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Combating the Dangers Lurking in the Shadows: The Macroprudential Regulation of Shadow Banking

To mitigate the risks of another run on the shadow banking system greatly amplifying financial instability, as occurred in the 2008/09 financial crisis, governments and regulators should adopt a range of policies, regulating some of these financial entities as banks while in other cases regulating their relationships with banks. Other policies should include regulating their procyclical behaviour in certain markets and regulating the ratings process for securitized products.

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THE STUDY IN BRIEF

Since the 2008/09 financial crisis, the international regulatory community has taken steps to reduce the probability of future significant financial instability. So far, the emphasis has been on tougher capital and liquidity regulations for banks and greater transparency for financial products, and greater regulation of financial infrastructure such as central counterparties, trade repositories, and the clearing of over-the-counter derivatives.

Regulatory work has recently shifted to some extent to the shadow banking sector. This system, which broadly refers to the system of credit intermediation that involves entities and activities outside the regular banking system, consists of finance companies, commercial paper issuance, money market funds, the securitization process, and repurchase (“repo”) markets for the short-term financing of securities. This system has greatly risen in importance over the past 20 years.

Prior to the recent financial crisis, many of the system’s short-term liabilities were seen as nearly risk-free (“AAA”) assets, but some proved not to be so. Not only did the shadow banking system contract considerably during the financial crisis in both the United States and Canada, but so did the system’s provision of financing to regulated banks, which exacerbated their liquidity difficulties.

To mitigate the risks of another run on the shadow banking system greatly amplifying financial instability, some shadow banking entities ought to be regulated as banks or in a similar fashion to banks (for example, with capital and liquidity requirements) while in other cases regulation should cover banks’ relationships with them, their procyclical behaviour in certain markets (such as those for repos), or the ratings process for securitized products. Because of the diversity of the various parts of the shadow banking system, the policy responses proposed in this study differ significantly across those parts. Taken together, the implementation of these policies should help reduce systemic risk and the probability of future periods of financial stress, for a stronger and more stable financial system.

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In many ways, the recent global financial crisis was similar to earlier ones. It was preceded by strong growth in many countries in the ratio of credit to gross domestic product relative to long-term trends, as well as by strong growth in real housing prices in the United States, the United Kingdom, and several smaller countries. As well, a number of banks failed or had to receive capital injections from government.

The crisis, however, also had many differences from previous ones. Chief among these was a run on the shadow banking system, which consists of finance companies, commercial paper issuance, money market funds, the securitization process, and repurchase (“repo”) markets for the short-term financing of securities. This system, which has risen in importance over the past 20 years, had expanded rapidly, with much of it providing maturity transformation – the short-term financing of long-term assets. Many of the system’s short-term liabilities were seen as nearly risk-free (“AAA”) assets, but some proved not to be so. Not only did the shadow banking system contract considerably during the financial crisis in both the United States and Canada, but so did the system’s provision of financing to regulated banks, which exacerbated their liquidity difficulties and worsened the crisis.

Since the major parts of this system are only lightly regulated, if at all, it largely operates in the shadows with respect to the attention it usually gets. In normal times, the system works very efficiently

– leading to financial innovations and lower borrowing costs – and few of its institutions or parts fail. A number of dangers lurk in the shadows, however, which can greatly amplify financial instability in times of stress, as we saw during the financial crisis. The crisis led to greater attention to systemic risk and to the need to deal with such risk through macroprudential regulation,¹ which focuses on the financial system as a whole – as opposed to microprudential regulation, which is concerned with individual financial institutions.

Until the end of 2010, the push for improved financial system regulation focused heavily on the creation by the Basel Committee on Banking Supervision of the so-called Basel III international standard for banking regulation (BCBS 2010a,b), and there was little emphasis on a consistent approach to the regulation of shadow banking apart from some work by the International Organization of Securities Commissions (IOSCO) on transparency and securitization (for example, IOSCO 2010b, 2011).² In the past year, however, the Basel-based

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- 1 On the thrust of macroprudential regulation, see CGFS (2010a); International Monetary Fund (2011); and Longworth (2011).
- 2 Securities regulators’ traditional focus is on transparency and disclosure. In 2010, IOSCO adopted some new principles of securities regulation that included the “need for processes to monitor, mitigate and manage systemic risk” (2010a); it discussed the implementation of the principle regarding systemic risk in IOSCO (2011). For an examination of the parts of “shadow banking” (as the authors define it) that go on within the banks themselves, see Calmès and Théoret (2011).

Financial Stability Board (FSB 2011a,b) has turned its attention to the shadow banking system.

This *Commentary* answers three questions regarding shadow banking, with the primary focus on the Canadian financial system: What's in the shadows? What dangers lurk there and how did they show themselves during the recent financial crisis? And how do we combat those dangers?

In the FSB process, it is in Canada's interest to develop strong macroprudential proposals to deal with systemic risk and market failures, and to convince other countries of the importance of those proposals. Domestically, Canada should meet – and, in the case of weak international agreement, exceed – agreed international standards in this area, which will require specific regulatory actions for each area of shadow banking, as I lay out in this *Commentary*.

Although most shadow banking areas fall under provincial jurisdiction, the absence of timely and appropriate action by the provinces should lead the federal government to act. In doing so, it could avail itself of the opening left to it in the recent Supreme Court of Canada decision³ on a proposed *Canadian Securities Act* and pass legislation where there is a national “need to prevent and respond to systemic risk” in the securities area. The federal government should also consider carefully the regulation of bank involvement in each area of shadow banking. As well, it should consider whether or not systemically important groups of finance companies are also heavily involved in maturity transformation and therefore should be regulated as banks.

