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How does capital affect bank performance during financial crises?[☆]

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ABSTRACT

This paper empirically examines how capital affects a bank's performance (survival and market share) and how this effect varies across banking crises, market crises, and normal times that occurred in the US over the past quarter century. We have two main results. First, capital helps small banks to increase their probability of survival and market share at all times (during banking crises, market crises, and normal times). Second, capital enhances the performance of medium and large banks primarily during banking crises. Additional tests explore channels through which capital generates these effects. Numerous robustness checks and additional tests are performed.

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1. Introduction

The recent financial crisis raises fundamental issues about the role of bank equity capital, particularly from the standpoint of bank survival. Not surprisingly, public outcries for more bank capital tend to be greater after financial crises, and post-crisis reform proposals tend to focus on how capital regulation should adapt to prevent future crises. Various such proposals have been put forth recently (e.g., Kashyap, Rajan, and Stein, 2008; BIS, 2010;

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Acharya, Mehran, and Thakor, 2011; Admati, DeMarzo, Hellwig, and Pfleiderer, 2011; Calomiris and Herring, 2011; Hart and Zingales, 2011). An underlying premise in these proposals is that externalities exist due to the safety net provided to banks and, thus, social efficiency can be improved by requiring banks to operate with more capital, especially during financial crises. Bankers, however, often argue that holding more capital would jeopardize their performance and lead to less lending. The academic literature suggests that this bankers' perspective needs to be more nuanced (e.g., Aiyar, Calomiris, and Wieladek, 2012; Jiménez, Ongena, Peydró, and Saurina, 2012; Osborne, Fuertes, and Milne, 2012), but has pointed out some negative consequences of more capital as well (e.g., Diamond and Rajan, 2001). Given the divergent views in the literature, the issue of the effects capital has on bank performance, the magnitude of these effects, and how they might differ across different types of crises and normal times boils down to an empirical question, one that we confront in this paper. In particular, the goal of this paper is to empirically examine the effects of bank capital on two dimensions of bank performance—probability of survival and market share—during different types of financial crises and normal times.

Survival and market share are two key performance issues that concern bank managers. Bank survival is central not only in strategic decisions made by banks, but also in decisions made by regulators concerned about banking stability. Market share is an important goal for most firms (e.g., Aghion and Stein, 2008), and banks often assess their performance relative to each other on this basis. Knowing how bank capital affects bank performance, both during financial crises and normal times, is also of paramount importance for regulators contemplating micro- and macroprudential banking regulation.[2] In particular, comprehending whether higher capital has a significant effect on a bank's survival likelihood and how this effect differs depending on bank size and the nature of the crisis are important details for regulators who are weighing the level and other specifics of capital requirements to achieve a desired level of banking stability. Even though the battle for market share is a zero-sum game, it matters to regulators because it affects bank behavior. For example, if higher capital impeded a bank's pursuit of market share, it might encourage higher leverage and greater banking fragility, something of concern to regulators. These issues also matter for how banking theory evolves, because it helps bring about a better appreciation for the reasonableness of assumptions about the channels through which bank capital affects various aspects of bank performance.

Most theories predict that capital enhances a bank's survival probability. Holding fixed the bank's asset and liability portfolios, higher capital mechanically implies a higher likelihood of survival. A deeper justification is provided by incentive-based theories such as Holmstrom and Tirole (1997), Acharya, Mehran, and Thakor (2011), Allen, Carletti, and Marquez (2011), Mehran and Thakor (2011), and Thakor (2012). In these models, either capital strengthens the bank's incentive to monitor its relationship borrowers, reducing the probability of default, or it attenuates asset-substitution moral hazard, or it lessens the attractiveness of innovative but risky products that elevate the probability of financial crises. However, some theories suggest that under certain circumstances increasing bank capital could be counterproductive because it perversely increases bank risk taking (e.g., Koehn and Santomero, 1980; Besanko and Kanatas, 1996). Nonetheless, the reviews in Freixas and Rochet (2008) suggest that the scales are tilted in favor of the prediction that capital has a salutary effect on the probability of survival. The view that capital strengthens a bank's competitive position in asset and liability markets, which can also improve its odds of survival, is also buttressed by the empirical evidence in papers such as Calomiris and Mason (2003) and Calomiris and Wilson (2004).

Recent banking theories also suggest a positive relation between capital and market share (e.g., Allen, Carletti, and Marquez, 2011; Mehran and Thakor, 2011). The empirical evidence suggests that higher-capital banks are able to compete more effectively for deposits and loans (e.g., Calomiris and Powell, 2001; Calomiris and Mason, 2003; Calomiris and Wilson, 2004; Kim, Kristiansen, and Vale, 2005), providing some support. In contrast, the literature on the interaction between a nonfinancial firm's leverage and its product-market dynamics argues that more highly-levered firms compete more aggressively for market share, suggesting that the relation between capital and market share could be negative (e.g., Brander and Lewis, 1986).

Thus, while existing theories provide valuable insights that guide the testable hypotheses we formulate in this paper, the predictions they produce conflict in some cases, pointing to the need for empirical mediation. Moreover, even when the theories strongly predict an effect in one direction, much is to be learned from documenting the sizes of various effects and how these vary in the cross section of banks, which again calls for empirical analysis. Furthermore, the theories generally do not distinguish between financial crises and normal times and do not distinguish between banks of different size classes, although these distinctions are important from a policy perspective and for the empirical tests in this paper.

For both survival and market share, we take our cue from the theories and formulate hypotheses that allow us to assess whether capital helps or hurts. The hypotheses are tested using data on virtually every US bank from 1984:Q1 until 2010:Q4. We examine small banks (gross total assets, or GTA, up to \$1 billion), medium banks (GTA exceeding \$1 billion and up to \$3 billion), and large banks (GTA exceeding \$3 billion) as three separate groups, because the effect of capital likely differs by bank size (e.g., Berger and Bouwman, 2009).[3] We also recognize that

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[2] For example, one impetus for the global harmonization of capital requirements was the claim by US banks that Japanese banks were able to gain market share at the expense of US banks because they were subject to lower capital requirements (Group of Thirty, 1982). Thus, market-share arguments have also influenced regulatory thinking about capital requirements.

[3] Gross total assets, or GTA, equals total assets plus the allowance for loan and lease losses and the allocated transfer risk reserve (a reserve for certain foreign loans). Total assets on Call Reports deduct these two

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