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How the Canadian Housing Finance System Performed through the Credit Crisis: *Lessons for Other Markets*

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Canada's housing finance system exhibited considerable resilience during the recent financial crisis, with comparatively little reliance on extraordinary government support. Canadian housing finance institutions got through the financial crisis generally better than their international peers. Canada's major banks remained profitable, and investor confidence in Canada's largest mortgage lenders remained relatively strong.

Several distinctive features of Canadian public policy and regulations have had a direct impact on the performance of the housing finance system. Among those features are the following:

- Government policy does not explicitly favor home ownership over rental housing; there is significant government support for low-income rental housing.
- Interest on homeowner mortgages is not tax deductible.
- Canadian financial institutions are not subject to legislation comparable to the U.S. Community Reinvestment Act.
- Canada's social safety net reduces the likelihood that issues such as temporary unemployment and medical expenses will result in serious payment problems.
- Lenders have recourse to borrowers' assets and future income in the event that proceeds from sale do not cover the outstanding debt; thus, "strategic" defaults seen in the United States are rare in Canada.
- Mortgage insurance is required if the loan-to-value of a mortgage exceeds 80%.
- The Canadian federal government provides a backstop guarantee of 90% for privately insured mortgages.

This article has three principal sections: The first provides an overview of Canadian residential mortgage markets, including key features of the Canadian compared to the U.S. housing finance system, a comparison of Canadian and U.S. residential house offerings, and policy implications. The second section provides an overview of Canada's housing finance system, including relevant features of Canada's public policy landscape, the role of the Canada Mortgage and Housing Corporation (CMHC), the role of the private sector, and current initiatives underway to improve the system. The third section shows how the Canadian financial system performed through the financial crisis, discussing the performance of the banking system, the impact of the recession on intermediation, and factors related to the banking, regulatory, and communication

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structures that contributed to favorable outcomes for the Canadian financial sector.

OVERVIEW OF CANADIAN RESIDENTIAL MORTGAGE MARKETS

Canada's housing finance system has been criticized for being too conservative or not dynamic enough. Indeed, when compared to the United States, Canadian banks seem to offer fewer loan options, and, until recently, prospective homeowners with less-than-pristine credit histories seemed underserved. However, this section will show that the availability and costs of Canadian residential mortgage loans to prime borrowers are comparable to those in the United States.

For example, although Canadian mortgages impose what seem to be hefty penalties on prepayments, when all costs of originating and refinancing are considered, the effective penalty is comparable, if not smaller, than those paid by U.S. homeowners. Furthermore, interest rates on fixed-rate mortgages are comparable, after accounting for some peculiarities in the officially published rates in both Canada and the United States (e.g., the Canadian practice of deeply discounting posted rates, and the U.S. practice of buying points upfront).

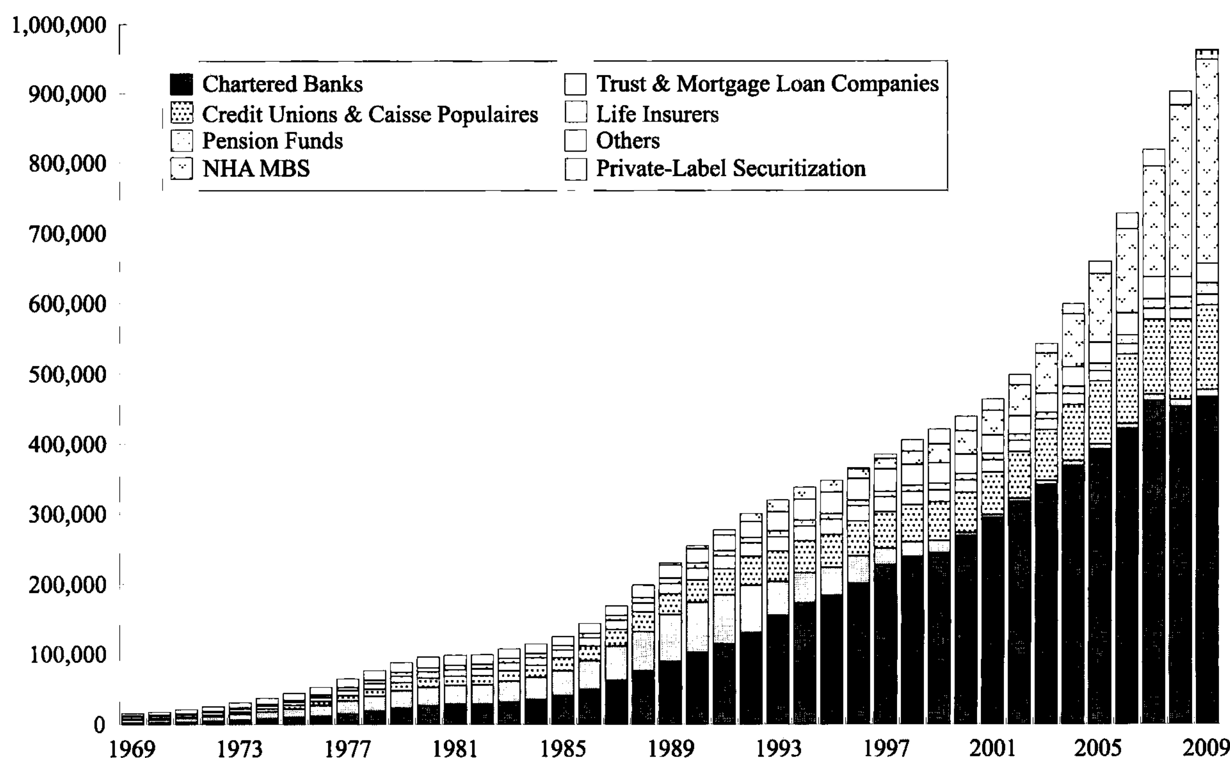
Also, it can be said that since 2007, the availability of mortgages to nonprime borrowers is roughly consistent, as the availability of such loans has virtually dried up in the United States. However, Canadian mortgages beyond five years seem expensive and limited, due possibly in part to a five-year maturity cap on government-guaranteed deposit insurance and a prepayment penalty limit on residential mortgage loans in the Interest Act.

Key Features of the Canadian (versus U.S.) Residential Housing Finance System

Mortgage origination in Canada has changed dramatically in the last 40 years. At the end of 2009, of C$964 billion outstanding residential mortgage loans in Canada,

EXHIBIT 1

Breakdown of Canadian Residential Mortgages Outstanding (Billions of Canadian Dollars)



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C$597 billion (62%) were held by deposit-taking institutions, of which C$466 billion were held by chartered banks (Exhibits 1 and 2). However, back in 1970, banks accounted for only 10% of the market.[1] By contrast, in the United States, the depository institution share of residential mortgage loan holdings declined from 75% to about 28% over the same 1970–2009 period (Exhibit 3).

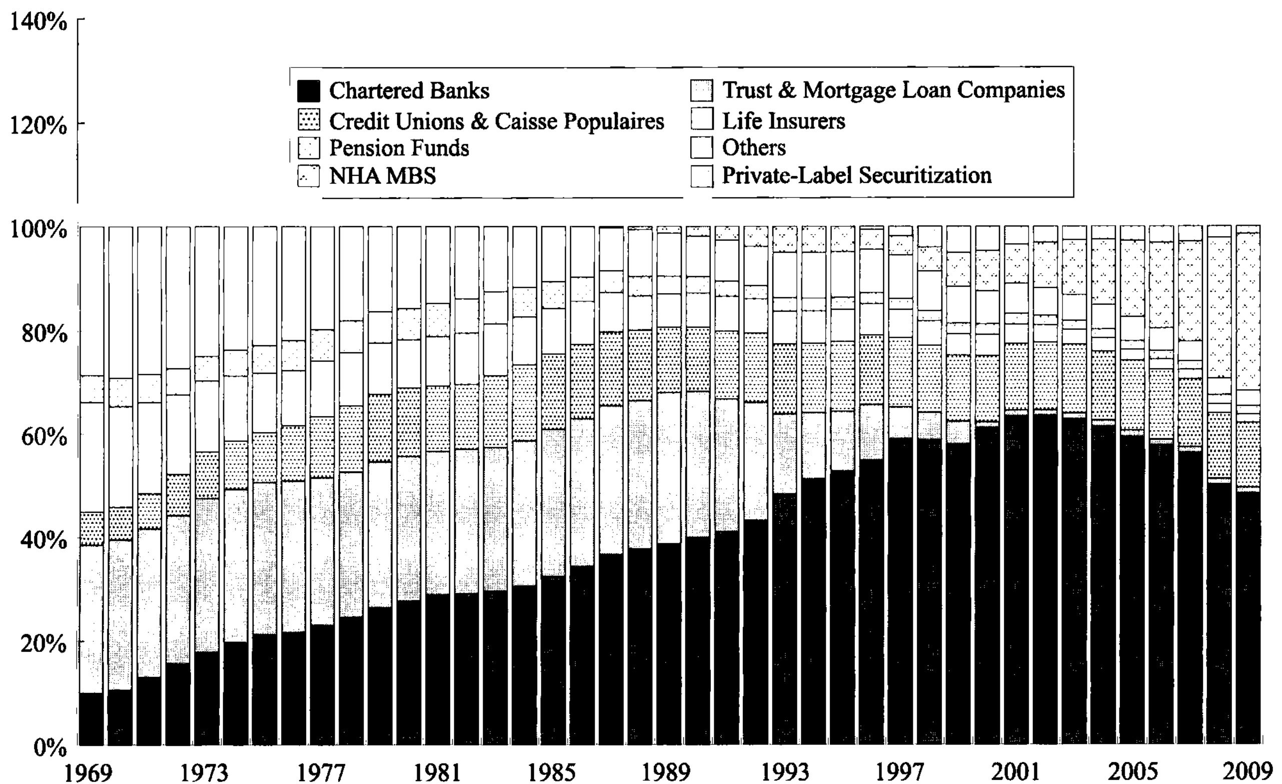
Federally regulated Canadian deposit-taking institutions, including all the chartered banks, can only originate "high-ratio" loans (i.e., those with loan-to-value (LTV) ratios greater than 80% since April 20, 2007, up from 75%) if they are insured against default. Hence, about 44% of all chartered bank-held mortgages were insured at the end of 2009. The largest mortgage insurer is government-owned Canada Mortgage Housing Corporation (CMHC), accounting for about 70% of all outstanding insurance.[2] U.S. deposit-taking institutions do not face such restrictions.

