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journal homepage: www.elsevier.com/locate/jfiA comprehensive view on risk reporting: Evidence from supervisory data[☆]Puriya Abbassi^{a,*}, Michael Schmidt^b^a Deutsche Bundesbank, Wilhelm-Epstein-Str. 14, 60431 Frankfurt am Main, Germany^b SAFE, GSEFM, Goethe University Frankfurt, Frankfurt am Main, Germany

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ABSTRACT

We show that banks' risk exposure in one asset category affects how they report regulatory risk weights for another asset category. Specifically, banks report lower credit risk weights for their loan portfolio when they face higher risk exposure in their trading book. This relationship is especially strong for banks that have binding regulatory capital constraints. Our results suggest the existence of incentive spillovers across different risk categories. We relate this behavior to the discretion inherent in internal ratings-based models which these banks use to assess risk. These findings imply that supervision should include a comprehensive view of different bank risk dimensions.

1. Introduction

Since the mid-1990s, banking regulators globally have allowed banks the discretion to use their own models to assess risk and thus calculate capital needs. The financial crisis, however, has triggered a fundamental debate among scholars and regulators about this flexibility given to banks to scale their regulatory capital (e.g., Haldane, 2013). Many observers distrust the complicated models that banks use, which they say tend to make assets look safer than they really are. Therefore, recent initiatives by regulatory bodies are aiming for simpler rules which are harder to manipulate (BCBS, 2016; Coen, 2016) and closer to what is deemed optimal from a benevolent regulator's perspective (Glaeser and Shleifer, 2001). An important argument against new measures, though, is that simpler rules are less efficient with respect to capital allocation and thus more stringent. As a result, banks would have to increase their capital or reduce lending with potential real effects on the economy (Dombrovskis, 2016).¹ To address malfunctions in an efficient manner but prevent over-regulation, it is crucial to understand how and why banks potentially use the discretion inherent in their models.

Recent studies show that banks using the internal ratings-based

(IRB) approach economize on capital by systemically reporting lower risk within a specific asset category, e.g., credit risk in the banking book (Mariathan and Merrouche, 2014; Plosser and Santos, 2014; Behn et al., 2016; Firestone and Rezende, 2016; Berg and Koziol, 2017), or market risk in the trading book (Begley et al., 2016). We complement this literature by assessing different bank risk dimensions comprehensively and ask whether banks report lower risks in one asset category to cross-subsidize risks (and losses) in another asset category. The idea being that, if banks can economize on capital by strategic risk-reporting in the banking book, they could use the 'freed capital' to cross-subsidize risk associated with assets in the trading book and thereby insulate their official capital adequacy ratio. In essence, banks would be less capitalized than what official capital ratios suggest and thus create a more fragile banking system. The implications of such a comprehensive risk management would be threefold: first, banks would use the regulatory discretion to manage short-term adverse market risk fluctuations. Second, banks would optimize risk and thus regulatory risk weights at an aggregate overall risk level as opposed to an asset-specific risk level. Third, supervisors should include a comprehensive view of the different bank risk dimensions. To the best of our knowledge, this is the first study that examines the cross-subsidy incentivized risk reporting across

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¹ Behn, Haselmann, and Wachtel (2016) and Jiménez, Ongena, Peydró, and Saurina (2017) (among many others) document how capital regulation affects lending.

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regulatory asset charges.

To examine this question, we use a unique, proprietary dataset from the Deutsche Bundesbank (the German central bank), which collects supervisory information on internal credit risk ratings for the loan portfolio of all banks in Germany using the IRB approach (hereafter: IRB banks). In particular, the data comprises IRB banks' estimates of creditors' one-year probability of default (PD) and the creditor-specific risk-weighted asset at the borrower-bank-time level for the period between 2008:Q1 and 2012:Q4. The granularity of the internal credit risk ratings for the loan portfolio of each IRB bank allows us to examine the differential PD reporting by banks and across borrowers. Notably, we also have access to quarterly supervisory data on market risk-weighted assets for trading book assets (hereafter: mRWA or market RWA) for each IRB bank during each quarter (BCBS, 2013). This allows us to examine whether IRB banks report credit risk ratings depending on their market risk exposure. Our exhaustive dataset is matched with comprehensive balance sheet information.

The testable hypothesis, which we study in this paper, is that IRB banks report lower credit risk for their loan portfolio when they have higher market risk exposure (as compared to banks with lower market risk exposure). Our results suggest the existence of incentive spillovers across these two risk categories. On average, an IRB bank with a one-standard deviation higher market RWA reports lower PDs by 0.03 percentage points, which is equivalent to a reduction of risk weights by about 3.57 percentage points and thus economically significant. Conditioning on the level of the regulatory Tier 1 capital ratio, we find that this effect is more pronounced for banks with more binding capital constraints (lowest 25th percentile of Tier 1 ratio). These results are robust to an exhaustive set of various fixed effects and bank-level controls.

To tease out the potential channels behind this finding, we examine and discuss three mutually non-exclusive possibilities, all of which relate to the level of discretion inherent in the models used under the IRB approach. First, we find that our result only holds for banks using the Advanced-IRB approach but not for banks that employ the Foundation-IRB approach. These findings suggest that there is self-selection when banks decide which approach (A-IRB vs. F-IRB) they should choose. That is, especially those banks that tend to exploit the greater degree of discretion may choose the A-IRB approach over F-IRB.

