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# The effectiveness of bank capital adequacy regulation: A theoretical and empirical approach

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## Abstract

The aim of this paper is to analyse how banking firms set their capital ratios, that is, the rate of equity capital over assets. In order to study this issue, two theoretical models are developed. Both models demonstrate the existence of an optimal capital ratio; the first one for firms not affected by capital adequacy regulation, the second one for firms which are. The models have been tested by estimating a disequilibrium model using data from Spanish commercial banks.

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## 1. Introduction

Although capital generally accounts for a small percentage of the financial resources of banking institutions, it plays a crucial role in their long-term financing and solvency position and therefore in their public credibility. In the event of a crisis, the lower the leverage ratio is, the lower the probability that a bank will fail to pay back its debts. This fact tends to justify the existence of capital adequacy regulation in order to avoid bankruptcies and their negative externalities on the financial system,

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although banks may respond to this regulation by increasing their risk exposure.<sup>1</sup> Other unintended negative effects associated to this regulatory mechanism or to the way it is implemented are also present in the literature. Santomero and Watson (1977) show that too tight a capital regulation lead banks to reduce their credit offer and, as a result, give rise to a fall in productive investment. Acharya (2001a,b) shows that capital adequacy regulation in some contexts could even accentuate systemic risk. So, under international financial integration, a simple coordination on some parts of banking regulation (uniform capital requirements) but not others (the forbearance in supervisor's closure policies) can give rise to international negative externalities that destabilize the global system. Furthermore, a design of capital adequacy requirements, based only on individual bank risk, as the actual proposed in the Basle Accord, is showed to be suboptimal in both papers. All the above arguments suggest the need for an analysis of how banks set their capital to assets ratio.

This topic is of special interest in Spain where from the late 1980s an important process of financial deregulation has coexisted with a supervisory re-regulation. The severe banking crisis suffered during 1978–1985 together with the international trend towards the application of risk-based capital rules seem to lie behind the 1985 risk-based capital legislation. The Spanish Capital Adequacy Regulation Act of 1985 imposed two simultaneous minimum capital ratios: A global or generic ratio and a selective or risk-based capital ratio. The former stipulated that capital had to be a minimum percentage of total investments. The latter stipulated a risk-weighted capital requirement, where capital had to exceed the sum of different assets or off-balance sheet exposures, weighted according to their relative risk. Accordingly, this last requirement was specific for each bank. The impact of this tighter capital adequacy regulation was apparently more pronounced in Spain than in most other EU countries. This can be corroborated by the fact that the average capital to assets ratio of Spanish banks rose substantially after 1985 reaching values above 3 percentage points with respect to the mean of EU countries.<sup>2</sup>

This legislation may have affected Spanish banking institutions (commercial banks, savings banks, credit co-operative banks) in different ways depending on their capital structure. This paper focuses only upon the analysis of the effectiveness of capital adequacy regulation on Spanish commercial banks, which account for over 50% and 50% of total loans and deposits, respectively, of the Spanish banking sector from 1985–1992. Nevertheless, this market quota has decreased over time as a result of the increasing competition in the financial sector.

Core capital (TIER 1) in Spanish commercial banks (share capital plus undivided profits plus reserves) accounts for over 80% of their total capital, accumulated re-

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<sup>1</sup> See Koehn and Santomero (1980), Lam and Chen (1985), Lackman (1986), Kim and Santomero (1988) and Rochet (1992). In contrast with this idea, Furlong and Keeley (1989) and Keeley and Furlong (1991) state that capital adequacy requirements reduce incentives to increase risky assets, thus decreasing the probability of the bank's bankruptcy. Other works such as Kendall (1991) and Camel and Rob (1996) show an ambiguous impact on this incentive to take more risks, depending on a bank's capital adequacy and financial situation.

<sup>2</sup> See OCDE: Bank profitability.

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