The effect of the US subprime crisis on Canadian banks

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ABSTRACT

We examine whether the Canadian banking sector was afflicted by financial contagion from the 2008 subprime crisis in the United States financial sector. We find that Canadian banks were affected by contagion, though those with higher liquidity withstood better its adverse effects. Our results indicate that Canadian banks that had more transparent asset practices appear to be less adversely affected by contagion. However, higher levels of real estate-related assets including mortgage-backed securities worsened the impact of contagion.

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We examine the nature of impact of the subprime crisis in the United States (US) financial sector on Canadian banks.[1] There appears to be a broad consensus in the financial press and among members of the international financial institutions that Canadian banks managed to withstand the ravages of the US subprime crisis.[2] The five largest Canadian banks were ranked among the world's top 40 safest banks for 2009.[3] However, while the resilience of Canadian banks during the recent financial crisis has been commented upon in the financial press, there has been little academic work on this issue. This work is intended to fill this void.

Commentators have attributed the strength of Canadian banks to two distinct sets of reasons, which can be broadly classified as economic, and political or regulatory. On the economic dimension, Canadian banks benefit from depository funding rather than other sources of funding, low leverage and low levels of securitized loans (Ratnovsky & Huang, 2009), higher liquidity and larger capital bases (Richburg, 2008), regulatory leverage constraints (Bordeleau, Crawford, & Graham, 2009), access to a larger capital buffer during expansions than in recessions (Guidara, Lai, Soumaré, & Tchana, 2013), and diversification benefits from non-interest income activities (Guidara, Gueyié, Lai, & Soumaré, 2014).

On the regulatory front, Krugman (2010) comments on better monitoring of Canadian banks by their regulators and Arjani and Paulin (2013) find that prudent risk-management practices at the major Canadian banks, fostered by the domestic regulators, primarily the Office of the Superintendent of Financial Institutions (OSFI), helped the Canadian banking sector to respond to the financial crisis better than many of their global peers. Bordo, Redish, and Rockoff (2015) contend that following deregulation in the 1980s, Canadian chartered banks acquired mortgage banks and investment dealers and became universal banks but were regulated by a single Canadian regulator, the OSFI. Bordo et al. (2015) argue that deregulation in the US in the 1980s resulted in the development of an unregulated shadow banking system, the growth of securitization and off balance sheet entities, and excessive speculation while continuing the fragmented US regulatory structure. The repeal of the Glass–Steagall Act by the Gramm–Leach–Bliley Act in 1999 expanded US banks' investment opportunities by allowing them to expand into new geographic markets and provide non-banking financial services such as investment banking, securities brokerage, and insurance sales. However, deregulation exacerbated the issue as it led to the expansion of the investment banking sector rather than the absorption of investment banks by universal banks as occurred in Canada. Deregulation encouraged

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[1] The financial crisis that originated in large-scale delinquencies in subprime mortgage loans made by US mortgage lenders has been extensively discussed in the literature. Demyanyk and Hemert (2011) contains a detailed discussion of the crisis and its implications. Also see Appendix 1 for a brief summary of the sequence of main events surrounding the crisis in the US and Canada.

[2] There has been considerable discussion in the financial press about the extent to which the Canadian financial sector has been isolated from the subprime crisis. See for example, Heinrich (2008), Dupuis, Durocher, and St-Maurice (2008), Kay (2008), and Carswell (2009).

[3] *Global Finance* magazine prepared a list of the "World's 50 Safest Banks" by comparing the long-term credit ratings and total assets of the 500 largest banks around the world. The comparison includes ratings from Moody's, Standard and Poor's, and Fitch. The rankings for 2009 are available at http://www.gfmag.com/awards-rankings/best-banks-and-financial-rankings/worlds-50-safest-banks-2009.

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increased risk-taking in the sector, as indicated by higher levels of credit risk, fee income from non-traditional services, and private mortgage securitizations.

Calomiris and Haber (2013) state that whereas in the US, where regulations were often used to serve political interests, successive Canadian governments have not used banking policy to subsidize credit to its political constituencies, resulting in less systemic risk exposure for the Canadian financial system. Commentators state that these strengths helped Canadian banks achieve a high level of resilience that helps counter financial crises. For example, Calomiris and Haber (2013) point out that the "United States has suffered 12 systemic banking crises since 1840, while Canada has had none," which speaks to the resilience of the Canadian banking system vis-à-vis US banks.[4]

A distinctive feature of the Canadian banking sector is that it is dominated by six large universal banks.[5] This is in contrast with the existence of a large number of large and mid-sized banks in the US. We use the sample of six Canadian banks, representing 90% of the assets of Canadian banks that report to regulators, to estimate the extent of the subprime crisis contagion from the US to Canada. For the US banks, we use a sample of 14 banks where each bank has total assets greater than $100 billion in 2006.

We examine a number of inter-related issues. First, we examine if, as claimed by the financial press and economic commentators, Canadian banks were able to completely withstand the economic ravages of the 2007–2009 financial crisis which devastated the financial sectors in the US and European Union. In our analyses of the spread of the crisis across national boundaries, we use two different approaches, both relying on the concept of contagion.[6] First, we estimate the probability with which extreme negative stock returns of Canadian banks are correlated with the extreme negative movements of an index of US banks' returns, during and surrounding the financial crisis period. In a different approach to measuring contagion, following Bae, Karolyi, and Stulz (2003), we identify periods of financial contagion when the frequency of simultaneous extreme negative daily bank returns for multiple banks exceeds the frequency of simultaneous extreme positive bank returns. This estimation is done for both countries separately and for the pre-crisis, crisis and post-crisis periods. Based on both approaches, we report systematic evidence that the Canadian banks were not isolated from the US financial crisis. We also examine whether banks' economic indicators, such as, deposit funding, liquidity and capitalization, played any role in the transmission (or otherwise) of the crisis from the US to Canadian banks. We find that Canadian banks with high liquidity and deposit funding are less likely to have been afflicted by the financial contagion.

