Draft September 2010

Not to be cited without permission

Why didn't Canada have a banking crisis in 2008 (or in 1930, or 1907, or 1893)?

Michael D. Bordo
(Rutgers University and NBER)

Angela Redish
(University of British Columbia)

Hugh Rockoff
(Rutgers University and NBER)

Paper prepared for the EHA conference, Evanston, September 2010.

For helpful research assistance we thank Yoichi Otsubo

"In attempting to speak on the subject of banking in Canada, I cannot avoid comparison with this great country where banking systems are being keenly discussed, and where it is admitted that changes, perhaps of a radical nature, are necessary. …. I do not wish to be understood as asserting that the points of superiority in our system could be adopted here. For over half a century, banking in the United States has been following lines of development opposed in many respects to the Canadian system, and ***it may well be that no matter how desirable, it is too late to adopt our practices***. [emphasis added]"

George Walker. President, Canadian Bank of Commerce,
JCBA, 1893

In the fall of 2008, a financial crisis engulfed the banking systems of the United States and many large European economies. Canada was a notable exception. In the US the crisis was characterized by bank failures and government bank bailouts (nationalizations/equity injections) and was the precursor to a recession that has been the worst since the 1930s. Indeed it was widely suggested that the US teetered on the edge of a second Great Depression. In Canada, there were no bank failures or government bank bailouts and the recession has been less severe than either that of the early 1980s or early 1990s. Naturally, many economists and policy analysts have looked for the source of Canadian stability and a variety of factors have been proposed, with the leading contenders being innate Canadian conservatism and superior Canadian regulation These analyses have almost exclusively focused on the 2007-8 crisis, and in this paper we take a step back from the immediate experience to see the crisis of 2008 in a historical context.

As the quotation in our header implies, the stability of the Canadian banking system is not a one-off event. While the US banking system experienced frequent crises under the National Banking system (1863-1914) and then again in the 1930s under the Federal Reserve System, Canada's banking system remained stable throughout. We argue in this paper that the comparative stability of the Canadian banking system emerged out of the very different structure of the financial sectors of the two countries from the early 19^{th} century. In Canada the banking system was created as a system of large financial institutions whose size and diversification enhanced their robustness. Moreover it evolved into an oligopoly which was tightly regulated in a grand bargain whereby the chartered banks would provide financial stability in exchange for the Canadian government limiting entry to the industry. In the US the fragmented nature of the banking system created financial institutions that were small and fragile. In response the US developed strong financial *markets* and a labyrinthine set of regulations for financial institutions. These different structures, and the political economy they generated created a path dependence that goes a long way to explaining the relative stability of the financial systems today.

A key initial difference between Canada and the US was that in Canada the Federal government had the power to charter and regulate banks. In the US the Constitution did not unambiguously give the Congress the power over banking. This led to the subsequent fights over the constitutionality of the First and Second Banks. In the US after the demise of the Second Bank the states were responsible for chartering banks. Also there has always been a strong populist distrust of the concentration of financial power in New York and the northeast. This in addition to states rights explains the revocation of the charters of the two Banks of the United States and the difficulty in establishing a central bank. The establishment of the national banking system during the civil war did not displace the state banking system leading to the creation of a dual banking system. Observers in the nineteenth century were cognizant of the advantages of the Canadian system but every proposal to have the US move in that direction ran into a brick wall. A consequence of this is that the US always had weak fragmented banking and a flawed payments system.

By contrast the jurisdiction over Canadian banking was not established until the British North America act that created Canada in 1867. By then the branch banking system with a few large banks was well established in the colonies and the BNA Act gave power to regulate banking to the Federal government effectively locking-in the branch banking system. This probably did not reflect a fundamental preference for central control in Canada, but rather a path dependent process. Contrast federal regulation of banking with the regulation of securities markets, which remains – albeit controversially – an area of provincial regulation. The Toronto Stock exchange was incorporated in 1878, the Montreal stock exchange in 1872 - a few years *after* confederation.

Moreover Canada didn't have the deep seated distrust of financial power that prevailed in the US. Indeed many Canadians were Tories (or their descendents) who had fled the American revolution and who had no problems with emulating the institutions of the mother country. Also the founders of the earliest Canadian banks were Scots who adopted the Scottish banking system which had served Scotland well in the eighteenth century. Financial populism never had the traction that prevailed in the U.S.[1]

The paper is organized as follows: we begin by briefly surveying the literature on the proximate causes of the 2007-8 financial crisis. We then document the different paths taken by the Canadian and US financial systems in the 19th and 20th centuries. We then consider reasons why the US and Canada had such different experiences in the crisis of 2007-2008. We conclude

[1] This is not to say that financial populism was non-existent. In the 1930s the Social Credit party took power in Alberta on a policy of printing money. The policy was short-lived.

with a discussion of the political economy factors that explain the divergent path dependency in the two countries.

1. The financial crisis of 2007-8

In the Fall of 2008, a major US bank failed – the first of roughly 300 in the following two years – and financial institutions across the globe needed dramatic injections of liquidity to survive. Risk spreads jumped and interbank lending seized up. Monetary and fiscal policy makers responded with unprecedented aggression injecting liquidity and fiscal stimulus to an extent not seen since World War II. There are almost as many theories of the cause of the financial crisis as there are economists. Partly the differences depend on whether one discusses proximate causes or longer run imbalances. The posited longer run factors include: the high savings rate in China, persistent US trade (im)balances with China, the 'Greenspan put', growing inequality, dismantling of the Glass-Steagall firewalls between commercial and investment banking, and the US policy bias for home ownership. In the medium term, the behaviour of credit rating agencies, the risk-bias in the structure of executive compensation, the gaming of Basel II capital adequacy standards, regulatory arbitrage, OTC trading and new financial products, are all assigned blame. In the shorter run, the decisions to bail out Bear Stearns and not to bail out Lehman Brothers are often considered to have been triggers.[2]

Quantitative analyses help to sift through the many factors. An IMF study of 72 large banks/bank holding companies in the OECD (Ratnovski and Huang, 2009) analyzed what bank

[2] There are by now myriad books and articles that describe various aspects of the financial crisis. Overviews include those of the IMF's Global Financial Stability Report (April 2009) and the BIS Annual Report (April 2009). Books focusing on particular aspects of the crisis, include Johnson, (2010), Rajan (2010) Tett (2008), Gorton (2009); See also various articles in *Journal of Economic Perspectives* (Winter, 2010) especially by Brunnermeier. Ben Bernanke (2010) presented his interpretation of the crisis in testimony before the Financial Crisis Inquiry Commission.

characteristics correlated with bank failure or dramatic decline in stock price. The study found that differences between Canadian and US banking outcomes did not reflect capital ratios (in both countries they were high) but did reflect the extent of retail (vs. wholesale) depository funding; many of the U.S banks that got into trouble in the crisis relied on wholesale funding which was withdrawn quickly as the crisis evolved. Weighing these many factors is difficult in that numerous factors added fragility to the system but it is unlikely that any one factor is uniquely responsible. Moreover the endogeneity of posited variables makes it difficult to identify causality. Our comparison of Canada and the US and use of historical analysis can help to assign weight on some factors rather than others.

We can divide the factors listed above into those where Canada and the US are broadly similar and those where there are important differences. Canada and the US had very similar monetary policy, for example; the amount of leverage of the commercial banks in the two countries was also similar, and in neither country were commercial and investment banks separated by law. Yet the differences are also significant: Canadian banks did not securitize mortgages to anything like the same extent as the US banks; Canadian banks held money market mutual funds (MMMFs) in house rather than in separate institutions. Canadian banks are all federally regulated.