Mortgage securitization is not as pervasive in Canada as in the United States. About 32% of Canadian residential mortgages have been securitized, compared to about 62% in the United States. Almost all securitized Canadian mortgages are funded by mortgage-backed securities (MBSs) guaranteed by CMHC under the National Housing Act.[3] Over half of those MBS were held by the Canada Housing Trust, funded by the CMHC-guaranteed Canada Mortgage Bonds (CMBs) (Exhibits 4 and 5).[4]

Only trivial amounts of Canadian mortgages have been privately securitized (less than 2% of outstanding loans), whereas 14% of outstanding U.S. mortgages are privately securitized. However, U.S. private-label securitization markets have virtually shut down since 2007. In 2009 the U.S. GSEs accounted for virtually all new loan securitization. Canadian banks have also started using covered bonds for some of their mortgage funding needs, but the Canadian bank regulator, the Office of the Superintendent of Financial Institutions (OSFI), has imposed issuance restrictions that will limit

Exhibit 2

Proportional Breakdown of Canadian Residential Mortgages Outstanding (Percent of Total Outstanding)



Source: Bank of Canada.

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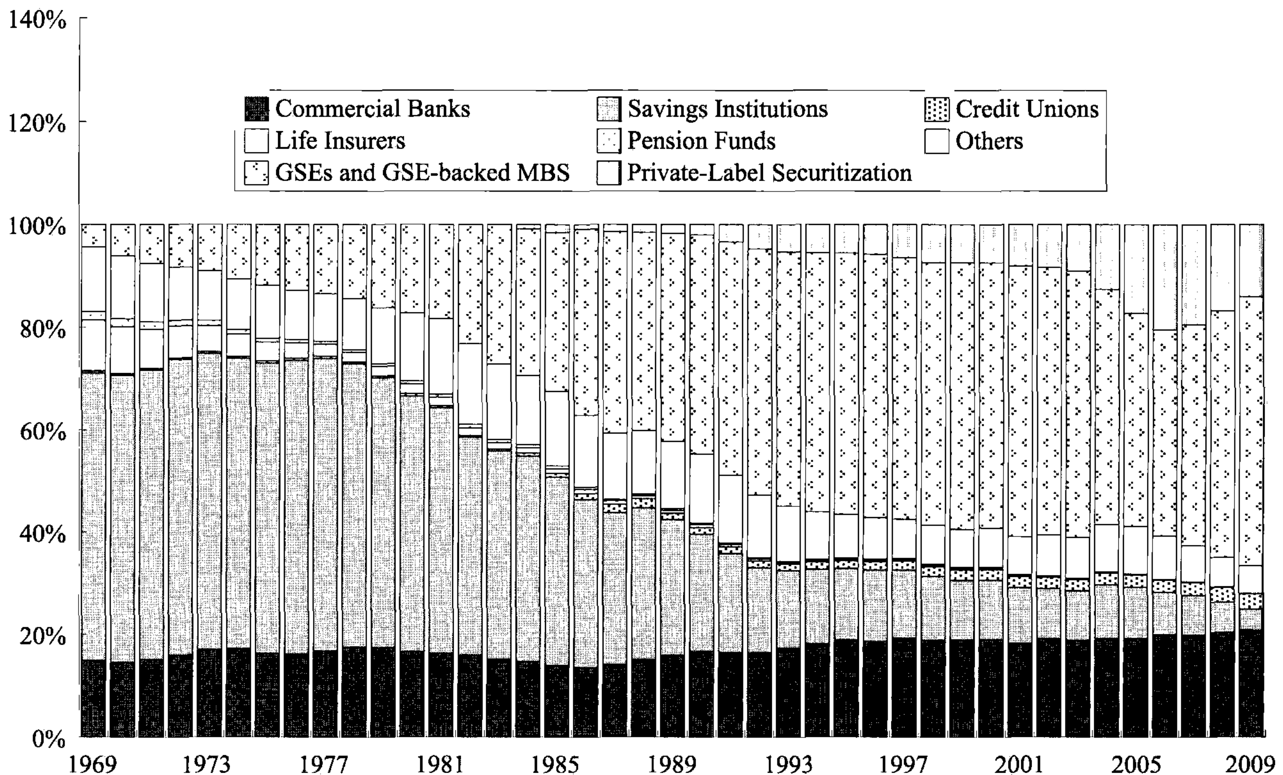
EXHIBIT 3

Proportional Breakdown of U.S. Residential Mortgages Outstanding (Percent of Total Outstanding)



Source: Federal Reserve Board.

their importance to about 10% of outstanding mortgages (Gravelle and McGuinness [2008]).

Mortgage insurance plays a big role in the Canadian mortgage market. The role of CMHC in the Canadian residential mortgage market is comparable to that of the GSEs in the United States. For example, CMHC insurance in force amounted to C$473 billion at year-end 2009 (about 49% of all outstanding residential mortgages), while the U.S. government-sponsored enterprises (GSEs) backed or held US$5,652 billion (52%). However, a key difference is that in Canada, mortgage insurance is required for both bank holdings and NHA MBS, whereas in the United States, it is required only on mortgages that are securitized by the GSEs.

In effect, both the Canadian and U.S. governments use mortgage insurance to influence the availability and costs of "high leverage" mortgage loans—those that exceed 80% of secured properties' market values. However, not only does Canadian MI police more of the landscape (bank and securitized lending), but it sets more restrictive criteria on leverage. For example, Canadian MI can only cover up to 95% of market value (90% on cash-out refinancings) versus effectively 103% in the United States. Hence, insured Canadian homeowners are required to have at least a 5% interest in their homes.

Comparison of Canadian and U.S. Mortgage Offerings

Canadian mortgage lenders offer a much more narrow range of products than their U.S. counterparts do. Although amortization periods of 25 years and longer are common, very few fixed-rate mortgage loans lock rates in for longer than five years, whereas U.S. borrowers can cost-effectively lock in for 30 to 40 years. Also, Canadian borrowers usually have to pay a penalty to prepay their loans, whereas U.S. prime borrowers do not. However, when other costs of mortgage originations and refinancings are accounted for, there is probably little difference in all-in costs in the two markets.

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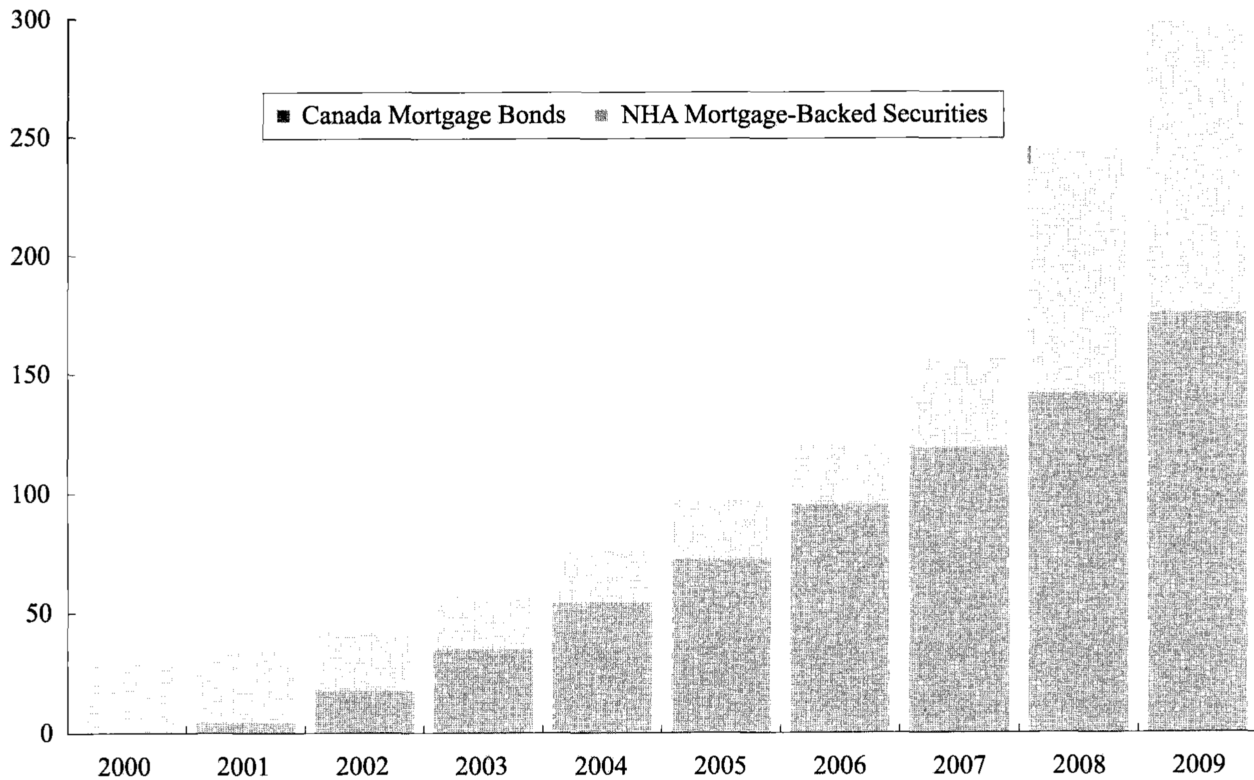
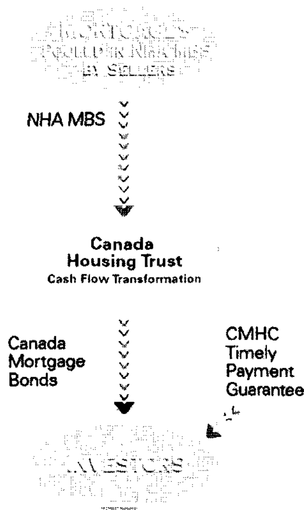
EXHIBIT 4
Outstanding Canada Mortgage Bonds and NHA Mortgage-Backed Securities (Billions of Canadian Dollars)



Source: CMHC.

EXHIBIT 5
Canada Mortgage Bonds



NHA MBS are backed by pools of amortizing residential mortgages insured by CMHC or private mortgage insurers

CMBs are backed by pools of NHA MBS and fully guaranteed by CMHC. They convert the monthly and amortizing NHA MBS cash flows into typical bond-like payments.

Basic attributes of Canadian mortgages. A borrower can pay down a mortgage at the end of the loan's term, but prepayment privileges are classified according to whether they are "open" or "closed." An open mortgage has full prepayment rights similar to those on most U.S. prime mortgages. Closed mortgages allow borrowers to prepay a certain percentage of their mortgage (usually 15%–20% of the original loan balance) annually but impose penalties on larger prepayment amounts. The typical penalty is at least three months of interest on the amount being prepaid.[5] Open mortgage offerings beyond the one-year term are rare, but on May 24, 2010, an online rate aggregator (RateSupermarket.ca) was showing three-year, fixed-term closed mortgage rates that ranged from 4% to 5%, versus a posting of 6.50% on the open counterpart. A difference of 200 to 400 basis points seems typical, versus 25 to 150 basis points on three-year variable-rate mortgages. However, all of these data are based on very skimpy observations.

