the considered years is generally negative so, a lower reduction of this variable is related to an increase in percentage of the number of BCCs branches. It seems that a persistent correlation with the number and the percentage of BCCs both in 2008 and 2010 exist; so, the trend of employment is correlated with the number of BCCs branches both before the impact of the crisis and in the immediately following period. It seems that the number of branches for BCCs changes, in pair with the employment without any linkage with the period taken into consideration, and consequently this type of banks has not experienced any kind of impact due to the crisis, confirming their higher resilience than SPAs whose number of branches was affected immediately in the years that follow the crisis.

Table 2: Pearson Correlation test using Cellini, Di Caro and Torrisi (2014) variables

	Var % y	Var % N	Imp shock 3 employment	Imp shock 3 GDP
# spa 2008	-0.2045	0.1800	0.0851	0.0014
# pop 2008	-0.0438	0.0722	0.0023	0.1025
# bcc 2008	0.0796	0.4084*	0.0316	0.0906
# spa 2010	-0.2102	0.1827	0.0894	-0.0019
# pop 2010	-0.0336	0.0852	0.0071	0.1015
# bcc 2010	0.0723	0.3978*	0.0353	0.0912
% spa 2008	-0.3390	-0.2756	0.0736	-0.1519
% pop 2008	0.1921	-0.2299	-0.2692	-0.0586
% bcc 2008	0.3018	0.4417**	0.0502	0.2088
% spa 2010	-0.3622	-0.2321	0.0615	-0.1273
% pop 2010	0.2373	-0.2775	-0.2311	-0.0897
% bcc 2010	0.3092	0.4299*	0.0505	0.2020
diff # 2010-2008 spa	0.0176	-0.0808	0.0456	-0.0966
diff # 2010-2008 pop	0.1451	0.2761	0.0838	0.0579
diff # 2010-2008 bcc	-0.0214	0.2093	0.0705	0.0817
diff % 2010-2008 spa	-0.4120*	0.5297**	0.2432	0.0694
diff % 2010-2008 pop	0.0714	-0.2909	0.2478	-0.3222
diff % 2010-2008 bcc	0.1585	-0.2108	0.0859	-0.0243

Source: Author elaboration on available data

Table 3: Pearson Correlation test using variation in the percentage of employment

	var%0807	*var%0908*	*var%0907*	*var%1009*	*var%1007*	*var%1008*
# spa 2008	0.1959	0.2558	0.2913	0.0884	0.2548	0.2204
# pop 2008	0.1335	0.1200	0.1627	0.0756	0.1526	0.1211
# bcc 2008	0.3322	0.3901*	0.4648**	0.2815	0.4613**	0.4132**
# spa 2010	0.2001	0.2574	0.2950	0.0902	0.2583	0.2224
# pop 2010	0.1502	0.1342	0.1825	0.0896	0.1731	0.1382
# bcc 2010	0.3342	0.3848*	0.4625**	0.2722	0.4559**	0.4048*
% spa 2008	-0.1870	-0.2949	-0.3138	-0.1789	-0.3108	-0.2990
% pop 2008	0.0597	-0.1258	-0.0445	-0.2546	-0.1258	-0.2133
% bcc 2008	0.1900	0.4115*	0.3923*	0.3403	0.4303*	0.4608**
% spa 2010	-0.2044	-0.2721	-0.3091	-0.1402	-0.2929	-0.2639
% pop 2010	0.1009	-0.1378	-0.0273	-0.2814	-0.1224	-0.2346
% bcc 2010	0.1923	0.4028*	0.3878*	0.3212	0.4197*	0.4452**
diff # 2010-2008 spa	-0.0509	-0.1803	-0.1517	-0.0269	-0.1254	-0.1375
diff # 2010-2008 pop	0.3848*	0.3326	0.4592**	0.2973	0.4644**	0.3826*
diff # 2010-2008 bcc	0.2964	0.2579	0.3535	0.1210	0.3147	0.2391
diff % 2010-2008 spa	0.2268	0.2948	0.3360	0.6279***	0.4902**	0.5207**
diff % 2010-2008 pop	0.2189	-0.0949	0.0702	-0.2675	-0.0442	-0.1985
diff % 2010-2008 bcc	0.2622	-0.0532	0.1232	-0.3268	-0.0269	-0.2004

Source: Author elaboration on available data

3.3 PROVINCIAL DATA AND ANALYSIS

In order to verify if there could be a change in the results by operating the same analysis on provincial level, which is the geographical disaggregation closest to the operating scale of BCCs, there has been an application of the previous analysis using provincial data, as the regional one, from the database of the Bank of Italy on the number of banks' branches on a provincial basis.

The provincial-data based analysis, needed a computation of the resilience indices (which are not readily available in literature), following the equation (1) and taking data from ISTAT database.

