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WHY DIDN'T CANADA HAVE A BANKING CRISIS IN 2008 (OR IN 1930, OR 1907, OR ...)?

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ABSTRACT

The financial crisis of 2008 engulfed the banking system of the United States and many large European countries. Canada was a notable exception. In this paper we argue that the structure of financial systems is path dependent. The relative stability of the Canadian banks in the recent crisis compared to the United States in our view reflected the original institutional foundations laid in place in the early 19th century in the two countries. The Canadian concentrated banking system that had evolved by the end of the twentieth century had absorbed the key sources of systemic risk—the mortgage market and investment banking—and was tightly regulated by one overarching regulator. In contrast the relatively weak, fragmented, and crisis prone U.S. banking system that had evolved since the early nineteenth century, led to the rise of securities markets, investment banks and money market mutual funds (the shadow banking system) combined with multiple competing regulatory authorities. The consequence was that the systemic risk that led to the crisis of 2008 was not contained.

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> —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]"
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> 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. In this paper we take a step back from the immediate experience to see the crisis of 2008 in a historical context.

As our title implies, the stability of the Canadian banking system is not a one-off event. The US banking system experienced frequent crises in the antebellum era, under the National Banking system (1863-1914), again in the 1930s under the Federal Reserve System, as well as in 2008; Canada's banking system, however, 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 19th 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 towards 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 Federal government power over banking: State governments continued to charter banks. This led to the subsequent fights over the constitutionality of the First and Second Banks. And from the end of the Second Bank until the Civil War, the chartering of banks was solely the responsibility of the states. The establishment of the national banking system during the civil war did not replace the state banking system, leading to the creation of a "dual banking system." In Canada banking was under federal jurisdiction permitting the creation of nation-wide branch banking. 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 and fragmented banking system and a flawed payments system. .

A consequence of the weak banking system was the development of a robust system of securities markets that were used to move funds geographically, provide capital for industry, and diversify portfolios. The growth of the securities markets was accompanied by the emergence of a range of financial intermediaries that evolved into the shadow banking system that proved problematic in financial crises.[1] The shadow banks were largely outside the regulatory umbrella and the risks that they took were therefore not well-understood or monitored. By contrast, Canadian securities markets evolved much more gradually and the banks absorbed non-bank financial intermediaries, regulation was unified and systemic risk remained under the regulatory umbrella.

The paper is organized as follows: we begin by documenting the different paths taken by the US and Canadian financial systems in the 19th and early 20th centuries. We then describe the differential impact of firstly, the Great Depression and secondly, the Great Inflation on the two systems. We then consider reasons why the US and Canada had such different experiences in the crisis of 2007-2008. We conclude with a discussion of the political economy factors that explain the divergent path dependency in the two countries.

We will argue that the Canadian system produced greater financial stability, obviously a great benefit to the Canadian economy, but there is a caveat to keep in mind: greater stability may have come at a cost. A more concentrated and regulated financial system may have been slower to innovate, may have been slower to invest in emerging sectors, and may have provided services at monopoly prices. Here we will not attempt to identify all of these costs let alone weigh them against the benefits of stability. Our focus will be on the sources of the difference in financial stability between the US and Canada.

[1] We use the term shadow banks to describe financial intermediaries that perform some of the functions of commercial banks, but which are subject to less or no regulation.

1. Setting Off on Different Roads

In this section we describe the differences in political economy of bank chartering in the U.S. and Canada that explains why the two systems set out on different roads.

The United States

There was a tug of war in the early republic between the federal government and the states over who would charter banks. Alexander Hamilton, who had helped found the state-chartered Bank of New York in 1784, 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, a larger institution similar in structure to the First Bank, 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 Second 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; from Wall Street because the home office of the Bank was in Philadelphia; and from the states which did not want to give up the valuable power of chartering banks. Indeed (Sylla et al., 1987) show that bank-chartering played an important role in state government finance during this era. As a result of this opposition the charter of the Second Bank was not renewed, and the chartering of banks became the sole prerogative of the states.[2] Even at this early date the case can be made (Sylla 2006) that the American system was more conducive to economic development, but as far as stability is concerned, the die had been cast in favor of Canada.

After the demise of the Second Bank, a number of states experimented with a system 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. This system diminished some of the direct benefits to the states from chartering banks, but the requirement that notes be backed by government bonds, including bonds of the state where the bank was located, strengthened the market for state government bonds.

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 banking system fragmented along state lines. Had the Supreme Court prohibited these exclusions, as it had, for example, in the case of steamships, the U.S. might have developed a nationwide branch banking system. But in Bank of Augusta v. Earle (1839) and other cases the court allowed states to exclude branches of banks chartered in other states. Many states went a step further and prohibited branching within the state, resulting in a system of

[2] Johnson and Kwak (2010) 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.

extremely small local banks.[3] However, it does not appear that Americans as a whole were resolutely opposed to branch banking because some states (California and several southern states including Virginia) did permit branching. The key fact was that each state was jealous of its power to charter banks: banking ended at the state line. Although individually small and weak, collectively local banks were able to exercise considerable political power: Congressman and Senators would not support legislation that undermined local banks, even if such legislation would have increased the stability of the system as a whole. Ultimately, the strength of the state 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. This system essentially elevated the successful free banking systems of New York and Ohio to the national level. One of the main political factors making for the adoption of the National System 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 allowed to continue, although the right to issue paper money was given to the national banks. More importantly for our purposes, 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 what was known as 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

[3] Calomiris (2000, 43-58) is a concise but thorough account of the origins of the state-bounded banking system of the United States.

regulators. If, for example, the rules governing the national banks were made too onerous, some national banks might switch to the state system (White 2011).

Thus, the fundamental source of the long-term fragility of the US banking system, small undiversified banks, was already well entrenched by 1870. In parts of the Midwest and South 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.

Moreover, America's fragmented banking system was unable to supply capital for America's rapidly growing industrial sector based on new industries. The weaknesses in the U.S. banking system, promoted the development of large and efficient financial markets. Because there were no large banks to provide longer-term financing, securities markets developed to fill the gap. The inability of a banking system fragmented along state lines to move funds across regions within the institution created an incentive to move funds 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.

