



Geographic diversification in banking[☆]



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ABSTRACT

In the aftermath of the 2007–2009 crisis, banks claiming positive diversification benefits are being met with skepticism. Nevertheless, diversification might be important and sizable for some large internationally active banking groups. We use a universally applicable correlation matrix approach to calculate international diversification effects, in which bank subsidiaries are treated as individual assets of the banking group portfolio. We apply the framework to 49 of the world's largest banking groups with significant foreign business units over the 1992–2009 period. Focusing on the most important risk in banking, credit risk, we find that allowing for geographical diversification could reduce banks' credit risk by 1.1% on average, with risk reduction ranging from negligible up to 8%.

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1. Introduction

In the run up to the 2007–2009 crisis, there was a strong lobby to incorporate diversification effects in regulatory risk metrics. It was argued that such diversification effects should be incorporated into the calculation of banks capital requirements under the second pillar of the New Capital Adequacy Framework, commonly referred to as Basel II, as this was expected to result in lower capital charges.¹ Basel II's predecessor, Basel I, largely

ignored the existence of diversification benefits for banks when calculating regulatory capital to cover risks.

Diversification effects might nevertheless exist in a banking group and even be sizable. Technically, they are generated by less than perfect correlation of country specific risks in a banking group operating in different countries, leading to lower than simple-sum aggregate risk for the banking group. If, for example, a subsidiary in Brazil suffers large losses due to a local economic downturn, this does not necessarily mean that a subsidiary in Spain will perform poorly as well. In fact, the Spanish subsidiary might compensate for the Brazilian losses.

Realistic accounting for diversification would allow for a better understanding of the actual risks of banks, which could aid the prevention of costly bank failures. Banks face both systematic and idiosyncratic risks and in theory, all idiosyncratic risk can be diversified away. In practice, however, this may not be possible. This paper is therefore of interest to risk managers, bank supervisors, and to society as a whole because banking crises can be very costly.

Regulators are currently reluctant to acknowledge diversification effects for two main reasons: (1) no consensus exists among risk managers and banking supervisors on how diversification effects should be measured; and (2) because a banking group's

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¹ Diversification effects are currently considered to a limited extent within risks. Diversification between risks or geographical diversification is only considered under the second pillar.

country business units are regulated in different jurisdictions, it is problematic for regulators to allocate the risk reduction to each separate international entity of the banking group. Allowing for diversification effects requires supra-national banking regulation, which is still in its infancy. Pragmatically, the crisis seemed to have hit diversified and undiversified banks alike although banks with diversified funding seem to have fared better, at least initially. The focus of this paper is on the first of these two problems.

This paper contributes to the empirical literature on international diversification in banking by gauging the magnitude of international risk diversification benefits for 49 of the world's largest banking groups. We consider one risk type, credit risk, as this is the most important risk in banking. Using a universally applicable correlation matrix approach, we estimate geographic credit risk diversification effects in internationally active banking groups. The international dependencies between credit risks at the national level are proxied by country business cycle correlations. Several existing studies investigate diversification effects in banking, but to our knowledge, no international comparative study exists for large, internationally active banks.

The set-up of this paper is as follows: Section 2 discusses the existing literature on diversification in banking and Section 3 introduces the theoretical concepts underlying diversification effects, such as Value-at-Risk and alternative methods for measuring diversification. Section 4 discusses the correlation matrix methodology by which we measure international diversification effects in banking, Section 5 discusses the data that we use for this approach, and Section 6 discusses our empirical results. Finally, Section 7 summarizes and concludes with our main findings.

2. Existing literature

The empirical literature on diversification in banking consists of the following three broad streams²: (1) international portfolio diversification; (2) diversification in banking within countries; and (3) international diversification in banking. This section provides an overview of all three streams, while the paper contributes to the third of the streams by applying a new approach to measuring international diversification in banking.