We also provide some *indirect* measures of US *versus* Canadian bank regulatory monitoring. We focus on financial accounting information in enhancing regulators' ability to monitor banks asset quality. In particular, we compare the properties of US and Canadian banks' annual *loan loss provisions* (LLP), a financial statement item that is charged to net income, because *loan loss reserves* or *allowance for loan losses* is the focus of guidelines of the Federal Deposit Insurance Corporation (FDIC, 2006)[7] to Bank Examiners for evaluating banks' accounting systems and the quality and transparency of bank assets.[8] Similar guidelines are also issued by the Basel Committee on Bank Regulation.

Bushman and Williams (2015) emphasize that loan loss provisioning is of interest to regulators since it directly influences the volatility and cyclicality of bank earnings as well as the quality of bank asset portfolios. Recent work by Beatty and Liao (2014) and Bushman and Williams (2012, 2015) examine the relation of LLPs of US banks to transparency of US bank assets. Bushman and Williams (2015) find that delay in expected loan loss recognition is associated with reduced bank transparency and higher risks of drops in equity values during downturns, especially for banks with lower capital. Beatty and Liao (2011) find that such a delay contributes to a decrease in capital causing banks to reduce lending. Our analyses using LLP models for US and Canadian sample banks provide evidence that Canadian banks followed more transparent and prudent banking practices as compared to those of the US.

We then investigate whether the quality and transparency of loan assets (loan loss provisioning) has a beneficial effect on contagion of the US financial crisis to Canadian banks. In this set of analyses, we attempt to integrate the foregoing economic and regulatory dimensions by examining if the economic indicators and asset transparency metrics together moderate the severity with which the US crisis spread to Canadian banks. We find support for the notion that Canadian banks that had more transparent asset practices appear to be less adversely affected by the US crisis. We also find that greater amounts of real estate loans and mortgage-backed securities that provide scope for accounting discretion in limiting impairment of assets worsen the impact of contagion, consistent with the findings of Huizinga and Laeven (2012) for US banks.

Our paper makes the following contributions to the literature. We integrate two distinct paradigms of bank research. The first stream identifies financial contagion by examining if low or negative *individual* bank stock returns are correlated with low or negative realization of US bank *index* returns. We find Canadian banks were affected by contagion from the US during the subprime crisis. Our results indicate that the Canadian banks' returns are more correlated with US banks returns during downswings as compared to upswings supporting the notion of financial contagion in Canadian banks. The second stream, exemplified by Bushman and Williams (2012) and Beatty and Liao (2014), compares the efficacy of bank monitoring by examining the distribution of sample US and Canadian banks' Loan Loss Provisions. Since recognition of loan loss allowances by banks is intensely scrutinized by bank regulators, a negative correlation between contagion and asset transparency would link enforcement of bank regulations to the containment of financial contagion. This link was implicit in Krugman (2010) and others about the Canadian financial sector and we find some supportive empirical evidence.

In the wake of the financial crisis that started in the US and then spread to other parts of the world, the Canadian banking system has been held up as an example of good governance that permitted Canada to avoid the economic downturn to which many other industrialized countries were subject. Governments and regulators around the world are currently studying different financial regulatory models that might avoid a recurrence of the crisis.[9] Our results indicate asset quality

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[4] Saunders and Wilson (1999) and Bordo et al. (2015) provide a detailed background of the evolution of both the Canadian and US banking systems since the late 1800s. Saunders and Wilson (1999) point out that "…US historically combined a weak safety net with restrictions on branching and other activities that resulted in a system prone to disruptive banking crises and bank failures. By contrast, both Canada and the UK evolved consolidated and highly branched banking systems that proved resilient to economic crises such as those during the 1930s."

[5] These banks are Bank of Montreal, Bank of Nova Scotia, Canadian Imperial Bank of Commerce, National Bank, Royal Bank of Canada, and Toronto-Dominion Bank.

[6] While early work (e.g., Glick & Rose, 1999; Kaminsky & Reinhart, 1998; Mason, 1999) on contagion related to the spread of currency crises across national boundaries and continents, more recent work on contagion has examined how markets for risky securities have experienced "meltdowns" that spread across geographical boundaries (e.g., Bae et al., 2003). In this context, contagion refers to the spread of financial instability from a specific market/institution to other markets or institutions via the balance sheet of financial intermediaries as well as through equity markets.

[7] The policy statement was issued jointly by the Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, National Credit Union Administration, and Office of Thrift Supervision.

[8] Federal Deposit Insurance Corporation (2006) advises bank examiners to concentrate on the quality of allowance for loan losses (ALW) reported by US banks (ALW is also referred to as ALLL). This financial statement item, sometimes also referred to as loan loss reserves is a contra-asset account that is related to loan loss provisions (LLP) in the following way: ALW (ending balance) = ALW (beginning balance) + LLP − net charge-offs (see, for example, Ng and Rusticus (2011, equation 1a)).

[9] See, for example, Avgouleas (2009).