Unless the federal and provincial governments give priority to the development of strong domestic

and international macroprudential regulation of the shadow banking sector while memories of the financial crisis are fresh, dangers will continue to lurk in the shadows and show themselves only in times of extreme stress.

WHAT'S IN THE SHADOWS?

Although there is no one definition of the shadow banking system, the FSB defines it as “the system of credit intermediation that involves entities and activities outside the regular banking system” (2011b). Some authors focus almost entirely on entities involved in the securitization process of pooling contractual debt and selling it to investors. Others focus on all financial institutions (or markets and processes) not regulated as banks, insurance companies, or pension funds.⁴ Indeed, most of the parts of the shadow banking system are lightly regulated, if at all. In particular, they are not regulated from a macroprudential perspective. For the purpose of this *Commentary*, I adopt the FSB definition and restrict the discussion to the privately owned part of the system – and thus exclude the role of Canada Mortgage and Housing Corporation (CMHC)⁵ – in order to focus on the need for macroprudential regulation of private markets.⁶

The five major parts of the shadow banking system are: (1) finance companies (or non-depository credit intermediaries) that fund long-term assets partly through the issuance of short-term assets such as financial commercial paper; (2) commercial paper issuance, whether asset-backed or not; (3) money market funds that hold financial and

3 Reference RE *Securities Act*, 2011 SCC 66, December 22, 2011.

4 Still other authors, such as Chapman, Lavoie, and Schembri (2011), prefer to talk about market-based financing rather than shadow banking, because activities are carried out primarily via markets rather than by institutions. For a diagram of the shadow banking system, see Poszar et al. (2010).

5 Issues concerning the role CMHC plays in the financial system are very different from those pertaining to shadow banking in general.

6 Systemic issues in government mortgage finance, as evidenced by the failures of Fannie Mae and Freddie Mac in the United States, are a separate concern.

Table 1: Amounts Outstanding in Major Parts of the Shadow Banking System, Canada, June 2007 and December 2011

Type of Shadow Bank	Amount Outstanding (June 2007)	Amount Outstanding (December 2011)
	<i>C\$ billions</i>	
Finance company loans	88	95
Non-financial commercial paper	11	11
Financial commercial paper	43	16
Asset-backed commercial paper	115	27
Money market funds	50	35
Securitizations (includes asset-backed commercial paper against Canadian real assets)	140	39
Repo	778	645
TOTAL	1,225	868

Note: There is double-counting in the table, as money market funds hold significant amounts of commercial paper, some of the loans held as assets by finance companies are financed by financial commercial paper, asset-backed commercial paper supporting real sector loans is also included in securitizations, and some of the repo loans could take commercial paper and asset-backed securities as collateral (but this is reportedly quite limited in Canada). For the purposes of this study, however, such double-counting is not important; rather, it is the size of the flows at each stage in the credit intermediation or funding process that is key.

Source: Bank of Canada, *Banking and Financial Statistics*, tables E1, F2, D3, E2, and F14.

asset-backed commercial paper; (4) the creation and selling of asset-backed securities (securitization); and (5) repo markets for fixed-income products such as bonds and treasury bills. The size of Canada's shadow banking system peaked around the beginning of the financial crisis in mid-2007, and has fallen by about one-third since then (see Table 1).⁷ Percentage declines are most pronounced in financial commercial paper, asset-backed commercial paper, and securitizations.

Finance companies: Finance companies are credit intermediaries that do not accept deposits and therefore are not regulated as banks. In their role as intermediaries, they can make both mortgage and non-mortgage loans. Some specialize in loans to households, while others specialize in loans to businesses. Many specialize in lending to households and businesses that have a lower credit rating than normally would be acceptable to banks. In Canada, finance companies do not fall under the

⁷ Chapman, Lavoie, and Schembri (2011) note that, if one adds up the five major types of market-based financing, the shadow banking system was worth about C\$1.2 trillion in Canada at the end of 2010 and just under US\$16 trillion in the United States; in both cases, these amounts were equivalent to about 15 percent of the size of traditional bank liabilities.

federal Bank Act and thus are regulated provincially.

Commercial paper: Commercial paper consists of short-term instruments of less than a year in maturity. Asset-backed commercial paper comes about from longer-term assets (typically mortgage loans, car loans, credit card loans, and other loans) financed through the issuance of commercial paper, with a liquidity line provided by a bank. Other commercial paper is described as either financial or non-financial depending on the industry to which its issuer belongs. In Canada, commercial paper is regulated by provincial securities commissions and is exempt from prospectus and other transparency requirements if it carries an approved rating from an accepted credit-rating agency.

Money market funds: Money market funds are mutual funds that invest in short-term assets – treasury bills, commercial paper, and certificates of deposit – with a maturity of one year or less. Money market funds typically have a constant net asset value (NAV), a constant price at which units are purchased and redeemed. In Canada, provincial securities commissions regulate mutual funds that are organized under the laws of their provinces.

Securitization: Securitization refers to the process by which loans to households (such as mortgages, car loans, and credit card loans) and businesses (such as loans to car dealers) are turned into asset-backed securities, including asset-backed commercial paper. In Canada, the securities are regulated by provincial securities commissions, which set transparency requirements for asset-backed securities (but not for asset-backed commercial paper). Any exposure – including residual exposure – of banks to securitized products is regulated by the federal Office of the

Superintendent of Financial Institutions (OSFI). In particular, OSFI regulates the capital requirements for the liquidity lines associated with asset-backed commercial paper that are granted by Canadian banks (OSFI 2008).