In this paper we argue that the origins of these differences lie in the deeper history of the banking systems of the two countries. This matters because it implies that there are no quick fixes and that there may not be a unique set of rules that are appropriate for all institutional arrangements.

2. Setting the stage

Canada

Differences in the banking systems today were set in place in the early 19th century. Canada (at the time a set of British colonies) chartered a small number of branching banks and continues today to have a system of nationwide branching banks. Over the course of the 19th century the number of banks increased, peaking in 1874 at 51. Then a series of mergers and bank failures reduced that number to 10 by 1928. Even when Canada had relatively many banks before 1920 the system remained concentrated with the 5 largest banks owning 80% or more of the system's assets. Co-ordination (the extent of which is not clear in the record) was facilitated by the Canadian Bankers Association an industry group established in 1890 and which was given legislative responsibility for supervising the clearing houses by the 1900 Bank Act.

The Canadian banks were only lightly regulated. They had the right to issue notes (after 1870 only notes of denomination greater than $4) against general assets, subject to the requirement that note issue be less than paid in capital. Industry entry was limited by the need for a charter and early charters imposed a double liability condition on stock ownership. After Confederation (1867) bank charter renewals were co-ordinated to occur every 10 years through a renewal of the Bank Act which frequently incorporated minor amendments. For example, in 1890 the banks agreed to pay into a Bank Circulation Redemption Fund that paid out to note holders of banks that failed.[3] Banks were also restricted in terms of the assets against which they could lend, banks could lend against real bills but not against real mortgages or household goods.

[3] The notes were a first charge against the assets of the bank and the Bank Circulation Redemption Fund only paid out if the remaining assets could not cover the note liabilities.

These are the classic restrictions on banks recommended by Adam Smith in the *Wealth of Nations* (Rockoff 2010).

Over the late 19th century restrictions on entry increased as the government imposed higher requirements on the capital stock and requirements that much of that stock be paid in before the bank opened and within a year of applying for a charter. In 1900 banks were required to have $500,000 in subscribed capital.[4] In addition, directors and the majority of shareholders were required to be resident in Canada and no shareholder was permitted to own more than 10% of the shares. In many respects, the Canadian banking industry was a cartel backed by the federal government limiting entry and policed by the Canadian Bankers Association.

Importantly, bank failures were not unknown in Canada and because each bank was relatively large they often caused sizable losses. In 1923 the Home Bank of Canada failed and brought losses of 75c on the dollar to depositors and in the face of a public outcry the government created an Inspector General of Banks who was responsible for monitoring the solvency of the banks (Beckhart, 1929).

The Canadian financial system until the middle of the twentieth century was built, and regulated, around what were known as the Four Pillars: banking, trust business, insurance and securities dealing. Each pillar had a distinct business line and its own regulator, with banking and federally chartered trust and insurance companies being regulated by a federal agency and others being regulated by a provincial authority.

[4] Note the contrast with the US. In the 1920s 60% of the banks that failed had capital stock of less than $25,000.

The United States

The United States has had a totally different experience. In the early republic there was a tug of war between the Federal government and the states over who would charter banks. Alexander Hamilton proposed the First Bank of the United States, a Federally chartered institution, which was established for a period of 20 years in 1791. It was modelled after the Bank of England, although the First Bank was permitted to branch nationwide along the lines of the celebrated Scottish banks. But from the initial proposal of the legislation there was strong opposition. Partly that opposition was based on constitutional issues. The Constitution had merely said that the Federal Government could coin money and regulate its value; it said nothing about setting up banks. The heat behind the constitutional debate reflected the fundamental political question of how power would be divided between the federal government and the states. Partly as a result of the ferocity of the opposition to the initial chartering of the bank, the First Bank was chartered for a period of 20 years. Its charter was not renewed in 1811. The deranged state of the currency after the War of 1812 led to calls for a new Federal Bank. The Second Bank of the United States was chartered in 1816, again for a period of 20 years. Once again the idea of a Federal Bank evoked strong passions. Opposition to the Bank came from politicians, especially in the South, who wished to preserve as much power in the states as possible; from ordinary people concerned about the concentration of power; from smaller banks in the South and West who feared competition from branches of the Second Bank; and from Wall Street because the home office of the Bank was in Philadelphia. [5] Its charter was not renewed, and the chartering of banks became the sole prerogative of the states.

[5] Johnson and Kwak (2009) argue that the failure to recharter the Second Bank represented a triumph of Main St. over Wall St and that this was a beneficial development. Others e.g. Hammond 1957 view the demise of the Second bank as the key cause of financial instability for the next 80 years.

One experiment that was tried in a number of states was known as free banking. This system allowed individuals to establish banks wherever they wanted in a state -- hence the term free banking -- but required a deposit of government bonds to protect note holders. To protect their own banks, whether created through free banking or traditional legislative charters, states prohibited branches of banks based in other states from being established, producing a system of small banks. Indeed, many states prohibited branching within the state, resulting in a system of extremely small local banks. Although individually small and weak, collectively local banks were able to exercise considerable political power: Congressman and Senators were unlikely to support legislation that would undermine local banks, even if such legislation would have strengthened the system as a whole. Ultimately, the strength of the small bank lobby was rooted in the structure of the American political system. Each Representative and Senator was more dependent on the goodwill of the people and interests important in his or her district or state than to the national party to which he or she belonged.

During the Civil War the Republicans were able to establish a new system of federally chartered banks: the National Banking system. The main political reason was simply that the Southerners, with their intense opposition to Federally chartered institutions, were out of the Congress. However the older system of State-chartered banks was not abandoned. The national banks were forced to follow state bank branching rules, meaning most importantly that they could not branch across state lines, and the United States ended up with a dual banking system. Banks could be chartered by either state governments or the federal government. Regulation was limited, moreover, because of the competition between the regulators. If, for example, the rules governing the national banks were made too onerous, some national banks might switch to the state system.

3. The implications of these structures

The choice of unit banks (including within this term branching systems that were limited to one state) rather than a nationwide branching system had multiple, long-lasting consequences:

(1) The unit banks were fragile. Their portfolios were small and lacked diversity. In some regions all of the loans made by a local bank would depend ultimately on the value of a single crop. When hard times hit distrust of the soundness of these institutions produced runs.

(2) The payment system was impaired. It was difficult to transfer good funds across the country. As a substitute for an intrabank transfer system rural banks developed correspondent relationships by depositing funds with banks in regional centers and in New York producing the well known "pyramiding of reserves." This system worked reasonably well during ordinary times, but failed during crises when rural banks would try to protect themselves by withdrawing funds from their correspondents, exacerbating the crisis.

(3) Because there were no large banks to provide longer-term financing, securities markets developed to fill the gap. As with correspondent banking, reliance on security markets worked well during ordinary times, but failed during financial crises when a panic on Wall Street could freeze real investment throughout the country.

(4) Another weakness in the system, a strong seasonal in short-term interest rates, was also produced by the fragmented structure of the U.S. banking system, and was also a source of instability. Rural banks in the United States would regularly withdraw funds

from their correspondents during the fall crop moving season. One reason for the cash withdrawals was simply that harvest workers had to be paid in cash. This in turn put pressure in the New York money market, increased short-term interest rates, and increased the vulnerability of the security markets in the fall of the year. In Canada, by way of contrast, seasonality of interest rates was not a problem because branch banks did not have to acquire large cash reserves at the start of the crop moving season (Selgin and White 1994).

