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Forecasting distress in cooperative banks: The role of asset quality

Antonio Fabio Forgione*, Carlo Migliardo

Department of Economics, Università degli Studi di Messina, Messina, Italy



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ABSTRACT

This paper analyzes the drivers of financial distress that were experienced by small Italian cooperative banks during the latest deep recession, focusing mainly on the importance of bank capital as a predictor of bankruptcy for Italian nonprofit banks. The analysis aims to build an early-warning model that is suitable for this type of bank.

The results reveal non-monotonic effects of bank capital on the probability of failure. In contrast to distress models for for-profit banks, non-performing loans, profitability, liquidity, and management quality have a negligible predictive value. The findings also show that unreserved impaired loans have an important impact on the probability of bank distress. Moreover, the loan–loss ratio provision on substandard loans constitutes a suitable antibody against bank distress. Overall, the results are robust in terms of both the methodology (i.e., frequentist and Bayesian approaches) and the sample used (i.e., cooperative banks in Italy and euro-area countries).

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1. Introduction

The global financial crisis of 2007–2008 renewed concerns regarding our ability to predict bank failures, considering mainly the role of bank capital adequacy. In this regard, banking regulations on banks' soundness have become more stringent, with the aim of preventing future banking crises. Several studies (Acharya, Gale, & Yorulmazer, 2011; Admati, De Marzo, Hellwig, & Pfleiderer, 2011; Hart & Zingales, 2011) have shown that morally hazardous behavior could be discouraged if banks operated with more capital, especially during financial crises.¹

The empirical literature is not unanimous in its view of the effect of equity on bank failure. One strand of the literature (Berger & Bouwman, 2013; Fiordelisi & Mare, 2013) shows that capital enhances the survival probability of small banks at all times, but only during banking

crises in the cases of medium and large banks. Berger and Bouwman (2013) note that higher-capital banks enhance their monitoring and make their investment policies safer by using three strategies: growth in non-core funding, on-balance-sheet relationship loans, and off-balance-sheet guarantees. Jimenez, Lopez, and Saurina (2013) argue that bank capital is related directly to the bank franchise value, and, as a consequence, indirectly reduces incentives to take risks as the franchise value increases the cost of failure.

Conversely, a second strand of the literature—e.g., Calem and Rob (1999)—maintains that the portfolio risk increases with capitalization, thus enhancing the overall risk of failure. Besanko and Kanatas (1996) argue that insiders are not able to exert the same monitoring once the capital has been diluted. In this regard, Diamond and Rajan (2001) provide evidence that over-capitalized banks have a weakened incentive for credit monitoring and credit recovery from their borrowers. Berger and Di Patti (2006) find a significant hump-shaped effect of capital on profitability. DeYoung, Gron, Torna, and Winton (2015) estimate a structural model of bank portfolio lending and find that

* Corresponding author.

E-mail addresses: fforgione@unime.it (A.F. Forgione), cmigliardo@unime.it (C. Migliardo).

¹ Duran and Lozano-Vivas (2015) argued that banks in the Euro area seemed to have shifted the risk to bond holders during the crisis.

smaller, less sophisticated banks have been able to manage their loan portfolio risk with the degree of efficiency suggested.

Given the divergent views in the literature regarding the effects of capital on bank distress, the magnitudes of these effects and the ways in which they may differ across the business cycle phases boil down to an empirical question, which we confront in this paper. In particular, we focus on banks that are characterized by a low capacity to attract institutional investors. In fact, the Italian cooperative law imposes restrictions on ownership and voting rights (one member, one vote) for this type of mutual society.² In addition, we assume that the governance of cooperative banks (BCC henceforth) is usually less subject to franchise value pressure and risk-averse attitudes, unless the banks' management predicts that bank assets are becoming riskier and requests recapitalization.³ Furthermore, cooperative banks are characterized by a greater financial soundness than commercial ones because cooperative banks' returns are less volatile, which more than offsets their lower profitability and capitalization (Hesse & Čihák, 2007).

This study uses a dataset that comprises typical items that are represented in the financial statements of all Italian BCCs, which are subjected to receivership procedures more frequently,⁴ as a result of serious corporate crises in the years considered (2007–2014). An attempt is made to study the causes of these crises.