Repo markets: Repo markets allow for the financing of fixed-income securities.⁸ In a repo transaction, a firm that sells securities agrees to buy them back at a specified price and time.⁹ The contract governing such a transaction specifies a margin, or “haircut” (I use the terms interchangeably) that determines the extent to which the value of the collateral securities posted by the seller exceeds the size of the loan. This provision protects the buyer against a large part of the market risk in the event that the counterparty fails. Haircuts depend on the credit-risk profiles of both the counterparty and the issuer of the collateral, as well as the term to maturity of the collateral. They tend to be set so that, with a high degree of confidence, a repo lender will be covered in the case of default by its counterparty. Thus, historical data tend to be used to calculate the volatility of the market price of the collateral over a period of about a week.

In Canada, the relationship between haircuts charged and the capital required against repo lending by banks is regulated and supervised by OSFI, according to international standards set by the Basel Committee on Banking Supervision. Haircuts charged by other securities dealers are regulated and supervised by the Investment Industry Regulatory Organization of Canada, as set out in its Rule 100 – Margin Requirement. The majority of collateral taken in Canadian dollar repo transactions is in the form of Government

8 In some repo markets, equity can be financed as well, but this is much less prevalent, and I exclude such transactions from the discussion.

9 If the term to maturity exceeds a day, there is usually provision for “margin calls” to take into account the change in the market value of the collateral.

of Canada bonds and treasury bills; a significant amount is also taken in the form of Government of Canada guaranteed bonds (including Canada Mortgage Bonds), provincial bonds, and provincially guaranteed bonds. To a lesser extent, provincial treasury bills, commercial paper, corporate bonds, and private asset-backed securities are also taken as collateral. A central counterparty for the netting and clearing of Canadian repo transactions operated by the Canadian Derivatives Clearing Corporation opened in 2012.

Interrelationships among Shadow Banks

The shadow banking system involves a number of interrelationships among its various actors, making the whole system vulnerable to shocks emanating from any one of them (see Figure 1). The private non-financial sector (both households and businesses) invests in commercial paper, money market funds, asset-backed securities, and repo markets. Money market mutual funds invest in commercial paper and (especially in the United States) in repo markets. Financial commercial paper is issued by both finance companies and banks. Banks, often through their in-house prime brokers, and hedge funds participate on both sides of repo markets. Some asset-backed securities are used as collateral in repo markets: Banks and hedge funds own asset-backed securities. Finance companies lend to households and non-financial businesses, while non-financial businesses are also partly financed by the issuance of non-financial commercial paper. Asset-backed commercial paper is used to finance loans made to households and non-financial businesses by banks and finance

companies, while asset-backed securities are used to finance mortgage and non-mortgage loans made to households and non-financial businesses.

THE DANGERS LURKING IN THE SHADOWS AND HOW THEY APPEARED DURING THE GLOBAL FINANCIAL CRISIS

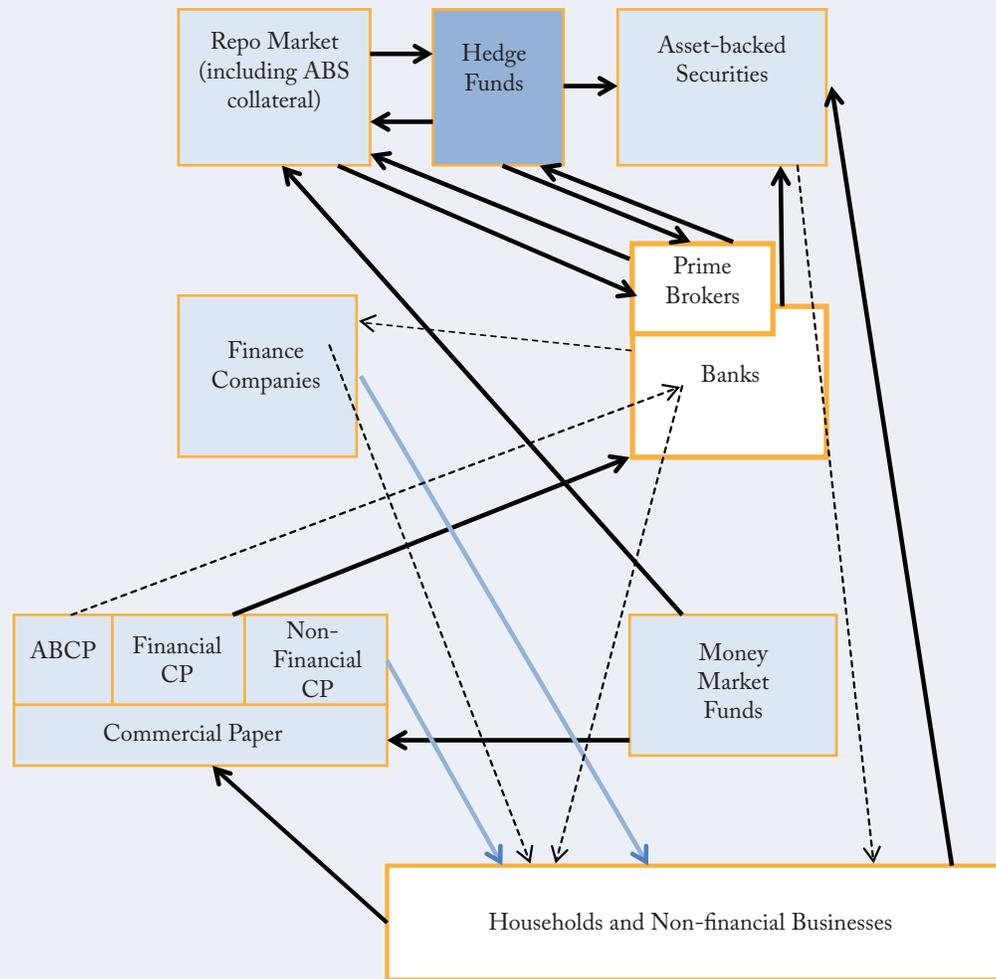
As the FSB has pointed out, systemic risk arises “from activities that generate maturity and/or liquidity transformation, that involve flawed credit risk transfer and that create or facilitate leverage.” (2011b, p.3) In particular, the FSB mentions the possibility of repeated runs on the shadow banking system, a build-up in leverage that could exacerbate the procyclicality of the financial system, and a high degree of interconnectedness between the shadow banking system and the systemically important banking system.¹⁰