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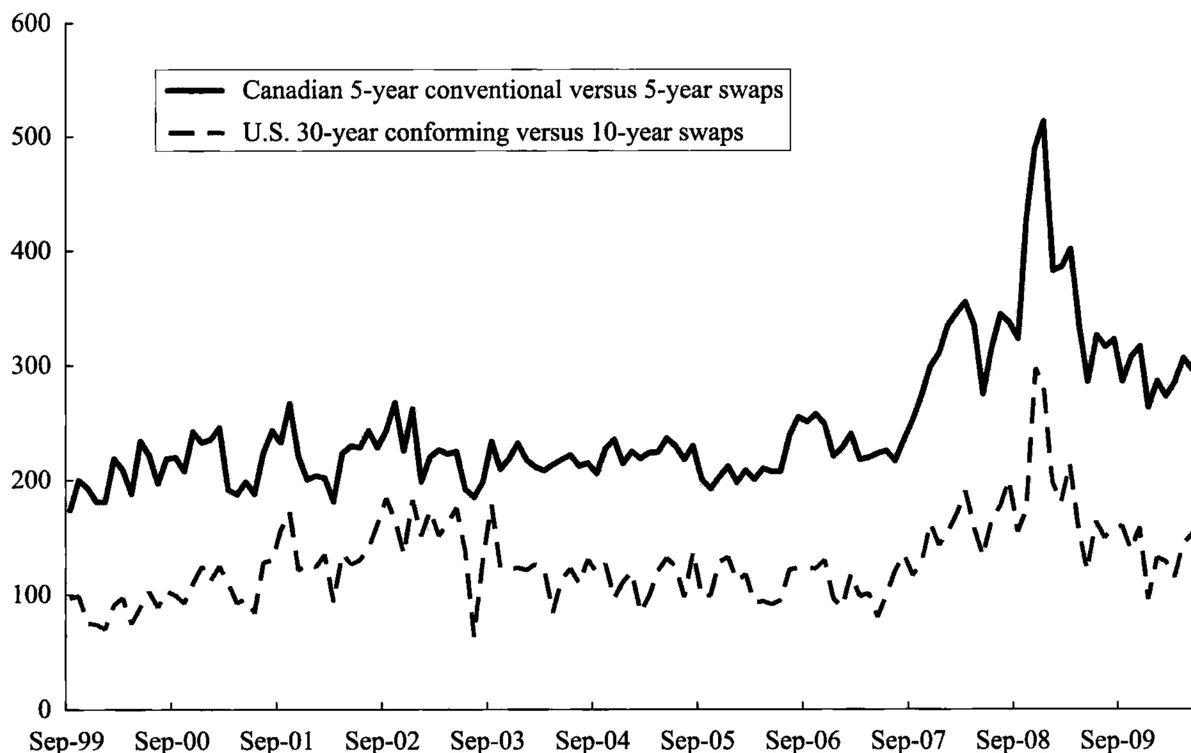
Most Canadian residential mortgages have recently been rollover loans that amortize over a 25-year period but reset the terms every six months to five years.[6] Reflecting a very conservative credit culture, the typical mortgage loan has recently been a five-year fixed-rate loan amortized over 25 years. However, terms have been shortening and amortization periods lengthening, and adjustable rates have been recently more popular.[7] The mortgage insurers, including CMHC, started to insure 40-year loans in 2006, but in July 2008 the government announced that it was pulling the maximum term back to 35 years and introducing a minimum 5% down payment (it had been as low as zero since 2006 for qualified borrowers).[8] Then in February 2010, the government selectively tightened the loan-to-value (LTV) ceilings on refinancing transactions (from 95% to 90%) and investment property loans (to 80%). Also, the affordability calculation basis was tightened by basing debt-to-income (DTI) ratios on five-year fixed-term rates.

Canadian versus U.S. mortgage interest rate levels are hard to compare. Direct comparisons of fixed-rate mortgage costs are complicated by the fact that the term of "long-term" mortgages is five years in Canada, compared to 30 years or more in the United States. However, Exhibit 6 compares the two series as spreads against their respective benchmark interest rate swap rates—Canadian five-year fixed-rate mortgage rates against five-year swap rates, and U.S. 30-year rates against 10-year swap rates, to reflect likely prepayment activity. On average, during the plotted period (end-of-month September 1999 to April 2010), the Canadian five-year conventional rate was about 118 basis points above the U.S. 30-year conforming rate.[9] Hence, at first blush, Canadian prime borrowers appear to be paying more for fixed-rate mortgages than their U.S. counterparts, particularly after accounting for the U.S. comparator's longer term (longer rate lock-in plus the "free" prepayment option).

EXHIBIT 6

Residential Mortgage versus Interest Rate Swap Rates (Basis Points of Spread)



Sources: Bank of Canada, U.S. Federal Reserve Board and Bloomberg.

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On the other hand, the Canadian rates used in Exhibit 6 are "posted" rates that overstate actual transacted rates, typically by more than 100 basis points. For example, on May 25, 2010 the five major Canadian banks were "posting" five-year fixed rates of 5.99%, but four of them were offering "specials" at 4.59%. The Canadian Association of Accredited Mortgage Professionals (CAAMP) estimated that, on average, posted rates exceeded transacted rates by 123 basis points in 2009 (CAAMP [2009]). Also, the U.S. 30-year conforming rate series reflect the payment of upfront points. For example, on May 20, 2010, the posted conforming rate was 3.91% with 0.6 points upfront, which is equivalent to about 4.16% (plus about 25 basis points) with zero points. Hence, when all of these factors are considered, it is hard not to conclude that Canadian fixed-term rates on prime mortgage loans are quite competitive with their U.S. counterparts.

Canadian versus U.S. prime borrower accessibility. Payment affordability criteria are similar to those in the United States for prime borrowers (Exhibit 7).[10] For example, for a borrower to qualify for mortgage insurance, gross debt service should usually not exceed 32% of gross household income, and total debt service cost should usually not exceed 40% (versus 28% and 36% to qualify for Fannie Mae and Freddie Mac insurance). However, the approval criteria for adjustable-rate loans are usually based on the highest fixed rates inside of the five-year term (typically at the three-year term), whereas U.S. practice is to use the current floating rate.[11] Canada also has a small "Alt-A" market aimed mainly at self-employed people who have difficulty documenting their stated income. In 2007, CMHC introduced a "Self-Employed Simplified" mortgage insurance program.

Canadian borrowers have faced larger downpayment requirements than their U.S. counterparts, but the two are now roughly in line.[12] Federally regulated deposit-taking institutions have been able to underwrite insured mortgages with LTVs as high as 95% since 1992, and for periods of time during the late 1970s and early 1980s.[13] There are no limits to the individual loans that CMHC and the other mortgage insurers will insure. By contrast, Fannie Mae and Freddie Mac will only purchase mortgages up to their "conforming limit" ($417,000), which varies by geographic areas, although in 2009 this limit was temporarily raised (to $729,750) for loans on single-family homes in "high-cost" areas (until the end of 2010).

Origination and prepayment costs. However, the non-interest costs of originating and refinancing mortgage loans is clearly cheaper in Canada. Canadian borrowers pay about $2,000 in upfront fees and taxes for a new loan, and on a refinancing about $1,000 plus a prepayment penalty of about $3,000 on the old mortgage (Exhibit 8).[14] On the same loan, U.S. borrowers pay origination fees of $1,000 to $3,000, plus about $1,000 of costs and fees and local government taxes of about $1,000.

In addition, U.S. borrowers often opt to pay upfront points on fixed-rate mortgages to reduce the interest rate on their entire mortgage loans. A point is 1% of the loan amount. For example, on a $240,000, 30-year fixed-rate mortgage loan, on May 25, 2010 AimLoan.com was offering the following three options: 1) annual interest of 4.75% with zero points; 2) 4.50% with 0.652 percentage points; and 3) 4.375% with 1.303 percentage points.[15]

Lastly, U.S. lenders may charge for rate lock-ins, whereas such lock-ins are generally free of charge in Canada. A rate lock-in is a lender's promise to hold a certain

EXHIBIT 7

Prime Borrower Access Broadly Similar in Canada and the U.S.

	Canada (conventional)	U.S. (conforming)
Maximum loan-to-value	95%	95%
Maximum payment	32% of income	28% of income
Adjustable-rate payment basis	Highest fixed rate inside of 5-year term	Current adjustable rate index
Maximum loan size	?	Varies up to $417,000*

*Note: *In 2009 this limit was temporarily raised to $729,750 for loans on single-family homes in "high-cost" areas (until end-2010).*

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EXHIBIT 8
Much Cheaper to Originate and Refinance in Canada

$240,000 Mortgage Origination Costs	Canada: New Mortgage	Canada Refinancing	United States New & Refi
Origination fees	n/a	n/a	$1,000 - $3,000
Settlement & closing costs	$850	$150	$1,000
State & local recordation	$100	$100	$1,000
Prepayment penalty	*n/a*	*≈$2,500 + 500 (3M interest+)*	*n/a*
Total	**$950**	**$3,250**	**$3,000 – 5,000**

Plus upfront points in US, by which borrowers "sell" away part of their prepayment option.

interest rate for the borrower while the loan application is processed. Canadian lock-ins also typically give the borrower the benefit of any rate declines that occur between the time a loan commitment is made and settlement.

Factors contributing to the paucity of long-term fixed-rate mortgages. The conventional wisdom is that the Canadian preference for shorter terms relates to the more important role (as compared to the United States) of retail deposits. The popularity of five-year retail term deposits, plus the banks' asset-liability gap management, goes a long way to explaining the attractiveness of five-year mortgage terms. Furthermore, with the Canada Deposit Insurance Corporation (CDIC) guaranteeing retail term deposits only out to five years, the rates needed to attract retail funding beyond five years is exorbitant.

However, another explanation lies in Section 10 of Canada's Interest Act, which effectively gives homeowners the right to prepay mortgages with a term to maturity greater than five years after five years of payments for a fixed prepayment penalty (i.e., the three months interest). Three months of interest is likely less than the penalty charged during the first five years of mortgage terms. Offsetting this to some degree is the portability of Canadian mortgages.[16] Lenders have no choice but to pass on the higher cost of hedging longer mortgage prepayment risk for longer mortgages in the form of higher interest rates.