(5) The Canadian branch banking system was oligopolistic implying higher cost banking and limited supply of banking services. But it also provided additional stability by avoiding some of the problems inherent in the American system. Since interregional clearing was intrabank clearing, periods of financial distress did not produce country bank withdrawals from the reserves of the major banks. Since firms relied more on banks than on security markets for funding, distress in financial markets produced smaller effects on the real economy.

The historical fragility of the US banking system is well-known. If we look only at the period before World War I, there were major banking panics in 1837, 1857, 1873, 1893, and 1907.[6] Both of the weaknesses noted above, the pyramiding of reserves and heavy reliance on securities markets to finance investment, contributed to these panics. Much of this story was laid out by O.M.W. Sprague in his classic History of Crises Under the National Banking Act (1910). Recent research on the origins of the panics -- for example, as surveyed in Calomiris and Gorton (1991) -- has further clarified the weaknesses in the system. Ultimately, it was deposit holders' uncertainty as to viability of a bank that produced bank runs. More specifically, the fragility of

[6] According to Jalil (2010) there were many more minor panics.

the undiversified banks was amplified by asymmetric information and – in the absence of a lender of last resort – bank runs led to financial crises.

One of the triggers for the Crisis of 1873, for example, was the failure of Jay Cooke and Company, a private investment bank that had leant heavily to the troubled Northern Pacific Railroad. But the distrust of the commercial banks and the withdrawal of funds by country banks from New York reinforced the crisis. The crisis of 1893 started with the failure of several stock market favorites that produced a stock market panic. Distrust then spread to the banks producing a wave of bank failures concentrated in the Middle West and the South. Banks in these regions attempted to strengthen themselves by withdrawing funds from their correspondents further weakening the system as a whole.

In 1907 the United States was hit by another major financial crisis. It was similar in many ways to previous crises. One of the important triggers was the failure of the Knickerbocker Trust Company in New York. This bank was chartered by and regulated by the state of New York. When trouble appeared the National Banks in New York were unwilling to come to the aid of the Knickerbocker Trust, and the other Trust Companies, because the National Banks felt that the lightly regulated Trust Companies had expanded at their expense. We don't mean to suggest that this failure was the sole cause of the crisis. Distrust of the banks was already widespread and the stage had been set for a crisis. Odell and Weidenmier (2004), for example, show that the San Francisco earthquake in the previous year had produced an outflow of gold from Britain and a tightening of credit by the Bank of England with worldwide implications. But this example does show how the fragmented structure of the U.S. banking system contributed to a weakened regulatory regime and lack of cooperation among large banks, even during financial crises.

The financial crisis in 1907 led to a clamour for regulatory reform leading to the creation of the Federal Reserve System in 1913. The Canadian example was well understood in the US at the time) and was even suggested as a solution to the problems of the national banking system (West 1978), but it was already too late to adopt it. The state banks were well-entrenched and no reform that turned them, if they were allowed to survive, into branches of large banks based in New York, would have won Congressional approval. Instead, a new institution was created, the Federal Reserve, which promised to end crises through discount window lending on the basis of eligible commercial paper to member banks (Bordo and Wheelock 2010). The fundamental flaw in the system, the dual banking system, was left intact (White 1983).

In Canada the banks were robust to the small shocks that generated panics in the US and while banks failed there were no banking panics. The contrast between the two countries can be seen in the response to the failure of the Sovereign Bank in January 1908. This Canadian bank had invested in US securities and in the crash of the Fall of 1907 became insolvent. The bank prepared to close its doors but 12 members of the Canadian Bankers Association agreed to guarantee all its liabilities and shared out the branches and assets amongst themselves. In the event, the guaranteeing banks lost nothing after the double liability of the shareholders was drawn on.

More generally, the Canadian banks did not experience the seasonal pressure that amplified the fragility of the US system. The Canadian banks were permitted to issue banknotes against general assets. Thus in Canada an increase in note demand was readily met and did not lead to an increase in interest rates and decrease in reserve ratios as occurred in the U.S. (Champ et al., 1996).[7] Until 1907 the increased in note demand did not hit the constraint that note issues could not exceed three times paid-in capital. In 1907, when it appeared that that constraint might be binding, the federal government raised the limit by 15%.

Table 1 reproduces results from an earlier paper analyzing the relative performance of the Canadian and US banking systems between 1870 and 1925 (Bordo, Redish, and Rockoff (1994)). It shows that losses on deposits at Canadian banks were comparable in magnitude to those on deposits at US national banks, but after 1900 were smaller than those at state banks. This may reflect the fact that the state banks tended to be smaller rural banks while national banks were more likely to be larger reserve city banks. While the number of Canadian banks that incurred losses totalled fewer than 20 compared to hundreds in the US, each Canadian bank represented a much larger share of the sector. The point we would emphasize here, however, is that the bank failures did not lead to banking panics nor did they lead to widespread suspension of convertibility. Thus their knock-on effects on the real economy were small.

Table 1: Losses on Deposits

Years	Canada	US National Banks	US All Banks
1865-1880	.01	.06	.21
1881-1900	.16	.08	.15
1901-1920	.01	.01	.05

Source: Bordo, Redish and Rockoff (1994)

Analysis of bank balance sheets shows that Canadian banks had a significantly greater share of loans on their books relative to US national banks which held more securities, in part to back their note issues. Leverage ratios (Debt/equity) were similar across the two systems as were rates of return on equity. These findings may be explained by greater competition in the US leading to a lower return on equity and low franchise value – combined with little regulation,

[7] In contrast, the US state banks did not issue notes and the US national banks could only issue notes secured by US government bonds, a slow process.

even branch banks failed – due to mismanagement and fraud For Canada the small club of large banks cooperated in dealing with potential bank failures by backing up the potential candidates for a run by their collective assets**.**[8]

The inability of the unit banking system to move funds across regions within the institution created an incentive to move funds externally through financial assets traded in financial markets. The development of the commercial paper market provides an early example. Bodenhorn (2000; 178) chronicles the explosion of brokers entering the market in the late 1830s and by the 1840s discount rates on commercial paper were quoted in newspapers in at least 5 cities (Bodenhorn (2000, 153)). Remarkably, there were no commercial paper rates quoted in Canadian newspapers in the entire 19th century, as Canadian firms discounted short term paper at their bank and brokerage houses dealt only with bonds and stocks.

Because of the fragmented US banking system, and because of various restrictions placed on the assets the banks could own, securities markets emerged to finance most economic growth, unlike Canada which developed a bank-based system. Mortgage markets and housing finance also developed differently in the two countries. Investment banks, which participated in the creation and marketing of securities, became an important part of the system. Thus the United States always had something like the 'Shadow Banking system' that has been the subject of so much recent discussion.

Finally we can ask whether the Canadian banking system was 'smaller' than that of the US. This exercise is fraught since the data are sketchy, but an order of magnitude is suggested by comparing the amount of bank note and deposit liabilities to GDP. The earliest data for Canada

[8] In 1900, there were 35 banks owning 708 branches in Canada. In the U.S. there were 8731 banks. Assuming that no U.S. bank had a branch and ignoring "offices' in both countries, there were 11.4 banks per 100,000 people in the U.s. and 13.3 branches per 100,000 people in Canada.

are for 1871, which is during the Greenback era in the US. At that time, relative to GDP, Canadian banks were larger than those in the US. In both countries the banking system expanded over the next thirty years, but more so in Canada.