These new indices let to denote provinces with different levels of resilience between 2008 and 2010; taking into consideration employment index, the less resilient (reduction of the index) provinces are in order Milano, Bari, Ascoli-Piceno, Torino, Treviso, Salerno and Cosenza, while the more resilient (increase of the index) are Monza-Brianza, Barletta-Andria-Trani, Fermo, Sassari, Roma, Siracusa and Alessandria. The first three provinces aren't taken into account for both reduction and increment because their values could come from the institution of the new provinces. Considering the index of added value, Milano, Bologna, Bolzano, Parma, Lucca, Verona and Ragusa show the highest level of resilience while the lowest one is shown by Treviso, Napoli, Torino, Brescia and Modena. Both indices show a low level of resilience for the provinces of Torino and Treviso and also for Campania which is present first with Salerno and then with Napoli. Furthermore, considering that the province of Torino is the most populated in Piemonte, its presence among the least resilient provinces meets the results on income index obtained by Cellini, Di Caro and Torrisi (2014).

As for regional data, starting from data collected from Bank of Italy on the number of branches of each type of banks in Italy for each province over the time period under consideration, some variation rates which occur on this variable have been calculated, such as the percentage of each type of banks, the change in the percentage between 2008 and 2010 and also the change in the proportion of each type across the considered years.

As expected and found for the regional analysis, even in this case there is a reduction in the percentage and in the proportion of SPAs with respect to the total number of branches in Italy, and at the same time an increase of the same indices both for BCCs and POPs.

In table 4 there are the differences in percentage (divided into north, center and south of Italy) of the number of branches for each type of banks between 2010 and 2008; from the initial dataset the values of the provinces which were born across those years have been removed.

Comparing the results obtained by calculating the arithmetic mean for each macro area of Italy, there is a reduction in the percentage of SPAs of -4,749%, -1,258% and -1,829% respectively for the north, the center and the south; on the contrary both BBCs and POPs increased their presence on each area respectively of 2,709% and 2,040% in the north, 1,236% and 0,022% in the center and 0,796% and 1,034% in the south. These data confirm that during the period of crisis SPAs suffered much more the negative effects that came from markets and their interconnections (Anard et al, 2013, Borio et al, 2016, Garraffo et al, 2012, Conroy, 1975, Martin, 2012); furthermore, SPAs, as American banks did, used to employ securitization's systems which was the cause of the collapse of the American banking system during the crisis and the consequent diffusion all over the world as a result of the modern financial systems (Vallascas, 2012, Marczyk, 2013).

Table 4: Differences in percentage of the number of branches for north, center and south of Italy

PROVINCE	BCC	POP	SPA	PROVINCE	BCC	POP	SPA	PROVINCE	BCC	POP	SPA
Torino	0,419%	0,200%	-0,619%	Massa-Carrara	0,877%	0,000%	-0,877%	Campobasso	1,916%	0,041%	-1,957%
Vercelli	0,000%	2,239%	-2,239%	Lucca	0,832%	0,017%	-0,849%	Isernia	0,159%	20,238%	-20,397%
Novara	0,000%	0,472%	-0,472%	Pistoia	1,241%	0,032%	-1,273%	Caserta	-0,476%	0,476%	0,000%
Cuneo	-0,523%	0,000%	0,523%	Firenze	1,028%	0,004%	-1,032%	Benevento	-0,272%	-0,113%	0,385%
Asti	1,737%	-0,016%	-1,721%	Livorno	0,907%	-0,014%	-0,894%	Napoli	0,127%	0,663%	-0,790%
Alessandria	0,003%	0,000%	-0,003%	Pisa	1,791%	0,506%	-2,297%	Avellino	1,082%	-0,368%	-0,714%
Biella	0,000%	1,493%	-1,493%	Arezzo	1,812%	-0,937%	-0,875%	Salerno	1,028%	0,372%	-1,400%
Verbano-Cusio-Ossola	0,000%	-1,111%	1,111%	Siena	1,666%	-0,024%	-1,642%	Foggia	0,730%	1,401%	-2,131%
Aosta	1,637%	0,000%	-1,637%	Grosseto	2,111%	-0,188%	-1,923%	Bari	1,741%	1,107%	-2,848%
Imperia	0,895%	0,014%	-0,909%	Prato	0,594%	0,664%	-1,258%	Taranto	2,160%	0,481%	-2,641%
Savona	0,650%	0,000%	-0,650%	Perugia	-0,091%	0,858%	-0,768%	Brindisi	1,064%	1,514%	-2,579%
Genova	0,012%	0,029%	-0,041%	Terni	0,602%	-1,003%	0,401%	Lecce	0,433%	0,333%	-0,766%
La Spezia	0,022%	0,000%	-0,022%	Pesaro e Urbino	0,875%	0,946%	-1,821%	Barletta-Andria-Trani			
Varese	0,317%	1,278%	-1,595%	Ancona	2,370%	0,030%	-2,399%	Potenza	2,928%	-0,135%	-2,793%
Como	0,430%	0,876%	-1,306%	Macerata	0,253%	0,025%	-0,278%	Matera	1,759%	0,499%	-2,257%
Sondrio	0,076%	4,330%	-4,405%	Ascoli Piceno	3,204%	0,091%	-3,295%	Cosenza	1,324%	0,116%	-1,440%
Milano	-1,216%	0,176%	1,040%	Fermo				Catanzaro	0,476%	0,916%	-1,392%
Bergamo	1,084%	0,449%	-1,533%	Viterbo	2,508%	-3,950%	1,442%	Reggio di Calabria	0,292%	0,000%	-0,292%
Brescia	1,837%	0,417%	-2,254%	Rieti	0,336%	0,462%	-0,799%	Crotone	0,000%	0,000%	0,000%
Pavia	0,694%	0,711%	-1,405%	Roma	0,974%	2,464%	-3,438%	Vibo Valentia	1,465%	0,000%	-1,465%
Cremona	2,155%	0,290%	-2,445%	Latina	1,345%	0,045%	-1,391%	Trapani	0,194%	0,000%	-0,194%
Mantova	2,083%	2,703%	-4,785%	Frosinone	1,664%	0,536%	-2,200%	Palermo	1,709%	0,247%	-1,956%
Lecco	3,014%	0,328%	-3,342%	L'Aquila	1,299%	0,000%	-1,299%	Messina	0,476%	0,481%	-0,957%
Lodi	2,875%	0,735%	-3,611%	Teramo	1,211%	0,006%	-1,217%	Agrigento	0,566%	0,348%	-0,915%
Monza-Brianza				Pescara	0,391%	-0,030%	-0,361%	Caltanissetta	3,000%	0,000%	-3,000%
Bolzano	0,024%	-0,641%	0,617%	Chieti	1,105%	0,000%	-1,105%	Enna	0,624%	0,045%	-0,668%
Trento	-1,484%	2,749%	-1,264%					Catania	0,697%	3,243%	-3,940%
Verona	1,118%	0,988%	-2,105%					Ragusa	0,104%	0,937%	-1,041%
Vicenza	1,343%	0,311%	-1,654%					Siracusa	0,098%	0,232%	-0,330%
Belluno	0,565%	3,509%	-4,073%					Sassari	0,000%	0,000%	0,000%
Treviso	1,136%	1,341%	-2,478%					Nuoro	0,000%	0,000%	0,000%
Venezia	0,473%	1,594%	-2,067%					Cagliari	0,241%	0,000%	-0,241%
Padova	1,329%	0,135%	-1,464%					Oristano	-0,188%	0,000%	0,188%
Rovigo	1,784%	0,552%	-2,337%					Olbia-Tempio			
Udine	1,104%	-0,690%	-0,414%					Ogliastra			
Gorizia	0,331%	0,198%	-0,529%					Medio Campidano			
Trieste	2,368%	0,120%	-2,488%					Carbonia-Iglesias			
Pordenone	0,525%	0,471%	-0,996%								
Piacenza	-0,298%	0,860%	-0,562%								
Parma	1,238%	0,912%	-2,150%								
Reggio nell'Emilia	1,326%	0,863%	-2,189%								
Modena	0,099%	1,056%	-1,155%								
Bologna	0,855%	0,851%	-1,706%								
Ferrara	0,964%	0,040%	-1,003%								
Ravenna	0,127%	0,013%	-0,140%								
Forlì-Cesena	2,266%	0,567%	-2,833%								
Rimini	1,449%	0,651%	-2,100%								