Second, we find that incentive spillovers across these different risk categories are weaker when market discipline is higher and stronger for less transparent borrowers with respect to fundamental information. Third, we find that more stringent regulatory supervision hampers the use of IRB model discretion for some banks, but not for institutions with stricter capital constraints. However, the latter finding might also be a result of the fading effect of the financial crisis. Both interpretations nevertheless suggest a more comprehensive view of risk reporting is required in future supervisory practice.

These results contribute to the growing literature in banking that investigates the link between risk reporting and bank capital under current internal ratings-based regulation (Mariathan and Merrouche, 2014; Plosser and Santos, 2014; Begley et al., 2016; Behn et al., 2016; Behn et al., 2016; Firestone and Rezende, 2016; Berg and Koziol, 2017). While these studies focus solely on how banks report risk in one asset category to economize on regulatory capital, our paper reveals two new dimensions: first, we show that banks use their risk reporting as a device to manage risk across different asset categories and, second, that banks optimize risk weights at the risk-comprehensive level rather than at the specific-risk level. In this regard, our paper is also connected to current debates on banking (capital) regulation (e.g., see Kashyap et al., 2008; Admati and Hellwig, 2013; Admati et al., 2013; Haldane, 2013; Dombrovskis, 2016). Our findings suggest that regulators can curtail the documented strategic risk reporting by taking a comprehensive view on the different bank risk dimension in the ongoing supervision.

Our work also adds to the literature on risk-management practice in banking (e.g., see Ellul and Yerramilli, 2013), which examines the role

of strong and independent risk management for the resilience of banks' exposure to tail risk. Our findings highlight, that strategic risk management can have severe consequences for the existence of an institution from a microprudential perspective. With incentive spillovers across different risk categories, banks reduce or even isolate the otherwise adverse effect on their official capital ratio, making the institution more prone to shocks, both with respect to the asset side (higher risk related to assets) and with respect to the liability side (less capitalized relative to the engaged risk). This is a form of incentive risk reporting unintended by the regulator. In this respect, our paper also relates to the literature on regulatory arbitrage (e.g., see Huizinga and Laeven 2012; Acharya et al., 2013; Boyson et al., 2016).

At a broader level, our results also relate to the literature that examines the misreporting incentives in financial markets (e.g., Piskorski et al., 2015; Griffin and Maturana, 2016) and the related role of incentives and information in the estimation of risk measures (Rajan et al., 2010; 2015). Our results highlight the importance of a regulatory design that elicits truthful disclosure of risk, which is a prerequisite step to the current discussion on the optimal level of regulatory capital banks need to hold. In this regard, our paper also contributes to the literature that examines the reliability and credibility of risk weights (e.g., Das and Sy, 2012; Le Leslé and Avramova, 2012, among others). Official capital adequacy ratios must reflect the actual truthful risks in order for them to be a proper regulatory tool for both the microprudential and macroprudential policy.

The remainder of the paper is structured as follows. In the next section, we will discuss the institutional details of current IRB-regulation. Section III presents our data set. Section IV shows our empirical strategy and presents our results. Section V concludes.

2. Institutional setting

The current regulatory framework (Basel II and Basel III) relies on the concept of risk-sensitivity and links capital charges to the risk associated with the assets held. More precisely, minimum capital charges are determined on the basis of core capital as a fraction of the (unweighted) sum of RWA across all sources of risk (total RWAs). On average, around 70% of bank's assets are allocated to lending and roughly 20% to securities investments (see Table 2). This means that both, credit risk (i.e., credit RWA) and market risk (i.e., mRWA) account for the largest part of the variation in bank's total RWA.

The regulator allows banks to use their own internal ratings-based (IRB) models to calculate risk weights (as opposed to standard risk weights, see BCBS, 2006). Under IRB, banks assess the risk weights in their credit portfolio such that each individual borrower receives a borrower-specific risk weight. The estimation of the borrower-specific risk weight relies on the bank's own borrower-specific estimated probability of default over the subsequent year. That is, reported PDs for a given creditor assess the credit risk over a one-year horizon irrespective of the loan-specific characteristics such as the actual maturity and the loss given default. Further, even though internal credit risk models are used on a portfolio basis, borrower-specific PD estimations are invariant to the bank's credit portfolio insofar that the capital required for a given loan depends only on the risk of that loan but not on the portfolio it is added to (BCBS, 2006).

The assessment of risk weights for trading book assets is somewhat different. For internal market risk weighting, IRB banks use internal Value-at-Risk (VaR) models that are based on their own assumptions with respect to correlation between all trading assets; that is, in contrast to credit risk, for market risk the required capital for a given trading asset depends on the portfolio it is added to. Also, in calculating value-at-risk, IRB banks typically assume an instantaneous price shock equivalent to a 10-day movement in prices. But in principle, the rationale remains the same insofar that a bank that uses the IRB approach can apply its own judgement on (i.e., use models to assess) how risky an investment is and thus on how much capital needs to be held. That is,

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