Table 2A: Bank liabilities: 1871

	Canada	US
Commercial Bank notes	$24.2 m	$311 m
Deposits	$50.1m	$960m
GDP	$412.1m	$7,800m
Population	3.689m	39.9 m
Bank Liabilities/GDP	0.18	0.16

Table 2B: Bank liabilities: 1900

	Canada	US
Commercial Bank notes	$48.9 m	$300m
Deposits	$286.6m	$5.39b
GDP	$901.7m	$19.42b
Population	5.301m	76.09m
Bank Liabilities/GDP	0.37	0.29

Note: Liabilities includes only deposits and notes.

Sources: Urquhart; Metcalf, Redish and Shearer (1988). Historical statistics of US Cj65; Cj46; Gordon.

4. The Great Depression and its aftermath

The creation of the Federal Reserve did not however prevent future financial panics. The Crisis of 1929-1933 bore a strong resemblance to earlier crises. First, of course, was the stock market crash which depressed economic activity and set the stage for the banking crises that followed. Once again distrust hit the small unit banks in the Midwest and South, and a contagion of fear spread among depositors producing bank runs. Thousands of banks suspended operations. Although the bank failures were concentrated among the smaller banks in the South and West, there were failures of larger banks. One that has received special attention because it may have been associated with a general increase in the distrust of the banking system was the failure of the Bank of United States in December 1930, the largest failure in U.S. history to that time. The Bank of United States was chartered by and regulated by the state of New York. There is considerable controversy about why the Federal Reserve did not step in and rescue the bank. But it may be that part of the explanation lies in the divided structure of U.S. banking system, and the reluctance of banks in the more tightly regulated National banking system to aid banks in the lightly regulated state banking sector.

In Canada, there were no bank failures during the Great Depression, but the Canadian economy suffered as dramatic a collapse as that of the US, as the export sector shrank and the terms of trade moved dramatically against the country.[9] As in the US there was a widespread call for a firm response to the economic situation and the government responded by holding an inquiry – Royal Commission - into the need for a central bank. The Commission was headed by an English central banker, Lord Macmillan, who travelled across the country listening to an outpouring of complaints about a monetary system that had caused deflation and reduced the availability of credit. The Commission responded, unsurprisingly in the face of both political outcry and the predisposition of its chair, by recommending the establishment of a central bank, and the Bank of Canada Act was passed in 1934 (Bordo and Redish 1987). The other major reform in Canada involved the creation of the Ontario Securities Commission. Since securities

[9] Kryzanwoski and Roberts (1993) argued that the absence of bank failures in Canada reflected regulatory forbearance rather than solvency.

markets were under provincial authority each province separately regulated the brokers and markets in their jurisdiction.[10]

The financial crisis in 1929-1933, like earlier crises, created calls for reform in the United States. These reforms included the establishment of the Securities and Exchange Commission (to regulate securities markets), the establishment of Federal Deposit Insurance, the freeing of the Federal Reserve from the constraints of the gold standard (so that it could act aggressively as a lender of last resort) and the adoption of a strict regulatory regime. The regulations included clauses in the Glass-Steagall act that limited interest rates on deposits and also separated the functions of investment and commercial banking.

But perhaps as important as what did happen, is what did not. Despite the obvious weakness of the U.S. dual banking system, no attempt was made to eliminate the state and local banks that had been the source of so much of the problem. Instead, deposit insurance was introduced as a way of protecting small local banks against runs. The fundamental weaknesses in the system, the multiplicity of small banks, and the multiplicity of agencies chartering and regulating banks, persisted. Indeed, the tendency in the legislation was to divide the banking system rather than consolidate it. The Federal Home Loan Bank Board was created to provide federal charters for savings institutions, and the Federal Savings and Loan Insurance Corporation was created to provide deposit insurance for savings institutions. Commercial banking was separated from investment banking under the Glass-Steagall Act and the newly created Securities and Exchange Commission then became the regulator for the investment banks.

[10] Unlike the U.S. authorities, the Canadian government did not create a deposit insurance fund; the Canadian Deposit Insurance Corporation was established in 1967.

These reforms created an era of stability in both Canada and the US that lasted until the 1970s. This era came to an end, however, in the 1970s when inflation undermined many financial institutions, especially the savings banks that were locked into long-term-low- interest loans and technological innovations dissolved the firm lines between sectors of the financial industry.

5. The later 20th century

In the 1970s both the U.S. and Canadian financial system were affected by a number of macro factors: emerging inflation, globalization (a decrease in barriers to international capital flows), reductions in information costs (domestically and internationally), and a political movement toward deregulation. There were similarities and differences in the ways that the two systems responded.

The 1970s have been characterized as the years of the Great Inflation as the inflation rate rose from less than 2% before 1965 to over 10% by 1980. Macro economists have proposed explanations of the inflation - including oil price shocks, faulty economic modeling, imperfect measurement, political pressure and fiscal wantonness – without reaching a consensus. For the financial systems of Canada and the US the unanticipated inflation had major effects because of (a) nominal interest rate ceilings and (b) fixed nominal debt contracts.

In the US the interest rate on bank deposits was initially fixed by Regulation Q in the Glass- Steagall Act at 0% on demand deposits and 2.5% on time and savings deposits. The legislation was apparently motivated by a desire that commercial banks not put money on deposit in reserve city banks, but rather lend it out.[11] While the ceiling was not initially binding, as interest rates rose in the late 1970s the ceiling became a constraint and led to an outflow of funds from banks and a rapid growth of money market mutual funds (MMMFs). These funds invested deposits in high return Treasury Bills and commercial paper and therefore paid higher interest rates than bank deposits. In Canada the banks were also prohibited from paying interest on demand deposits but interest rates on savings accounts were not restricted. Thus as inflation rose, funds moved out of demand deposits and into savings accounts. (See Table 3) [12] That is, they stayed within the banking system.

Table 3

Share of MMMF/ Deposits at banks

	1982	1998
US	10%	18%
Canada	1%	4.5%

Source: Freedman (1998; 19)

In the 1960s the large Canadian banks had acquired majority (but typically not whole) ownership of mortgage lenders.[13] In the seventies as deposit rates rose, depositors who had long-term deposits (at low rates) in the banks withdrew funds from their notice accounts. The banks faced a maturity mismatch. Rather than have to create new bank accounts, the banks had their subsidiaries - which offered accounts without the right to early withdrawal - expand, and sold their mortgage liabilities to their subsidiaries. The 1981 Bank Act revision acknowledged this

[11] Gilbert (1986). Others have argued that the legislation was motivated by a desire to remove the incentive for banks to compete with each other on price on the basis that this competition created adverse selection.

[12] Freedman, (1998). In 1987 amendments to the Bank Act permitted the Banks to issue MMMFs and they hold about half the MMMFs in Canada. In contrast the majority of MMMFs are outside the banks in the US.

[13]

CIBC	Kinross Mortgage
TD	Canada Permanent
BNS	Holborough Investments
Royal	Roymor
Montreal	?

Source: Neufeld (1972, 131)

behaviour and required that the banks report on a consolidated basis; by then the mortgage subsidiaries were holding about the same amount of mortgages as the banks.