Source: Author elaboration on available data

After this preliminary analysis on the change of the percentage of branches per province, the correlation analysis has been conducted, considering on one side the variables “employment var%1008” and “income var%1008” which represent respectively the percentage of variation between 2008 and 2010 for employment and income and, on the other side, the variables “var 1008 bcc quota”, “var 1008 pop quota”, “var 1008 bccpop quota”, “var 1008 spa quota” which represent the variation of the share, per province, of

each type of bank with respect to the total number of branches between 2008 and 2010, the variables “var%1008spa”, “var%1008pop” and “var%1008bcc” which are the difference, in percentage, of the number of branches for each type for each province, the variables “%bcc2008”, “%bcc2010”, “%pop2008”, “%pop2010”, “%spa2008”, “%spa2010” which represent the percentage of each type of bank, in 2008 and 2010, with respect to their total number. I also verified the correlation of the variables “diff%1008bcc”, “diff%1008pop” and “diff%1008spa” which represent the difference between 2008 and 2010 respectively of the variables “%bcc2008” and “%bcc2010”, “%pop2008” and “%pop2010”, “%spa2008” and “%spa2010”.

The results obtained, as can be seen in table 5, show significant correlations between the calculated employment variable and some of the others. In particular, results signed with asterisks show some level of significance; hence, two asterisks mean a level of significance of 5%, while three asterisks a level of significance of 1%.

Differently from the correlation on regional level, for provincial one, both variables (variation of employment and income between 2008 and 2010) show some levels of significance. The variables that represent the change in the share of branches per province with respect to the total number of branches of the same type of bank, are significant both for SPAs and BCCs and POPs; it means that, during the last “Great Recession”, labor market and banking system moved in the same direction, and the correlation between the two variables is also showed by the others significant variables such as “var %1008 spa”, “var %1008 bcc”. As for regional analysis, the variables “var %1008 spa” and “var %1008 bcc” are both significant, even if it is important to consider that the variable for SPAs suffered from negative variation while for BCCs had a positive one.