Exhibit 9 provides some indication of the combined effect of the five-year cap on CDIC deposit insurance and prepayment penalties on the term structure of interest rates on closed mortgages. Note the blipping-up of rates past the five-year point. By comparison, the difference between seven-year and five-year Canadian dollar interest rate swap rates was 37 basis points on May 25, 2010, whereas bank fixed-rate mortgage postings jumped by 66 to 91 basis points. The authorities may wish to review these and other potential impediments to the further development of longer-term mortgage markets.

OVERVIEW OF CANADA'S HOUSING FINANCE SYSTEM

Canada's housing finance system exhibited considerable resilience during the recent financial crisis. Much of this resilience owes to the system's structure and the regulatory and policy foundations that support it. This section describes key features of Canada's housing finance system and highlights elements that have been helpful in maintaining its strength.

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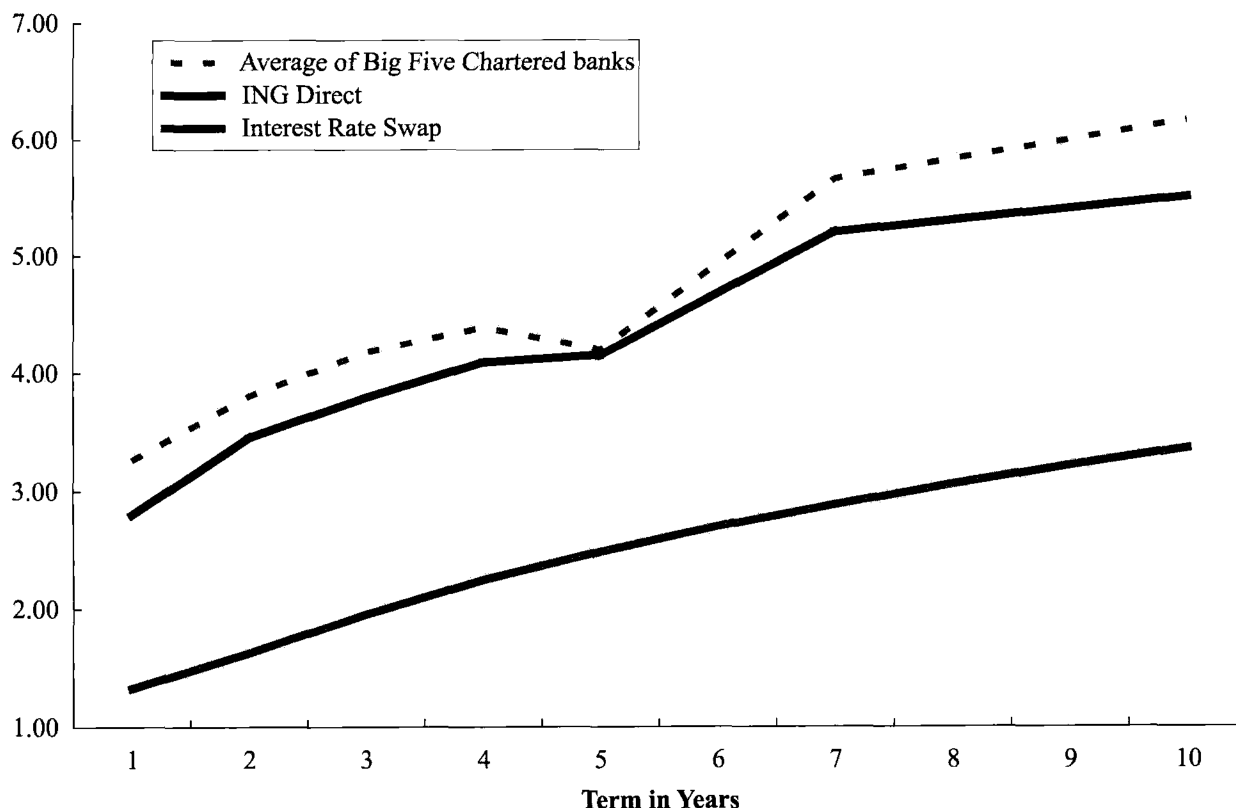
EXHIBIT 9

Canadian Bank Fixed-Term Closed Mortgage Rates on August 6, 2010



Source: Bank web pages and Bloomberg.

Canadian housing finance institutions got through the financial crisis generally better than their international peers. Canada's major banks remained profitable, as cumulative write-downs were much less than those suffered by major U.S. and European banks[17] (Bank of Canada [June 2009 and December 2008]). Moreover, investor confidence in Canada's largest mortgage lenders remained relatively strong as the major Canadian banks were able to maintain their capital positions. Some of the major banks were even able to raise capital during the crisis in the form of both preferred shares and common stock.

Although there were tightening lending standards and a mild softening of the housing market, Canadian consumers were relatively less affected than those in several other countries, including the United States. Throughout Canada, mortgage arrears remained low—less than 0.5%—and mortgages remained available to all qualified borrowers, in every part of the country, at attractive interest rates.

Not only did Canada's housing finance system exhibit more stability than those of many other countries, it did so with comparatively less reliance on extraordinary government support. Significantly, the Canadian government did not need to recapitalize housing finance players, as was required elsewhere.

Policy Backdrop and Regulatory Framework

Several features of Canada's public policy landscape directly impact Canada's housing finance system. Most notably, government policy does not explicitly favor home ownership over rental housing. It is understood that renting is a sensible option for many households. Federal and provincial governments provide significant support for low-income rental housing, and a significant proportion of CMHC mortgage insurance in-force covers loans to owners of rental housing. Additionally, interest on homeowner mortgages is not tax deductible

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in Canada. Moreover, Canadian financial institutions are not subject to legislation comparable to the U.S. Community Reinvestment Act. Thus, whereas almost half of American households in the lowest-income quintile own their own homes, the home-owning share for the lowest quintile in Canada is just over 38%.

In terms of mortgage arrears, two aspects of Canada's policy environment are particularly noteworthy. First, Canada's social safety net means that issues such as temporary unemployment and medical expenses are less likely to result in serious payment problems. Second, with limited exception, lenders have recourse to borrowers' assets and future income in the event that proceeds from sale do not cover the outstanding debt. Thus, "strategic" default, as has been anecdotally described in the United States, is rare in Canada.

As the country's consumer protection agency for financial matters, the Financial Consumer Agency of Canada (FCAC) contributes to the strength of Canada's housing finance system. The agency has two mandates: It promotes financial literacy, including an understanding of mortgage products; and it ensures that federally regulated financial institutions comply with federal consumer protection laws and regulations.

The Office of the Superintendant of Financial Institutions (OSFI) oversees all federally regulated financial institutions. OSFI typically takes a principles-based approach to prudential regulation. Rigorous supervision and regulation on the part of OSFI help to ensure that housing finance players have adequate capitalization and are not over-levered. OSFI imposes a maximum leverage multiple of 20.[18] As a member of the Financial Institutions Supervisory Committee (FISC), OSFI cooperates with the Department of Finance, the Bank of Canada, the Canada Deposit Insurance Corporation (CDIC), and FCAC, all the while focusing on its mandate of promoting solvency.

The Canadian Bank Act prohibits federally regulated lending institutions from providing mortgages without mortgage loan insurance for amounts that exceed 80% of the value of the home. Thus, mortgage loan insurance serves as an important credit enhancement in Canada's housing finance system, providing risk management and capital relief benefits. Mortgage insurance is also widely used in conjunction with lower-ratio mortgages, and it is required for mortgages securitized through government securitization programs. The majority of Canadian mortgages carry mortgage loan insurance, underwritten either by the federally owned Canada Mortgage and Housing Corporation (CMHC) or one of Canada's private mortgage insurers.

Private mortgage insurers are 90% back-stopped, guaranteed by the Government of Canada. As a government-owned corporation, CMHC is fully backed by the Government of Canada. In light of this government backing, OSFI assigns a risk weight of zero to mortgages insured by CMHC and a slightly higher risk weight to mortgages insured by private insurers. As well, government backing has inspired more confidence in the housing finance system, especially during the crisis. Since 2008, both CMHC and the private mortgage insurers have operated in accordance with enhanced rules promulgated by Canada's Department of Finance. These rules, which are discussed below, aim to strengthen Canada's housing finance by limiting the federal guarantee to loans that meet certain enhanced underwriting parameters.

Role of CMHC

The Government of Canada, through CMHC, plays instrumental roles in the country's housing finance system. A number of CMHC's functions are funded through government appropriations: assisted housing, research and information transfer, housing market analysis, international export assistance, and housing policy development for the Government of Canada. Two of CMHC's functions are self-funding on a commercial basis: mortgage insurance and securitization.

CMHC mortgage insurance. CMHC has offered mortgage loan insurance since 1954. This insurance is available across Canada for both homeowner and rental properties. Additionally, nursing and retirement home operators can use CMHC mortgage insurance to help finance their properties. In 2009, CMHC approved mortgage loan insurance for approximately 1.2 million homes. Close to 40% of the total of rental and high-ratio homeowner mortgage loan insurance units were in areas or markets that are not served or less-well served by the private sector. This includes rental housing, nursing and retirement homes, housing on-reserve, and owner-occupied housing in rural areas and small towns.

As CMHC is mandated to operate its mortgage insurance business on a commercial basis, the premiums and fees it collects and the interest it earns must cover the related claims and other expenses. It must also provide a reasonable rate of return to the Government of Canada, ensuring a level playing field with private mortgage

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insurers. CMHC's insurance activity is operated at no cost to Canadian taxpayers. Currently CMHC maintains approximately twice the minimum level of capital reserves recommended by OSFI for private mortgage insurers.

CMHC insurance products cover the entire amount of the mortgage loan for its entire amortization period. Unlike most U.S. mortgages, Canadian mortgages have an interest-rate term (typically five years) after which the loan is renegotiated and the interest rate reset for a subsequent term. The mortgage insurance remains in place following term renewal and can be transferred if the borrower decides to switch lenders. That makes renewal of the loan at term renewal virtually guaranteed to the borrower. Mortgage insurance premiums are paid up front in a lump sum and may be added to the mortgage loan amount. There is no annual fee.

CMHC mortgage funding. Government-backed—i.e., CMHC—securitization programs accounted for 30% of the funding of outstanding mortgage credit in 2009, up from 27% in 2008, and have served as a stable and reliable source of funding for large and small lenders both in good times and during the economic downturn. CMHC has two permanent securitization programs: the National Housing Act Mortgage-Backed Securities program (NHA MBS) and the Canada Mortgage Bonds program (CMB). Additionally during the financial crisis, between fall 2008 and spring 2010, CMHC administered the Insured Mortgage Purchase Program (IMPP).