After 1980 the US system changed radically. First, deregulation was tried as a way of salvaging the savings banks from the ravages of inflation. Perhaps, it was thought, by allowing the savings banks to invest in risky high-yield assets the savings banks could offset the losses on their portfolio of long-term-low-rate mortgages; they could grow out of their difficulties. But in the end deregulation simply encouraged excessive speculation that produced even more spectacular failures. There were some long-run reforms of the financial system in the wake of the crisis -- the Office of Thrift Supervision replaced the Federal Home Loan Bank Board and the Federal Savings and Loan Insurance Corporation was terminated and its functions transferred to the Federal Deposit Insurance Corporation -- but the fragmented structure of the U.S. financial system and its regulatory structure remained intact. Indeed, despite what appeared to be a disastrous experience with deregulation , enthusiasm for financial market deregulation took hold, reflecting perhaps larger political currents. Deregulation tended to move the U.S. closer to the Canadian model. Restrictions on branch banking were relaxed, and some banks such as Bank of America, developed a coast-to-coast presence along the lines of the Canadian banks. In 1999, moreover, the Glass-Steagall Act, which had separated investment banking from commercial banking in the United States was repealed by the Financial Services Modernization Act (Gramm–Leach–Bliley Act). It was expected that this would lead to the purchase of investment banks by commercial banks, forming “universal banks.” This is what had happened in Canada after 1987 when universal banking was first allowed.

The U.S. system, however, evolved differently from Canada’s. Investment banks had long been more important in the U.S. than in Canada, and the lifting of restrictions in the U.S.

led to an expansion of the investment banking sector. Investment banks continued to originate, invest in, and trade securities, while tapping into larger sources of funds, rather being absorbed into universal banks in which the commercial banking arm was dominant. The U.S., moreover, developed what became known as the "shadow banking system" which included the investment banks, money market funds, mortgage companies, asset backed commercial paper vehicles, special investment vehicles, hedge funds, and other institutions that had in common that they served as intermediaries between short-term lenders and long-term borrowers. US regulation, however, did not keep up with the regime shift of US banking in the Canadian direction nor the expansion of the shadow banking system. Commercial banks and investment banks became more powerful and in competition with each other their balance sheets (and off balance sheets) took on more risk. The end of the Glass-Steagall restrictions encouraged the investment banks to increase their leverage in competition with the commercial banks and the commercial banks in response increasingly moved into higher rate of return but riskier off balance sheet investments. At the same time regulation remained in the hands of a patchwork of agencies. A commercial bank, for example, might be regulated by the Federal Deposit Insurance Corporation, the Comptroller of the Currency (for National Banks), and the Federal Reserve. Canadian regulation under OSFI proved tougher than in the United States, mandating higher capital requirements, lower leverage, less securitization, the curtailment of off balance sheet vehicles, and restricting the assets that banks could purchase. The result is that the Canadian system was able to avoid the bubbles in real estate mortgages and exotic financial instruments.

Over the last decade the use of markets by banks increased in the U.S. on both the asset and the liability side. On the asset side, the use of securitization expanded dramatically especially in the area of mortgage backed securities, while on the liability side banks relied more on wholesale deposits and less on retail deposits.

US mortgages after the 1930s typically were amortized over a 30 year term with a fixed interest rate over the period. A bank issuing such a mortgage is likely to have a serious maturity mismatch and selling the mortgage (often to Fannie Mae or Freddie Mac) enabled the banks to focus on the assessment of borrowers in what became known as an " an originate to distribute " model. Indeed if a bank wanted to keep assets backed by real estate on its books, it typically could reduce the capital called for by regulators by selling the mortgage and holding an agency Mortgage Backed Security.

In Canada, the banks in the 1960s shifted from 25 year fixed rate mortgages to renewable mortgages with interest rates fixed for periods up to five years[14] Thus the motivation of eliminating maturity mismatch was not there and the banks did not get into the securitization of mortgages at anything like the U.S. level. In 2007, when 60% of U.S. mortgages were securitized only 25% of Canadian mortgages were (Macgee 2010).

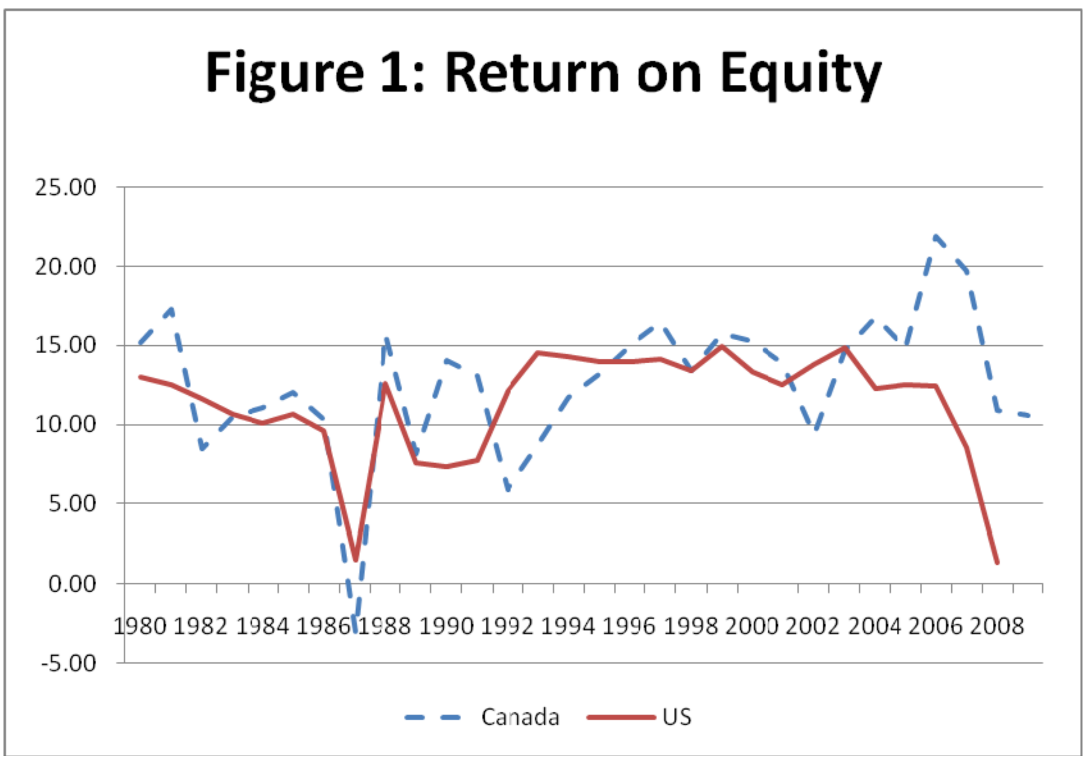
Implications of these changes

In earlier work (Bordo, Redish, and Rockoff, 1994b) we compared the structure and efficiency of the banking systems of the US and Canada over the period 1920-1980 and concluded that the Canadian system was more profitable and more stable than that of the US. The higher profitability reflected not higher net interest margins (potentially a sign of

[14] A possible reason for this change is that in 1967 the introduction of deposit insurance on deposits of five years or less encouraged depositors to limit their deposits to a maximum term of five years, and the banks responded to eliminate maturity mismatch.