Market Failures

The systemic risks that concern the FSB are associated with market failures in the financial system. These failures have to do with the special nature of banks and the interconnections and common exposures of banks – both among themselves and with the shadow banking system. Market failures in the financial system are related to the fact that “the failure of a banking-type institution...weakens the other banks and financial markets with which they were involved” (Brunnermeier et al. 2009, p.3). This is the opposite of what is typically the case for firms in other industries, where the failure of one institution

10 The FSB has set up five workstreams to make detailed policy recommendations on the regulation of: (i) banks’ interaction with shadow banking entities; (ii) money market funds; (iii) other shadow banking entities; (iv) securitization; and (v) activities related to repo and securities lending, including the possible regulation of haircuts and margins. Interim reports on (ii), (iv), and (v) can be found, respectively, in IOSCO (2012b), IOSCO (2012a), and FSB (2012). A final report is now expected before the end of 2012.

Figure 1: Interrelationships among Shadow Banks



	Light blue background: shadow banking entities of primary interest;
	Medium blue background: financial entities of secondary interest;
	White background: banks and primary borrowers
	Flows of investments (in which we are interested) into and through shadow banks
	Flows of loans from shadow banks to households and non-financial businesses
	Flows in securitization process (including the original loans that are financed)

Note: By design, the figure does not include investments by households and businesses in the capital of institutions or the flows of credit from banks to households and businesses; rather, the focus is on flows relevant to shadow banking.

usually strengthens its competitors. This is the overall sense in which “banking” (including shadow banking) is special.

As Brunnermeier et al. (2009) discuss, some market failures in the banking sector are related to two ways in which banks and certain non-depository credit intermediaries are special to their customers.¹¹ First, the failure of one such institution typically leads to the loss of access to future credit for that institution’s small and medium-sized customers. Second, the failure or severe weakening of several institutions likely leads to a credit crunch and the loss of access to credit for many households and businesses in the economy, which, in turn, is likely associated with significant declines in output and employment.

Other market failures are related to three ways in which banks and parts of the shadow banking system (whether institutions or markets) are special to each other. First, informational contagion, whereby facts about problems or difficulties at one institution or market are taken to indicate problems at others, can arise if the institutions concerned are believed to have similar assets or funding models. This can lead to runs – as the recent financial crisis with the run on certain AAA securitized assets¹² – or, in the case of institutions, higher funding costs. Second, because institutions are often interconnected, in that they trade with each other in markets for interbank deposits, repos, and derivatives, as well as hold each other’s bonds and shares, the failure of one institution can lead to prolonged uncertainty throughout the

bankruptcy or resolution process about the effects on other financial institutions that are exposed to the failed institution. Third, and most important, when liquidity problems are present in more than one institution, perhaps because of informational contagion or interconnectedness, margin and loss spirals can arise (see Brunnermeier and Pedersen 2009).

In these spirals, lower market liquidity leads to greater market volatility, in response to which counterparties require higher margins (haircuts). At the same time, the higher volatility is typically associated with market losses on existing positions. The need to post higher margins, together with the market losses, results in funding problems for banks and other dealers. As a result, they engage in fewer market transactions, which leads to even lower market liquidity, and the spiral continues, which can lead to fire sales of the assets held by banks (see Shleifer and Vishny 1997, 2011). These dynamics can lower the net worth of several banks and potentially lead to their insolvency.

Special to Their Customers: Finance Companies

A finance company is the one type of shadow banking institution that is potentially special to its customers in the same way a bank is. Some customers might rely uniquely on a particular finance company for credit because of the niche they are in – for example, they might have higher-than-average risk or they borrow to purchase a durable good or equipment for which funding tends to be supplied by the finance company sector,

11 These two market failures and the three market failures discussed in the next paragraph take the form of “negative externalities” in which the price mechanism does not take into account related social costs.

12 Several authors – including Caballero (2009); Coval, Jurek, and Stafford (2009); and Gennaioli, Shleifer, and Vishny (2012) – have stressed that the search for AAA assets, especially short-term assets, fed into the engineering of financial instruments that turned out to be unstable in difficult times. It appears that investors neglected certain unlikely risks, contributing to the issuance of an excessive amount of these securities. Then, when the risks were finally realized, there was a run on these securities toward more traditional securities, especially government treasury bills and bonds.

Figure 2: Finance Company Loans



Source: Bank of Canada *Banking and Financial Statistics*, table E1.

but not the banking sector, in a particular country. Similarly, the failure or general weakness of the finance company sector (separately or together with the banking sector) could lead to a credit crunch, particularly for certain categories of borrowers (again, by their creditworthiness or by the purchases they make). During the recent financial crisis, some finance companies affiliated with large auto manufacturers came under severe strain and were taken over by banks or converted to banks.