Table 5: Correlation test using variation in the percentage of employment and income

CORRELATION	employment var%1008	income var%1008
var 1008 bcc quota	0.8731***	-0.3706***
var 1008 pop quota	0.8585***	-0.3802***
var 1008 bccpop quota	0.8937***	-0.3885***
var 1008 quota spa	0.947***	-0.2678**
var %1008 spa	0.3146***	-0.1366
var %1008 pop	0.1277	-0.0158
var %1008 bcc	0.3315***	-0.2241**
%bcc2008	0.0917	0.1059
%bcc2010	0.0627	0.0707
%pop2008	-0.0818	0.0528
%pop2010	-0.0069	0.0370
%spa2008	-0.0096	-0.1180
%spa2010	-0.0408	-0.0786
diff%1008bcc	0.1474	-0.1000
diff%1008pop	0.0199	-0.0017
diff%1008spa	-0.0802	0.0428

Source: Author elaboration on available data

The results of the test, taking the income into account, show an inverse correlation with the variation of the share of branches both for SPAs and BCCs and POPs, so it does not allow to find decisive arguments in favor of one or others on incidence of their presence on provinces resilience.

The obtained results could be the signal of the support that an economy can receive from BCCs in a period of crisis; during the period in which SPAs suffered the increasing difficulties that comes from other financial markets, BCCs did not stopped operating in their core businesses activities which were directed to give support to SMEs and consumers. Although it is undeniable that the effects of the crisis hit all the financial institutions in Italy and abroad, it is important to admit the relevance of the role of BCCs and POPs even considering that their presence make it relevant the existent differences to resist among different Italian provinces and regions.

3.4 THE LOGIT MODEL SPECIFICATION

The results obtained from the previous analysis on provincial level both for employment and income (table 5), and their importance in order to affirm the relevance of BCCs and POPs in improving the ability to resist to external negative shocks, can be also checked using a logit model.

Employing the same dataset used for provincial analysis, in order to obtain a binary variable of both dependent variables “employment var%1008” and “income var%1008”, their mean values has been calculated and giving value “1” to provinces which show a value higher than the mean and “0” to the others. In the following regression model, variables which showed the highest level of significance in the previous correlation analysis will be used as control variables. Hence, the following test is focused on variables “var 1008 bcc quota”, “var 1008 pop quota”, “var 1008 spa quota” which represent the variation of the share, per province, of each type of bank with respect to the total number of branches between 2008 and 2010. In most case variables are predetermined and hence exogenous; furthermore, the use of cross-sectional data lets to compare the resistance of each type of bank in the moment in which they experimented the greatest difficulties due to the impact of the crisis and to capture the differences among types of banks.

The model (3) used for the analysis is the following:

$$(3) EMPL\ VAR/INC\ VAR_{i,t} = f\left(var1008bccquota_{i,t}; var1008popquota_{i,t};\ var1008spaquota_{i,t}\right)$$

The results obtained by using income as dependent variable are shown in table 6. The variables “var1008bccquota” and “var1008spaquota” show some level of significance, confirming their importance in influencing the trend of income during the “Great Recession”; the most important result of the analysis is given by the values of the coefficients of all considered variables, in fact they are positive both for BCCs and POPs while it is negative for SPAs. The number of correct expectations is equal to 0.62.

So, the probability of an increase of income (being more resilient) is positively influenced by the variation of BCCs and POPs, confirming the results already obtained in the previous analysis of the positive influence of such types of banks on resilience; at the same, it is also proved the negative effect on resilience deriving from the presence of SPAs.

Results obtained by using as dependent variable the variation of employment (table 7) confirm again the significance of the considered control variables, and their coefficients bear out the hypothesis of higher resilience for those provinces which have a higher presence of BCCs. The number of correct expectations is equal to 0.68.

Using employment as dependent variable, the result for POPs is not significant, and it shows a moot result if compared with the previous analysis. Anyway, the model shows again the negative effects of SPAs on resilience; the latter is the steady result which is present in all the conducted analysis and it is confirmed that an excessive presence limited to only these types of banks could represent an element able to influence negatively local resilience.

Table 6: Logit model using variation of income

	Coeff.	*Std.Er.*	*z*	*p-value*	*significance*
const	−1.08156	0.282951	−3.8224	0.0001	***
var1008bccquota	37.9391	18.7803	2.0202	0.0434	**
var1008popquota	8.45673	16.2902	0.5191	0.6037	
var1008spaquota	−7.92585	3.01835	−2.6259	0.0086	***

Mean var dep	0.3636		SQM var. dep	0.4832
McFadden R2	0.0731		R2 corr	0.0177
Log-likelihood	−66.82984		AIC	141.6597
SC	152.4616		Hannan-Quinn	146.0410
# of obs	110			

Source: Author elaboration

Table 7: Logit model using variation of employment

	Coeff.	*Std.Er.*	*z*	*p-value*	*significance*
const	−1.07186	0.2876	−3.7269	0.0002	***
var1008bccquota	36.3422	21.1942	1.7147	0.0864	*
var1008popquota	−23.6726	15.3153	−1.5457	0.1222	
var1008spaquota	−10.2811	4.2282	−2.4315	0.0150	**

Mean var dep	0.3364		SQM var. dep	0.4746
McFadden R2	0.0956		R2 corr	0.0387
Log-likelihood	−63.52960		AIC	135.0592
SC	145.8611		Hannan-Quinn	139.4405
# of obs	110			

Source: Author elaboration

Both previous models have been used again, omitting the variable "var1008popquota" which does not show any level of significance. Results confirm the previous ones and the importance of the presence of BCCs as shown in table 6a and 7a.