- *National Housing Act Mortgage-Backed Securities (NHA MBS)*

CMHC launched the NHA MBS Program in 1987 to improve the availability of low-cost funding for mortgages. NHA MBS are securities backed by pools of residential mortgages insured by CMHC or private mortgage insurers, and carrying a full guarantee by CMHC, thus the government of Canada, of the timely payment of principal and interest for investors.

Investors in NHA MBS receive monthly installments of principal and interest as passed through from the underlying mortgages, and have the underlying mortgages as their collateral. For mortgage lenders, the proceeds from the sale of NHA MBS provide an additional source of mortgage funding, reducing the dependence on retail deposits.

NHA MBS may also be purchased and funded via the Canada Mortgage Bond Program, as explained below, The amount of NHA MBS issued in 2009, for sale outside of the CMB program, was C$55.1 billion, up C$19 billion from 2008. There was a total of C$298.3 billion of NHA MBS outstanding by year-end 2009, including those sold into the CMB Program.

- *Canada Mortgage Bond (CMB)*

Introduced in 2001, the CMB program was designed to complement CMHC's NHA MBS program. CMBs carry a full guarantee of timely payment of principal and interest by CMHC and thus by the government of Canada. CMB are issued by the Canada Housing Trust (CHT), and the proceeds are used to purchase NHA MBS from the lenders and serve as a source of funds for them. The NHA MBS purchased, including the underlying mortgages, make up the collateral security for the CMB bondholders. Since its introduction, the program has expanded and also includes multi-family residential mortgages. The CMB program converts the monthly and amortizing cash flows of the NHA MBS into typical bond-like payments—i.e., semi-annual coupon payments and a final principal payment with fixed or floating rates. Thus, CMBs are appealing to a broader investor base and are more investor-friendly, and therefore, funding via CMBs can be achieved at relatively lower costs with greater market acceptance and demand.

A further important aspect of the CMB program is its appeal to large and small lenders, which helps promote the competitiveness of the residential mortgage market and, thereby, decreased consumer mortgage loan costs (Canada Mortgage and Housing Corporation [2009]).

Total CMB issuance rose to C$46.9 billion in 2009, compared to C$46.billion in 2008 and C$25.1 billion in 2006 before the financial crisis. At year-end 2009, C$175.6 billion CMB were outstanding.

- *Insured Mortgage Purchase Program (IMPP)*

In October 2008, when the global financial turmoil reduced the availability of private funding for Canadian mortgage markets and broader credit markets, the Canadian government created the Insured Mortgage Purchase Program (IMPP). The program, which ended in March 2010, supported the availability of longer-term credit in Canada during the crisis by purchasing NHA MBS from Canadian financial institutions through a competitive auction process managed by CMHC. Although the authorized program size was up to C$125 billion, only C$69 billion were purchased by the end of the program in March 2010, as the market conditions had gradually improved.

Since the program purchases NHA MBS, all of the underlying mortgages involved were high-quality assets

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that were already insured through CMHC or private insurers backed by the government. As a result, there was no additional credit risk or cost to taxpayers or to CMHC. The IMPP helped mortgage lenders obtain the funding needed to continue to make mortgages to consumers at reasonable interest rates. Thus, it represented an efficient, cost-effective, and safe way to support longer-term funding to Canada's financial institutions during a period of market stress.

Role of Private Sector

Notwithstanding the important roles of CMHC, private firms make up the foundation of Canada's housing finance system.

Mortgage lenders. Most mortgages in Canada are made by large, federally chartered banks, but credit unions, caisses populaires, regional banks, and specialized financial institutions also play an important role. Federally chartered banks have been a fixture of Canadian banking since Canada's creation in 1867. The six largest chartered banks account for approximately 85% of the combined assets of all chartered banks (PricewaterhouseCoopers [2009]). Since the 1990s, all of Canada's major investment dealers have been owned by the big banks. Like the banks that own them, these investment dealers are regulated by OSFI.

Compared to their international peers, Canadian mortgage lenders have been more conservative in terms of underwriting and product offerings. Major Canadian mortgage lenders did not offer subprime mortgages. More generally, compared to their international peers, Canadian banks have been more prudent with respect to capitalization, leverage, and liquidity management.

Canada is also home to a number of small "monoline" lenders that specialize in mortgage finance and use warehousing and securitization as main funding sources. Prior to the financial crisis, several of Canada's monolines operated outside the scope of federal banking regulation; since the crisis, given the freezing of certain private capital market and securitization funding options, some of these have become regulated banks so as to be able to access deposit funding.

Mortgage brokers. Mortgage brokers have been a growing part of Canada's housing finance system. They arranged approximately 38% of new mortgage loans made in 2009, up from 27% in 2006. In contrast with most mortgage brokers in the U.S., most of the loans originated via broker channels are funded by federally regulated institutions, and therefore they still have to go through the underwriting process and qualification of the lenders and mortgage insurers.

Private mortgage funding. Traditionally in Canada, the majority of funding for mortgage lending has come from deposits. As of the end of 2009, about 60% of outstanding mortgages were funded through deposits. Eligible retail depositors are insured by the Canada Deposit Insurance Corporation, which helps solidify deposits as a funding source, even during times of uncertainty.

In addition to the CMHC securitization programs mentioned earlier, lenders also obtain funding through private mortgage securitization (e.g., MBS, ABCP). While the proportion of these alternatives had been increasing until 2008, since the onset of the credit crisis these funding sources have virtually disappeared. No private MBS issues were reported during 2009, and the volume of ABCP outstanding declined sharply.

Covered bonds are also emerging as a funding alternative for some Canadian mortgage lenders. OSFI first authorized their use in Canada in 2007. In 2009, a total of approximately C$1.43 billion of covered bonds were issued by Canadian banks. During the first four months of 2010 alone, there were three covered bonds issuances by Canadian banks to the U.S. and Canadian markets, totaling approximately C$4.37 billion. Of note, in some cases, all underlying mortgage collateral is insured by CMHC. Looking ahead, the Government of Canada has indicated that it will consider introducing a legislative covered bond framework in Canada.

Improving Canada's Housing Finance System

Across the globe, policymakers and industry groups are working to improving housing finance systems, and, more generally, to strengthen broader financial markets and avoid future turmoil. Canada is no exception. Within Canada, enhancements have been implemented or proposed along a number of dimensions.

In 2008, the Canadian government implemented new rules for government-backed mortgage insurance as a proactive measure to protect and strengthen Canadian housing markets. The framework specified rules that included:

- A prohibition against loans with no amortization in initial years

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- A maximum loan-to-value ratio of 95%
- A maximum amortization of 35 years
- A maximum total debt service ratio of 45%
- A minimum credit score and minimum loan documentation standards

On February 16, 2010, the government announced several additional new rules for government-backed mortgage insurance to further reinforce the long-term stability of Canada's housing market:

- All borrowers must meet the standards for a five-year fixed-rate mortgage even if they choose mortgages with lower interest rates and shorter terms.
- The maximum amount Canadians can withdraw in refinancing their mortgages was lowered from 95% to 90% of the value of their homes.
- A minimum down payment of 20% is required for a borrower to be eligible to obtain government-backed mortgage insurance on non-owner-occupied properties purchased for speculation (Department of Finance—Canada [2010]).

Beyond the new mortgage insurance rules, efforts to improve Canada's housing finance system include, for example, the Canadian government's Task Force on Financial Literacy, announced in the 2009 federal budget. It aims to provide advice and recommendations to the Minister of Finance on a national strategy to strengthen the financial literacy of Canadians, in order to help Canadians make more informed mortgage and financial decisions. This will not only promote increased financial well-being among individuals and households, but also strengthen Canada's housing finance systems.

As noted earlier, in its 2010 budget, the Government of Canada also indicated that it would explore ways to help diversify the funding sources for mortgage lenders, by developing a legislative covered bonds framework. Ultimately, this will also help consumers by ensuring that mortgage lenders have access to diverse sources of funding that can be used to originate mortgages.

THE PERFORMANCE OF THE CANADIAN FINANCIAL SYSTEM

The 2007–2009 global financial turmoil affected banking systems around the world, including Canada's. Nevertheless, Canadian banks are regarded as having performed relatively well. They did not, for example, require capital injections at any time, nor did deposit guarantees have to be expanded. Sustained strength in the housing market helped to minimize the credit risk that Canadian banks faced. In turn, healthy banks supported intermediation, particularly credit flows to households, including residential mortgages.

Performance of the Banking System

Canadian banks entered the crisis with levels of liquid assets that were low by historical standards, and in a painful lesson on the potency of cross-border contagion in financial markets, they experienced substantial liquidity pressures as funding costs tightened. Nevertheless, funding costs did not rise by nearly as much for Canadian banks as elsewhere, and they were generally viewed by markets throughout the period of turmoil as being among the top tier of borrowers (Exhibit 10). They also benefited from strong flows of retail deposits, a reflection of the confidence that they engendered.[19]

Funding pressures were, nevertheless, sufficiently serious to warrant an official response. The Bank of Canada provided short-term liquidity support (generally one month to a year) to the financial system through several programs that expanded upon its traditional liquidity tools. Terms to maturity, amounts, counterparties, and the range of eligible securities were all adjusted to meet the extraordinary requirements of the day.[20] By early 2010, however, these exceptional liquidity programs had ceased to provide new funds, and the amount of extraordinary liquidity provision on the central bank's balance sheet was declining (Exhibit 11).[21]

The Canadian government also provided longer-term funding support (up to five years) to Canadian banks. In particular, the Insured Mortgage Purchase Program (IMPP) allowed the commercial banks to sell their insured residential mortgages to the federal government-owned Canada Mortgage and Housing Corporation. This successful program, representing a source of funds for banks at favorable terms, was expanded several times.

