Medium-term effects of enforcement actions: Evidence from the Italian banking system

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Abstract
The recent financial crisis has increased the attention of scholars and policy makers on the effectiveness of supervision to ensure the safe and sound management of banks. This paper investigates the impact of supervisory enforcement actions on banks' behavior. We consider the effect of administrative sanctions issued by the Bank of Italy on bank risk, capital, profitability and cost efficiency. Employing a unique panel data covering the period 2005-2012, we run a fixed-effect model, showing that banks receiving sanctions (i.e., the treatment group) are riskier, less profitable and less capitalised than their competitors (i.e., the control group), with no significant differences in the level of capitalisation. Furthermore, the study finds that administrative sanctions are negatively related to both the one-year and the two-year survival rates in our sample. These results suggest that sanctions are not effective in improving the risk profile and the performance of the involved banks, possibly because they are imposed in case of serious irregularities, after that the authority has unsuccessfully tried other enforcement instruments.

Keywords: Banking; Supervision; Performance
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1. Introduction

If anybody still had reservations about the need for putting into place robust supervisory mechanisms for the financial services, the recent crisis should have put those doubts to rest by now. Indeed, there is increasing momentum behind the idea that the rules and supervisory procedures were (and still are) not severe and thorough enough. Hence, the increasing call for *re-regulation*.

However, the debate is open: in fact, to simply call for "increased regulation" seems to ignore the fact that, in recent years, the amount of rules has increased rather than decreased. Meanwhile, the supervisory bodies have also increased in both number and size, and likewise the weight of compliance by banks and financial services providers. Accordingly, a hypertrophic oversight apparatus and the proliferation of regulations seem to get worse the problem, hurting the patient instead of curing him.

Based on this line of reasoning, we should examine the effects of regulation and supervisory activities, to determine under which terms they are successful, redundant or unsuccessful. It is not a matter of expressing a judgement of value, but of understanding the consequences of specific regulatory behaviours.

We have therefore measured the effectiveness of the sanctions applied by the authorities, as a result of inspections of the financial services providers. Of course, sanctions have an essentially "punitive" function. Indeed, their purpose is primarily that of obliging the management to change their policies in order to adapt them more closely to the rules and guidelines laid down by the regulatory authorities. Therefore, we need to verify whether sanctions actually produce these effects, or whether they bring on others that are not in keeping with the original intentions. At the same time, we need to further investigate how the sanctions interact with the other policy measures and their timeline of implementation.

Based on the consideration that sanctions can hardly be appreciated by the parties to which they are applied, finally, we need to understand whether they can be made to become part of a process of interaction between supervisors and supervisees. In other words, the paper aims to assess whether

sanctions are effective in promoting management changes and improve the performance of financial intermediaries.

The remainder of the work is organized as follows: Section 2 presents a literature review, followed by some reflections on the supervisory function, with particular reference to Italy, in Section 3. Section 4 describes the database and the methodology adopted for the empirical analysis, while Section 5 discusses main results. The final section is devoted to conclusions and policy implications.

2. Literature review

The literature features a great deal of contributions focusing on the motivations at the core of financial oversight. Most of the analyses carried out concern Anglo-Saxon countries, although several recent applications also deal with the Emerging countries. The most frequent investigations focus on the effectiveness of the instruments employed in relation to prudential and protective supervision, such as, for example, capital and liquidity requirements, early warning and deposit insurance systems (Berger *et al.* 2011; Barrell *et al.* 2010; Bhattacharya *et al.* 1998). In particular, there are various applications that emphasise the role of the minimum capital standards in preventing bank failures (Hovakimian and Kane 2000). There is also a large number of analyses that highlight the difficulties encountered by the competent authorities in adequately measuring the minimum requirements. Indeed, excessive restrictions can produce perverse effects, requiring expensive capital facilities and fuelling the intermediaries' appetite for risk (Jalilian *et al.* 2007). Several studies even question the minimum requirements' capability of reducing the riskiness of credit institutions (Blum 1999).

There are also many articles that focus on estimating the expenses entailed by financial supervision; many of which provide international comparisons of compliance costs, generally made up of direct (external and internal) and indirect costs (Franks *et al.* 1998; Goodhart *et al.* 1998). The purpose of these studies is often that of identifying any causes of "unnecessary" costs.

External direct costs are incurred in connection with the operation of the supervisory authorities, such as, for example, personnel costs and the costs directly incurred by the financial regulation departments. Instead, internal direct costs are those incurred by the single intermediaries, in order to comply with regulatory provisions and requirements, such as, for example, periodically reporting to the supervisory authorities, distributing mandatory reports to their customers, maintaining a complaints office, making available a regulatory capital.

External direct costs are calculated based on the data set out in the supervisees' financial statements; internal direct costs, instead, are generally measured based on the surveys and case studies produced by the trade associations, consulting firms and business schools (Europe Economics 2003; Filotto and Caratelli 2012). The main drawback of these surveys is that they tend to overestimate the costs of compliance. Less frequently, internal direct costs are determined based on multivariate statistical analyses applied to the financial statements (Elliehausen 1998). The estimates are often based on a comparison of the costs incurred by the intermediaries in regulated jurisdictions and business areas, rather than left to the free market. Alternatively, the effects of any radical changes to the regulations are measured (Joskow and Rose 1989).