The problem of insufficient support for industrial funding became more acute after the Civil War as new industries of national scope came on line. The result was that financial markets -- including stock and bond markets and investment banks for organizing enterprises and distributing their stocks and bond -- became the main suppliers of industrial capital (Davis 1966, Calomiris 1995). This crucial sector was mostly unregulated. And because it was based in New

York it enjoyed a large measure of political protection under America's representative system which is highly protective of regionally based industries. Reliance on financial markets and investment banks successfully provided capital for long term development, but created a large unregulated sector that was subject to financial panics.

Thus, the development of securities markets meant that investment banks, which participated in the creation and marketing of securities, became an important part of the US financial system. The United States, therefore, always had something like the ‗Shadow Banking system' that has been the subject of so much recent discussion. In contrast, in Canada securities markets and the broker dealers remained much smaller than the banking sector. 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.

Canada

In the early nineteenth century, the colonial governments in (now) Ontario and Quebec chartered banks that looked very similar to the First Bank of the United States.[4] The banks had the right to issue bank notes, had the right to branch, had time-limited charters and had close ties to the State. But the evolution from that point was very different. The charters of the Canadian banks *were* renewed and political concern about monopoly was mitigated by granting competing groups their own charters. By the time of Confederation in 1867 there were 35 chartered banks in the four colonies that amalgamated in the Canadian federation.

[4] The Bank of Upper Canada (Upper Canada comprised mostly the area now Ontario) was established in 1822 and the Bank of Montreal in 1817.

In the British North American Act that created Canada, the federal government was given exclusive jurisdiction over (i) currency and coinage and (ii) banking.[5] The U.S. constitution, by way of contrast, gave the federal government exclusive jurisdiction over (i), but was silent on (ii), and hence opened the door to the continuing role of the states in bank chartering. The Canadian federal government, after passing place-holder legislation in 1867, turned to establishing the framework for banking in the new country. This was a pivotal moment in the structure of the Canadian banking system. In 1869 the Minister of Finance - supported by the single largest bank, the Bank of Montreal - argued for the adoption of a system similar to the National Banking system, with a bond backed currency and local unit banks.[6] The proposal was opposed by petitions from Boards of Trade and all the other banks, and the rancorous debate in the House led to the resignation of the Minister of Finance. Opponents argued that the bond supported bank notes were expensive relative to the issue of notes backed by the general assets of the bank and ‗unresponsive' to the needs of trade. The new Minister of Finance decided to continue the banking system largely as it had been in the colonial period with the exception of introducing a government note issue (‗Dominion Notes') with small denominations (<$5) and also very large denominations that could be used between banks only.

The Canadian banks were only lightly regulated. They had the right to issue notes (after 1880 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 bank charter renewals were co-ordinated to occur every 10 years through a renewal

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[5] BNA Act section 91 listed the powers reserved for the Federal government 91(14) Currency and Coinage; (15) Banking, Incorporation of Banks and the Issue of Paper Money; (16) savings Banks; ...(20) Legal Tender. In practice, banks are only chartered federally while trust companies and life insurance companies can have provincial or federal charters.

[6] Proposals laid before Parliament, May 14, 1869. (Beckhart, 1929: 298).

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.[7] 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. 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 raised the minimum capital stock and required 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.[8] In addition, shareholders faced double liability and directors and the majority of shareholders were required to be resident in Canada. In many respects, the Canadian banking industry was a cartel backed by the federal government limiting entry and policed by the Canadian Bankers Association.[9]

Canadians didn't have the deep seated distrust of financial power that prevailed in the US. The founders of the earliest Canadian banks were Scots who adopted the Scottish banking system, which had served Scotland well in the eighteenth century, and which emphasized Scotland-wide branch banking. Financial populism never had the traction in Canada that prevailed in the U.S.[10] Financial populism in the United States helped protect its system of state-

[7] 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. In 1913 the Bank Act amendments created the Central Gold Reserves which allowed the banks to issue notes above the value of their capital stock to the amount of their gold deposits in the Central Gold Reserve.

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

[9] The Canadian Bankers' Association was established in 1891 as an industry association which represented the banks and also managed the Clearing Houses.

chartered (frequently small unit) banks. Politicians who wished to protect local interests could appeal to deep seated fears about Wall Street bankers.

The implications for financial stability

The twin weaknesses of the American financial system -- a commercial banking system divided along state lines and volatile financial markets in which a "shadow banking system" of unregulated or lightly regulated investment banks and other financial intermediaries participated produced a series of financial panics. There were major banking panics in 1837, 1857, 1873, 1893, and 1907, and minor panics in 1839, 1884, and 1890. [11]

Much of this story was laid out by O.M.W. Sprague in his classic *History of Crises Under the National Banking Act* (1910). Sprague's analysis has been refined and amplified in subsequent accounts, such as Friedman and Schwartz (1963, 15-167), but still remains the foundation for accounts of U.S. bank instability during this era. Sprague argued in particular that the "pyramiding of reserves" and heavy reliance on securities markets to finance investment, contributed to these panics. More recently, Calomiris and Gorton (1991) argued that ultimately, it was deposit holders' uncertainty as to viability of a bank that produced bank runs. More specifically, the fragility of the undiversified banks was amplified by asymmetric information and – in the absence of a lender of last resort – bank runs led to financial crises.

The ‗pyramiding of reserves' refers to the right of rural national banks to hold some of their reserves in the form of deposits in a reserve city national bank, which could in turn could

[10] 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.

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

hold some of its reserves in the form of deposits in a central city national bank.[12] In New York the largest central reserve city, most of the reserves were held by just six national banks, which invested them in call loans.[13] Because the country banks were relatively undiversified they held higher levels of reserves than the Canadian banks, and the pyramiding of reserves enabled some return on reserve balances. Additionally, as it was difficult to transfer good funds across the country, correspondent relationships could act as a substitute for an intrabank transfer system. 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.

The pyramiding of reserves interacted with the seasonal weakness caused by the restrictions on the issue of national banknotes. The National Banking System required that bank notes be backed by U.S. government bonds. This was a modification of the system that had been used in the free banking laws adopted in many states before the Civil War. It increased the safety of the notes from the point of view of the public, and not incidentally strengthened the market for U.S. government bonds at a time when the war was straining the Federal fiscal system to the utmost. But these benefits came at a cost. Because the issue of notes was tied to the holding of government bonds, the amount of notes could not easily expand to satisfy seasonal fluctuations in the demand for currency. Each fall, demand for currency in agricultural areas increased significantly as harvest workers and transport costs were paid in cash. Since rural banks could not easily issue more notes, they tended to draw on their correspondents for cash. This in turn put

[12] Pyramiding occurred before the national bank act for the reasons discussed below, however it was explicitly permitted in the national bank act.