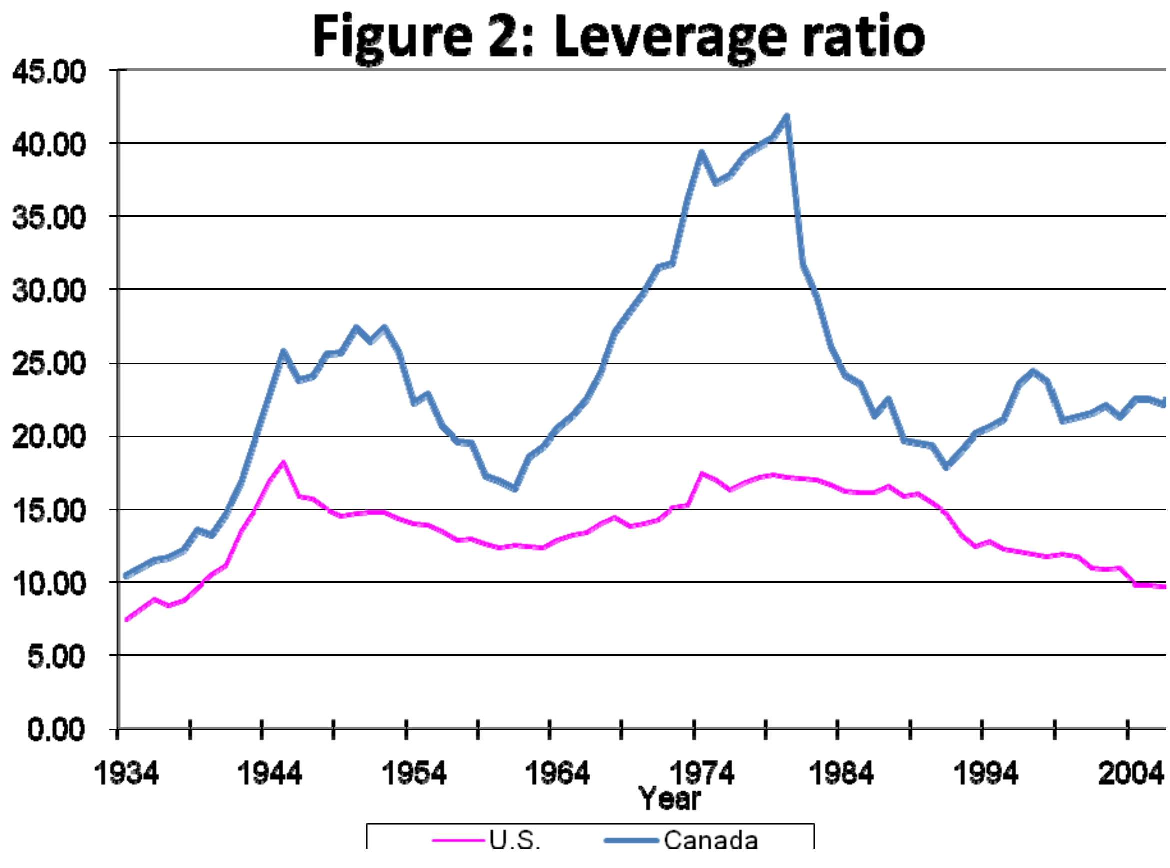
oligopolistic rents) but greater leverage. We concluded that branch banking gave the banking system greater stability and that therefore the banks could have greater leverage.

We now update this analysis and look at the rates of return in the two banking systems and the extent of leverage in each. Figure 1 compares the return on equity of the 6 largest banks in Canada and of FDIC insured banks in the US. Until the mid 2000s, returns were broadly similar with both systems experiencing (nominal) returns greater than 10%. The figure suggests an integrated market in which investors earned about the same return whether they invested in Canadian or U.S. banks.



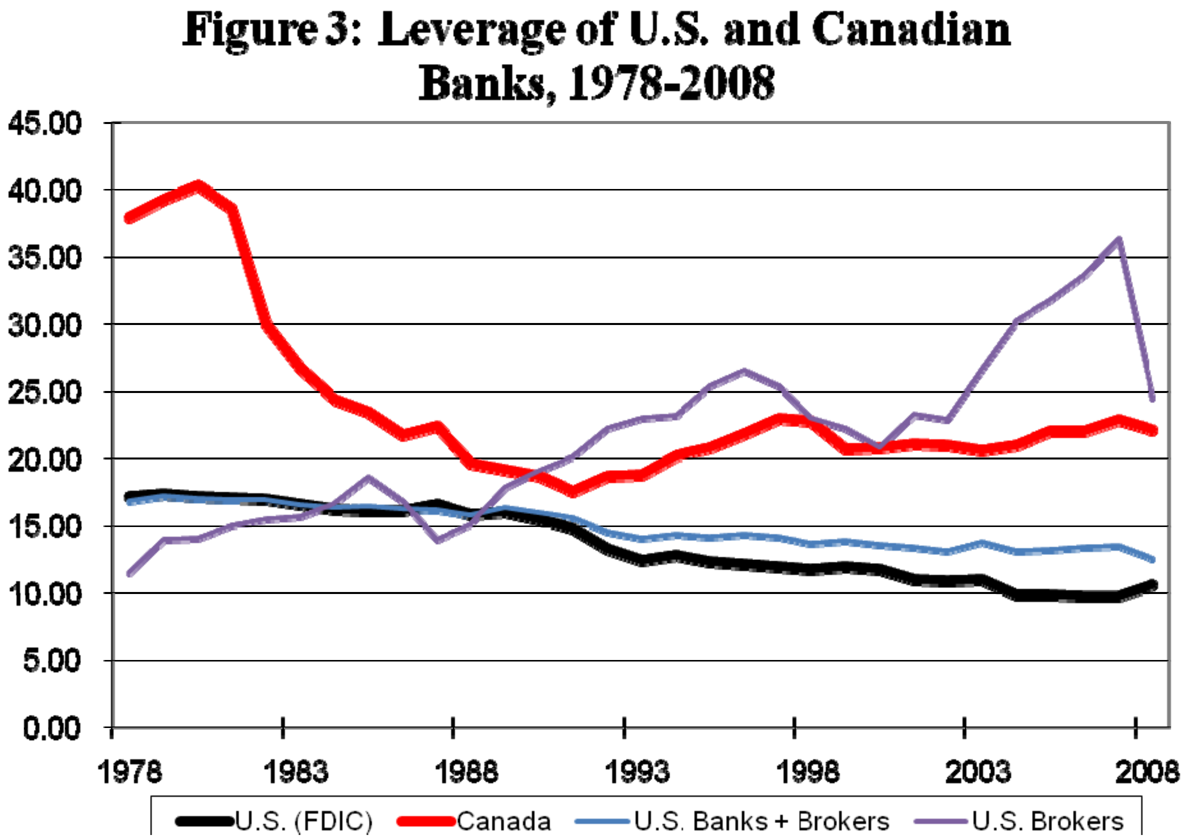
Source: Canadian banks: data are for the 6 largest banks which represent over 90% of assets www.cba.ca; US banks: data are for FDIC insured banks (and therefore omit investment banks) www.fdic.com.

Data on relative leverage ratios (the ratio of total assets to equity) are shown in Figure 2. Although it may be somewhat surprising to those who look to Canada for stodgy risk- avoiding behavior, the figure shows that Canadian commercial bank were consistently more leveraged than U.S. commercial banks. Indeed, since 2004 leverage ratios of US banks were lower than at any time since the start of World War II, and Canadian leverage ratios were lower than the post war average.[15] In level terms leverage ratios of US banks were about 1:10 and of Canadian banks 1:23.



[15] We have tried to use comparable data but differences in accounting standards make this challenging. For example, in 1981 the Canadian government required that the Canadian banks report the results for their mortgage subsidiaries on a consolidated not equity accounting basis. This explains much of the sharp decline in the leverage ratio in 1981. Similarly, Canadian and US banks may report their derivative exposures differently (the US GAAP accounting standard allows some positions to be reported on a net basis, while Canadian accounting standards typically do not).