Pioneering work by Markowitz (1952) studies diversification effects in asset portfolios. Applying his portfolio diversification theory to multiple lines of business within a firm, an extensive literature has suggested that multiple lines of business can achieve risk reduction as the cash flows of different business segments are imperfectly correlated (Lewellen, 1971; Amihud and Lev, 1981). Extending this research to international portfolio diversification,³ early studies include Grubel (1968), Levy and Sarnat (1970). All find that risk reduction depends on the correlations between return distributions of individual securities, which tend to be lower between countries than within countries. In a more recent study on international portfolio diversification, Buch et al. (2010) apply a mean-variance portfolio model to study international diversification gains in asset portfolios of banks located in France, Germany, the United Kingdom, and the United States using aggregate data on cross-border claims of banks during 1995–1999. Their main finding is that cross-border diversification entails considerable gains, since banks are likely to benefit from diversifying risks on their balance sheet by lending internationally through an improvement in the risk-return trade-off given the diversification of country-specific risks.

While the theory of diversification in portfolios of securities is well understood, the application of these ideas to gauge domestic diversification in banking is less straightforward. For example, Deng and Elyasiani (2008) find that geographic diversification is associated with value enhancement and risk reduction for U.S. bank holding companies. However, Morgan and Samolik (2003) show that domestic geographical diversification of U.S. banks is not associated with higher returns or lower risk. Acharya et al. (2006) examine the effect of focus versus diversification on the return and the risk of banks using data from 105 Italian banks between 1993 and 1999. Taking the Herfindahl–Hirschman index as their measure and focusing on diversification across different industries, sectors and local geographical regions within Italy, their main finding is that local geographical diversification did not necessarily improve the risk-return trade-off of banks. Thus diversification of bank assets is not guaranteed to produce superior performance and/or greater safety for banks. For financial conglomerates, which combine banking with other activities, results are mixed; Schmid and Walter (2009) report a significant diversification discount for U.S. financial conglomerates while for European conglomerates, Van Lelyveld and Knot (2009) find no universal discount. Supporting the diversification discount argument, Goetz et al. (2013) show that geographic diversification of bank holding companies across U.S. reduces their market valuations. Francis et al. (2011) find that geographical expansion results in higher levels of risk taking for U.S. banks. According to these studies, the synergy gains from diversification in banking within countries are limited, possibly caused by strong co-movement of fundamental economic variables within countries.

Not surprisingly, the co-movement of fundamental economic variables is likely to be weaker between countries than within countries, which brings us to the third stream of the diversification literature: international diversification in banking. This strand of literature emphasizes that the benefits of international diversification in banking could potentially be large because economic risks across markets are less correlated (Dell'Ariccia and Marquez, 2010). For example, Griffith-Jones et al. (2004) argue that unexpected losses on a portfolio diversified across developed and developing markets will be lower than those on a portfolio that focuses on developed markets exclusively, and support this with a modified CreditMetrics simulation approach. Although providing strong support for the likelihood that diversification effects are substantial, Griffith-Jones et al.'s approach is not easily applicable to real-world cases. Using the same theoretical basis as Griffith-Jones et al. (2004), we use an approach that can be applied to actual real-world banking groups to determine the magnitude of international credit risk diversification effects. Moreover, using publicly available data, we apply our approach to 49 of the world's largest banking groups.

Reflecting the growing interest in this topic, several empirical studies have recently emerged. Cetorelli and Goldberg (2012) find evidence that global banks rely on overseas operations to insulate themselves from liquidity shocks when monetary policy in home countries becomes tighter. Regulators should consider the distribution of bank failure across countries for multinational banks when designing deposit insurance and bailout policies (Mälkönen and Niimäki, 2012). Using a dataset of portfolios of individual bank loans of 983 German banks across the 1996–2002 period, Hayden et al. (2007) address the issue of focus versus diversification in banking by investigating whether geographic diversification leads to increased performance, and hence greater safety on the part of banks. To do so, they analyze the link between bank profitability and portfolio diversification as measured by the Herfindahl–Hirschman index across different industries, sectors and geographic regions. Their results indicate that each

² Garcia-Herrero and Vazquez (2013) make a similar broad distinction of categories for the empirical literature on diversification in banking.

³ See for example Lintner (1965).

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