Italian BCCs are typically characterized by traditional operations, mainly regarding their members, and smaller customer bases than commercial banks. BCCs work under predominantly traditional conditions: low investments held for trading, loans granted almost exclusively to families and small businesses established and operating in the same territory in which the bank is located, and funding mainly retail customers, with limited recourse to the securitization of assets. These banks adopt critical methodologies in the measurement of credit risk, and their governance is conditioned by the structure of cooperatives; in addition, their management faces difficulties in raising capital due to the prohibition of capital subscription from other financial institutions. The recession diminished the quality of these banks' assets, and their customers have suffered as a consequence.

² Italian law establishes that BCCs must grant credit mainly to their members, which stimulates borrowers to associate with the banks. However, each shareholder must reside in the area in which the bank operates and cannot own shares over an overall nominal value of 50,000 euros. Members have equal voting rights, according to the cooperative principle of "one person, one vote", independently of the shareholders, and must set aside 70% of profits, thus limiting corporate strategies regarding profit distribution.

³ A recent reform of Italian cooperative banking legislation aims to provide capital injections to institutional subscribers who are facing insolvency.

⁴ The literature offers several definitions of financial distress. In early studies, economists such as Beaver (1966) consider financial distress to reflect an acclaimed event, such as bankruptcy or bond default. Alternatively, Gordon (1971) identifies financial distress as a state of negative profitability and/or a condition of over-indebtedness. Subsequently, Andrade and Kaplan (1998) interpret financial distress as also existing when a borrower tries to restructure their debt to avoid default. This paper follows Beaver's definition.

Expanding on previous studies, this paper aims to contribute to the empirical literature on bank failure in several directions. First, we examine the nonlinear effect of bank equity on the probability of failure. To the best of our knowledge, only one study has investigated whether the effect of equity on bank distress is non-monotonic, and no one has investigated this effect for cooperative banks. Second, we aim to investigate whether the asset quality indicators, among the other corporate profiles that are used commonly (such as capital adequacy, profitability, management efficiency, interest rate risk, and liquidity), constitute elements of vulnerability for a major mutual bank. It turns out that the recent financial crisis constitutes a unique opportunity of carrying out a stress test of the standard early warning systems, given the relevant Italian bank distress rates originating from nonperforming loans. In addition, some asset quality indicators show the ability of bank risk management to hedge against the impact of bad loans. Surprisingly, the empirical literature does not evaluate the role of asset quality in bank distress events extensively. Against this background, we point out that one of the main pitfalls of bank soundness arises from the way in which management mitigates the negative effect of substandard loans. Finally, this paper applies an empirical methodology that has rarely been implemented in bankruptcy studies (Lu, Yang, & Huang, 2015),⁵ namely Bayesian analysis.

The remainder of the paper is organized as follows: Section 2 reports a brief review of the relevant literature; Section 3 describes the variables used for constructing a system of early-warning financial ratios that is specific to Italian cooperative banks; Section 4 presents the sample and summary statistics; Section 5 describes the empirical methodology; Section 6 reports and discusses the main results; and Section 7 provides concluding remarks.

2. Literature review

Bankruptcy forecasting models have a long history in the finance literature, dating back to the 1960s. Pioneering studies by Altman (1968) and Beaver (1966) focused on the core idea that firms with certain financial structures have higher probabilities of bankruptcy than firms with other characteristics, which is taken as a benchmark value. Since then, many other studies have been conducted using a range of statistical techniques (logit and probit models, the linear probability model)⁶ and non-statistical methods

⁵ The authors apply several econometric techniques in a prediction model for the US aviation industry, and find that Bayesian binary quantile regression exhibits the optimal bankruptcy prediction accuracy among all econometric methodologies.

⁶ The late 1970s witnessed an increase in the use of discrete-response models, such as logit and probit models, as standard approaches to macroeconomic data analysis. Observing a very large dataset of all Federal Reserve member banks for seven years, Martin (1977) identified, through financial ratios, the main corporate indices that act as significant determinants of bank failure, namely capital ratios, liquidity measures, and profitability over his sample period. Martin (1977) also finds that the provision expense and loan concentration appear statistically significant, as indirect measures of the asset quality.

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