Source: Canada: all domestic banks Cansim shareholder's equity/total assets; US FDIC banks shareholder's equity/total assets

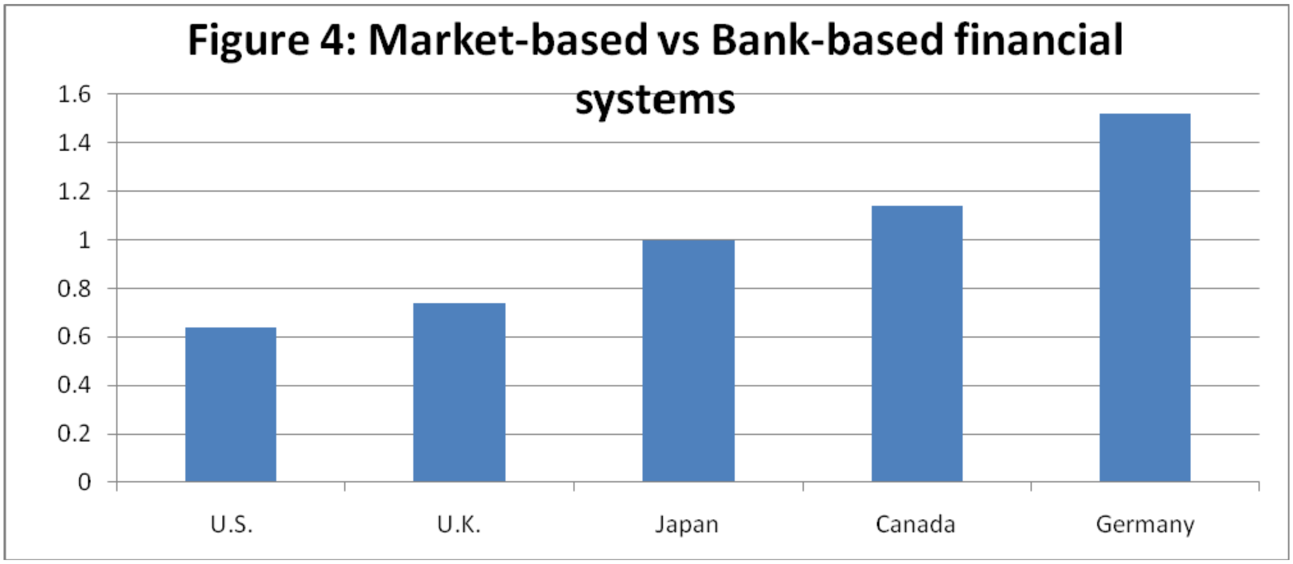


Source: as for Figure 2 plus US brokers: SEC.

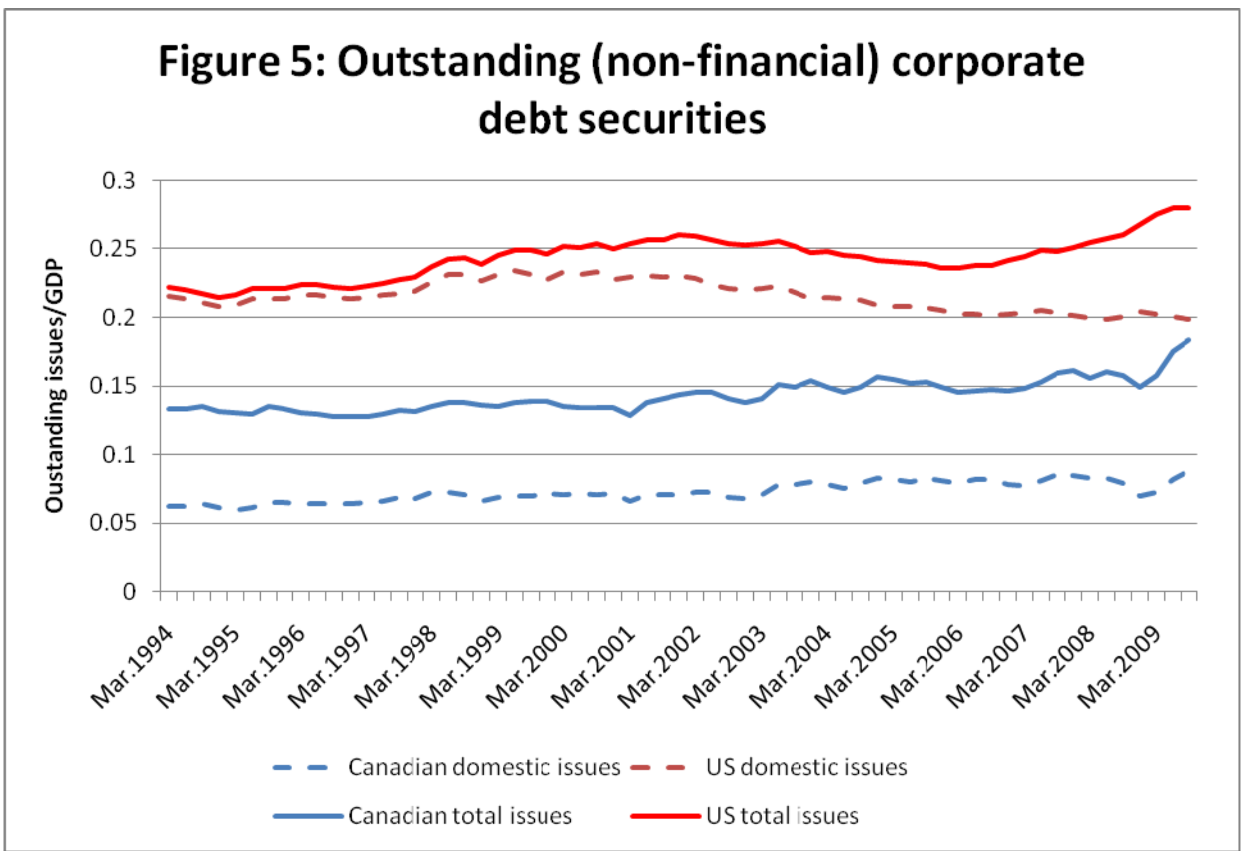
In Canada the largest brokers are all owned by a large bank, and so the leverage ratio for Canada shown in Figure 2 includes the investment banks. We therefore need to take a closer look at the U.S. investment banks. Figure 3 shows that the U.S. investment banks rapidly increased their leverage in the early 2000s (the line marked U.S. Brokers). The investment banks were not large relative to the commercial banking system. (Compare the line marked US (FDIC), which plots leverage for all commercial banks, with the line marked US Banks + Brokers, which plots leverage for the aggregate of the two sectors.) But their rising leverage, and light regulation, increased the fragility in the system. Clearly, it would be useful to move beyond the investment banks and include other members of the shadow banking sector. The statistics that would allow one to plot the overall leverage of the banking system (conventional and shadow), however, are not readily available (Bernanke 2010, 9). Indeed, the absence of adequate statistics may help to explain why there were so few warnings of the impending crisis. The availability of statistics usually depends on the structure of the regulatory system because statistics are a by-product of reports made by financial institutions to their regulators. A fragmented and competitive regulatory system is unlikely to produce a coherent statistical picture of the financial system as a whole.

