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Which banks are more risky? The impact of business models on bank stability

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ABSTRACT

In this paper, we analyze the impact of business models on bank stability in 15 EU countries between 2002 and 2011. We represent banks' business models by the share of non-interest income in total operating income and the share of non-deposit funding in total liabilities. In contrast to the literature, we include in our sample a large number of unlisted banks, which represent the majority of banks in the EU. We believe this to be important, since many unlisted banks typically have a more retail-oriented business model. We show that banks will be significantly more stable and profitable if they increase their share of non-interest income, indicating that substantial benefits are to be gained from income diversification. Such benefits are particularly large for savings and cooperative banks. Investment banks, in contrast, become significantly more risky. Diversifying into non-deposit funding has a different impact as well. While retail-oriented banks will be significantly less stable if they increase their share of non-deposit funding, investment banks will be significantly more stable. These findings indicate that it is important to enlarge the sample of banks and to include different types of banks with different business models in order to arrive at general conclusions about the effect of non-interest income and non-deposit funding on bank stability.

1. Introduction

In this paper, we analyze the impact of business models on bank stability in the EU banking sector for the period between 2002 and 2011. We represent banks' business models by the share of non-interest income in total operating income and the share of non-deposit funding in total liabilities. In contrast to the literature (Altunbas et al., 2011; Demirgüc-Kunt and Huizinga, 2010), we include a large number of unlisted banks. This should not only give a more representative picture of the EU banking sector, as unlisted banks account for the majority of banks in the EU, but also increase the number of bank types and business model analyzed.

We think this to be important, since unlisted banks have a more retail-oriented business model. Retail-oriented banks are typically smaller and provide lending and deposit-taking services for households and small and medium-sized enterprises. This contrasts with investment-oriented banks, which fund most of their activities on wholesale markets and generate a large share of their income from non-traditional activities, such as investment banking and trading. In this paper, we argue that such differences affect the way in which a larger share of non-interest income and non-deposit funding impacts on bank risk and return. We hypothesize that retail-oriented banks will be more stable and profitable if they increase their share of non-interest income and non-deposit funding, since this makes them less dependent on interest income and customer deposits and improves risk diversification. Investment banks, in contrast, will be more risky. Due to their business model, they already have a large share of non-deposit and non-interest income, which might limit the benefits of diversifying further into non-deposit funding and non-interest income. This indicates that banks might also overdiversify. The activities used to generate non-interest income also differ significantly between retail- and investment-oriented banks, which might also affect the way in which non-interest impacts on bank risk and return. We take this as a starting point for analyzing the impact of non-interest income and non-deposit funding on the stability of banks in the EU banking sector.

We show that banks will be significantly more stable and profitable if they increase their share of non-interest income, indicating that substantial benefits are to be gained from income diversification. Such benefits are particularly large for savings and cooperative banks. These banks are traditionally more retail-oriented.

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Investment banks, in contrast, will become significantly more risky. Diversifying into non-deposit funding has a different impact as well. While retail-oriented banks will be significantly less stable if they increase their share of non-deposit funding, investment banks will be significantly more stable. These findings indicate that it is important to enlarge the sample of banks and to include different types of banks with different business models in order to arrive at general conclusions about the effect of non-interest income and non-deposit funding on bank risk.

Not only is analyzing business models important for investors and analysts, it has recently gained in importance for supervisors as well. While supervisors, in the past, were often concerned with capital, liquidity and risk management, the financial crisis has shown that it is also necessary to take a more detailed look at banks' business models. In general, business models describe how banks generate profits, what customers they serve and which distribution channels they use. Analyzing business models, therefore, goes beyond looking at traditional indicators of bank risk and return and should give supervisors a deeper understanding of the sustainability of bank profits and stability. This should allow them to be more forward-looking.

Our paper is related to a large number of studies that analyze the impact of income diversification on bank risk and return. Most of these studies do not include crisis data and find only little evidence of gains from diversifying into non-interest income.[1] More recent papers that incorporate data for the financial crisis period provide mixed evidence as well. Not only do these papers examine the impact of income diversification, they also analyze how the diversification of funding sources affects banks' risk and returns. Demirgüc-Kunt and Huizinga (2010) find some risk diversification benefits at very low levels of non-interest income and non-deposit funding. For the most banks, however, a larger share of non-interest income and non-deposit funding is associated with greater instability. Altunbas et al. (2011) show that banks which are more reliant on wholesale funding were significantly more likely to fail during the crisis as well. Banks with a more diversified income structure, in contrast, were found to be more stable. Common to both studies is their focus on listed banks. Such banks are usually larger and more investment-oriented.