The last group of compliance expenses includes indirect costs, i.e. costs incurred in connection with the negative impacts on the financial market, such as the costs associated with competition impairment, the introduction of uniform rules of behaviour for companies, the moral hazard related, for example, to deposit insurance, increased credit costs, rationing. Indirect costs are generally estimated on the basis of applied multivariate statistical analyses, such as the measurement of the financial vulnerability of enterprises and households (Guiso *et al.* 2007).

The analysis of the benefits (and of any costs) descending from the various implementable control models is a common feature of many of the more recent empirical articles on the topic of supervision. Despite the contrasting evidence (cf. Masciandaro 2012; Carretta *et al.* 2011), the purpose of these analyses is to guide the regulators and authorities in adopting more effective arrangements and instruments. Below is an overview of the main surveys carried out, in chronological order. The major focus on these analyses is justified by the intention of including this paper in the related stream of research.

In 2002, Barth *et. al.* based their analysis of various supervisory models on the data collected in 107 countries, as part of a survey promoted by the World Bank in 1999. The results highlight significant amounts of non-performing loans when the central bank is responsible for exercising supervisory powers over the intermediaries. Instead, the presence of several supervisors is accompanied by lower capital ratios and a greater exposure to the liquidity risk. In 2004, Barth *et. al.* employed the same survey data to determine the effects of specific controls on the performance of the intermediaries. The evidence shows how measures aimed at fostering disclosure by the supervised entities can improve their management and stability, encouraging the monitoring of private undertakings. Also in 2004, Demirgüç-Kunt *et. al.* analysed the income statements of a sample of 1,400 banks operating in 72 countries between 1995 and 1999. The authors highlight the presence of higher intermediation costs, in connection with the greater restrictions imposed by the supervisors on the intermediaries' operations. In 2005, Fernández and Gonzáles examined the financial statements of 275 listed banks operating in 29 countries between 1995 and 1999. Their analyses confirmed the assumption according to which stricter supervisory controls tend to reduce the appetite for risk in those countries in which the accounting and auditing systems are less effective. At the same time the two authors acknowledged that restrictions to operations can help prevent financial crises. In 2006, Beck *et. al.* used the 1999 *World Business Environment Survey* to analyse a sample of 2,500 undertakings operating in 37 countries. The authors demonstrated how greater enforcement – almost exclusively based on massive action – leads to less transparent loan granting procedures. At the same time, the evidence collected supports the assumption according to which the inefficient allocation of credit can be prevented through supervisory actions aimed at fostering disclosure by the intermediaries. In 2009, Pasiouras *et. al.* investigated the cost and profit efficiency determinants of 615 listed commercial banks operating in 74 countries in 2000-2004. The results support the assumption according to which stricter market rules and stronger supervisory activities can effectively and positively affect performance. In 2010, Murè and Pesic focused on the 730 administrative sanctions applied by the Bank of Italy to bank intermediaries operating in Italy between 1998 and 2009. The results highlight the weak influence of these measures on performance. In 2011, Delis and Staikouras analysed the effects of inspections and sanctions, respectively carried out and applied in 1998-2008 by the supervisory authorities in 17 countries. The results feature an inverted "U" relationship between the inspections and the riskiness of the supervised intermediaries. On the contrary, the application of sanctions seems to exercise a linear and positive influence for safeguarding the stability of the system. Also in 2011, Brogi examined the 898 sanctions applied by the Bank of Italy to intermediaries operating in Italy between 1998 and 2009. The author confirmed the development of supervisory activities by the competent authorities in the observation period; despite this, she assumed the ineffectiveness of regulating the managers' behaviour, given the high re-offending rate. In 2012, Chortareas *et. al.* analysed a sample of commercial banks operating in 22 European countries between 2000 and 2008. The evidence collected suggests that more stringent capital requirements and greater powers by the supervisory authorities can help improve the operating efficiency of the intermediaries, especially in those countries with better-quality institutions. At the same time, the analysis assumes that the greater the activity of the supervisors the lower the efficiency of the supervisees. In 2013, Fernández *et. al.* examined 36 systemic crises in 30 different countries between 1980 and 2000. The authors prove that competition in the banking system is unable, on its own, to neutralise the negative effects of a crisis. It can support growth in a period of economic development; in order to be effective, in a period of crisis, it needs the support of more stringent capital requirements and the easing of the measures for protecting debtors. Also in 2013, Delis *et. al.* examined a dataset of 3,688 sanctions, applied to 2,658 different intermediaries, between 2000 and 2008, by three different authorities supervising the US banking system (the *Federal Deposit Insurance Corporation*, the *Office of the Comptroller of the Currency* and the *Federal Reserve Board*). The sanctions were grouped into four categories, based on the type of violation:

failure to adhere to sound and prudent management practices (regarding capital requirements, the conditions affecting the risk profile of assets, etc.); internal organisational shortcomings, including risk management; infringements regarding the adequacy and professionalism of the members of the board and of the managers. The fourth category is of a reductive nature compared to the others. Based on the outcome of their analysis, Delis *et. al.* conclude that the sanctions belonging to the first group tend to reduce the risk profile of assets, while increasing the risk of insolvency and the volatility of the ROA, also because they are applied too late. On the contrary, the second group of sanctions seem to be faster and more effective in safeguarding stability, without impairing the fundamentals. Finally, the other sanctions appear to be much less significant.

