Cyclical behavior of the financial stability of eurozone commercial banks

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ABSTRACT

In light of the financial crisis and the European sovereign debt crisis, we investigate the cyclical behavior of the financial stability of banks of the Eurozone, using an unbalanced dynamic panel of 722 commercial banks covering the period 1999–2013, and the generalized method of moments system. We find a negative relationship between business cycle and bank risk-taking, indicating that financial stability is procyclical. In addition, the study shows that lending activity increases risk-taking while rising capital requirements boost financial stability. Moreover, our findings suggest positive co-movements between the business cycle and lending, compared to bank's capital, whereby the procyclicality of lending and bank capital have negative effects on the financial stability of commercial banks in the Eurozone. We notice then that the cyclical behavior of commercial banks, in terms of capital requirements and lending activities, depends on their size. Therefore, lending and capital of smaller banks are procyclical while lending and capital of larger banks are countercyclical. Finally, we find the Troika institutions' bailouts programs significantly impacted banking stability in the Eurozone.

1. Introduction

Recent international financial turmoil shows a strong association between financial markets and the real economy (Mclean and Zhao, 2014). Adding to this global financial economic crisis, the European sovereign debt crisis, as mentioned by Amisano and Tristani (2011), highlights one of the notable features of the Eurozone sovereign debt crisis through its progressive spread across various Eurozone countries. After the intensification of tensions in the Greek government bond market in spring 2010, Ireland, Portugal, and eventually Spain and Italy, increasingly became engulfed in the sovereign crisis. In addition, French and German sovereign credit default swaps (CDS) increased. One of the greatest concerns was banking stability. If a sovereign debt were to lead to the failure of European banks, the resulting financial instability could be disastrous for the real economy. This type of scenario highlights the need to identify and understand the cyclical behavior of bank risks.

In this study, we analyze the cyclical behavior of financial stability, defined as risk-taking by banks over the business cycle from 1999 to 2013. We investigate whether bank risk-taking moves procyclically or countercyclically over the business cycle. We examine in particular whether the financial stability of Eurozone commercial banks is procyclical (or countercyclical) during economic upturns (or down-turns). The cyclicality of bank stability is defined as the relationship between business cycle and bank risk-taking. A positive link implies countercyclicality of financial stability and a negative relationship denotes procyclicality.

This study contributes to the literature in several respects. First, it uses the largest available dataset of 722 commercial banks in 16 Eurozone countries since the adoption of the Euro in 1999. In our sample, we include unlisted banks, which represent the majority of banks in the EU. European banks became a source of risk to international financial markets during the financial crisis and attention to the European banking sector increased during the sovereign debt crisis (Black et al., 2016). Moreover, the recent global financial crisis and the large production losses incurred in several European countries have eroded bank bailout costs. These costs have a large impact on the real economy and thus, there is need of a better understanding of the cyclical behavior of bank risk. We focus on the Eurozone because these countries must coordinate their economic and fiscal policies closely, much more so than the other European Union (EU) member states (Baselga-Pascual et al., 2015). As stated by Poghosyan and Čihak (2011), an important motivation in favor of more centralized banking regulation in the EU is the notion that risks in the banking sectors of EU members have become increasingly homogeneous. An improved understanding of bank risk fluctuations over the business cycle in the Eurozone is important for regulators and supervisors interested in validation issues related to the new EU banking rules.

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The second contribution of this study is that it extends the existing literature, which focuses on either the effect of cyclicality of lending and bank capital on financial stability or on the cyclical behavior of bank risk and the. This study considers overall bank default risk (Z-score) as an indicator of financial stability at the bank level. The Z-score is the number of standard deviations by which returns would have to fall from the mean to deplete all equity in the bank. Consequently, higher values of Z-score indicate lower risk and greater stability. The Z-score has been used widely in previous empirical literature concerning the measurement and determinants of the safety and soundness of financial institutions (Angkinand and Wihlborg, 2010; Beck et al., 2012). In our study, we distinguish between the reverse of the Z-score for return on assets (ZA) and the reverse of the Z-score for return on equity (ZE). In addition, we include two alternative and complementary measures of financial stability for the Eurozone banking industry: volatility of return on assets (VOL_ROA) and volatility of return on equity (VOL_ROE). Because banks (mainly commercial banks) need to assume risk to make profits, they ultimately become insolvent when they are exposed to different types of risk. In addition, for deeper insights, we use the Z-score components, like previous studies (e.g., Lepetit et al., 2008; Fazio et al., 2015). However, we add only risk-adjusted asset profits (RAR) using one component of the ZA and risk-adjusted market profits (RER) using one component of the ZE in order to check the sensitivity of our models.