[13] Myers (1931) argues that the amount of call loans held by the large banks was very closely tied to the amount of bankers' balances they held.

pressure on the New York money market, increased short-term interest rates, and increased the vulnerability of the security markets in the fall of the year.

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. 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 in New York further weakening the system as a whole.

In 1907 the United States was hit by another major financial crisis. The crisis began with the Trust Companies in New York City (Moen and Talman 1992, 2000). The Trust Companies were chartered and regulated (lightly) by the state of New York. They engaged in a wide range of activities including both the traditional deposit taking of commercial banks and investment banking, and had grown to be a major force in New York (Neal 1971). Indeed, the term "shadow banks" does not seem entirely out of place. One of the important triggers of the panic was the failure of the Knickerbocker Trust, the third largest Trust, in October 1907. The contagion of fear that began with the Knickerbocker soon spread to the other Trusts and eventually engulfed the entire banking system, producing a suspension of specie payments. Perhaps if the National Banks in New York, operating through their clearinghouse, had been willing to come to the aid of the Trust companies the crisis could have been ameliorated. But the National Banks were unwilling to come to the aid of the Trust Companies, because the National Banks felt that the lightly regulated Trusts had expanded at their expense. We don't mean to suggest that suspicion of the trusts and the failure of the Knickerbocker were the sole causes 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 suggested as a solution to the problems of the national banking system (West 1978). But it was too late to adopt the Canadian model. 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 flaws in the system, the dual commercial banking system and the unregulated investment banking, were left intact. Indeed, by creating another regulatory apparatus, the Federal Reserve Act increased the scope for regulatory arbitrage (White 1983; 2011).

In Canada the banks were robust to the shocks that generated panics in the US. In part, this reflected the fact that 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 during the fall crop-moving season was readily met and did not lead to an increase in interest rates and decrease in reserve ratios as occurred in the U.S.[14] Champ et al. (1996) show that between 1880 and 1910 in Canada the bank note circulation rose by about 15% in the fall while in the US there was no significant seasonal variation. In contrast, US interest rates rose in the fall and the reserves of the New York banks fell while in Canada these variables did not vary seasonally.

To be sure, there were bank failures in Canada, but 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 in 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. There was no panic, and the guaranteeing banks lost nothing after the double liability of the shareholders was drawn on.

Table 1 reproduces results from an earlier paper analyzing the relative performance of the Canadian and US banking systems between 1870 and 1925 (Bordo et al., 1996). 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 reflects the fact that the state banks tended to be smaller rural banks with less diversified portfolios than the national banks, which were more likely to be larger reserve city banks. It may also reflect somewhat weaker regulatory standards for the state banks, particularly with respect to real estate loans. 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

[14] In Canada, until 1907 the increase 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%.

did they lead to widespread suspension of convertibility. Thus their knock-on effects on the real economy were smaller than in the United States.

Table 1: Losses on Deposits (Percent per Year)

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

[a]This figure is for 1867 (Confederation) to 1880. In 1866 there was a minor failure: The Bank of Upper Canada. If this failure were included the Canadian average for 1865 to 1880 would be about 0.07. Source: Bordo et al. (1996)

The Canadian branch banking system was oligopolistic. Standard theory implies that an oligopolistic system will imply higher cost banking and limited supply of banking services, relative to a competitive industry. In our earlier work (Bordo et al., 1994) we found that the Canadian banking was not characterized by higher costs (as measured by interest rate spreads) than those in the US – which we speculated reflected the high costs of bolstering the stability of an inherently unstable system. Furthermore, the Canadian banks had similar rates of return on equity, although the Canadian banks had a greater share of loans (and lower share of securities) in their portfolios. We concluded that over the period 1880-1980 the Canadian banking system was not significantly less competitive than that of the US. Whether the costs of oligopoly have risen or fallen since the 1980s, however, is beyond the scope of this paper.

2. The Great Depression and its aftermath

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 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 initially 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 caused a general increase in the distrust of the banking system was the failure of the Bank of United States in December 1930, the largest bank failure in U.S. history to that time. Friedman and Schwartz (1963, 309-311) believed that this failure was an important contributor to the financial crisis because currency in the hands of the public began to rise at this time, indicating an increase in distrust of the banks. Although a member of the Federal Reserve System, 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. It may be that part of the explanation lies in the divided structure of U.S. banking system. Opposition to a rescue by more tightly regulated national banks may have contributed to the decision by the Federal Reserve not to bail out the bank.

In the United States, the financial crisis in 1929-1933, like some of the earlier crises, generated successful calls for reform. 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 stricter regulatory regime, among other reforms. The regulations included clauses in the Glass-Steagall act that limited interest rates banks and savings banks could pay on deposits. Part of the motivation for the latter reform was the belief that competition for deposits had led to excessive risk taking by banks.

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. 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. 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.

In Canada, there were no bank failures during the Great Depression, but the Canadian economy suffered as dramatic a real collapse as that of the United States, as the export sector shrank and the terms of trade moved dramatically against the country.[15] 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 – a 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). Other major reforms in Canada included the Dominion Housing Act and the creation of the Ontario Securities Commission.[16] Unlike the U.S. authorities, the Canadian government did not create a deposit insurance fund; the Canadian Deposit Insurance Corporation was established in 1967.

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

The 1950s and 1960s proved to be a period of financial stability in both Canada and the United States. Canadian stability, of course, was simply a continuation of the norm. But the American stability was unusual. There were, it appears, a number of plausible explanations for U.S. financial stability during these years, although it is difficult to order them in terms of importance. (1) Deposit insurance reduced the incentive for bank runs, even in circumstances when there was distrust of the ultimate solvency of a bank was high. (2) Banks and other financial intermediaries had invested heavily during the war years in obligations of the federal government leaving them with low-risk portfolios. (3) The Federal Reserve freed from the constraints of the gold standard, and perhaps chastened by its failures during the 1930s, was ready to intervene in financial markets if distrust of the system threatened to become widespread. (4) Inflation was low protecting the solvency of banks and similar financial intermediaries which are net monetary creditors.

This era of stability 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 financial innovations dissolved the firm lines between sectors of the financial industry.