As shown above, the surveys relating to control models have cross-country features. Instead, two articles among those mentioned specifically regard the Italian market. The analyses are based primarily on regression models used to interpret the contribution by the authorities to the system's well-being. Only a few applications employ the outputs of the supervisory activities to measure the "quality" of the supervisors' activities, such as, for example, the number of inspections carried out and the sanctions applied. Instead, there is a prevalent use of judgements expressed by the interviewees regarding the characteristics of the controls. Among the major drawbacks affecting this type of analysis is the subjective nature of the opinion. This solution, however, is often the only viable one, given the scarcity of public data relating to the intermediaries concerned. As anticipated, the evidence is conflicting and there are very few surveys dealing with the capacity of the monitoring and enforcement activities to mitigate the negative effects of the financial crises, which would be particularly useful at this moment in time. However, several key features that seem to emerge are that the effectiveness of the supervisory mechanisms (i) also depends on the background economic and cultural circumstances, (ii) are affected by the split-up of powers among the different authorities, and (ii) are a function of the specific instruments adopted each time. Regarding the latter item, it would seem that the measures supporting disclosure by the intermediaries, and for encouraging competition and control by the private sector, are more effective.

This paper fits into the latter strand for estimating the benefits of the financial supervisory activities on the banks' operations. In particular, the focus is on the effectiveness of the sanctions, whose impact is examined on both the operating costs of the supervised intermediaries and on their profitability and risk measurements. Furthermore, the analysis focuses not just on the more short-term but also on the medium-term effects of the sanctions, consistently with data availability, examining any time lags between the date of application of the administrative sanctions and their effectiveness on the entity's processes. The latter aspect aims to verify the existence of any "learning effects" by the supervised intermediaries, which should not simply remedy their deficiencies by paying the sanction, but should also take the appropriate actions to alter and improve their business processes accordingly. In other words, the sanction should not be viewed simply as a punishment for improper behaviour, but should foster the introduction of virtuous practices, which should be the ultimate and, indeed, primary objective of the supervisory activities. The empirical analysis is conducted on the case of Italy. As outlined by Cosma and Gualandri (2012), the Italian case is particularly interesting for at least two reasons: first of all, the Bank of Italy supervisory approach has never been of the *soft touch* variety (recently accused to be one of the driver of the crisis, see IMF 2013); secondly, the crisis impact on Italian banks was not as severe as in other European countries in a first stage, but was more intense from 2010 onward.

3. The supervisory function of financial intermediaries

The regulation of the financial system can be included within the broader framework of public intervention in the economy, with a view to ensuring stability, the fair distribution of resources and their efficient use.

In all modern financial systems, oversight functions are delegated to independent authorities. Italy has adopted a hybrid model, which, although predominantly organised by purpose, also features important elements of supervision by entities. In particular, stability controls on banks are carried out by the Bank of Italy, while compliance with the rules governing transparency and correct behaviour fall under the

responsibility of both the Consob, the Italian Securities and Exchange Commission, and, once again, the Bank of Italy, with regard to the credit intermediation sector. Supervising competition, instead, is the reserve of the Antitrust Authority.

Clearly, therefore, the Bank of Italy plays a key role – within the overall Italian financial system – in supervising the banking system, through a large number of tools, such as the power to authorise both the establishment of the intermediaries and their most significant transactions (e.g., mergers, demergers and stock purchases). At the same time, the Bank of Italy may launch official proceedings to prevent any transactions that might conflict with sound and prudent management practices.

Alongside these authorisations, there is a complex system of prudential controls primarily aimed at determining whether the intermediaries have a sufficient amount of equity and an appropriate organisation to face the risks they undertake. The controls are based on audits of their financial reports and the examination of their organisation and management systems, and are conducted either at the Bank of Italy's headquarters or through inspections carried out at the intermediaries' premises, or by means of auditions of members of the intermediaries' management. The inspections end with an assessment report by the inspectors, which is also useful to analyse the strong and weak points of the banking system as a whole, and the objections relating to any irregularities found.

Furthermore, auditions of members of bank management boards are carried out. In scheduling its inspection and fact-finding activities, the Bank of Italy gave priority to banks in critical or worsening conditions. All considered, auditions are an important instrument of moral suasion adopted by the Authority, together with deficiency letters, also addressed to management board members.

Serious management irregularities and regulatory violations, resulting, for example, from governance shortcomings and the failure to comply with the applicable transparency and anti-money laundering regulations, entail the opening of crisis management proceedings, which can differ - in respect of both their structure and their functioning - according to the more or less irreversible nature of the crisis, and can lead to either the suspension or dissolution of the governance body, or, in the more serious cases, to the expulsion from the market of the intermediary, as the case may be.

The Bank of Italy also has the power to apply administrative monetary sanctions, in respect of any irregularities it comes across during its supervisory and inspection activities, and acting on any reports received from the other supervisors. The sanctions are generally applied to the individuals directly responsible for any irregularities, while the intermediaries are accountable *in solido* for the payment, with the obligation to secure repayment of the amount from the person(s) held liable. An adequate system of sanctions represents the necessary complement of the supervisory process, because it ensures the prevention and repression of any conduct contrary to the sound and prudent management principles, ensuring transparency and fairness to customers. All sanctions are advertised, in summary form, in the Bank of Italy's supervisory bulletin. In the more serious cases, the intermediary can be struck off the official register.

On 1 February 2013, the new supervisory provisions governing sanctions entered into force. These have been issued also taking into account the proposed EU directive of July 2011. The new rules aim to streamline the procedure for applying sanctions and to increase their effectiveness and dissuasive effect. Furthermore, they also serve the purpose of encouraging the proactive collaboration of and the adoption of corrective measures by the supervised entities.