In Canada, through 2007 and early 2008, loans by finance companies were not significantly affected by the evolving global financial crisis, but beginning in the third and fourth quarters of 2008, with

growing problems of liquidity in financial markets, their loan growth became quite negative. Their mortgages outstanding declined from \$11.3 billion to \$10.6 billion in the third quarter of 2008, and the decline continued until the third quarter of 2010 (see Figure 2). Their non-mortgage loans fell from \$90.4 billion to \$87.0 billion in the fourth quarter of 2008, starting a decline that continued until the third quarter of 2009, when the outstanding stock reached \$82.0 billion. Only further study, however, would show whether these declines were associated with a specialness to their customers that was a significant market failure.

Special to Each Other: Commercial Paper and Money Market Funds

During the recent financial crisis, many banks and shadow banks had common exposures to US sub-prime and other mortgages. Doubts about the credit quality of such assets and uncertainty about the extent to which institutions were exposed to them led to informational contagion and runs in both Canada and the United States on asset-backed commercial paper and financial commercial paper, as well as US money market funds. These runs negatively affected the liquidity positions of banks.

In the spring and early summer of 2007, concerns mounted about the quality of US sub-prime mortgages. As these mortgages backed some issues of asset-backed commercial paper, concerns began to be voiced about the quality of such paper in the United States and elsewhere. In Canada, tensions built in early August of that year, and contagion led, on August 15, to the freezing of the market for asset-backed commercial paper sponsored by institutions other than banks,¹³ illustrating that financial markets can suffer from informational contagion when they are not sufficiently transparent. In the Canadian non-bank asset-backed commercial paper market, many holders were not aware that the vast majority of issues were backed by “leveraged super senior collateralized debt obligations,” a highly complex

derivative instrument. Some \$28.8 billion – or most of the non-bank asset-backed commercial paper – was dealt with under the rescheduling process under the so-called Montreal Accord. The search for “AAA-type” assets led outstanding Canadian asset-backed commercial paper to peak at \$115 billion at the end of July 2007 before the run on such paper caused it to decline steadily to \$23.8 billion in August 2011 (Figure 3).¹⁴ Canadian financial corporate paper outstanding peaked at around \$46 billion in mid-2007 before declining steadily, initially as a result of informational contagion leading to a run.¹⁵

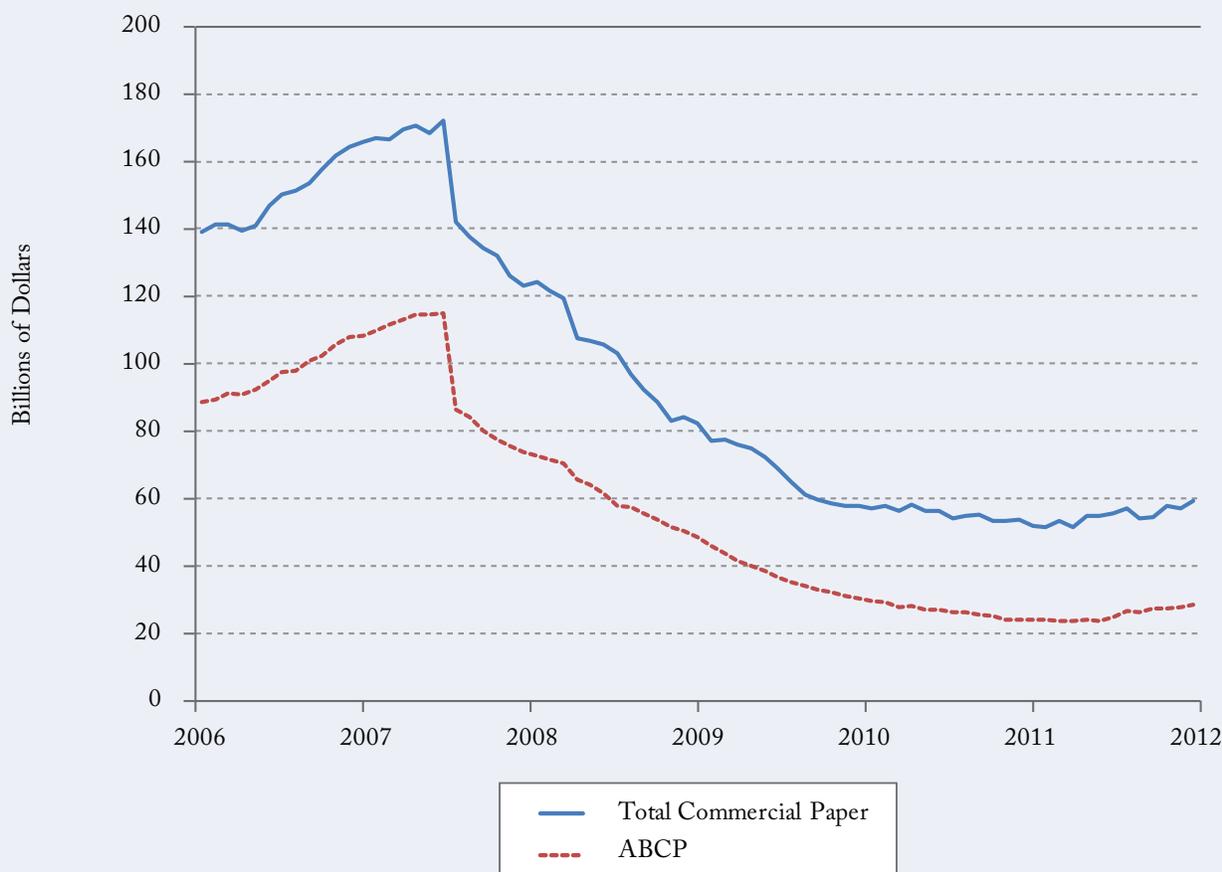
Meanwhile, in the early part of the crisis, the stock of money market funds increased rapidly from \$50.7 billion in July 2007 to \$74.0 billion in August 2008 (Figure 4). The story might have been different – potentially involving contagion – had not the National Bank of Canada (2007) announced that it would acquire all asset-backed commercial paper currently held in National Bank and Altamira public mutual funds following the freeze in parts of the Canadian market for such paper. In the fourth quarter of fiscal year 2007, the National Bank took a \$365 million after-tax charge and compensation adjustment related to its holdings of asset-backed commercial paper, including what it had acquired from these public mutual funds. Then, the run on money market funds in the United States in September 2008, which