Table 6a: Logit model using variation of income omitting "pop"

	Coeff.	*Std.Er.*	*z*	*p-value*	*significance*
const	−1.7735	0.28045	−3.8416	0.00010	***
var1008bccquota	43.33840	15.83700	27.36500	0.00620	***
var1008spaquota	−7.26157	2.62943	−2.7616	0.00580	***

Mean var dep	0.36364		SQM var. dep	0.48325
Mcfadden R2	0.07120		R2 corr	0.02959
Log-likelihood	−66.6955		AIC	139.93910
SC	148.04050		Hannan-Quinn	143.22510
# of obs	110			

Source: Author elaboration

Table 7a: Logit model using variation of employment omitting “pop”

	Coeff.	*Std.Er.*	*z*	*p-value*	*significance*
const	−1.0121	0.28032	−3.6105	0.00030	***
var1008bccquota	18.83820	17.74910	1.06140	0.28850	
var1008spaquota	−8.56721	3.52614	−2.4296	0.01510	**

Mean var dep	0.33636		SQM var. dep	0.47463
Mcfadden R2	0.07750		R2 corr	0.03479
Log-likelihood	−64.0156		AIC	135.60310
SC	143.70460		Hannan-Quinn	138.88910
# of obs	110			

Source: Author elaboration

Furthermore, the analysis can be extended by including in the model (3) some different control variables in order to capture the role of relevant economics determinants such us human capital and workers specialization; the detected variables are “gradquota” and “manufquota” which respectively represent the percentage of graduated people in Italy per province and percentage of people employed in manufacturing sector. The analysis has been conducted using as dependent variable both income and employment respectively in table 8 and 9; using income as dependent variable, results show a certain level of significance for the variables “var1008bccquota” and “var1008spaquota”, with no significance for both the variables added in this computation and moreover confirm the positive influence of bcc on resilience on one side and the negative one of spa on the other. The use of variation of employment as dependent variable shows the same result with regards to the influence of bcc and spa on resilience and at the same time the variable “gradquota” shows some level of significance; the increase of the percentage of graduated people has a positive influence on resilience as the presence of bcc, and it can be linked to the improvement of the abilities of people in doing investment choices and generally speaking to the increased knowledges that influence transversely the whole economy.

Table 8: Further determinants: extension of logit model on income

	Coeff.	*Std.Er.*	*z*	*p-value*	*significance*
const	−1.77788	1.08431	−1.6396	0.10110	
var1008bccquota	44.82400	22.65630	1.97840	0.04790	**
var1008popquota	9.94150	18.16670	0.54720	0.58420	
var1008spaquota	−6.4275	3.67665	−1,.251	0.08450	*
manufquota	0.45019	2.70096	0.16670	0.86760	
gradquota	6.95297	8.32461	0.83520	0.40360	

Mean var dep	0.37383		SQM var. dep	0.48610
Mcfadden R2	0.09034		R2 corr	0.00550
Log-likelihood	−64.33405		AIC	140.66810
SC	156.70510		Hannan-Quinn	147.16930
# of obs	107			

Source: Author elaboration

Table 9: Further determinants: extension of logit model on employment

	Coeff.	*Std.Er.*	*z*	*p-value*	*significance*
const	−3.37078	1.21955	−2.7640	0.00570	***
var1008bccquota	17.84570	23.67500	0.75380	0.45100	
var1008popquota	−29.1431	16.74500	−1.7404	0.08180	*
var1008spaquota	−7.01622	4.55429	−1.5406	0.12340	
manufquota	0.96889	2.76410	0.35050	0.72590	
gradquota	26.32870	9.82887	2.67870	0.00740	***

Mean var dep	0.34579		SQM var. dep	0.47787
Mcfadden R2	0.14375		R2 corr	0.05678
Log-likelihood	−59.07653		AIC	130.15310
SC	146.19000		Hannan-Quinn	136.65420
# of obs	107			

Source: Author elaboration

3.5 CREDIT QUALITY INDEX

The greatest problem which emerged during the "Great Recession" was linked to the lower quality of credits. Proceeding with credits securitization, lots of the newest instruments adopted by financial markets brought to an increasing of credits risk with a consequent reduction of their quality.

Using the index by Mazzù as measure of banks credit risk (Mazzù et al, 2002), this section analyses the quality of banks credits distinguishing among different type of banks and verifying which banks used riskier financial instruments and suffered more the incoming crisis.

The index used by Mazzù (Mazzù et al, 2002) is the following:

$$Q_{is} = \frac{\sum_{i=a_1}^{a_n} \frac{\Delta IS_i}{I_i}}{a_n - a_1 + 1} * 100$$

where:

$a_1 = initial\ year$

$a_n = final\ year$

$S_i = non - performing\ loans\ in\ the\ year\ i$

$I_i = loans\ in\ the\ year\ i$

$\Delta IS_i = (I_i - S_i)$

This index could be considered as a measure of resilience to evaluate the presence of significant differences among different kinds of banks in Italy and that of differences among Italian regions, identifying if some regions are more affected by credit risks than others.

The results of the analysis show that before the "Great Recession" SPAs have on average a little higher value of credit's quality index of 99.22 than BCCs and POPs which have respectively values of credit's quality indices of 98.97 and 98.93. Hence, in the period immediately before the starting of the crisis, the credit risk of SPAs seems to be lower than other banks, but in order

to verify their resilience, it is important to consider the variation of the index between 2006 and 2010. In this case, the variation of the average value of the index shows a reduction of -1.49 for SPAs, -0.48 for BCCs and -0.67 for POPs.