Table 1 shows the trend of monetary administrative sanctions applied by the Bank of Italy between 2005 and 2012. Instead, figure 1 shows the grouping into classes of the various types of irregularities. Most of the sanctions concern irregularities in the organisation and internal control system and inadequate oversight by the boards of statutory auditors (48% of the total), followed by other shortcomings, in the credit process, for example (22%). Failed, imprecise or delayed notices account for 18% of the total

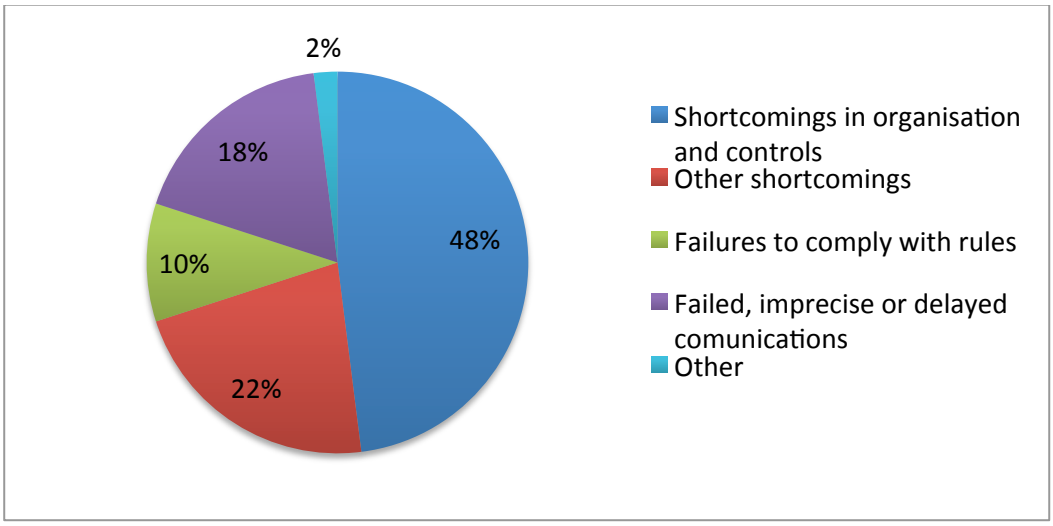
sanctions applied. The failure to comply with the applicable standards and regulatory provisions accounts for 10% of the irregularities, of which the violation of the transparency obligations account for less than one fifth of the group.

Table 1 – Sanctions imposed on banks by year

	Number of banks santionated	Amount of sanctions (in euros)
2005	47	2.723.293
2006	27	3.685.634
2007	56	10.558.080
2008	35	6.761.804
2009	38	7.010.213
2010	55	10.462.222
2011	70	12.182.134
2012	42	4.919.300
Total	**370**	**58.302.680**

Source: Authors' elaboration on Supervisory Bulletin, Bank of Italy

Figure 1 – Sanctions imposed on banks by type of irregularities (2005-2012)



Source: Authors' elaboration on Supervisory Bulletin, Bank of Italy

4. Analysis of the effects of sanctions on the behaviour of the intermediaries - methodology

The effect of sanctions applied by the Bank of Italy is assessed based on different outcome variables, all represented by financial ratios[1]. We have decided here to examine the unconsolidated, rather than the consolidated, financial statement, to avoid any duplication and overlapping effects. The period taken into account is between 2005 and 2012, for both financial statements[2] and data about sanctions, drawn by

1 Financial statements are taken from the ABI Banking Data database, for which the authors wish to thank the *Associazione Bancaria Italiana*.

2 The main IAS/IFRS international accounting standards have been applied to the financial reporting and statements of Italian banks since 2006. However, for a significant sample, ABI Banking Data also provides IAS-compliant financial data for 2005 as well. The financial statements taken into account here are, therefore, all perfectly comparable.

supervisory bulletins. Compared to the totality of sanctioned entities shown in Table 1, financial reporting data were available only for 343 and not all the intermediaries.
The variables examined in this paper may be defined as follows:

- ***Risk***. Two different risk variables are taken into account. The first is the ratio of risk-weighted assets to total assets (*RWA_ratio*). This ratio features several advantages. First of all, it is a global measurement incorporating all the risks considered relevant by the Basel agreements (credit, market and operational risk). Secondly, the riskiness of the assets is assessed based on the indications set out in the prudential supervisory regulations, therefore according to the parameters that, by definition, are shared by the Authority applying the sanctions. Lastly, the ratio also features a prospective relevance, albeit with some limitations, since it is not based on the *ex post* manifestations of the risks undertaken by the bank in the past. The second measurement taken into account is the ratio of non-performing loans to total loans (*NPL ratio*). The main advantage of this ratio is that it enables an effective comparison between different operators, because it is based on credit risk, which is a significant feature also of banks whose core activities include conventional intermediation transactions, albeit not in an exclusive manner (it should be remembered that the sample also includes numerous BCCs, i.e. cooperative credit banks). However, as highlighted by Delis and Staikouras (2011), the use of this ratio features several criticalities because it might reflect the consequences of risks undertaken in the past, rather than a variation of the riskiness of the bank's current or future transactions.
- ***Capitalisation***. Two different ratios can be observed here: the ratio of a banking firm's core equity capital to the total risk-weighted assets (*Tier 1 Capital ratio*) and the ratio of the bank's total regulatory capital to its risk-weighted assets (*TCR ratio*). Regarding the former, only the prime quality resources are taken into account, as those deemed most suited to hedging any unexpected losses, while the latter also includes the bank's supplementary regulatory capital.
- ***Profitability***. Two different measurements are taken into account in this case also: the ratio of net income to shareholders' equity (*ROE*) and the ratio of annual net income to average total assets (*ROA*). In both cases, the profit or loss of the bank before tax is taken into account, to avoid the comparison between different banks being affected by the effects of taxation.
- ***Efficiency***. Is based on the ratio of operating costs to operating revenues. This ratio (*Cost_inc*) is inversely proportional to the efficiency of the bank's management.