Structure of Financial Systems

The unit banking system established in the US in the early 19th century created an incentive to use financial markets to transfer funding across regions and economic sectors and to reduce risk through diversification. The result is that the US developed deep and open capital markets while the Canadian financial system remained more bank based. The differences can be seen in both aggregate and micro data. Keay and Redish (2004) compare the financing of the steel industry in the two countries and find that the Canadian firms used more short-term debt while US firms use more long-term debt (which they take to be bonds). At the macro level, comparisons of the use of equity markets and banks as sources of finance – see Figure 4 – and of the extent of bank loan vs. bond financing in the two countries, Figure 5, shows that the greater reliance on security markets continued up to the recent crash.



Source: Levine (2002) Measure is the negative of the log of structure-activity variable which captures the relative size of the equity and bank credit markets.



Source: BIS Table 16b.

6. Conclusions

The structure and performance of financial systems is path dependent. The relative stability of the Canadian banks in the recent crisis, in our view, reflected the original institutional foundations laid in place in the early 19th century system. In the early national period in the United States, the states assumed the right to charter and regulate the banks in their states. Supporters of Hamilton's vision of an active federal government were able to charter the First and Second Banks of the United States, but opposition to federal control from a variety of sources including opposition from advocates of a narrow construction of the constitution, especially in the South, and from the state chartered banks themselves, prevented the development of nationwide branching systems. The result was a fragile, crisis prone, banking system, but one that for all its weaknesses was deeply entrenched politically. Inadequate financing from a weak banking system in turn led to heavy reliance on security markets for industrial finance. This may have contributed to rapid economic growth, but it also contributed to financial instability when stock market crashes and the failure of investment banks triggered financial panics. Attempts were made to reform the system, but the fundamental weaknesses remained. The national banking system was set up during the Civil War, but the state banks were allowed to continue, and the national banks were prevented from branching across state lines, resulting in America's dual banking system. The Crisis of 1907 produced the Federal Reserve System, and the Crisis of 1929-33 produced Federal Deposit Insurance and the Glass-Steagall Act. But despite these reforms the fundamental weaknesses of the U.S. financial system, a fragmented banking system regulated by a patchwork of regulatory agencies survived intact. In short, even severe financial crises failed to generate sufficient political pressure for reform to overcome entrenched special interests.

The Canadian banking system began with note issuing branching banks which were more robust than their neighbours to the south. The system became stronger when double-liability was required to get a bank charter and as entry restrictions produced an oligopoly. By 1920 five large banks dominated the system and while new banks could enter the market they faced a formidable challenge in competing with the incumbents.

An attempt was made beginning in the 1980s to encourage the U.S. system to move in the direction of the Canadian system. But this did not happen. Partly the failure of a Canadian style banking system to emerge in the United States was the result of the initial state of the industry in the United States where the investment banks had long played a larger role than in Canada. Partly, however, it may have been because the United States had failed to understand the nature of the Canadian "Great Bargain" whereby oligopoly would be permitted, but it would be a tightly regulated oligopoly, or more likely because from the beginning of the nineteenth century there was great opposition to the United States establishing a British style oligopoly and once that option was rejected political economy considerations prevented it from ever being adopted.

Bibliography

Beckhart, B.H. (1929) *The Banking System of Canada* New York: Henry Holt and Co.

Bernanke, B. (2010). "Statement by Ben S. Bernanke, Chairman, Board of Governors of the Federal Reserve System, before the Financial Crisis Inquiry Commission." September 2, Washington D.C.

Bodenhorn, H. (2000) *A History of Banking in antebellum America: financial markets and economic development in an era of nation-building* New York: Cambridge University Press

Bordo, Michael D., and Angela Redish. (1987) Why did the bank of canada emerge in 1935? *Journal of Economic History* 47 (2) (06): 405-17.

Bordo, M., A. Redish, and H. Rockoff (1994a) "A comparison of the stability and efficiency of the Canadian and American banking systems 1870-1925" NBER Historical Papers #67.

Bordo, M., A. Redish, and H. Rockoff (1994b) "The US Banking System from a Northern Exposure: Stability and Efficiency" *Journal of Economic History* 54 (June): 325-41.

Bordo,M., and D. Wheelock (2010) "The Promise and Performance of the Federal Reserve as Lender of Last Resort 1914-1913' Jekyll Island conference (mimeo)

Calomiris, C. and G. Gorton (1991) "The Origins of banking panics: Models, facts and bank regulation" in R. Glenn Hubbard ed., *Financial Markets and Financial Crises* Chicago: University of Chicago Press.

Champ, B., B. Smith and S. Williamson (1996) "Currency elasticity and banking panics", *Canadian Economic Journal* Nov. 29(4): 828- 864.

Freedman, C. (1998) "The Canadian Banking System" Bank of Canada Technical Report No. 81.

Gilbert, R.A. (1986) "Requiem of Regulation Q: What it did and why it passed away" Federal Reserve Bank of St. Louis *Review*, Feb. 68(2): 22-37.

Gordon, R. (1986) *The American Business Cycle* Chicago: University of Chicago Press.

Gorton, G. (2010) *Slapped by the Invisible Hand: the panic of 2007* New York: Oxford University Press

Hammond, Bray. (1957) *Banks and politics in America, from the revolution to the civil war*. Princeton: Princeton University Press.

Jalil, Andrew. (2009) "A New History of Banking Panics in The United States, 1825-1929: Construction and Implications!" Mimeo, University of California, Berkeley.

Johnson, S. and J. Kwak (2009) *13 Bankers: the Wall Street takeover and the next financial meltdown* New York: Pantheon Books

Keay, I. and A. Redish (2004) "The micro-effects of financial market structure: evidence from 20th century North American steel firms" *Explorations in Economic History* vol 41: 377-403.

Kryzanowski, L. and G. Roberts (1993) "Canadian Banking Solvency, 1922-40" *Journal of Money, Credit and Banking* Vol. 25, No.3 (Aug.): 361-376.

Levine, R. (2002) "Bank-based or Market-based financial systems: Which is better?" *Journal of Financial Intermediation* Vol. 11: 398-428.

Metcalf, C., A. Redish and R. Shearer (1988) "New Estimates of the Canadian Money stock" *Canadian Journal of Economics* Vol. 31 No. 1 (Feb): 104-24.

Neufeld, E. (1972) *The financial system of Canada: its growth and development* Toronto: Macmillan of Canada.

Odell, Kerry A., and Marc D. Weidenmier. (2004) "Real shock, monetary aftershock: The 1906 san francisco earthquake and the panic of 1907" *Journal of Economic History* 64 (4) (Dec.): 1002-1027.

Rajan, R. (2010) *Fault Lines: How hidden fractures still threaten the world economy* Princeton: Princeton University Press.

Ratnovski, L. and R. Huang (2009) "Why are Canadian banks more resilient?" IMF Working Paper 09/152

Rockoff, H. (2010) "On Daedalian Wings of Paper Money: Adam Smith and the Crisis of 1772." NBER working paper w15594.

Selgin, George and Larry White. (1994) "Monetary Reform and the Redemption of National Bank Notes," *Business History Review* Summer

Sprague, O. M. W. (1910) History of crises under the national banking system. Washington D.C..

Tett, G. (2009) *Fool's Gold* New York: Simon & Schuster Inc.

Urquhart, M. (1983) *Historical Statistics of Canada* Ottawa: Statistics Canada

West,P.C. *Banking Reform and the Federal Reserve 1863-1927*. Ithaca: Cornell University Press.

White, Eugene N. (1983) *The Regulation and Reform of the American Banking System, 1900-1929*, Princeton University Press.