

# Is bank portfolio riskiness procyclical? Evidence from Italy using a vector autoregression

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## Abstract

This study analyzes the procyclical behavior of the default rates of Italian bank borrowers over the last two decades. A vector autoregression (VAR) is employed to assess the extent to which macroeconomic shocks affect the banking sector (first round effect). The VAR also helps to disentangle the feedback effects from the financial system to the real side of the economy. We find evidence of the first round effect and some support for the feedback effect, which tends to operate when banks have thin capital buffers. From a policy perspective, our results confirm the importance for banks to keep capital well above the regulatory minimum in order to maintain an adequate credit supply also during contractions thus reducing second round impacts. © 2006 Elsevier B.V. All rights reserved.

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## 1. Introduction

A large empirical literature has focused on the analysis of the effects of macroeconomic disturbances on the banking system. This stream of work is usually referred to as research on the procyclical nature of banks' behavior. These studies consider the current macroeconomic

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conditions as the main exogenous determinants of banks' soundness. Their goal is to assess to what extent the macroeconomy affects banks' performance (cyclicality) and whether, in turn, banks' reaction to changing macroeconomic conditions further influences the macroeconomy, amplifying its fluctuations (procyclicality). In general, the evidence arising from these investigations tends to confirm that banks' balance sheets are affected, simultaneously or with some delay, by the business cycle and many authors claim that banks' behavior is procyclical. However, most of them tend to assume, rather than really document, that procyclicality is a consequence of cyclicality. The main argument is that, in unfavorable phases of the business cycle, losses due to credit risk tend to deplete banks' profits, which in turn may reduce capital buffers and thus banks' willingness to lend. In particular, in those countries where bank lending is the main source of external financing for corporations, the decline in credit supply can reduce firms' ability to invest, thus reinforcing recessionary impulses. However, the current literature largely neglects to empirically test the significance of such a feedback mechanism.

This paper is an attempt to make a step forward towards the understanding of how banking variables impact the macroeconomy. We explicitly analyze this issue using a vector autoregression (VAR) approach. With respect to cross-sectional or panel techniques, VARs allow to fully capture the interactions among micro and macroeconomic variables, providing an ideal framework for financial stability purposes. We start with a simple open economy model in which we introduce the default rate equation to capture the direct effect of the business cycle on banks' portfolio riskiness. To evaluate the possible existence of a feedback effect, we add an equation linking credit supply and bank capital. This allows us to test whether banks' portfolio riskiness affects the real economy and the nature of the transmission mechanism. Following the capital crunch hypothesis, we use some measures of capital adequacy as indicators of banks' ability to keep sufficient loan supply in recessionary conditions.

Our empirical results confirm the existence of a first round effect in the Italian economy over the last two decades, with default rates that follow a cyclical pattern, falling in good macroeconomic times and increasing during downturns. We also find some support to the idea that a feedback effect operates via the bank capital channel. In particular, our findings suggest that, when capital surpluses are low, banks may reduce lending, which, in turn, negatively affects the economic cycle. From a policy perspective, our results confirm the importance for banks to keep sufficient capital buffers in order to maintain an adequate credit supply also during contractions, thus reducing the possibility of procyclicality.

The paper is organized as follows. Section 2 gives both the theoretical underpinnings and the empirical evidence of cyclicality and procyclicality of banks' operations. Section 3 presents the economic model, while Section 4 describes the data and the estimation method employed. Section 5 illustrates the empirical evidence and the main results, whereas Section 6 sketches some conclusions.

## **2. Cyclicality and procyclicality of banks' behavior**

### *2.1. Theory...*

There are a number of possible explanations to the procyclicality of banks' behavior: disaster myopia, over-optimism, herd behaviors, and insufficient market discipline. A possible pattern is as follows. At the beginning of the expansionary phase, firms' profits tend to increase, asset prices rise and customers' expectations are optimistic. The expansion of aggregate demand leads to a remarkable growth in bank lending and in economy's indebtedness. In such a boom, banks may

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