We follow the literature (e.g. Stiroh, 2004a,b; Stiroh and Rumble, 2006; Demirgüc-Kunt and Huizinga, 2010) and measure bank risk using the Z-score, defined as the number of standard deviations by which a bank's return on assets has to fall for the bank to become insolvent. The Z-score is, hence, an indicator of insolvency risk. Because we are interested in the overall stability of business models, we use the Z-score as our main indicator of bank risk. In addition, we examine the impact of non-interest income and non-deposit funding on the profitability and capitalization of banks, and analyze which business models expose them to greater income volatility.

Our paper contributes to the literature in three important aspects. First, we include in our sample a large number of unlisted banks. This should give a more representative picture of the EU banking sector. Including unlisted banks also enlarges the number of bank types analyzed, since savings and cooperative banks are typically not listed. For example, among the unlisted banks in our sample, more than two-thirds are savings and cooperative banks. We believe this to be important for the broader applicability of the results. Second, unlike previous studies, we make several sample splits and examine whether the effect of income and funding diversification differs across bank types, in general, and between investment- and retail-oriented banks, in particular. We think that this should allow us to better identify the impact of income and funding diversification on the level of risk and return. Third, our paper analyzes the impact of non-interest income and non-deposit funding on bank stability for a more recent period that comprises the years between 2009 and 2011. This is important, since retail-oriented banks were much less affected by the financial crisis of 2007/2008 than investment-oriented banks, because most of their activities were funded by customer deposits, which were more stable during the crisis. They are also less dependent on non-interest income, which was much more volatile during the crisis than investment-oriented banks. While this made them more stable during the financial crisis, their retail-orientation might have made them less stable thereafter owing to the economic downturn and the worsening of credit quality. This might particularly affect banks with large-scale lending activities, such as smaller banks with a retail focus. Moreover, owing to the expansionary monetary policy during this period, interest rates have shown a significant decline and depressed net interest margins. Due to their reliance on interest income, retail-oriented banks are particularly affected by this reduction.

We show that business models differ considerably across bank types. While listed banks, in general, and investment banks, in particular, have a large share of non-interest income and are more dependent on non-deposit funding, which is characteristic of banks with an investment-oriented business model, unlisted banks such as savings and cooperative banks are more retail-oriented and fund most of their activities by customer deposits and provide predominantly loans. Our results indicate that such differences have a major effect on the way in which a larger share of non-interest income and non-deposit funding affects bank stability and return.

More specifically, we find that smaller banks, in general, and savings and cooperative banks, in particular, will be significantly more stable if they generate a larger share of their income from non-traditional activities, but will be less stable if they increase their share of non-deposit funding. This contrasts with investment banks, which will be significantly more stable if their share of non-deposit funding increases. However, we also find that these banks will become more prone to risk if they increase their share of non-interest income. Unlike retail-oriented banks, banks already derive a large share of their income from non-traditional activities. Because of this, they might overdiversify if they increase their share of non-interest income further, which raises their default risk. Investment banks also differ with respect to the non-traditional activities from retail-oriented banks. While the latter usually earn account administration, loan and consultancy fees and commission income from the sale of insurance products and the like, investment-oriented banks derive most of their non-interest income from underwriting, treasury management, securitization and clearing and other transaction-related services. Income from the latter type of activities is usually more volatile, because it is more closely linked with market evolution. This indicates that the risk characteristics of these two types of activities are fundamentally different (DeYoung and Torna, 2013). Because of these differences, retail-oriented banks might be affected in a different way than investment banks if they increase their share of

[1] Many studies focus on US banks (see, for example, DeYoung and Roland, 2001; DeYoung and Rice, 2004; Goddard et al., 2008 and several papers by Stiroh, 2004a,b; Stiroh and Rumble, 2006). For Europe, the evidence is also mixed. Lepetit et al. (2008), for example, show that banks that have expanded their non-interest income activities are more risky than banks that mainly supply loans. Mercieca et al. (2007) obtain similar findings for a sample of small European banks. Chiorazzo et al. (2008), in contrast, finds that Italian banks will have significantly higher risk-adjusted returns. For Germany, Busch and Kick (2009) show that savings and cooperative banks will be significantly more profitable as well if they increase their share of non-interest income, while they find no impact of non-interest income on the profitability of commercial banks. There are also findings which suggest that banks from developing countries benefit from a better revenue diversification (Sanya and Wolfe, 2011).