3. The Great Inflation and the Growth of Shadow Banking

In the 1970s both the U.S. and Canadian financial system were affected by a number of macro factors: inflation, globalization (a decrease in barriers to international capital flows), reductions in information costs (domestically and internationally), and a political movement

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

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 in the United States rate rose from less than 2% per year before 1965 to over 10% by 1980. Macro economists have proposed various 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.[17] While the ceiling was not initially binding, as interest rates rose with inflation the ceiling became a constraint and led to an outflow of funds from commercial banks and savings banks and a rapid growth of money market mutual funds (MMMFs) – see Table 1. These funds, an innovative response to the interest rate environment, were unregulated by any of the regulatory agencies, but performed many of the basic functions of banks: they issued checkable deposits and invested in longer term assets. Initially the money market funds tended to invest their deposits in high return Treasury Bills and commercial paper. But as the industry developed they moved into a wider variety of assets.

Table 2

Share of MMMF/ Deposits at banks

[17] 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.

	1978	1983	1988
US	1.0%	11%	14%
Canada	0.1%	0.2%	0.7%

Source: Canada: Cansim v37245;v36939; US: Flow of funds – IMFNS; FDIC deposits in insured banks.

In Canada the banks were also prohibited from paying interest on demand deposits but interest rates on savings accounts were not restricted, and there was no substitution out of bank deposits into MMMFs (see Table 2). In the 1960s the large Canadian banks had acquired majority (but typically not whole) ownership of mortgage lenders.[18] 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 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.

In both Canada and the US there was a pattern of deregulation after the 1980s, but in Canada that deregulation led to bigger banks while in the US it led to shadow banks. The Canadian financial system had been organized around four separate pillars (banks, trust companies, insurance companies and broker/dealers) but beginning in the 1970s the functional distinctions between the pillars eroded and the government acted to increase competition. The most significant change occurred with the 1987 Bank Act revision which allowed the Canadian

[18]

CIBC	Kinross Mortgage
TD	Canada Permanent
BNS	Holborough Investments
Royal	Roymor

Source: Neufeld (1972, 131)

banks to own securities dealers. Within a year, four of the five major banks had each bought one of the four big dealers (between them about 65% of the market), and the fifth (TD Bank) started a dealership from scratch.[19]

The blurring of the functions of financial institutions was accompanied by regulatory changes. The Office of the Superintendent of Financial Institutions (OSFI) took over the functions of the Inspector General of Banks and the Superintendent of Insurance and became the regulator and monitor of all federally incorporated financial institutions. That is, OSFI regulates federally incorporate trust companies and pension funds as well as insurance companies and banks. Note that Canada Deposit Insurance Corporation does not have a regulatory function and the Bank of Canada does not regulate or supervise individual financial institutions although the Bank is responsible for regulation of systemically important clearing and settlement systems and as lender of last resort for systemic financial stability.

After 1980 the US system also changed radically. First, deregulation was tried as a way of salvaging the savings (savings and loan) 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

[19] Royal – Dominion Securities; CIBC – McLeod Young Weir; BMO – Nesbitt Thomson; Scotiabank –Wood Gundy. The dealers owned by the big-6 banks continue to dominate the securities dealerships. Source: Yakabuski (1993).

what appeared to be a disastrous experience with deregulation, enthusiasm for financial market deregulation took hold, reflecting 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 -- the result, we argued above, of the 19th century fragmentation of the commercial banking system -- and the lifting of restrictions in the U.S. led to an expansion of the investment banking sector rather than their absorption by universal banks in which the commercial banking arm was dominant, as was the case in Canada. U.S. investment banks continued to originate, invest in, and trade securities, while tapping into larger sources of funds. The basic source of funds was the repurchase agreement in which an investment bank accepted cash, possibly from a money market fund or a hedge fund, in exchange for a promise to repay with interest in a short period of time. The investment banks were regulated by the Securities and Exchange Commission. But this agency, which had been created in the depression, traditionally focussed on the accuracy of the information being supplied to the ultimate purchasers of securities, and may not have been well equipped to regulate large systemically important financial intermediaries. An oft criticized decision by the Securities and Exchange Commission in 2004 to allow the investment banks to increase their leverage, illustrates the problem. As the rivalry between investment banks and commercial banks intensified, their balance sheets (and off balance sheets) took on more risk. Securitized mortgages provided a vehicle for rapid accumulation of high yielding, but apparently safe investments.

Regulation in the U.S. rested in the hands of a patchwork of agencies born over the course of two centuries. A national bank, for example, would be regulated by the Federal Deposit Insurance Corporation (1934), the Comptroller of the Currency (1863), and the Federal Reserve (1913). Investment banks, as we noted, were regulated by the Securities and Exchange Commission (1934). 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. The question here is whether competition, which works well in private markets, also works well for regulatory agencies. It may be that the ability of private firms to shop for the most favorable regulatory environment and the resulting competition among regulatory agencies for clients produces an overall decline in regulatory oversight that more than offsets possible benefits from competition among agencies in adjusting to new trends, reducing response time, simplifying reporting, and so on.

Implications of these changes

While deregulation and financial innovation changed much about the financial system in the two countries, the relative stability of the two systems did not change. Figure 1 shows that after the introduction of deposit insurance in the United States, and following World War II, both commercial banking systems were stable. However, beginning in the 1970s commercial bank failures increased in the US but as in the past, not in Canada.[20] In Canada two small banks failed in 1986 and – as in the period before 1934 – while these were ‗small' Canadian banks they were much larger than the typical US bank that failed.[21]

Although there was a return to low rates of institutional failure in the U.S. in the mid-1990s similar to those in Canada, the structure of the two systems continued to diverge. Financial deregulation was tried in both countries, but the results of that deregulation were very different in ways that reflected the initial structure of the system. In Canada, the result of deregulation was that the chartered banks absorbed more of the financial system and regulation became more unitary. In the US, financial innovation and deregulation led to an expansion of shadow-banking and greater reliance on financial markets.

Use of Money market mutual funds

The initial development of money market mutual funds in the US reflected the inability of the commercial banks to offer customers high interest rates on deposits, which were available on market instruments. As we saw above, Canadian banks did not face this constraint and MMMFs were widely used. In the 1990s the funds became more popular in both Canada and the US, but much more so in the US, see Figure 2. Indeed the funds only became significant in Canada, after 1987, when the banks were permitted to create them and today approximately half the total MMMFs are held at banks. [22] That is, they stayed within the banking system.