The third contribution is that this study uses the system generalized method of moments (GMM) technique for the dynamic panel data model to estimate the cyclical behavior of banking stability. Compared to the conventional static panel data regression model, the GMM system is much more consistent and efficient for estimating coefficients and controlling the potential problems of endogeneity, heteroscedasticity, and autocorrelation (Arellano and Bover, 1995; Lee and Hsieh, 2014; Ben Bouheni et al., 2016). Persistence is another crucial feature of financial stability. The dynamic GMM estimator can control unobserved heterogeneity and the persistence of the dependent variable.

The fourth contribution is that, unlike previous studies, we undertake two sample splits and examine whether the cyclical behavior of financial stability differs across bank size. Fifth, we consider the effect of Troika institutions' bailouts programs on banking stability in the Eurozone (the three institutions involved are the European Commission, EC, International Monetary Fund, IMF, and European Central Bank, ECB).

Our first finding shows the procyclical behavior of the financial stability of banks in the Eurozone. This result is robust to several panel specifications and tests. In other words, during economic upturns, risk-taking by commercial banks in the Eurozone decreases and during downturns, bank managers are less risk averse. Banks of the Eurozone are insured implicitly through the depot-insurance, which might lead to a higher possibility of moral hazard. Bank managers are able to take excessive risks, since they have little or nothing to lose but more to gain. Prospect theory, proposed by Kahneman and Tversky (1979), can explain such behavior. It is, therefore, reasonable to argue that bank managers have an incentive to increase risk-taking when in a distressed situation (Zhang et al., 2016).

Second, the results show that lending activity increases banking risk and financial instability, while capital requirements support financial stability. This result is, partly, consistent with Schularick and Taylor (2012), who test the behavior of money, credit, and macroeconomic indicators over the long run based on a historical dataset for 14 developed countries over the years 1870–2008. The authors examine the sources of recurrent financial instability in modern economies to know whether the financial system itself creates economic instability through endogenous lending booms, and conclude that leverage in the financial sector increased strongly in the second half of the twentieth century. In addition, the authors discover a decline in safe assets on banks' balance sheets. Schularick and Taylor (2012) demonstrate that credit growth is a powerful predictor of financial crises.

In addition, we find positive co-movements between the business cycle and lending and between the business cycle and bank capital, indicating that procyclicality of bank lending and capital encourages risk-taking, but negatively affects the financial stability of commercial banks. These results about the cyclical behavior of bank capital are in line with Guidara et al. (2013), who note that bank capital buffers show positive co-movement with business cycles in research using quarterly financial statements and stock market data from 1982 to 2010 for the six largest Canadian banks. However, Shim (2013), using U.S. bank holding company data during the period 1992:Q1−2011:Q3, finds a negative relationship between the business cycle and the capital buffer.

Moreover, we highlight that capital requirements and lending related to the cyclical behavior of commercial banks depend on the bank's size. Therefore, lending and capital of smaller banks are procyclical while lending and capital of larger banks are countercyclical. We conclude that banking capital and lending behavior depend on the size of banks. Therefore, smaller banks tend to be in similar lines of business to the real economy. Thus, during recessions, they reduce their lending activities and capital requirements, but during economic upswings, they increase lending and capital. However, the largest banks operate differently: they lower their lending activities and their capital requirements during economic upturns, but increase them during economic downturns. According to Shim (2013), larger banks might deter excessive risk-taking behavior to protect their charter or franchise value. Bertay et al. (2015) consider that bank size captures the impact of a bank's too-big-to-fail status. Larger banks might be involved in riskier lending activities, since the moral hazard issue is likely to occur for them due to a government's safety net through implicit too-big-to-fail policies. Finally, dividing our sample according to Troika institutions' bailouts programs confirms that the link between financial stability and economic growth might depend on the financial autonomy and market structures of countries. Indeed, financial stability is countercyclical for commercial banks from the five major countries that received bailouts in the Eurozone (Cyprus, Greece, Ireland, Portugal, and Spain), indicating they are business cycle "followers" and they continue to struggle. However, for European countries without Troika assistance, financial stability is procyclical, meaning that during economic expansion, European commercial banks reduce risk-taking in anticipation of higher expected losses and during economic downturn, they are better able to act as a lubricant for the economy.

The rest of our paper is structured as follows. Section 2 presents our data and methodology, Section 3 presents the empirical results, and Section 4 concludes.

2. Data and methodology

Our empirical analysis is based on the Eurozone sample of 722 commercial banks from 16 European countries[1] for the period since the adoption of the Euro as a currency in 1999 until 2013. Table A1 in the Appendix presents details on the number and percentage of banks per country. For the reliability of our results, we eliminated countries that had recently entered the Eurozone and that did not provide data for at least 5 years. Thus, referring to the European Commission (2015),[2] we exclude Lithuania, which joined the Eurozone in 2015, Latvia in 2014, and Estonia in 2011. Today, the Eurozone accounts for 19 EU member states. The main data source of bank-level information is from Bureau van Dijk of Bankscope (2015), which is a widely used database in banking studies. As for country-level variables, we collect gross domestic product (GDP) and inflation from the World Bank 2015