From the results obtained above, in the considered period, POPs and in particular BCCs, show to be more resilient than SPAs, and the reason of such results must be found in the different kind of investments, in particular securitization, realized by them in those periods. Generally speaking, a greater presence of internationalization for SPAs meant a higher risk of "infection" that comes from other markets (Delios et al, 1999, Dess et al, 1995, Geringer et al, 2000, Hitt et al, 2006); so, the credit's quality of SPAs become increasingly lower in particular for those banks which have shares in those, American and European, banks that suffered more the crisis of 2007.

In order to conduct an analysis on the variation of credit's quality per region, the variation of the index for each region and type of bank have been calculated and they are reported in table 8. Considering average values, regions which suffered the higher reduction on credit quality were Lazio and Umbria, while the lower reduction was suffered by Puglia and Liguria. As found by Cellini, Di Caro and Torrisi (2014), Umbria shows the worst performance in terms of resilience, and even in this analysis, it is possible to denote an important loss in terms of credit quality as it is possible to see in table 10.

Proceeding with a correlation analysis between the quality index and the variables used by Cellini, Di Caro and Torrisi (2014), the correlation index between the mean value and the variation of both income and employment has been calculated, finding a lower significant inverse correlation with the variation of employment. Although the result of the correlation does not give a decisive result, it seems interesting to underline its being "inverse" which gives, even in this case, a positive sign towards the acknowledgement of the primary role of BCCs and POPs on Italian economy.

Although not significant, this latter analysis, with the employ of the credit quality index, is really useful in order to highlight how the quality of credit was better for bcc and pop with respect to spa.

Table 10: Change of credit quality per region

Region	mean values spa	mean values bccpop	general mean values
PIE	-0.4785	-0.3705	-0.4380
VDA		-0.2929	-0.2929
LOM	-0.7805	-0.7163	-0.7805
TAA	-0.4004	-0.3830	-0.4004
VEN	-0.8485	-0.8752	-0.8485
FVG	-0.8715	-0.6565	-0.8715
LIG	-0.2388		-0.2388
EMR	-0.7694	-0.7451	-0.7277
TOS	-0.7317	-0.7908	-0.7317
UMB	-1.1756	-1.0886	-1.1176
MAR	-0.9397	-0.9058	-0.9157
LAZ	-2.8526	-3.6636	-2.7942
ABR	-0.6471	-0.6854	-0.6750
MOL		-0.2750	-0.2750
CAM	-0.4069	-0.7213	-0.6592
PUG	-0.7080	0.7022	0.6653
BAS		-0.8376	-0.8376
CAL	-0.4445	-0.8563	-0.8014
SIC	-0.5099	-0.2338	-0.5099
SAR	-0.9388	-0.3279	-0.7861

Source: Author elaboration on available data

3.6 POLICY IMPLICATION AND BIODIVERSITY

The concept of biodiversity used by biological sciences means the presence of different species on a territory and describes the equilibrium they create on that territory with their mutual influences.

In economics and specifically in banking sector, the term can be used as a way to evaluate if the presence of different "species" of banks can influence somehow economic behaviors of regions. The recent Italian "*Decreto Popolari*" which treats about transforming all banks with relevant level of activities,

indistinctly, into SPAs, creates a debate on the necessity of the maintenance of a certain level of “diversity” on banking sector in order to preserve the different nature of different types of banks.

As recalled by Becchetti (2015), the different nature of BCCs and POPs with respect to SPAs makes them able to offer services to a different market segment interested only in traditional services and not in the use of modern financial instruments. Furthermore, the presence of BCCs and POPs is still relevant in several nations and sometimes represents the majority of banks branches. So, the designed way to be followed in Italy seems to be unique in the panorama of the major world economies.

In order to obtain an index able to describe regions biodiversity in terms of presence of banks different from SPAs, starting from the absolute number of banks branches for each region, it is useful to use the share of the market covered by banks other than SPAs. This index is a control variable to evaluate if the presence of different types of banks can influence regions’ resilience using both the previous indices of employment and income variance. The correlation analysis conducted on these variables shows a positive sign although not significant, confirming the positive influence of BCCs and POPs on resilience.

Running logit models using the same variables and with “1” regions more resilient than the mean and “0” regions less resilient then the mean, the variables show the same results as obtained with the correlation analysis (see table 11 and 12); so, although the variable “nonspaquota” (share of the market covered by banks other than SPAs) is not significant, both for income and employment it shows a positive coefficient meaning a positive influence on regions’ resilience.