On the eve of the financial crisis, January 2008, deposits in MMMFs in the United States were nearly six times as large as private domestic demand deposits ($3,033 billion/$511 billion)

[20] The data are for commercial banks in each country and exclude savings and loans in the US and trust companies in Canada which both had greater failure rates than the commercial banks.

[21] There has been one other bank failure BCCC a subsidiary of BCCI in 1991 but its deposits were very small.
[22] Freedman, (1998). For data on the size of MMMFs see Bank of Canada, Banking and Financial statistics.

(Lucas and Stokey 2011). When the Reserve Primary Fund _broke the buck' in September 2008, the Treasury guaranteed a net asset value of $1 for MMMFs to prevent a run on the funds – essentially providing deposit insurance to these non-bank liabilities.

Reliance on markets

A fragmented banking system, with a multitude of competing regulators, the heritage of early political-constitutional decisions in the U.S. spurred the use of financial markets to transfer funds across regions and economic sectors and to finance industrialization. The result was 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 micro and aggregate data. Keay and Redish (2004) compared the financing of the steel industry in the two countries and found that the Canadian firms used more short-term debt while US firms use more long-term debt. At the macro level, comparisons of the use of equity markets and banks as sources of finance (Figure 3) and of the extent of bond financing in the two countries (Figure 4) shows that the greater reliance on security markets in the U.S. continued up to the recent crash. Reliance on security markets may have had advantages, for example it may have permitted the more rapid exploitation of industrial innovations, an issue that we don't explore here, but it increased the vulnerability of the US financial system to panics.

Mortgage finance

Mortgage finance provides a case study of how initial differences in financial institutions led to very different financial arrangements. In the US a typical homeowner in the late 20th century would probably have had a fixed rate mortgage with a term of 30 years, and the right to prepay the mortgage, for example if interest rates fell.[23] The mortgage market presented two challenges to the banks: how to access a national (or international) capital market and how to avoid a maturity mismatch between demand (or short-term) deposits and long-term loans. The solution was to bundle mortgages together and sell them as a security. In addition, by carefully constructing (tranching) the securities and setting up off-balance sheet vehicles to hold residual claims, regulatory capital requirements (Basle I and II) could be reduced. By 2000, US banks had widely adopted an originate-to-distribute mortgage system and more than half of all mortgages were securitized (see Figure 5).

Mortgage finance in Canada is organized differently. The typical Canadian homeowner in the late 20th century held a mortgage that amortized over 25 years but a term of only 5 years. The mortgage was kept on the bank's books, and if the mortgage were arranged by a mortgage loan subsidiary of the bank, that subsidiary's accounts were consolidated with the parent bank, and OSFI regulated the consolidated entity. The Canadian bank resolved the maturity mismatch by putting the burden of refinancing on the consumer.[24] Unlike small banks in the US there was no difficulty in accessing national funding markets because they could use their nation-wide branching systems. In 2000, approximately 10% of Canadian mortgages were securitized (see Figure 6).

This bare bones story omits much of the complexity of the story of securitization but it sketches the way that the legacy of the fragmented banking system of the 19th century affected U.S. financial markets of the 21st century. The point that we wish to highlight is that the lower

[23] The 30-year fixed rate mortgage was a product of New Deal reforms of the mortgage market. Before the 1930s shorter term mortgages, say 5 years, with the principal due at the end were the most common.

[24] The banks first were permitted to make mortgage loans in 1954, but did not become major mortgage lenders until after the 1967 Bank Act. Prior to 1967 mortgages were typically for longer terms, but the banks were not willing to make long loans because (a) deposit insurance, which also began in 1967, was only available for deposits of 5 years or less so that long term deposits were unlikely and (b) the Canada Interest Act restricted the ability of the banks to collect on unpaid interest on loans of greater than 5 years.

level of securitization of mortgages in Canada reflects the different incentives in the Canadian financial system. In the US, securitization of mortgages enabled banks to (1) address maturity mismatch (2) reduce their capital requirements and (3) access the national capital market. In Canada, the potential maturity mismatch was addressed by the short term of mortgages; OSFI did not allow banks to evade capital requirements through off-balance sheet vehicles and the branch banking system created a national capital market.

Leverage

The importance of securities markets in the US had its corollary in the importance of investment banks, and there were important differences between in the organization of broker/dealers across the two countries. In Canada the largest brokers are all owned by a large bank, and the consolidated entity is regulated. In the US the investment brokers remained distinct from the commercial banks. Figure 7 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 of the system.

It is true that OSFI imposed higher capital requirements on the Canadian banks than the basic Basle rules required, but Figure 7 makes clear that when Canadian banks are compared to all US banks (including broker dealers), the US banks were less leveraged. The key is that in the US there was a functionally significant portion of the banking system that was very highly leveraged while in Canada no bank was extremely leveraged.

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 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.

4. Conclusions

The structure and performance of financial systems is path dependent. The relative stability of the Canadian banks in the recent crisis compared to the United States, where the recent crisis originated in the shadow banking system and spread to the universal banks, in our view reflected the original institutional foundations laid in place in the early 19th century in the two countries. The Canadian concentrated banking system that had evolved by the end of the twentieth century had absorbed the key sources of systemic risk—the mortgage market and investment banking—and was tightly regulated by one overarching regulator. In contrast the relatively weak and fragmented U.S. banking system that had evolved since the early nineteenth century, led to the rise of securities markets, investment banks and money market mutual funds combined with multiple competing regulatory authorities. The consequence was that the systemic risk that led to the crisis of 2007-2008 was not contained.

The historical origins of the U.S. system go back to the early national period when the states obtained the right to charter and regulate the banks. 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 opposition from the state chartered banks themselves, prevented the development of nationwide branching systems. Each state separately, jealous of its power to charter banks, prohibited branches of banks chartered in other states; an exclusion that was endorsed by the U.S. Supreme Court. 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 and fragmented 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 structural weaknesses persisted. The national banking system was set up during the Civil War, but the state banks were allowed to continue, and to protect them 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 an end to the gold standard. These were important reforms that contributed to stability, as did the rapid increase in federal debt in the portfolios of financial intermediaries during World War II. But despite these reforms the fundamental structural weaknesses of the U.S. financial system, a fragmented banking system regulated by a patchwork of regulatory agencies, survived intact. Although, some stability was achieved in the 1950s and 1960s, this system was undermined by the inflation of the late 1960s and 1970s. In the 1980s a weakened savings and loan sector collapsed with massive losses, but the crisis did not engulf the financial system as a whole. In this respect the Savings and Loan Crisis was more reminiscent of the troubles that affected, but were largely confined to, the savings bank sector in 1877-1878. Various reforms were put in place to deal with the savings and loan crisis, but again the fragmented banking and regulatory system remained in place. In short, even costly financial crises failed to generate sufficient political pressure for reform to overcome entrenched special interests.