The relatively strong bank performance was reflected in a variety of dimensions. While credit losses rose in line with the global recession and the accompanying rise in household and business defaults, the

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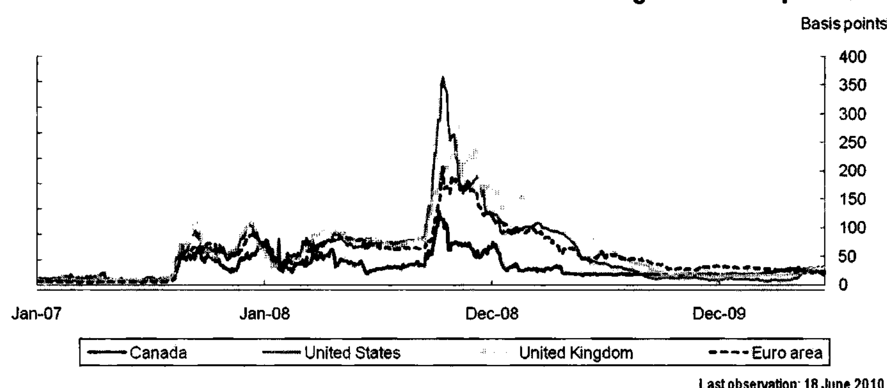
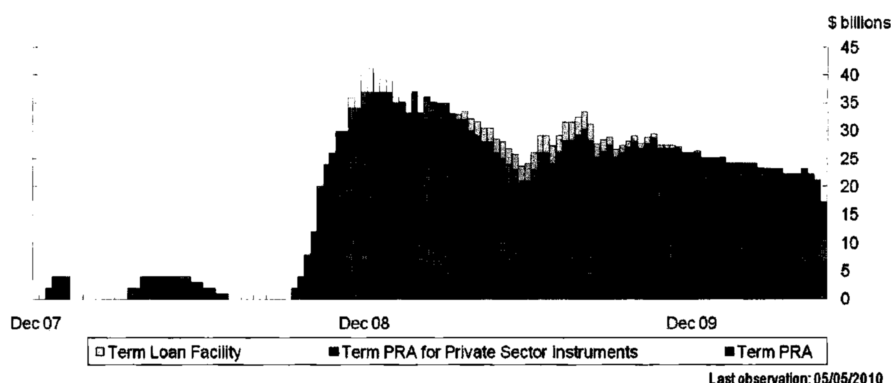
EXHIBIT 10
Short-Term Funding Markets During the Turmoil



Source: Bloomberg.

EXHIBIT 11
Bank of Canada Extraordinary Liquidity Provision



Source: Bank of Canada.

Canadian banking system performed well, in relation to U.S. and other foreign banks and compared with its own past experience. Charge-off rates on loans, for example, remained at modest levels and began to fall from recent peaks even as they continued to rise within the U.S. banking system (Exhibit 12). Losses were concentrated in business-sector exposures (as opposed to household exposures), but even there, losses were low compared with earlier historical episodes, aided by the strong balance sheet of the aggregate business sector at the beginning of the crisis.

Cumulative writedowns, which are more reflective of losses on the banks' trading books, were also comparatively low (Exhibit 13). These low loss rates helped to contain the need to build provisions and supported the banks' profitability. The average return on equity of the Canadian banking system fell during the crisis, but remained substantially positive throughout (Exhibit 14). This compared favorably not only with other countries' experiences in the banking sectors, but also compared with previous episodes of stress in the Canadian banking system (e.g., in the early 1990s).

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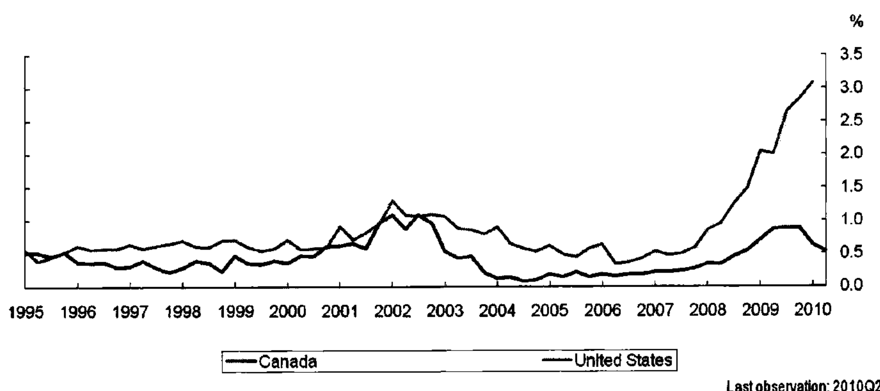
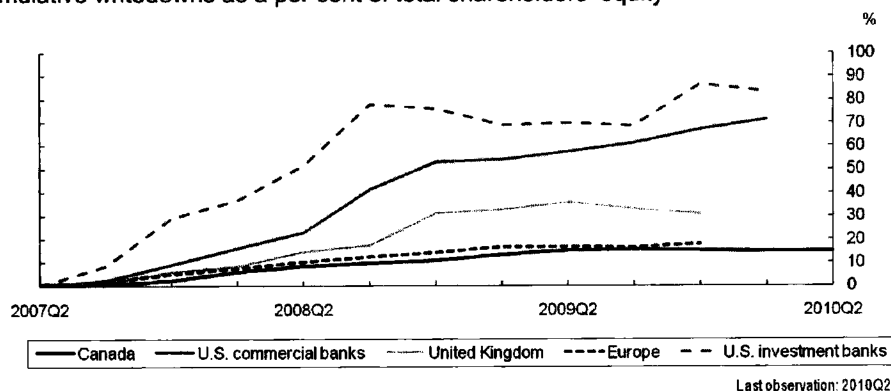
EXHIBIT 12
Diverging Losses on Bank Credit: Canada and the United States



Source: OSFI, Federal Reserve Board.

EXHIBIT 13
Cumulative Writedowns by Banks



Source: Bloomberg.

Impact on Intermediation

The recent economic recession in Canada, although serious, was less pronounced than in other major advanced economies. Canada entered the crisis with a supportive economic policy framework, including successful inflation targeting and a string of fiscal surpluses. The sectoral nature of the downturn was also quite different compared to the United States, especially from the perspective of the housing sector. Housing prices in Canada experienced a relatively mild deceleration (Exhibit 15). A striking development was the amount of equity held in real estate assets, which remained at historical levels as opposed to falling dramatically as in the United States (Exhibit 16). Mortgage defaults also remained at comparatively low levels and, as the economy moved into recovery, the housing sector picked up quickly (Exhibit 17).

The relative strength of the economy in general, and of the housing sector in particular, helped to moderate the impact on the domestic banking system. This dynamic would also have benefited from a feedback mechanism whereby a solid financial system supported ongoing intermediation and economic growth.[22] The growth of household credit, including residential mortgage credit, in fact remained relatively robust during the

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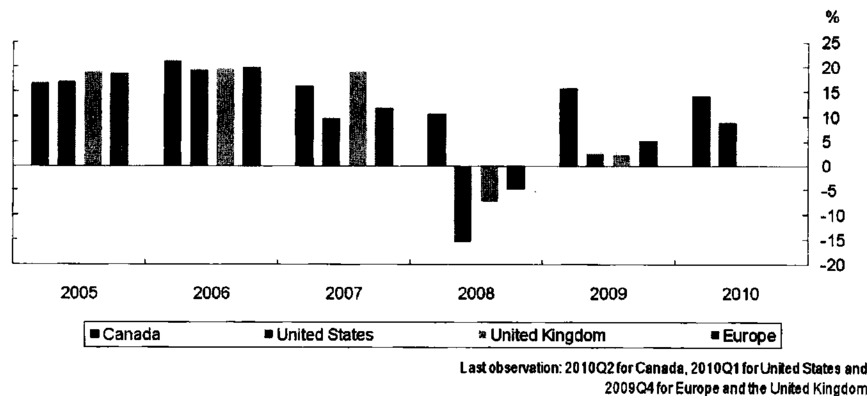
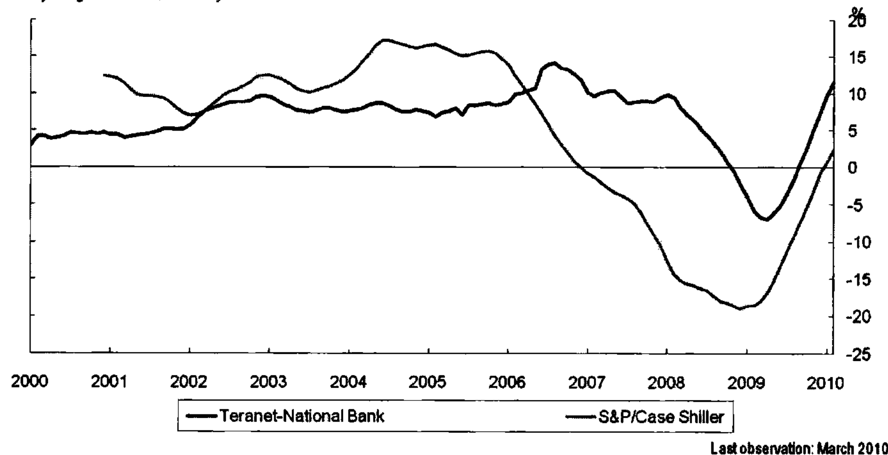
EXHIBIT 14
Rate of Return on Equity—Banks (2005–2010)



Source: Bloomberg.

EXHIBIT 15
Housing Prices (2000–2010)



Sources: Teranet-National Bank of Canada and S&P/Case Shiller.

downturn and close to historical averages (Exhibit 18). In comparison, business credit stalled, closer to the experience in other countries (where it often declined).

One of the surprising outcomes of Canada's economic and financial performance is that throughout the downturn and in subsequent quarters, household indebtedness continued to rise. As a result, it is now much closer to the levels in countries such as the United States and the United Kingdom (Exhibit 19). The higher level of indebtedness, including the rapid growth of residential mortgage credit, suggests that Canadian households are becoming increasingly vulnerable to the financial impact of higher interest rates.[23] In early 2010, the Canadian government tightened some of the rules associated with qualifying for government-backed insured mortgages.

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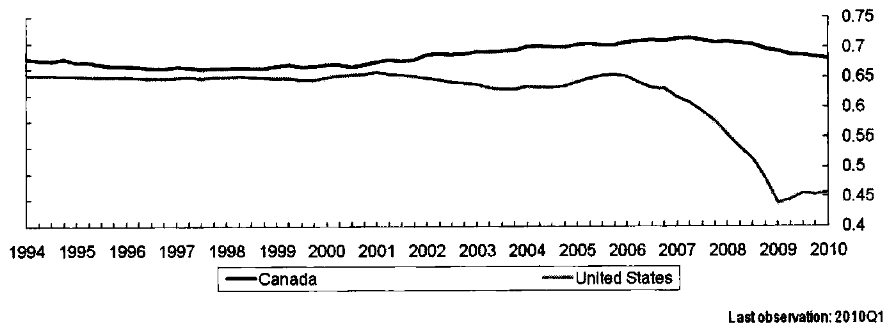
Exhibit 16

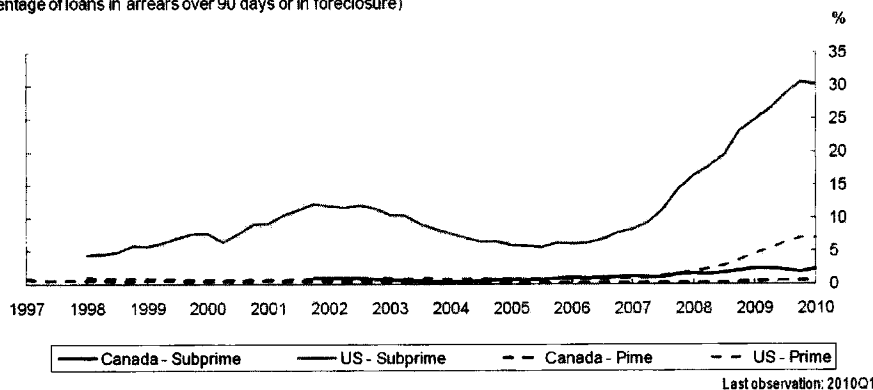
Real Estate Equity (1990–2009)



*Note: *Real estate equity = real estate assets excluding mortgages.*
Sources: Statistics Canada, U.S. Federal Reserve (at market value).

