The impact of off-balance-sheet activities on banks returns: An application of the ARCH-M to Canadian data

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A B S T R A C T

This paper revisits the impact of off-balance-sheet (OBS) activities on banks risk-return trade-off. Recent studies (e.g., Stiroh and Rumble, 2006) show that increasing OBS activities does not necessarily yield straightforward diversification benefits for banks. However, introducing a risk premium in the standard banks returns models, and resorting to an ARCH-M procedure, Canadian data suggest that banks risk-return trade-off displays a structural break around 1997. In the second subperiod of our sample (1997–2007), we find that the noninterest income generated by OBS activities no longer impacts banks returns negatively. While during the first period (1988–1996) the volatility variable is not significant in any returns equations, a risk premium eventually emerges, pricing the risk associated to OBS activities.

1. Introduction

Beginning in the 1980s, financial deepening\textsuperscript{1} and financial innovations led to a more market-oriented structure, with firms increasingly relying on financial markets to fund their investments, an evolution observed both in Canada, the United States and elsewhere (Boyd and Gertler, 1994; Calmès, 2004; Roldos, 2006).\textsuperscript{2} This evolution gave way to a major change in corporate financing, characterized by a relative decrease in the share of banks loans (i.e. indirect financing) and an increased share of bonds and stocks. This financial transformation challenged the banking business and justified, in part, the financial deregulation waves. Banks were progressively allowed to act as security dealers and to offer fiduciary services and portfolio advices to investors. They also began to securitize loans, a move in line with the financial deepening process.\textsuperscript{3} These kinds of non-traditional activities are loosely classified as OBS (off-balance sheet) activities – i.e., activities related to commission and fee income, trading income and other noninterest income. At first, banks might have thought that these new types of activities could lead to important diversification benefits, with an improvement in their risk-return trade-off (Rose, 1989; Saunders and Walter, 1994). Indeed, the decision to diversify might be considered endogenous (Campa and Kedia, 2002; Stiroh and Rumble, 2006; De Jonghe, 2009) and the result of an optimization process, theoretically leading to a better risk-return trade-off on an expanded efficient frontier. However, banks can also use diversification benefits to actually take more risk, holding less capital and granting more loans, especially through securitization, which then becomes a “money machine” (Demsetz and Strahan, 1997; Buiter, 2009). As a matter of fact, in the United States, researchers find that OBS activities triggered a substantial increase in the volatility of banks’ net operating revenue growth.
To shed more light on this phenomenon, we consider three hypotheses using aggregate data about the whole Canadian banking system. First, we check the impact of OBS activities on the aggregate banking risk-return trade-off over the whole sample, which runs from the first fiscal quarter of 1988 to the last fiscal quarter of 2007. Doing so, we can confirm that OBS activities increase banks risk in Canada. Over the whole sample period, our results show that OBS activities actually reduce Canadian banks mean accounting returns, while they also increase the volatility of bank net operating revenue growth. However, as in the European studies, we find an improvement in the risk-return trade-off over the period 1997–2007, OBS activities leading to greater returns on assets and equity. As their European counterparts, Canadian banks have more experience in OBS activities than US banks. Indeed, Canadian banks have been allowed to perform brokerage activities since 1987, whereas they began only in 1999 in the US. In any case, the surge in OBS activities actually increases the banking system riskiness. To explain the paradoxical weakness of the diversification benefits associated to OBS activities, and rationalize the deterioration of the risk-return trade-off observed in Canada over the 1988–2007 period (Calmès and Théoret, 2009a,b), we resort to the commonly accepted view that noninterest income, being more related to aggregate shocks (compared to interest income), increases the exposure of banks to market conditions, and more generally to macroeconomic shocks, which are not easily diversifiable, and whose relative importance tends to grow relative to idiosyncratic shocks (Houston and Stiroh, 2006; Baele et al., 2007). This risk-return worsening is also partly explained by bank herding behaviour – a collective reaction of banks to aggregate shocks – which contributes to increase the risk exposure of the whole banking system (Baum et al., 2002, 2005; Calmès and Salazar, 2006; Quagliariello, 2006).

The second hypothesis we want to test regards the change in banking business, the new practices that lead to a better integration of the traditional bank lending activities with OBS ones. This change is associated to a structural break in 1997, which coincides with a sharp increase in the volatility of banks net operating revenues growth and in the ratio of noninterest income. 1997 is a natural break since it is precisely at this time that Value-at-Risk (VaR) became the standard bank risk measure. The VaR, being based on returns volatility, has a tendency to underestimate the negative impact of fat tails. This may have induced banks to blindly increase their total leverage with riskier activities, and particularly OBS activities. It certainly explains a great deal of the increased bank income volatility in the immediate years following 1997. In this respect, the results we find are consistent with the recent changes observed in the banking industry and the gradual adaptation to new, non-traditional activities, which Adrian and Shin (2009) call shadow banking. As it is usually the case, financial markets and institutions eventually adjust to financial innovations (Calmès, 2003; Caballero and Engle, 2003; Delong and DeYoung, 2007). Incidentally, our results are also in line with the study of Baele et al. (2007) who find diversification benefits in a large sample of European banks. The authors explain their contradictory results in regard to the American experience by noting that European banks have more expertise in OBS activities than their US counterparts, these activities being allowed since 1989, i.e. 10 years before the USA. Baele et al. (2007) also note that Europe has a long tradition with investment banking, which is not the case for US banks.

Last but not least, our third hypothesis concerns the emergence of a risk premium over the last period (i.e. 1997–2007), eventually pricing the increased risk associated to surging OBS activities. Our results suggest that OBS activities are actually endogenous, a fact generally overlooked in previous studies on banks risk-return trade-off. To the best of our knowledge, Baele et al. (2007) is one of the rare studies considering explicitly the relation between OBS activities and the risk premium required to price the risk associated to these activities. They find that a bank which is more oriented towards non-traditional banking activities has a higher market beta. Although our results are consistent with theirs, our approach is not. Baele et al. (2007) study is based on cross-section data, while ours adopts an ARCH-M approach to the study of time series comprising the whole Canadian banking system – i.e. aggregate data.

In this respect, the main contribution of this paper is to apply a new empirical framework to study the recent changes in the relationship between various measures of banks returns and the share of noninterest income. We analyze the emergence of a risk premium accounting for the riskiness of OBS activities with a model of banks returns estimated by ARCH-M (Engle et al., 1987), a novelty in this literature. From the standpoint of asset pricing theory, to consider risk-adjusted measures only is not completely satisfying when returns are not first-degree homogenous in volatility – precisely the case with banking data. Instead, the volatility should appear on the RHS of the returns equations, as it is usually the case in asset pricing. Running this kind of experiment reveals that banks
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