13 As Allan and Bergevin (2010) have noted, however, the Canadian conduits for asset-backed commercial paper whose funding froze included those sponsored by the National Bank of Canada and some foreign banks, but not those of the “Big Five” chartered banks, whose conduits did not include US sub-prime mortgage assets; for discussion of aspects of the events in the Canadian market for asset-backed commercial paper, see Kamhi and Tuer (2007) and Chant (2008). Difficulties occurred in that market even though a large number of sophisticated investors were active participants and the nature of the liquidity guarantees provided by banks was well known.

14 A run on commercial paper shows up as a refusal to roll over existing holdings and to purchase new issues. At times, there might also be an attempt to sell existing holdings.

15 Canadian non-financial corporate paper outstanding peaked at \$15.2 billion at the end of August 2008, just prior to the failure of Lehman Brothers, and, with extremely low liquidity in all commercial paper markets, it dropped rapidly to \$10.5 billion over the next two months before recovering to \$13.0 billion by February 2009. It is not clear that this decline had a major economic effect.

Figure 3: Commercial Paper



Source: Bank of Canada *Banking and Financial Statistics*, table F2.

began with the Reserve Primary Fund’s “breaking the buck” – that is, experiencing a decline in its NAV – because of its holdings of Lehman Brothers paper, led to uncertainty regarding money market funds in Canada. As a result, there was a minor run on such funds and the stock fell by \$4.0 billion to \$70.0 billion by the end of October 2008.¹⁶ Assurances from money market fund sponsors

settled concerns, however, and the stock rose to \$77.4 billion by March 2009.

Special to Each Other: Securitized Products and Repo Markets

Shadow banks and banks alike can be affected by margin and loss spirals and fire sales of assets. In

16 Putnam Investments, a US subsidiary of Canada’s Great-West Lifeco, shut down a US\$12.3 billion money market fund on September 17, 2008, as it faced significant redemption pressures.

Figure 4: Money Market Funds



Source: Statistics Canada and Bank of Canada *Banking and Financial Statistics*, table D3.

the recent financial crisis, this was particularly true for securitized products (including asset-backed commercial paper) based on sub-prime mortgages, partly because uncertainty about the quality of the underlying mortgage assets kept some potential participants out of the market. Some felt that the products were not sufficiently transparent and had been poorly rated by credit-rating agencies.

Four elements came together to create a lack of trust in AAA-rated asset-backed securities¹⁷ and

to the collapse of the entire ABS market: poor US mortgage underwriting; the lack of “skin in the game” – that is, the maintenance of some exposure – on the part of US mortgage originators; the lack of transparency of asset-backed securities and collateralized debt obligations; and the use of poor rating techniques by credit-rating agencies. As far as the last of these elements was concerned, one flaw in particular was not well appreciated. Some agencies rated securities primarily by probability

17 Gorton and Metrick (2010) place particular emphasis on the “loss” of apparently risk-free AAA securities.

of loss rather than by expected loss – that is, the probability of loss multiplied by the expected loss given that a loss is experienced – which opened them up to the multiplication of AAA securities by the creation of “collateralized debt obligations squared” and other complex financial instruments (Hull and White 2010). Such complex securities tend to have high expected loss when any loss is experienced, which differs greatly from the situation with corporate or sovereign bonds, for example, and was not well understood by many asset holders.

Concern over asset quality hit the demand for all securitized products starting in the summer of 2007. In Canada, securitization slowed considerably then, with the amount outstanding of securitizations supporting loans to Canadian households and businesses peaking at \$142.6 billion in September (Figure 5). The amount outstanding then declined steadily to some \$63.4 billion in July 2011. Because banks provided the liquidity backstop to some types of securitized products, they had to raise more funding themselves or sell assets. In other words, the banks’ funding liquidity position was made worse. Concern about counterparty credit risk, particularly starting in September 2008, was rising across the entire financial system, which lowered market liquidity as potential buyers were less interested in participating in markets. With lower market liquidity, asset prices in most countries were becoming more volatile. This rising concern combined with higher volatility led to an increase in haircuts on repos – especially on securitized assets – as repo lenders sought to protect themselves, which, in turn, further weakened the funding liquidity of investment banks, hedge funds, and some commercial banks.

As a result, sales of assets, particularly of securitized assets, took place. The way in which assets were priced started to resemble that of cash-in-the-market pricing (see Allen and Gale 1994), whereby short-run prices reflect the liquidity of regular participants in the market (rather than long-run market fundamentals), or of fire sales

(Shleifer and Vishny 1997, 2011). Normal market participants were strongly liquidity constrained – that is, they were unable to finance new purchases and wanted to sell assets – so prices moved below their long-run fundamental levels. It took some time for those not active in the market day in and day out to enter and pick up some bargains.

In contrast to what happened in the United States, there was no obvious persistent weakness in repo market volumes in Canada during the period from August 2007 through March 2009, either in total or in that part of the market backed by bonds not issued by the Government of Canada (Figure 6). In particular, there was no decline in activity in the non-government component in August or September 2007 following the Canadian non-bank asset-backed commercial paper crisis or in September and October 2008 following the failure of Lehman Brothers, mainly because private securitized products are not commonly used as collateral in repos in Canada.