As suggested by Delis *et al.* (2013), a first simple test for assessing the effect of any sanctions may be based on a univariate analysis. In particular, we can examine only the subset of sanctioned intermediaries and assess the difference between the mean value of the variable of interest at time t+1 and its mean value at t-1 (with the sanction applied at time t). Delis *et al.* (2013) highlight how the same rationale can also be extended to the time t+2; for the purpose of better isolating the effect of the sanction at time t, the authors recommend to conduct the test on the sanctioned banks only in that year, removing the data of any banks to which sanctions have been repeatedly applied during the considered time interval (therefore also at t-1, t+1 or t+2). On average, this difference test features the twofold benefit of being simple to conduct and requiring a limited amount of data, but it does have a significant limitation because it focuses exclusively on the sanctions applied, without taking other factors into account, such as firm and environment-specific factors, which can direct its results. A further weakness lies in the fact that only the subset of sanctioned banks is taken into account, whereby the measurement of the effects of the sanctions does not take into account the comparison with the intermediary's non-sanctioned competitors. In order to

overcome this criticality, we must consider conducting a multivariate analysis similar to the one proposed in the paper by Delis *et al*. (2013). A panel type model is used with fixed effects for the bank:

$$y_{it} = \alpha + \beta_1 sanction_{i,t-1} + \beta_2 sanction_{i,t-2} + \sum_j \gamma_j bank_{ji,t-1} + \sum_k \lambda_k common_{k,t-1} + v_i + e_{it} \quad (1)$$

The model takes into account both sanctioned (*treatment group*) and non-sanctioned (*control group*) intermediaries. The dependent variable y_{it} is represented by the risk, capitalisation, profitability and efficiency measurements surveyed for the i-enth bank at the time t. The coefficients of major interest are β_1 and β_2, i.e. the effect of having been sanctioned at time t-1 or t-2. The second lag (t-2) is introduced because it is not easy to imagine beforehand the interval of time over which the sanction can display its effects[3]. These effects are estimated by controlling the impact of different factors, especially those relating to the environment. Regarding the former, the following variables are included:

- the size of the bank, measured as the natural logarithm of the total assets (*Tot_assets*);
- the degree of diversification, expressed as the ratio of interest margin and earnings margin (*Divers*);
- the ratio of loans to deposits (*Loans/Deposits*).

Furthermore, it should be highlighted how, in the different models, several of the values surveyed as dependent variables may, instead, be used as control factors. For example, in the profitability model, the operational efficiency expressed as cost-income is included among the regressors. The environmental factors are of the firm-invariant type, i.e. variables common to all the banks, which change over time because they are affected by the macroeconomic trends in the banking sector. In order to prevent the mistaken attribution to sanctions of changes linked to the trends under way for the entire industry, the following regressors have been introduced:

- the annual GDP growth rate (*Delta_GDP*)[4];
- the rate of inflation, meaning the annual increase of consumer prices (*Inflation*)[5];
- a variable representative of the banking industry trends. As suggested by Delis *et al.* (2013), the mean value of the dependent variable at the time t-1 is included ($averagey_{t-1}$). Since, in our survey, the sample consists of three types of rather different banks (stock banks, savings banks ,and cooperative credit banks[6]), we have preferred to calculate the mean value separately for each type of bank.

All the control variables are introduced in the regression at the time t-1. The fixed effects for each bank should ultimately reflect the impact of the specific characteristics of the surveyed companies constant over time, thus preventing the attribution to the sanctions of firm-specific factors not included in the model.

3 The limited number of banks whose financial statements are available over a long period of time makes the exploration of further lags (e.g t-3, t-4,…) hardly feasible.

4 Source: Eurostat.

5 Source: Eurostat.

6 The branches of foreign banks are not included.

During the examined period of time it is possible that the single banking firms carry out extraordinary financial transactions, such as mergers or demergers. In order to verify the soundness of the results obtained, each model has also been estimated with the addition of dummy variables capable of identifying the presence of any of these events at the time t-1 for the i-enth bank.
The number of annual observations used in each model, as also the number of total sanctions taken into account, can be considerably lower than the total available financial statements and the total irregularities surveyed for two main reasons: the removal of any anomalous figures (*outliers*) and the unavailability of financial statement data for the time interval taken into account each time.

5. Analysis of the results

Before moving on to the analysis of the results relating to the impact of the sanctions on the risk profile and performance of the banking firms, it is expedient to show several descriptive statistics relating to the entire sample. The average of the variables resulting for each examined year is shown in Table 2: the global riskiness trend (*RWA_ratio*) is down after the start of the crisis. The incidence of non-performing loans (*NPL_ratio*) instead is up. Capitalisation too is up, considering both the base capital (*TIER1_ratio*) and the entire regulatory capital (*TCR_ratio*), while the return on assets (*ROA*) and equity (*ROE*) is shrinking significantly. The ratio of operating costs to operating revenues (*Cost_inc*) features a downgrading of efficiency between 2005 and 2010, followed by an improvement in 2011 and 2012.