Table 11: Biodiversity: the use of variation of income

	Coeff.	*Std.Er.*	*z*	*p-value*
const	0.0706	0.8566	0.0825	0.9343
nonspaquota	1.7053	3.7634	0.4531	0.6505

Mean var dep	0.6000		SQM var. dep	0.5026
McFadden R2	0.0081		R2 corr	-0.1404
Log-likelihood	−13.3505		AIC	30.7011
SC	32.6926		Hannan-Quinn	31.0899
# of obs	20			

Source: Author elaboration

Table 12: Biodiversity: the use of variation of employment

	Coeff.	*Std.Er.*	*z*	*p-value*
const	0.3789	0.8703	0.4354	0.6633
nonspaquota	1.2217	3.7976	0.3217	0.7477

Mean var dep	0.6500		SQM var. dep	0.4894
McFadden R2	0.0042		R2 corr	-0.1503
Log-likelihood	−12.89465		AIC	29.7893
SC	31.7808		Hannan-Quinn	30.1781
# of obs	20			

Source: Author elaboration

3.7 CONCLUSIONS

This chapter, starting from the existing literature on the resilience of Italian regions, has tried to analyse the role of the banking system in determining such ability to resist to adversities.

The analysis conducted in order to evaluate the resilience of banks in Italy shows, both for regional and provincial data, an evidence on advantages of

both BCCs and POPs with respect to SPAs. Results confirmed the presence of correlation between the trend of employment and changes in numbers of branches and percentage of banks across Italian territory and make it possible to underline the importance of the role of BCCs and POPs in bearing SMEs activities. Furthermore, results of higher resilience for provinces in which a relevant share of BCCs and POPs is present are confirmed by the logit model specification, which demonstrates once again the importance of their presence on territories and their opposite effects with respect to SPAs.

The latter analysis about the quality index, which takes into account an evaluation of the credit risk by using the amount of non-performing loans, gives a measure of the increasing difficulties that hit Italian economy. As confirmed by the results, SPAs suffered the effects of the crisis more than BCCs and POPs, and the reasons of such higher resilience lays on the different primary characteristics of the two types of banks and on the different choices they pursued before and after the impact of the crisis.

The notion of resilience, analysed upon territories, is a mean trough which it is possible to shed light on the existent competitiveness inequalities among different regions. The preexistent inequalities surely contributed in determining the level of resilience of regions, but the effects of the crisis on banks that come from abroad made them more vulnerable and incapable to help local economy. Hence, considering that SPAs are the most internationalized banks, crisis made them suffering more negative effects.

The conducted analyses follow the line and confirm the results which sustain the importance of the maintenance of a certain level of biodiversity of banking system in order to satisfy different needs; furthermore, they confirm the negative effects that could derive from an indistinct transformation of all BCCs and POPs with a certain level of activities into SPAs, as expected from “Decreto Popolari” in Italy.

REFERENCES

Aiello F. and Bonanno G. (2016), Looking at the determinants of efficiency in banking: evidence from Italian mutual-cooperatives, *International Review of Applied Economics.*

Aiello F. and Bonanno G. (2016), Bank efficiency and local market conditions. Evidence from Italy, *Journal of Economics and Business 83, pp. 70-90.*

Anard K., Gai P., Kapadia S., Brennan S. and Willison M. (2013), A network model of financial system resilience, *Journal of Economic Behavior & Organization, Elsevier, vol. 85, pp. 219-235.*

Bavarelli M., Feliciotto P. and Mazzù S. (2002), Banche e rischio di credito in Sicilia, Milano: *Egea.*

Becchetti L. (2015), Elogio della diversità bancaria (ed errori del decreto popolari), *La Repubblica.*

Blanchard O. and Katz L. (1992), Regional evolutions, *Brookings Papers on Economic Activity, pp. 1-75.*

Blundel R., Baldock R., Dadd D., Schaefer A. and Williams S. (2014), Resilience and recovery: SME experiences of extreme weather events and other external threats, *Institute of Small Business and Entrepreneurship, Manchester.*

Bongini P. and Ferri P. (2007), Governance, Diversification and Performance: The case of Italy's Banche Popolari, *paper presented at "Corporate Governance in Financial Institutions" SUERF and Central Bank of Cyprus, Nicosia.*

Borio C., Cohen B., Domanski D., Shin H.S. and Turner P. (2016), International banking and financial market developments, *Bank for International Settlements.*

Carri (2013), Definitions of Community Resilience: An analysis, *Report for Community & Regional Resilience Institute*.

Cecchetti S., Mark N. and Sonora R. (2002), Price index convergence among United States cities, *International Economic Review 43, pp. 1081-99.*

Cellini R., Di Caro P. and Torrisi G. (2014), Regional resilience in Italy: do employment and income tell the same story?, *Handbook of regions and Competitiveness, UK.*

Cellini R. and Torrisi G. (2014), Regional Resilience in Italy: A very long-run analysis, *Regional Studies*.

Conroy M. (1975), Regional Economic Diversification, *Praeger New York.*

Dabson B., Helfin C. and Miller K. (2012), Regional Resilience, *Rupri Rural Futures Lab Research and Policy Brief*.