HOW SHOULD THESE DANGERS BE COMBATED?

To address market failures in the shadow banking system, I argue that some shadow banking entities ought to be regulated as banks or in a similar fashion to banks (for example, with capital and liquidity requirements) while in other cases regulation should cover banks’ relationships with them, their procyclical behaviour in certain markets (such as those for repos), or the ratings process for securitized products.

It is useful to expand on the relationships banks have with shadow banking entities. As in many other countries, banks in Canada are often the largest players in shadow banking markets – notably the securitization and repo markets. Thus, bank regulatory measures proposed by the Basel Committee on Banking Supervision – especially those motivated by the desire to reduce systemic risk – could have significant effects on those markets and on their bank and non-bank

Figure 5: The Securitization Market



Note: The decline in November 2011 is associated with the adoption of new accounting standards by the banks.

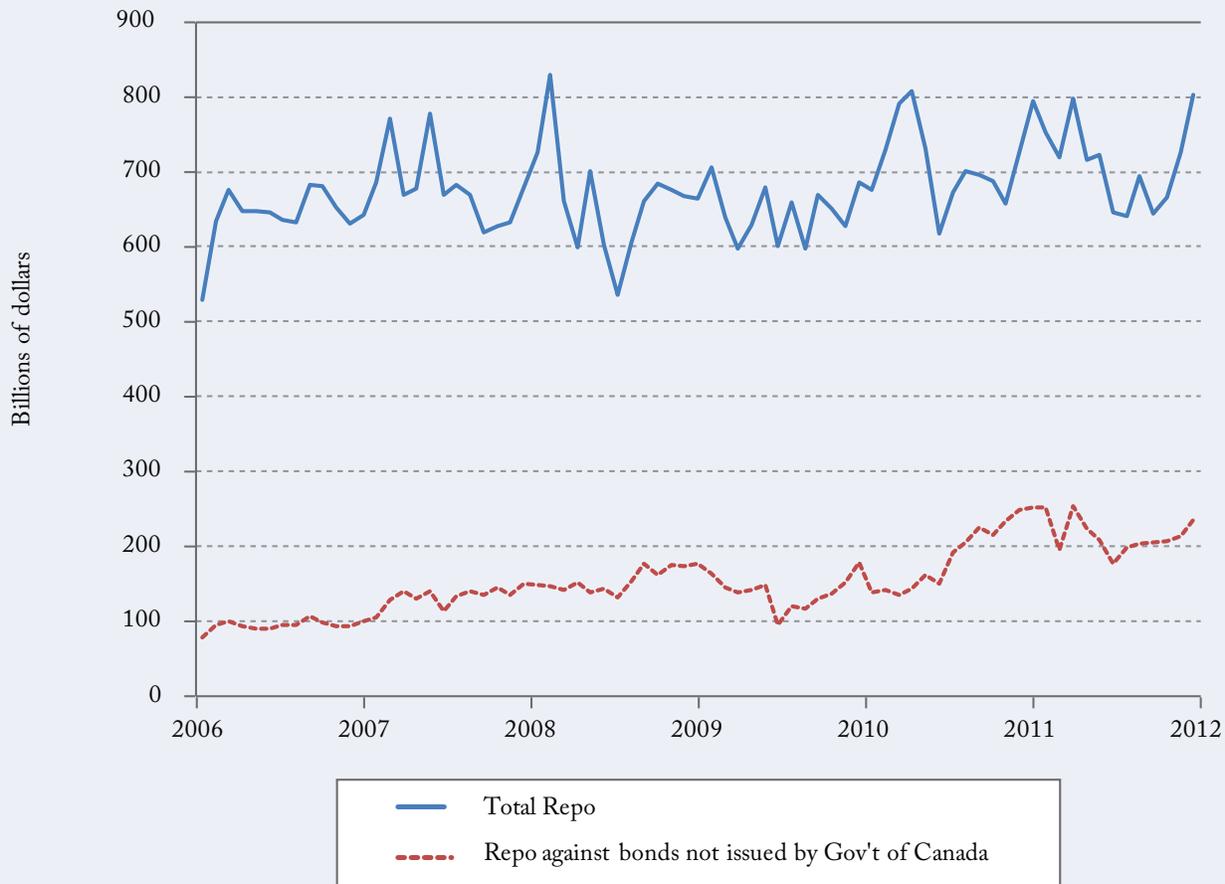
Source: Sum of the four types of securitizations (defined as those not reported as assets on bank balance sheets) reported in Bank of Canada *Banking and Financial Statistics*, table E2.

participants. In the context of this *Commentary* and the need to reduce systemic risk in the financial sector, shadow banking markets should be examined for market failures leading to significant systemic risk — whether those failures arise from the relationships among banks themselves, between banks and non-bank institutions, among non-bank institutions, or independent of which institutions are transacting in the markets.

Finance Companies

As noted above, finance companies are a type of shadow bank that is possibly special to its customers. If most customers of finance companies also tend to borrow from banks, then there are no grounds for regulating them on the basis of their being special to their customers. If they fail, there probably would be little social cost because their involvement in other market failures appears to be limited; there would therefore be no case

Figure 6: The Repo Market



Source: Bank of Canada *Banking and Financial Statistics*, table F14.

for more regulation than at present. If, on the other hand, a significant percentage of finance companies' customers have a borrowing relationship only with them (and could not easily move to another financial institution to borrow) and are therefore special to their customers, they should be regulated just as banks are, with liquidity and capital requirements. A study, perhaps by the Bank of Canada or OSFI, to determine if some types of finance companies should be regulated as banks ought to examine whether their balance sheets, loan types, and customer characteristics are such

that their maturity transformation and systemic importance might lead to future credit crunches.