The financial system recovered from the Savings and Loan Crisis and from a number of scares that might in different circumstances have triggered a panic: the Latin American Debt Crisis in 1982, the failure of Continental Illinois in 1984, the failure of Drexel Burnham (the junk bond investment bank) in 1992, and the failure of Long-term Capital Management 1998, among others. But the rapid growth of the "shadow banking system" in the late 1990s and early 2000s produced an environment in which major failures, although addressed by the Federal Reserve, ignited a panic. Opinions on the most important causes for the growth of the shadow banking system tend to diverge along political lines. The Report of the U.S. Financial Inquiry Commission (2011), reflecting the majority of Democrats on the Commission, attributed the growth of the "shadow banking system" to an ideological turn toward less regulated markets and political clout of regulated industries achieved through lobbying and campaign contributions. The dissenting Republicans put more weight on the Federal Reserve's accommodative monetary policy and government housing policies.

What is clear is that the crisis of 2007-8 was, as Gary Gorton (2010) has argued persuasively, a return to the full-scale financial crises of the nineteenth century. Once again unregulated or lightly regulated sectors of the financial system, now dubbed the shadow banking system, proved to be the source of trouble. The details in terms of financial institutions and instruments were unique in 2008, but below the surface there were strong parallels with the nineteenth-century crises. True, prompt actions by the Federal Reserve and other agencies mitigated the damage. When a run on the MMMFs threatened, deposit insurance was extended, ending what might have been an extremely destructive run. Nevertheless, the macro-economic consequences of the crisis of 2008 rival those of the nineteenth-century crises.

The Canadian story is very different. 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. Later in the twentieth century the Canadian chartered banks were able to absorb both the mortgage banks and investment dealers and become true universal banks. These institutions were regulated by an overarching regulator, OFSI, which basically contained the development of an unregulated shadow banking system and restricted the proliferation of securitization and off balance sheet entities. In terms of stability, to put it somewhat differently, the Canadian system benefitted from the ―Grand Bargain" in which the Canadian banking oligopoly was protected from competition, especially from American banks, in return for tough regulation.

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. This reflected the legacies of the nineteenth century: a dual banking system, a strong shadow banking system, heavy reliance on financial markets, and multiple competing regulators. Even more basically it reflected long-seated opposition to allowing the financial system to be dominated by a tightly regulated oligopoly. This opposition to the establishment of a British style oligopoly (which is embedded in the Canadian grand bargain) goes back to the beginnings of the Republic and once that option was rejected political economy considerations prevented it from ever being adopted.

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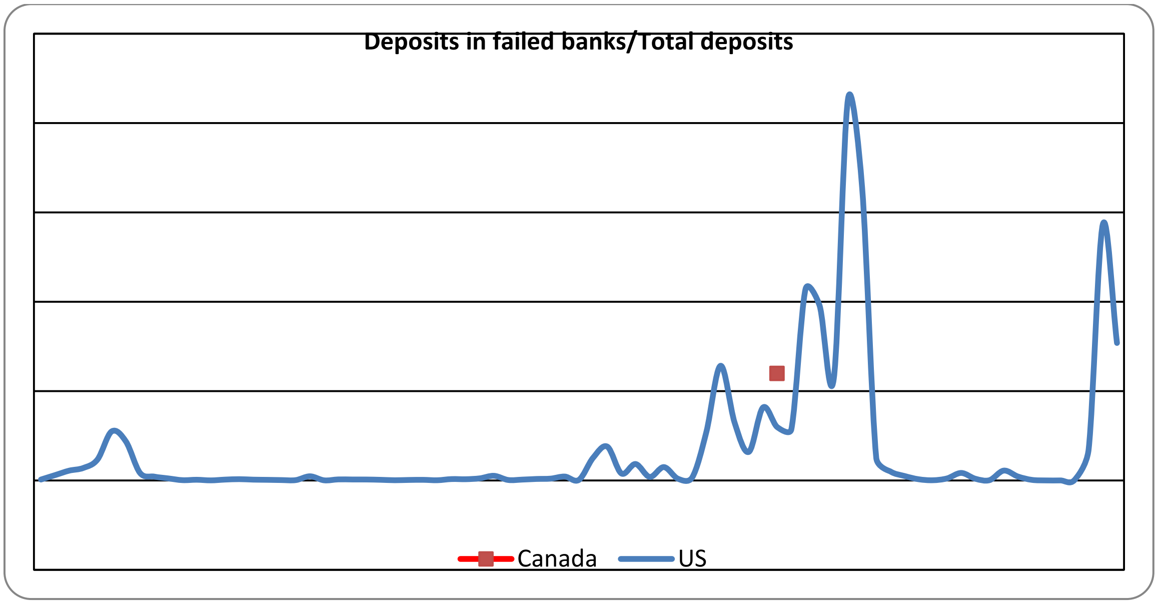
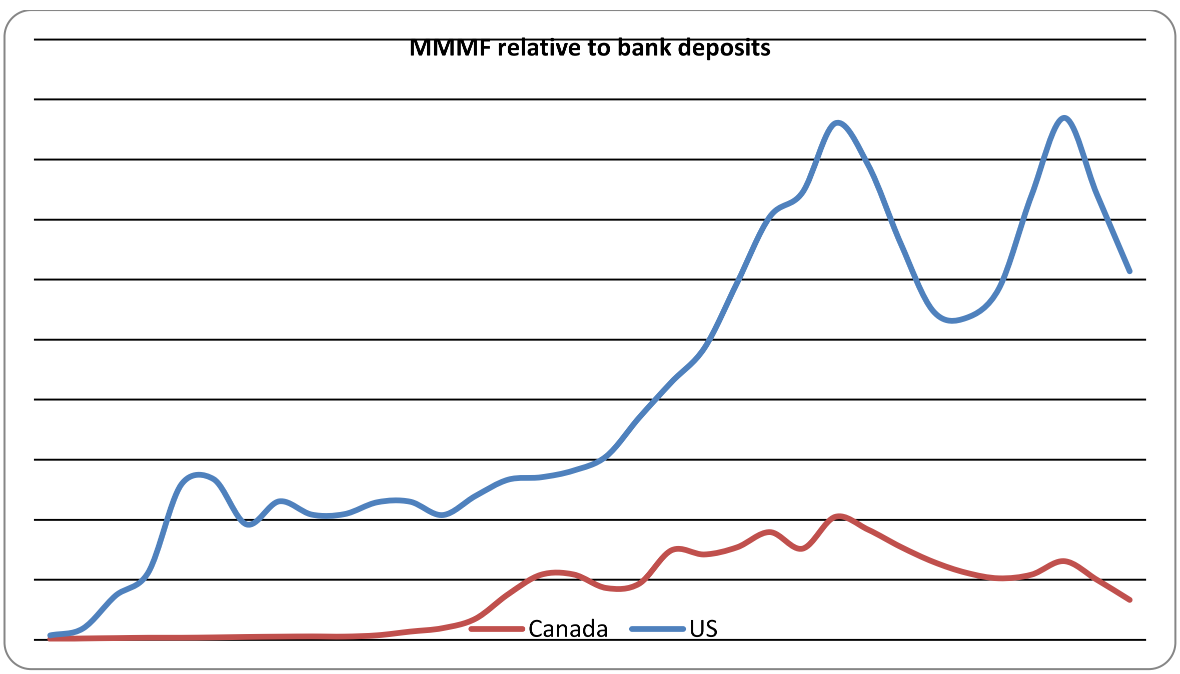
Figure 1