Delios A., Beamish P.W. (1999), Geographic scope, product diversification and the corporate performance of Japanese firms, *Strategic Management Journal, pp.711-727.*

Dess G.D., Gupta A., Hennart J., Hill C. (1995), Conducting and integrating strategy research at the international, corporate and business level: issue and directions, *Journal of management 21, pp. 357-393.*

Di Caro P. (2015a), Recessions, recoveries and regional resilience: Evidence on Italy, *Cambridge Journal of Regions, Economy and Society, 8 (2), 273-91.*

Di Caro P. (2015b), Testing and explaining economic resilience with an application to Italian regions, *Papers in Regional Science*, *forthcoming, doi:10.1111/pirs.12168.*

Di Caro P. (2014), An exploratory analysis on the determinants of regional resilience in Italy, *https://www.aisre.it.*

Evans R. and Karecha J. (2014), Staying on top: Why is Munich so resilient and successful?, *European Planning Studies, Taylor & Francis.*

Ferri G. (2008), Why cooperative banks are particularly important at a time of credit crunch, *Mimeographed, University of Bari.*

Ferri G., Masciandaro D. and Messori M. (2000), Governo societario ed efficienza delle banche locali di fronte all'unificazione dei mercati finanziari, *in P. Alessandrini (a cura di), Il sistema finanziario italiano tra globalizzazione e localismo, Bologna: il Mulino*.

Fingleton B., Garretsen H. and Martin R. (2011), Recessionary shocks and regional employment: evidence on the resilience of UK regions; *Journal of Regional Science.*

Garraffo F., Giaccone S. and Longo M.C. (2012), Performance delle imprese internazionalizzate e crisi dei mercati: capacità di resistenza alla crisi o "resilienza strategica"?, *IX Convegno annuale SIM Società Italiana di Marketing.*

Geringer J.M., Tallman S., Olsen D.M. (2000), Product and international diversification among Japanese multinational firms, *Strategic Management Journal 21, pp.51-80.*

Gilly J., Kechidi M. and Talbot D. (2013), Resilience of organisations and territories: The role of pivot firms, *European Management Journal*.

Hallegatte S. (2014), Economic resilience – definition and measurement, *Policy research working paper 6852, The World Bank Climate Change Group.*

Henriet F., Hallegatte S. and Tabourier L. (2011), Firm-network characteristics and economic robustness to natural disasters, *Journal of Economic Dynamics and Control 36.*

Hitt M., Bierman L., Uhlenbruck K. and Shimizu K. (2006), The importance of resources in the internationalization of professional service firms: the good, the bad and the ugly, *Academy of Management Journal 49, pp. 1137-1157.*

Kamen C. and Behrer C. (2012), Navigating uncertainty and growing jobs: Considering small employers firm resilience during challenging economic times, *Federal Reserve Bank of San Francisco.*

Kick T. and Prieto E. (2015), Bank Risk and Competition: Evidence from Regional Banking Markets, *Review of Finance 19: pp. 1185-1222*.

Lagravinese R. (2014), Crisi economica e resilienza regionale, *EyesReg, pp. 48-55.*

Lagravinese R. (2014), Economic crisis and rising gaps North-South: evidence from the Italian regions, *Cambridge journal of Regions, Economy and Society, pp. 331-342.*

Lu J.W. and Beamish P.W. (2001), The internalization and performance of SMEs, *Strategic Management Journal 22, pp. 565-586.*

Luzzati L. (1863), La diffusione del credito e le banche popolari, *Libreria Sacchetto, Padova*.

Marczyk J. (2013), Resilience, stability and complexity of banks: a quantitative approach to systemic risks, *Bancaria no. 9/2013.*

Martin R. (2012), Regional economic resilience, hysteresis and recessionary shocks, *Journal of Economic Geography 12, pp. 1-32.*

Martin R. and Sunley P. (2014), On the notion of regional economic resilience: conceptualization and explanation, *Journal of Economic Geography, pp. 1-42.*

Romer R. (2001), Advanced Macroeconomics, *McGraw Hill: New York.*

Singh D.A., Gaur A.S., Schmid F.P. (2010), Corporate diversification, TMT experience and performance. Evidence from German SMEs, *Management International Review 50, pp. 35-36.*

Vallascas F. and Keasy K. (2012), Bank resilience to systemic shocks and the stability of banking system: Small in beautiful, *Journal of International Money and Finance 31, pp. 1745-1776.*

CONCLUSIONS

The present research evaluates the role of the banking system in ability of Italian regions to resist to external adverse shocks; the analysis started from the available literature on the concept of resilience and its previous employment on subjects other than economics. The idea behind the analysis considered the importance of a well working banking system able to support enterprises and families in periods of crisis.

The starting point of the analysis has been represented by the studies on regional resilience in Italy and by the recent doubts on the maintenance of different types of banks with a focus on the importance of the role of BCCs and POPs in the Italian contest. Using an OLS estimation, results demonstrate the relevant role that these banks have in Italy and also that their resilience is influenced by the percentage of managers whose role can be crucial even more in period of crisis as happened during the “Great Recession”. Furthermore, this paper proposes an innovative approach to analyse how the presence of banks can influence regions’ resilience and if banks’ typology can be an important variable for local economies’ stability.

Both correlation test and logit specification show that regions and provinces with higher presence of BCCs and POPs turn out to be the less vulnerable regions and provinces to external shocks, probably for their own structure which let them to focus their attention on customers and local economy, as confirmed by the credit quality index.

Surely, pre-existent inequalities among regions can influence their ability to resist to shocks, but it is also undeniable that banks have a relevant role in order to provide the necessary help to overcome difficult periods. Although someone believes that larger banks have to give up their BCCs or POPs nature for SPAs, the best solution seems to be the maintenance of a certain degree of “biodiversity”, letting BCCs and POPs to maintain their traditional activities and privileged relationships with local economy’s actors.