Table 2 – Summary statistics

	RWA_Ratio	NPL_ratio	TCR_ratio	TIER1_ratio	ROA	ROE	Cost_inc
2005	0.7216	0.0252	0.1267	0.1168	0.0122	0.1506	0.5704
2006	0.7484	0.0391	0.1639	0.1570	0.0116	0.1209	0.5842
2007	0.7429	0.0356	0.1681	0.1579	0.0125	0.1264	0.5658
2008	0.7176	0.0398	0.1700	0.1591	0.0083	0.0875	0.5950
2009	0.6755	0.0491	0.1730	0.1610	0.0056	0.0584	0.6741
2010	0.6689	0.0529	0.1789	0.1660	0.0043	0.0401	0.6937
2011	0.6486	0.0585	0.1800	0.1672	0.0035	0.0382	0.6711
2012	0.6086	0.0680	0.1810	0.1698	0.0031	0.0382	0.6360
	0.6886	**0.0482**	**0.1723**	**0.1614**	**0.0072**	**0.0752**	**0.6293**

Source: Authors' elaboration on ABI Banking Data

The results of the univariate analysis are shown in Table 3, considering two different time intervals relating to the application of the sanction at time t: (t-1, t+1) and (t-1;t+2).

Table 3 – Pre and post sanction performance – Univariate analysis

	Pre-sanction (t-1)	Post-sanction (t+1)	Difference (Post -Pre)	T-stat
Risk				
RWA_Ratio	0.7251	0.7002	-0.0249	-1.7183*
NPL_ratio	0.0627	0.0716	0.0089	3.3571***
Capitalisation				
TCR_ratio	0.1604	0.1635	0.0032	0.6030
TIER1_ratio	0.1484	0.1486	0.0002	0.0309
Profitability				
ROA	0.0052	0.0021	-0.0030	-2.4753**
ROE	0.0497	0.0207	-0.0289	-1.9675*
Cost efficiency				
Cost_inc	0.6402	0.6533	0.0130	1.1197

	Pre-sanction (t-1)	Post-sanction (t+1)	Difference (Post -Pre)	T-stat
Risk				
RWA_Ratio	0.7069	0.6965	-0.0104	-0.5152
NPL_ratio	0.0561	0.0707	0.0145	3.6644***
Capitalisation				
TCR_ratio	0.1658	0.1701	0.0043	0.4864
TIER1_ratio	0.1534	0.1534	0.0000	0.0013
Profitability				
ROA	0.0068	0.0025	-0.0042	-3.4616***
ROE	0.0661	0.0243	-0.0419	-3.3084***
Cost efficiency				
Cost_inc	0.6322	0.6931	0.0609	4.6814***

Source: Authors' elaboration on ABI Banking Data and Bank of Italy

The evidence relating to the subset of only those intermediaries subject to the application of sanctions shows how, following the application of the said sanctions, these banks have worsened their performance: in particular, they have undergone a drop in both the profitability ratios in each time interval, while there has been an increase of the ratio of operating costs to operating revenue in the long est time span (t-1; t+2). No appreciable and significant changes from a statistical point of view seem to emerge in respect of the capitalisation measures. The incidence of non-performing loans, in relation to both time periods, seem to be worsening. The only signal in a different direction is a small reduction in the risk indicator, statistically significant only at the 10% confidence level. The effectiveness of sanctions would seem to be doubtful with regard to these results: it would seem, in fact, that the performance of the sanctioned banks worsens after their application, without appreciable results on the level of capitalisation. It is, however, premature to jump to conclusions without first observing the results of the multivariate analysis, which also takes into account the subset of non-sanctioned banks (control sample) and a set of other factors potentially capable of affecting the results.

Before showing the results of the various regression models, we would like to mention some of the precautions adopted that have conditioned the continuation of the analysis. First of all, we carried out a

correlation analysis of the various independent variables used, for the purpose of ruling out the presence of any problems of multicollinearity.
Secondly, we carried out a Hausman test to make sure that the data adapted to a fixed effects model or whether a random effects model would have been more appropriate. The test values have always pointed to the expediency of choosing a fixed effects model, with a high degree of statistical relevance.

For reasons of briefness, the comment is limited only to the coefficients of interest, in relation to each regression model, which are those that measure the effects of the sanctions (Table 4). Regarding the control variables, if statistically significant for at least 10%, the coefficients show relations that do not appear to contrast with either the economic theory or the previous literature.