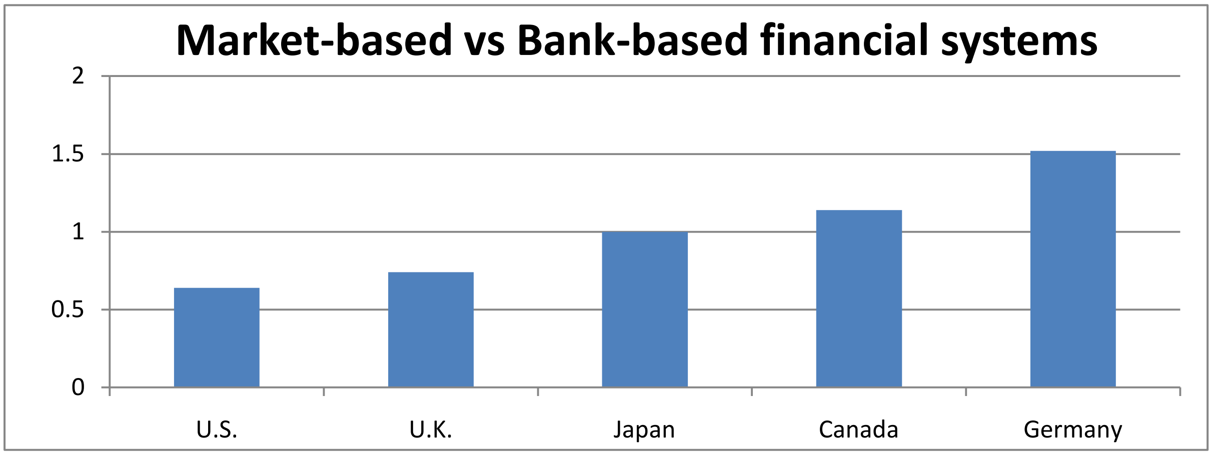
Source: US banks – FDIC (commercial bank deposits; commercial bank deposits in failed banks)
Canada - Estey commission;

Figure 2



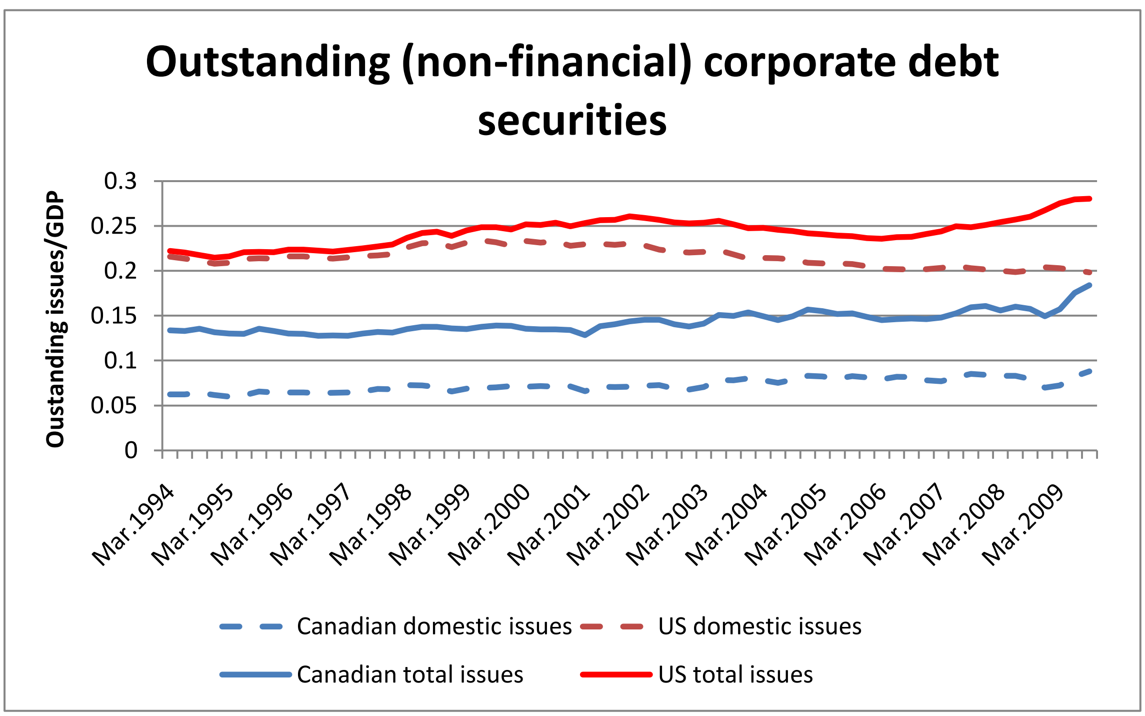
Source: Canada: Cansim v37245;v36939; US: Flow of funds – IMFNS; FDIC deposits in insured banks.

Figure 3



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.

Figure 4



Source: BIS Table 16b.