Exhibit 17

Mortgage Delinquencies



Source: TDS and financial reports, Mortgage Bankers Association, Canadian Bankers Association.

Banking, Regulatory, and Communication Structures

A variety of factors contributed to these favorable outcomes for the Canadian financial sector, some of which are explored further below.

The Canadian banking system is dominated by five or six large banks that together hold the majority of domestic banking assets. Investment banks are not present in the financial system (the once-independent large Canadian investment dealers were absorbed by the major banks following legislative changes in the early 1980s). The large banks are in turn diversified geographically and across product lines, while the non-traditional, or shadow, banking system is relatively limited in scope compared with that of the United States. Oversight is facilitated by a single authority (the Office of the Superintendent of Financial Institutions, or OSFI), which has responsibility for the prudential oversight of these federally incorporated institutions. Communication with the banking community is thus reasonably straightforward.

There is a strong focus on the quality of the banks' risk-management practices. While that is often attributed to a traditionally conservative business culture in Canada,

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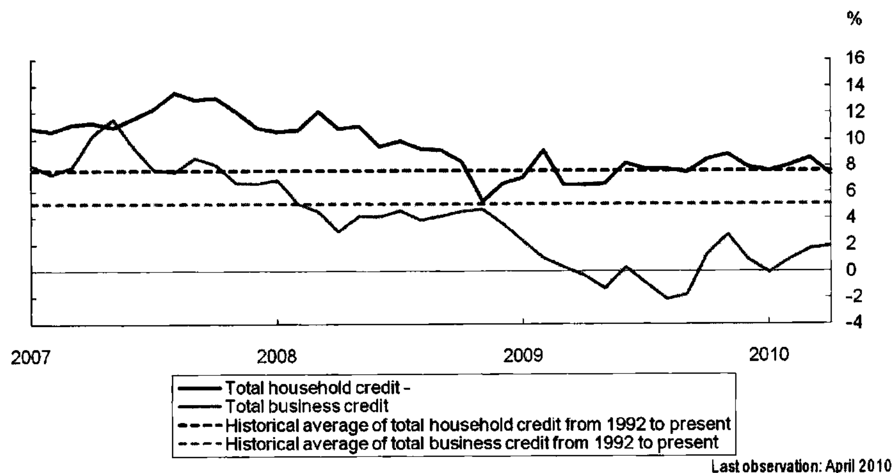
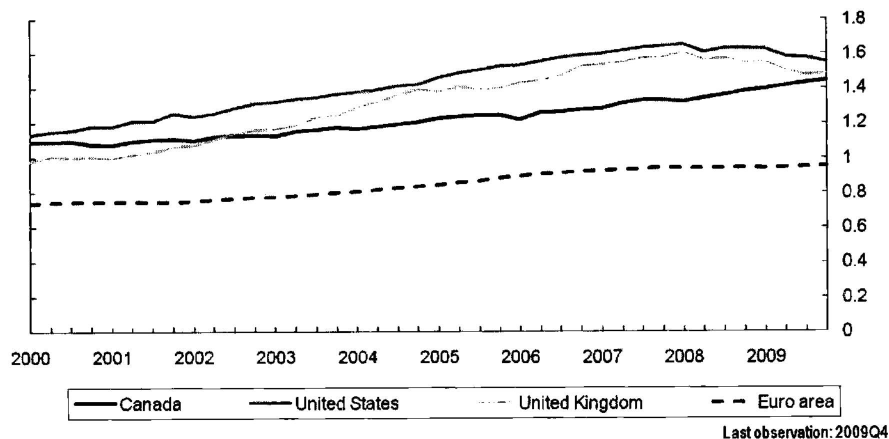
Exhibit 18
Household and Business Credit—Canada



Source: Bank of Canada.

Exhibit 19
Household Indebtedness (2000–2009)



Sources: Statistics Canada, U.S. Federal Reserve, ECB, U.K. Office for National Statistics.

an important factor here is the difficult lessons learned from previous banking problems. An example is the economic difficulties in the early 1990s, which included a significant housing downturn. Canadian banks therefore entered the recent period of financial stress with better risk-management practices, focused on limiting credit losses, than in previous episodes. This helped to limit their exposure to some potentially riskier sectors and products. For example, subprime mortgages, as they occurred in the U.S. market, remained a relatively limited phenomenon in Canada.

This focus on risk management was reinforced by OSFI's approach to prudential oversight, covering, as it does, most systemically important financial institutions, including federally incorporated insurance companies. OSFI employs a principles-based supervisory approach that is intended

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to be broad-based and adaptive in nature and therefore less open to arbitrage. Substantial discretion is retained to enunciate principles in guidance that do not require new legislation or regulations to introduce. If institutions do not comply with the guidance, OSFI has the necessary practical and legal powers to enforce compliance.[24]

Canadian banks maintained substantial amounts of capital as a result of their own business practices and the regulatory regime. While the Basel standards required Tier 1 and total capital ratios of 4% and 8%, respectively, OSFI required the banks to hold 7% and 10%, and in practice they typically held more, with a large proportion in the form of common equity. From a strong starting position at the beginning of the turmoil, the banks' capital positions were further buttressed by the strength of their retained earnings and the issuance of common shares during the crisis.[25]

Another key feature of the Canadian regulatory landscape was the implementation in the early 1980s of limits on bank leverage, known as the assets-to-capital multiple (ACM). The ACM is calculated as the ratio of total assets (including some but not all off-balance-sheet items) to total capital, and banks were not allowed to exceed specific limits (typically 20 or 23 for the large well-managed banks). It is intended to capture elements that may not be adequately reflected in the risk-weighted Basel framework and thereby complement that approach. There is some evidence that the ACM has restrained the behavior of Canadian banks under certain conditions and in turn may have prevented them from growing their assets as aggressively as they might otherwise have done.[26] Leverage ratio requirements are not unique to Canada (e.g., they are also present in the United States), suggesting that the manner in which they are implemented is critical, especially with respect to asset coverage.

Although OSFI is responsible for the prudential oversight of the most important financial institutions, it does not hold sole responsibility for the stability of the financial system. Implementing a system-wide approach to financial stability is a shared responsibility, and includes, in addition to OSFI, the Department of Finance, the Bank of Canada, the Canada Deposit Insurance Corporation, and the Financial Consumer Agency of Canada. The establishment of clear mandates and rapid communication among the regulatory authorities is essential in the midst of a crisis. In response to earlier difficulties in the Canadian financial system, a committee structure already existed to encourage communication and coordination across these bodies. The Financial Institutions Supervisory Committee, or FISC, was used extensively during the financial turmoil to facilitate an overall policy response.

CONCLUSION

The resilience of Canada's housing finance system during the recent financial crisis may be linked to a combination of factors, including prudent housing finance firms, conservative mortgage consumers, careful regulatory oversight, supportive government involvement in mortgage insurance and securitization, and Canada's broader public policy backdrop, which does not place undue preference on homeownership.

The regulatory environment reflects efforts made over the past 20 years by the Canadian authorities to reinforce Canada's financial policy framework, often motivated by historical episodes of financial difficulties in Canada (For a fuller description see Engert [2005]). In concert with the banks' own efforts to improve risk management practices, they were able to weather the turmoil of the past several years comparatively well. The current global financial reform agenda nevertheless is important to improving the robustness of the Canadian and global financial systems.

Even though Canadian mortgage markets seem less innovative than in the United States, prime Canadian homeowners are well served by their mortgage finance system, with accessibility and costs roughly in line with those in the United States. The U.S. experience suggests that access to longer fixed-rate terms for mortgages can help some households to better manage their financial risks. The authorities may wish to review potential impediments to the further development of longer-term mortgage markets.

ENDNOTES

[1]Much of the growth in the bank share came after the 1980 Bank Act revision, which allowed the banks to own trust and loan companies that had been dominant players in the market (see Harris and Ragonetti [1998] and Freedman [1998]).

[2]Two private insurers, American International Group and Genworth Financial, account for almost all of the rest. Since 1988, the federal government has been providing a 90% guarantee to private insurers. They are required to contribute to a guarantee fund and set aside reserves to absorb losses. The 10% guarantee differential recognizes the cost associated

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with CMHC's mandate to serve all parts of the country, and other forms of housing such as rental housing. For example, more than one-third of CMHC's business is in markets that private insurers do not serve, or are less active, such as homes in rural or remote locations and nursing homes.

[3]CMHC is owned by, and its financial obligations are a direct obligation of, the government of Canada.

[4]NHA MBS are pass-through securities that are issued in various terms to maturity, but five-year terms have been most popular. CMBs insulate investors from prepayment risk and pay interest coupons over the full term of the bond and the full principal on the specified maturity date. Most are fixed-rate five-year bonds, but some floating-rate and 10-year bonds have been issued. See Box 2 in Klyuev [2008] for more detail on NHA MBSs and CMBs.

[5]On a typical closed mortgage, the actual prepayment penalty depends on when it is made. If it is in the "closed period" (e.g., the first three years of a four- or five-year mortgage), the penalty is equal to the greater of 1) three months of interest on the prepaid amount, or 2) an interest rate differential (the contractual rate minus the current rate with the same remaining term) applied to the prepaid amount. During the "closed period" (e.g., the last two years of a five-year term), the penalty is equal to the three months of interest on the prepaid amount. To these penalties are added a "reinvestment fee" that starts at about $500 in the first year, sliding down to $300 in the third year, and zero thereafter. However, if it is a refinancing transaction with the same bank, the penalties may be lower. (These rates were taken from a Bank of Nova Scotia term sheet.)

[6]25-year terms had long been the norm prior to the period of rising rates that commenced in the late 1960s. For example, 25-year terms were required for NHA-insured loans prior to 1969, when the minimum term was dropped to five years; the term was further reduced to three years in 1978 and one year in 1980, and then to adjustable rates in 1982. However, adjustable-rate mortgages only became eligible for NHA MBS and CMB in 2004. Bill C-66, which was passed in 1999, gave CMHC new authorities. Using these authorities, CMHC created the CMB program in 2001 and soon thereafter began expanding the type of mortgage eligible for the program. Variable-rate mortgages securitized through NHA MBS were introduced in 2004.

