



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

Christian Calmès^{a,*}, Raymond Théoret^b

^a *Chaire d'information financière et organisationnelle, École des sciences de la gestion (UQAM), Université du Québec (Outaouais), 101 St. Jean Bosco, Gatineau, Québec, Canada J8X 3X7*

^b *Chaire d'information financière et organisationnelle, École des sciences de la gestion (UQAM), Université du Québec (Montréal), 315 Ste. Catherine, Montréal, Québec, Canada H2X 3X2*

ARTICLE INFO

Article history:

Received 18 August 2009

Accepted 25 March 2010

Available online 31 March 2010

JEL classification:

G20

G21

Keywords:

Regulatory changes

Noninterest income

Diversification

Structural break

Shadow banking

Risk premium

ABSTRACT

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.

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1. Introduction

Beginning in the 1980s, financial deepening¹ 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).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 finan-

cial deepening process.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

* Corresponding author. Tel.: +1 819 595 3000 1893; fax: +1 819 773 1747.

E-mail addresses: christian.calmes@uqo.ca (C. Calmès), raymond.theoret@uqam.ca (R. Théoret).

¹ The expression “financial deepening” refers here not only to disintermediation and increased liquidity but also to greater market completeness.

² On this, see also the recent evidence in Brown and Petersen (2009).

³ Many non-banks financial institutions also experience a substantial increase in their noninterest income since the end of the 1980s. For the US credit unions experience, see Goddard et al. (2008).

(Acharya et al., 2002; Stiroh, 2004a, 2006b; Stiroh and Rumble, 2006; Lepetit et al., 2008b; De Jonghe, 2009). This volatility surge does not seem to be associated to greater, absolute or risk-adjusted (accounting) measures of bank returns – i.e. the return on assets or the return on equity. Actually, these measures of banks returns decreased with the upward trend in the share of noninterest income. Given the direct link between accounting measures of bank performance and the level and volatility of bank market returns, this situation might be perceived as problematic by banks stakeholders.

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 2007.⁴ 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.⁵ 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).⁶ 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 nat-

ural break since it is precisely at this time that Value-at-Risk (VaR) became the standard bank risk measure.⁷ 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 1997.⁸ 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.⁹ 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.¹⁰

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.¹¹ 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

⁴ Note that the involvement of Canadian banks in OBS activities was quite restricted before 1987, banks being not allowed to get involved in investment banking until this date. For example, before 1987, Canadian banks reported very low commissions.

⁵ On this matter, remind the arguments of DeYoung and Rice (2004), Baele et al. (2007), Lepetit et al. (2008a), Busch and Kick (2009), and Gropp and Heider (2009). They argue that, since universal banking has been the historic norm in many European countries, these banks may be more experienced and performing in generating noninterest income, like fees income, and in exploiting diversification benefits. The argument may be transposed *pari passu* to the case of Canadian banks, which got involved in OBS activities before US banks.

⁶ See also Wagner (2006, 2010) and Coval et al. (2009a,b). Note, however, that these authors do not necessarily refer to the correlation of the share of noninterest income with aggregate shocks (both macroeconomic and financial) but rather to bank herding and the tendency they have to strategically imitate the behaviour of their competitors. The literature suggests that decision complementarities and externalities in the decision to get involved in OBS activities eventually generate an increase in banking risk, such that the regulator should be more concerned by the consequence of one bank action on the system than by its specific risk-taking behaviour (De Jonghe, 2009).

⁷ For details on the Canadian banks VaR experience since 1997, see Pérignon et al. (2008).

⁸ As evidenced by Canadian financial flows accounts, the magnitude of banks financial flows also jumped after 1997, providing an additional indication that Canadian banks were entering into a new risk regime.

⁹ Loosely speaking, this new banking is the result of a maturation process understood both as a progressive change in the banks activities mixture and a learning-by-doing or learning-by-observing adaptation to new business lines. For more on this, see Delong and DeYoung (2007).

¹⁰ Note that Stiroh (2004b) also proposes this explanation for the diversification benefits of OBS activities when banks objective is profits maximization. He notes that gaining experience in their interest income generating activities also took a long time. The same process could be at play for noninterest generating activities. Eventually, the performance gap should close. But if banks had other objectives than profit maximization, the deterioration of the risk-return trade-off (due to OBS activities) could persist. This would be the case if managers were maximizing their self-interests, the case of agency costs. But, in light of the European experience, which seems shared by Canada, we are inclined to prefer the former scenario, i.e. a maturation under way.

¹¹ See also Stiroh (2006a).

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