Figure 5

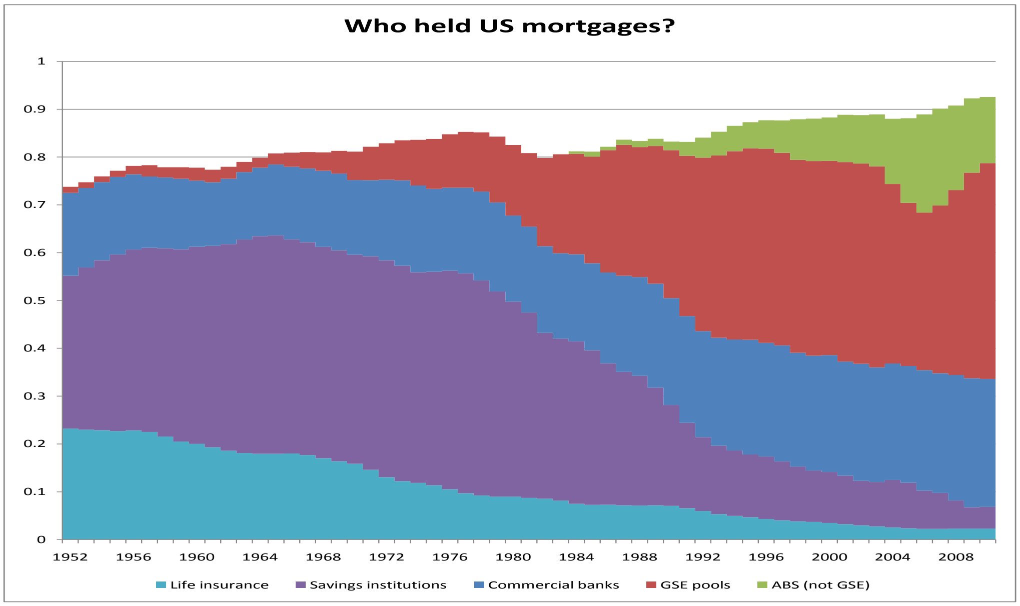


Figure 6

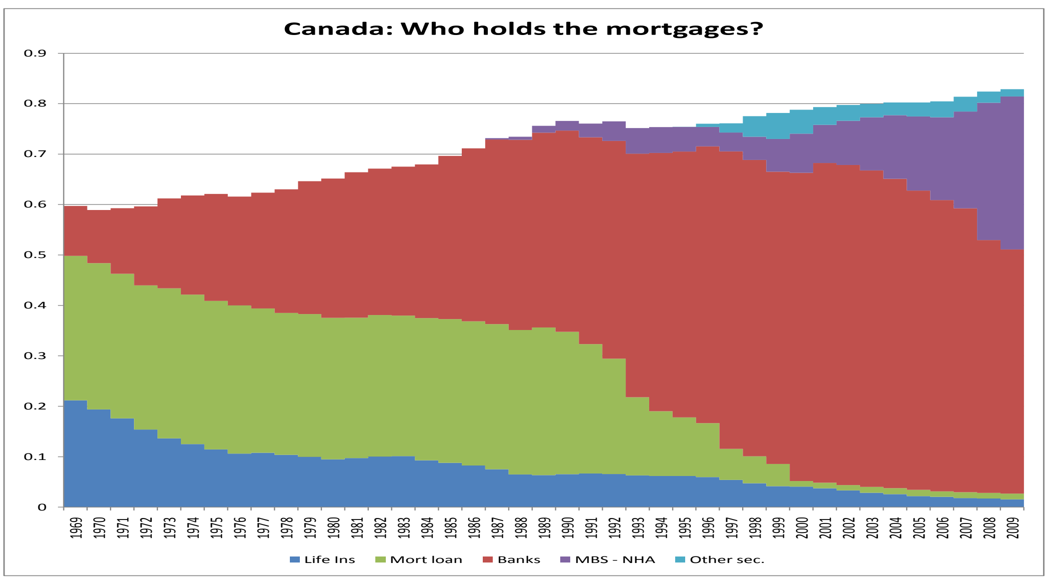
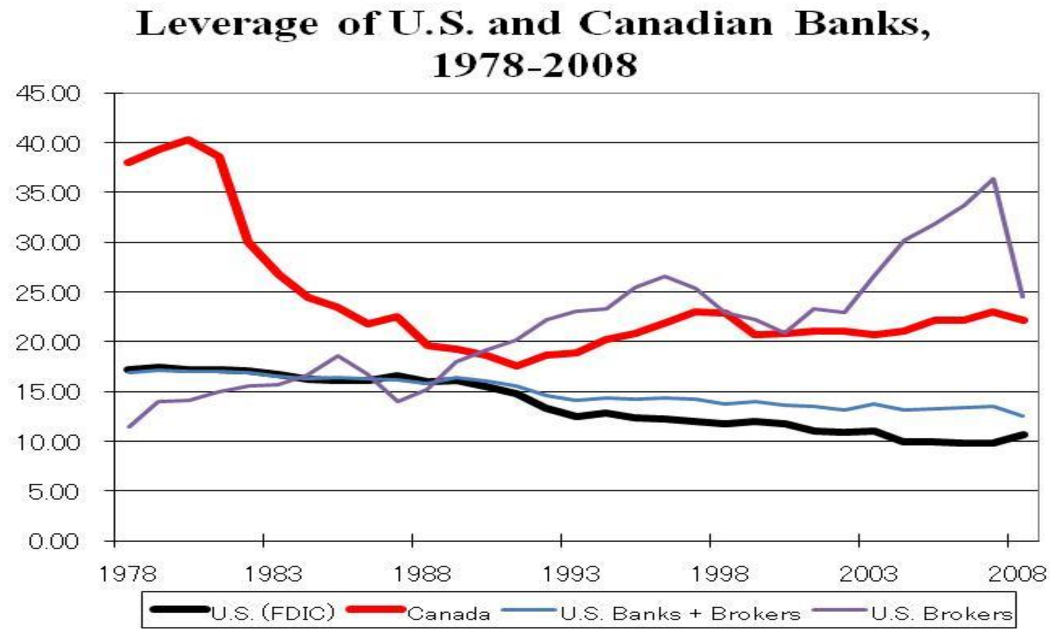


Figure 7



Source: Canadian banks: Cansim - all domestic banks; shareholder's equity/total assets; US banks: FDIC - banks shareholder's equity / total assets; US brokers: SEC.