[7]According to the CAAMP [2009] survey, 18% of mortgages had amortization periods longer than 25 years, but only 10% had terms longer than five years. Only 27% had adjustable rates.

[8]The government also introduced more stringent asset and income documentation standards and consistent credit scores for new mortgages. The insurers' extended amortization mortgage insurance surcharges are 20 basis points for amortization periods longer than 25 years up to 30 years, and 40 basis points up to 35 years.

[9]Comparing variable- or adjustable-rate mortgage (VRM or ARM) costs is complicated by the fact that, whereas Canadian VRMs are fairly plain vanilla, U.S. ARMs embed numerous bells and whistles, such as "teaser rates" (see Kiff and Mills [2007]).

[10]To qualify as a prime borrower for CMHC mortgage insurance purposes, the borrower or guarantor must have a minimum credit score of 620 (it was 600 prior to October 15, 2008). If a lender wants to insure a loan with an LTV between 60% and 80%, the credit score must be at least 580, which is the prime threshold in the United States. No minimum credit score is required to insure loans with LTVs below 60%. In Canada, three firms offer credit scoring services. They are Equifax, Trans Union, and Experian, which base their formulas on that developed by Fair Isaac Credit Organization (FICO).

[11]In fact, until recently, it was U.S. practice to use a fixed "teaser rate" that applied to the first two or three years of many adjustable-rate mortgages (ARMs) for affordability calculations (Kiff and Mills [2007]).

[12]In the United States, 50% downpayments were required until the FHA introduced loan insurance in 1934. After that, the downpayment requirement quickly dropped from 25% to 10% by the late 1940s. In Canada, until 1954, 20% downpayments were required on NHA-insured loans, but 40% was the norm on conventional mortgages (Harris and Ragonetti [1998]).

[13]For example, in the early 1970s, CMHC's Assisted Home Ownership Program (AHOP) insured mortgages with LTVs greater than 95%.

[14]The cost calculations are based on a $240,000, 5% loan. The Canadian costs are based on a transaction in the City of Ottawa in the Province of Ontario (provided by Steven Sheppard of Ottawa's BrazeauSeller LLP). The U.S. costs are based on a transaction in McLean, Virginia (AimLoan.com).

[15]This offer was based on a mortgage loan to a prime borrower who is putting up a 20% downpayment on a home in Fairfax County in the state of Virginia. Other lenders may charge more or less. See Stanton and Wallace [1998] for the economics of points. Styron, Basciano, and Grayson [1995] discuss the tax aspects of upfront points (when paid on the purchase of a principal residence, they are tax deductible).

[16]U.S. homeowners that relocate must prepay their existing mortgages and take on a new one at prevailing rates.

[17]At the end of 2008, cumulative banking-sector writedowns as a share of shareholder's equity had surpassed 50% in the U.S. and 30% in the U.K. Canada's cumulative writedowns remained below 20% at the end of 2009.

[18]The asset-to-capital multiple equals a banking group's total adjusted consolidated assets divided by its consolidated capital.

[19]The positive contribution that a strong retail funding base can provide is discussed in Ratnovski and Huang [2009].

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[20]An extensive review of the Bank of Canada's liquidity actions may be found in Engert, Wilkins, and Zorn [2009].

[21]In May 2010, in response to the re-emergence of U.S.-dollar funding pressures in Europe, the Bank of Canada, along with other central banks, reintroduced temporary U.S.-dollar liquidity swap facilities.

[22]Although Canadian banks did move to augment their capital from private markets during the financial turmoil, they were not under the same pressure to deleverage as occurred elsewhere.

[23]The Bank of Canada's December 2009 *Financial System Review* examines these vulnerabilities in greater detail (see pp. 23-26, "Stress testing the household sector"). This work was extended in the June 2010 issue.

[24]For more detail on OSFI's regulatory approach, see Northcott, Paulin, and White [2009], especially pp. 46-50.

[25]Although direct capital support was not required, OSFI nevertheless increased the allowable limits on innovative and preferred shares in banks' Tier 1 capital.

[26]See Bordeleau, Crawford, and Graham [2009] for further discussion of the impact of an unweighted leverage ratio in Canada.

REFERENCES

Bank of Canada, *Financial System Review*, various issues.

Bordeleau, E., A. Crawford, and C. Graham. "Regulatory Constraints on Bank Leverage: Issues and Lessons from the Canadian Experience." Bank of Canada Working Paper, 2009.

Canadian Association of Accredited Mortgage Professionals (CAAMP). Annual State of the Residential Mortgage Market in Canada, November 2009.

Canada Mortgage and Housing Corporation, Canada Mortgage Bonds Program Evaluation, 2008. http://www.cmhc-schl.gc.ca/en/hoficlincl/in/camobo/upload/CMB-Evaluation-Jun08.pdf.

Department of Finance—Canada. Department of Finance Backgrounder, Residential Mortgage Insurance, http://www.fin.gc.ca/n08/data/08-051_1-eng.asp (accessed February 18, 2010).

Engert, W. "On the Evolution of the Financial Safety Net." In the Bank of Canada's *Financial System Review*, June 2005.

Engert, W., C. Wilkins, and L. Zorn. "Bank of Canada Liquidity Actions in Response to the Financial Market Turmoil." In the *Bank of Canada Review*, Autumn 2009.

Freedman, Charles. "The Canadian Banking System," Bank of Canada Technical Report No. 81, March 1998.

Gravelle, Toni, and Karen McGuinness. "An Introduction to Covered Bond Issuance." *Bank of Canada Financial System Review*, June 2008, pp. 33-37.

Harris, Richard, and Doris Ragonetti. "Where Credit is Due: Residential Mortgage Finance in Canada, 1901 to 1954." *Journal of Real Estate Finance and Economics*, Vol. 16, No. 2 (1998), pp. 223-238.

Kiff, John, and Paul Mills, "Money for Nothing and Checks for Free: Recent Developments in US Subprime Mortgage Markets." Working Paper No. 07-188, International Monetary Fund, July 2007.

Klyuev, Vladimir. "Show Me the Money: Access to Finance for Small Borrowers in Canada." Working Paper No. 08-22, International Monetary Fund, January 2008.

Northcott, C.A., G. Paulin, and M. White. "Lessons for Banking Reform: A Canadian Perspective." *Central Banking*, Vol. 19, No. 4 (2009).

PricewaterhouseCoopers. *Canadian Banks 2009: Perspectives on the Canadian Banking Industry.*

Ratnovski, L., and R. Huang. "Why Are Canadian Banks More Resilient?" Working Paper, International Monetary Fund, July 2009.

Stanton, Richard, and Nancy Wallace. "Mortgage Choice: What's the Point?" *Real Estate Economics*, Vol. 26, No. 2 (2000), pp. 173-205.

Styron, W. Joey, Peter Basciano, and James M. Grayson. "Mortgage Interest Rates and Points: Practical Advice for Your Clients." *Tax Notes*, December 12, 1995, http://taxprof.typepad.com/taxprof_blog/files/2005-24073-1.pdf.

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The Journal of
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LESSONS LEARNED FROM THE FINANCIAL CRISIS

HOW THE CANADIAN HOUSING FINANCE SYSTEM PERFORMED THROUGH THE CREDIT CRISIS: *Lessons for Other Markets* 44

JOHN KIFF, STEVEN MENNILL, AND GRAYDON PAULIN

Canada's housing finance system exhibited considerable resilience during the recent financial crisis with comparatively little reliance on extraordinary government support. Several distinctive features of Canadian public policy and regulations have had a direct impact on the performance of the housing finance system. This article has three principal sections: The first section provides an overview of Canadian residential mortgage markets, including key features of the Canadian compared to the U.S. housing finance system, a comparison of Canadian and U.S. residential house offerings, and policy implications. The second section provides an overview of Canada's housing finance system, including relevant features of Canada's public policy landscape, the role of the Canada Mortgage and Housing Corporation (CMHC), the role of the private sector, and current initiatives underway to improve the system. The third section shows how the Canadian financial system performed through the financial crisis, discussing the performance of the banking system, the impact of the recession on intermediation, and factors related to the banking, regulatory, and communication structures that contributed to favorable outcomes for the Canadian financial sector.

CREDIT RATINGS IN STRUCTURED FINANCE: *Some Lessons from the Current Credit Crisis and Beyond* 65

ROBERTO VIOLI

This article reviews the relevant facts and discusses the main issues that have loomed large in the structured finance credit rating crisis of 2007–2008. Two key features have played a critical role: risk substitution (from diversifiable to systemic exposure) and rating fragility. The main focus of the article is the enormous number of downgrades of senior AAA bond tranches, in the effort to explain this unprecedented burst of (downward) rating volatility. The rating of structured finance products poses far greater challenges than standard corporate bond practice, as parameter uncertainty and estimation/measurement errors can have a much larger impact on their (credit) risk (e.g., rating grades). Unanticipated systemic risk shocks can greatly amplify these margins of error. The adverse impact is greatest for the structured finance instruments least exposed to actual credit risk (AAA senior bond tranches). Moreover, as the credit crisis was approaching, senior bond tranches were priced as if market participants were neglecting the risk that large macro-shocks might downgrade the quality of structured finance collateral pools.

INVESTORS BEWARE: *Flaws in the Residential Mortgage Securitization Process* 88

LAURIE S. GOODMAN, ROGER ASHWORTH, BRIAN LANDY, AND LIDAN YANG

This article focuses on some of the less discussed flaws in the securitization process. In particular, the authors focus on: 1) the enforcement of representation and warranty violations, 2) defects in the deal closing process, and 3) defective transaction surveillance and reporting. The authors make the case that, even if you knew the prepayment rates, default transition rates and severities, you could not necessarily determine the cash flows and hence the yield on the security. Even if the deal modeling is correct (and, as the authors have shown, there can be issues) and the documents are internally consistent, there is a total lack of transparency in reporting on modifications and liquidations. More irritating, it is very difficult to tie out the cash coming into the deal with what is actually distributed to investors.

ASSET CLASS UPDATE

U.S. DEALER FLOORPLAN ABS: *Navigating through the Storm* 99

HYLTON N. HEARD AND JOHN BELLA, JR.

As asset performance in Fitch-rated dealer floorplan (DFP) asset-backed securities (ABS) improved and stabilized over the past year, transactions continue to incur minimal losses. Performance metrics supporting the positive trends in DFP ABS have included higher purchase rates, improved sales, stronger monthly payment rates (MPRs), and a return of inventory aging to historical levels. After several years of

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