Table 4 – The impact of sanction on the performance of banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	RWA_Ratio	NPL_ratio	TCR_ratio	TIER1_ratio	ROA	ROE	Cost_inc
tot_asset_{t-1}	-0.04533**	0.00949***	-0.03345***	-0.03295***	-0.00490***	-0.01491	-0.01802
	(0.02301)	(0.00363)	(0.01010)	(0.01009)	(0.00121)	(0.01437)	(0.01426)
$cost\_inc_{t-1}$	-0.05583	-0.00977	0.05238***	0.05216***	-0.00577*	-0.04705	
	(0.04102)	(0.01074)	(0.01898)	(0.01645)	(0.00296)	(0.03951)	
$loan\_deposit_{t-1}$	0.01208	0.00676	-0.00287	-0.00276	-0.00302	-0.03096**	0.04423***
	(0.01713)	(0.00498)	(0.00642)	(0.00657)	(0.00190)	(0.01314)	(0.01135)
$divers_{t-1}$	-0.01003*	0.00991***	0.00096	0.00049	-0.00246**	-0.01709**	-0.00904
	(0.00549)	(0.00205)	(0.00266)	(0.00315)	(0.00106)	(0.00797)	(0.00917)
roa_{t-1}	-0.24757	-0.76090***	0.19212	0.16618			-0.33207
	(0.50061)	(0.15848)	(0.22388)	(0.21430)			(0.50445)
tier1_ratio					-0.02066***	-0.18367***	0.10164*
					(0.00663)	(0.06305)	(0.05252)
npl_ratio					-0.01885*	-0.24045*	-0.03117
					(0.01066)	(0.14581)	(0.04781)
$sanction_{t-1}$	**-0.00481**	**0.00317**	**0.00010**	**-0.00045**	**-0.00109**	**-0.01681**	**-0.00172**
	(0.01035)	**(0.00206)**	**(0.00264)**	**(0.00251)**	**(0.00087)**	**(0.01089)**	**(0.00753)**
$sanction_{t-2}$	**0.03250*** **	**0.00238**	**-0.00403**	**-0.00398***	**-0.00130***	**-0.01195**	**0.01048**
	(0.00889)	**(0.00227)**	**(0.00287)**	**(0.00232)**	**(0.00072)**	**(0.00793)**	**(0.00782)**
$delta\_gdp_{t-1}$	0.06524	-0.03233**	-0.11046***	-0.11531***	0.02431***	0.30742***	-1.13433***
	(0.06199)	(0.01392)	(0.02581)	(0.02293)	(0.00583)	(0.05166)	(0.05868)
$average(y)_{t-1}$	0.98125***	1.01397***	0.88074***	0.86143***	0.59185***	0.71236***	0.53230***
	(0.09573)	(0.09756)	(0.12322)	(0.11678)	(0.06990)	(0.09419)	(0.05143)
$inflation_{t-1}$	-1.38563***	0.25474***	0.22170***	0.24008***	-0.05478***	-0.48274***	1.64382***
	(0.18554)	(0.04237)	(0.06050)	(0.05799)	(0.01886)	(0.18122)	(0.18199)
Constant	0.64639**	-0.13197***	0.42571***	0.42046***	0.08178***	0.34587*	0.43436**
	(0.31659)	(0.04978)	(0.12555)	(0.12555)	(0.01739)	(0.19287)	(0.17399)
Obs	3,033	3,033	3,033	3,033	3,033	3,033	3,033
Within R-sq	0.23595	0.34485	0.09594	0.11564	0.24624	0.23108	0.34123
No. cross section	668	668	668	668	668	668	668

Robust standard errors in parentheses

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

Source: Authors' elaboration on ABI Banking Data and Bank of Italy

Let us consider, first and foremost, the results relating to the risk variables. The dependent variable is represented by the ratio of risk-weighted assets to total assets in model (1), and by the incidence of impaired assets compared to the total financial assets in model (2). Commenting the coefficients of interest, with regard to the sanctions applied at t-1 or t-2, we can observe the following. Regarding the *RWA_ratio*, the coefficient relating to the effects of the sanction at t-1 is negative, but insignificant. On the contrary, the coefficient relating to the effects of the sanction at t-2 is positive, larger and statistically more significant. Regarding the incidence of the impaired assets (*NPL_ratio*), the result is non-significant. For the

above mentioned reasons, we believe that the results relating to the *RWA_ratio* variable are more significant, since the incidence of the non-performing loans is less related to the present conduct of the bank and, probably, also more subject to the greater influence of the economic situation (which also emerges from the effects of the control variable, with regard to the GDP trends). The evidence, when statistically significant, seems to suggest that the banks to which sanctions are applied become riskier, over time, than when the sanctions were applied. It also appears interesting to view how the effects of the measures applied by the regulatory Authority become more visible when observing a longer time span of two years, rather than one.

Regarding the level of total capitalisation, instead, there is no significant impact of the sanctions, as confirmed by the results of model (3), for the *Total Capital ratio*. When total capitalisation is included as the dependent variable of the model, the coefficients relative to sanctions are never significant at the 10% confidence level or less. Observing results for model (4), where the *TIER1 ratio* is the dependent variable, we can notice that the coefficient for sanctions in t-2 is negative and statistically significant at the 10% level. This seems to suggest that for sanctioned banks there is a reduction in the primary regulatory capital and, hence, in the average quality of own funds devoted to cover unexpected losses.
In terms of profitability, it seems to emerge that the sanctioned banks experience a drop in their performance when expressed in terms of return on assets (model 5), while results are not statistically significant at the 10% confidence level or less when using the return on equity indicator (model 6).
Lastly, in terms of operational efficiency, we have no evidence of statistical significance for the coefficients measuring the impact of sanctions in both t-1 and t-2. In all the models, the inclusion of the control variables to consider the effect of any extraordinary transactions does not alter the results[7].

The results obtained appear to be consistent with the evidence produced by the other studies investigating the effects of the sanctions. Murè and Pesic (2010) have highlighted how the sanctions applied by the regulatory Authority are scarcely effective on the banking firms, which continue to implement their strategies, for example by continuing to expand their assets without a corresponding growth of their equity. Delis *et al.* (2013) conclude that the sanctions are ineffective in modelling the risk profile of the sanctioned banks, probably due to the fact that they are not timely. In our case too the Authority's actions seem scarcely effective: on the one hand, the fact that the sanctioned banks feature a drop in their performance, compared to the others, may confirm the fact that the supervisory systems correctly identify the riskier operators; on the other hand, the observation of their downward performance over time could prove that the sanctions are not always timely and effective. If this interpretation were proved right the sanctioned banks should have a lower "probability of survival" than the control sample. Therefore, we have decided to carry out the survey taking the whole sample into account, without removing the outliers, to make sure that the results are not affected by the observations removed for anomalous or missing financial data. For each observation we have built two dummies made equal to one if, respectively, the bank was still existing the following year and two years later. Since the surveyed variable is dichotomic in nature, we did not consider it expedient to carry out a parametric test of the mean difference between the two sets

7 A further control of the soundness of results has been carried out introducing in the regression the value of y at time t-1 (the punctual value, rather than the sample average). The results do not change: the sanctioned banks show a worsening of their riskiness and performance, accompanied by a substantial stability in the level of capitalisation.

and preferred to use a non-parametric test, based on the difference between proportions (*Pearson's chi-squared*). The results of this test are shown in Table 5.

Table 5 – Survival analysis

Sanction in t				Sanction in t			
Survival in t+1	No	Yes	Total	Survival in t+2	No	Yes	Total
No	165	15	180	No	269	28	297
	170	10	180		282	15	297
Yes	5,070	290	5,360	Yes	4,286	209	4,495
	5,065	295	5,360		4,273	222	4,495
Total	5,235	305	5,540	Total	4,555	237	4,792
Pearson chi2 = 2.8599 Pr = 0.091				Pearson chi2 = 14.8322 Pr = 0.0001			

Source: Authors' elaboration on Bank of Italy

Each cell contains two different sets of information: the effective frequency and the expected frequency, assuming no relationship between the sanctions and the survival rate. We can see, for example, what happens at t+2: assuming no relationship, the sanctioned banking firms surviving past the time t+2 should total 15. Instead, they are 28. On the contrary, those that continue to operate after having been sanctioned by the Bank of Italy should be 222, but they are only 209. This means that the two variables are not independent and that the application of sanctions is negatively related to the probability of survival. At t+1, the test p-value is 0.091. At t+2, instead, the result appears sounder, with p-value 0.0001. We might ask ourselves about the effects of the extraordinary transactions: in other words, a bank with a certain ABI code might disappear from the panel not because it no longer operates, but as the result of a merger, for example. We repeat the test without all these cases and the results are absolutely confirmed, even with higher levels of significance[8].

It would seem obvious that the sanctioned banks feature a lower survival rate compared to their non-sanctioned competitors. This does not mean that the regulatory Authority intervenes only in borderline cases, concerning which it would be difficult to imagine a "happy ending", but which in less impaired conditions might prefer actions based on different – less coercive – instruments, capable of producing less reputational damage for the banks, such as letters of warning or auditions.

6. Conclusions

Before providing an overview of the main evidence emerging from this paper, it might be expedient to highlight certain aspects. The analysis is not a cross-country analysis but covers only the Italian market,

8 The results have not been tabled for reasons of briefness, but are available on request.

whereby we do not compare different systems and monitoring methods, nor do we analyse the consistency or coherency of the different authorities, their organization and efficiency. Instead, the analysis focuses on a single output, the administrative monetary sanctions applied by a single regulatory authority, the Bank of Italy. The key purpose of this paper is to assess the effects of the sanctions applied on the behaviour of the intermediaries; their impact is examined based on a set of performance variables relating to specific credit institutions and represented by single fiscal indicators. The paper covers all the banks operating in Italy: the examined variables are related to risk, capitalisation, profitability and operating efficiency. Therefore, all the core business processes are taken into account, but the focus remains general and, therefore, we do not investigate their effects on the single business areas or specific corporate processes. Moreover, we do not take into account the opinion of the markets, the impact on reputation or the customer satisfaction indicators, except indirectly, through the profitability measurements. The examined period runs from 2005 to 2012. Compared to the other surveys conducted, to date, therefore, the data are more recent and we consider in full the effects of the economic and financial crisis. The analysis also focuses on appreciating not just the more immediate effects of the sanctions, but also, consistently with the available data, their more medium-term effects, also examining any time lags between the date of application of the sanctions and the date of evaluation of their effects on the business processes.

The evidence collected is rather clear, and the message for the supervised intermediaries should be equally clear. A precise function of the sanctions emerges, in fact; their purpose seems to be that of alerting the management when the banking firm is sailing through stormy waters and, presumably, after a certain degree of moral suasion has been applied, as described in the paragraph on the complex set of controls falling under the responsibility of the Bank of Italy. No less than 99.6% of the addressees of the measures members of the management board, statutory auditors or managers or deputy general directors of the sanctioned banks. Moreover, despite the sanctions are addressed to the top management, they rarely have the effect of re-establishing sound and prudent management practices, as confirmed by the high mortality rate surveyed two years on from the date of the sanction, which confirms the assumption according to which sanctions are simply a borderline measure applied after all other measures have been put into place and all other attempts made to put the bank back onto a proper footing. Therefore, we must highlight the commitment by the regulators and supervisors to improve the effectiveness and dissuasive capacity of the sanctions, by encouraging the proactive collaboration of the intermediaries and the adoption of corrective measures by the supervisees. The result of this commitment is, for example, the entry into force in February 2013 of the new supervisory regulations relating to sanctions procedures, which have been issued also taking into account the recent EU directive proposals. Against this backdrop, the broadening of the toolbox made available to the Authorities and the development of a different culture, in respect of the relationship between supervisors and supervisees, might ensure more gradual, effective and, ultimately, useful control procedures.

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