Asset-Backed Commercial Paper

In Canada, the market for asset-backed commercial paper is regulated just like the market for regular commercial paper, where the relevant information on the issuing firm is readily available. Thus, even today – five years after the freezing of non-bank asset-backed commercial paper – there are no transparency regulations for such paper in Canada.

In these circumstances, informational contagion could easily happen again.

A proposal by the Canadian Securities Administrators (CSA 2011) would greatly improve the transparency of all securitized products in Canada, in part by greatly restricting exemptions from prospectuses and by requiring information notices even when prospectuses are not required. In the interim, only the transparency requirements for eligibility for Bank of Canada liquidity facilities have changed the disclosure rules for asset-backed commercial paper. It is important to note that, although transparency is important for investor protection, it is even more important for preventing significant informational contagion when markets come under stress.¹⁸ Transparency also helps regulators to understand the nature of the products being traded.¹⁹ For all these reasons it is important that something close to the CSA proposal be adopted promptly.

As noted earlier, asset-backed commercial paper involves a significant maturity mismatch; it thus opens the possibility of a liquidity call on a bank. The Basel Committee on Banking Supervision has proposed increasing the capital charge for providing short-term liquidity lines by eliminating differences between the charges for short-term and long-term liquidity facilities (BCBS 2009).

During the financial crisis, some banks stood behind their sponsored asset-backed commercial paper, essentially guaranteeing its value to holders of the paper, even though they had no legal obligation to do so. The Basel Committee has also

been looking at the implications of such behaviour for bank capital charges. Relatedly, the Canadian conversion to International Financial Reporting has meant that many securitizations and off-balance-sheet structures have to be reported on the balance sheets of Canadian banks (OSFI 2010), thus requiring them to hold additional capital. In short, if asset-backed commercial paper is held by regulated leveraged financial institutions, it will be taken account of in the capital and liquidity regulation of those institutions. If asset-backed commercial paper is held by other types of institutions, then the only further regulation needed would be for transparency, which is the key to controlling contagion in stressful times.

Other Commercial Paper

There appears to be no need to further regulate the issuance of commercial paper by financial and non-financial businesses. The issuance of financial commercial paper by banks (which is small in Canada) and finance companies falls under the general liquidity regulations of those institutions and need not be regulated separately. The new liquidity regulations for banks under Basel III tend to discourage short-term funding relative to longer-term funding.

Money Market Funds

As noted above, most money market funds are of a constant NAV type and thus are supposed always

18 Hendry, Lavoie, and Wilkins (2010) describe the macroprudential reasons for regulating transparency.

19 Many Canadian-bank-sponsored conduits are being consolidated on the balance sheets, but there are a few that are not owing to the presence of “first loss providers” – investors who absorb a first level of credit losses in the conduit. Improvements in the regulation of financial market infrastructure, in fact, predated the recent financial crisis, but the crisis has led to important initiatives to improve the regulation of central counterparties, to establish trade repositories, and to move the clearing of standardized over-the-counter derivatives to central counterparties. These are important moves that will increase transparency for both regulators and the market as a whole.

to trade at their par value, but this cannot happen continuously if the fund has no capital (or an owner who will support the fund unconditionally) and is taking on any credit risk. Thus, there is a risk of a run on the fund, with potential consequences for the issuers of the commercial paper that it holds.

Since there is a significant probability of a run on a fund only when there is a conjunction of three conditions – no capital and liquidity regulation, credit risk, and a constant NAV – this suggests that appropriate regulation would require that only two of these conditions be present. Thus, the only constant NAV money market funds that should be allowed by provincial regulators are ones that hold only risk-free assets (federal government treasury bills) or that are regulated similarly to banks – that is, with capital and liquidity requirements and asset concentration limits. Baily et al. (2011) lay out a view of how this could be done. Non-constant NAV money market funds should also be allowed, and should trade like other mutual funds and without the possibility of capital injections by any bank that sponsors them.²⁰ A regulatory system that allowed these two types of constant NAV money market funds as well as non-constant NAV money market funds would reduce the probability of the type of run on money market funds that took place in the United States in the aftermath of the collapse of Lehman Brothers. It would also greatly reduce the probability that banks would take their sponsored money market funds back into their own balance sheets or cover their losses.

The Creation and Sale of Asset-backed Securities

Although the issuance of mortgage-backed securities and other asset-backed securities fell off considerably following the financial crisis, it has been rising recently in both the United States and Canada, and this market should play a larger role again in the future (see IOSCO 2012a). To help restart a viable market for asset-backed securities that would not pose systemic risk, there should be appropriate levels of mortgage underwriting standards; originators should be required to have “skin in the game” so that they have clear incentive to assess the risk of the mortgages they are originating; there needs to be greater effective transparency of asset-backed securities and collateralized debt obligations; and credit-rating agencies should be required, as part of a code of conduct, to use different scales for asset-backed securities than they use for corporate and sovereign bonds and to provide more information about their models.²¹

In regard to the latter point, provincial regulators should forbid the rating of complex securities issued in Canada primarily on the basis of probability of loss. Furthermore, regulators should require that the percentage of AAA securities manufactured from a particular collateral pool should be given prominence in the prospectus.²² In addition, securities regulators should implement the proposal of Allan and Bergevin (2010, 2011) to require an informed third-party institution to buy some of

20 The US Securities and Exchange Commission seems to be headed in the direction of requiring capital and liquidity for constant NAV money market funds, while allowing non-constant NAVs to trade like other mutual funds; see Nasiripour and McCrum (2011). IOSCO (2012b) has issued a consultation report that includes a wide variety of possible options, including the ones argued for here.

21 On the transparency front, IOSCO (2012a) is consulting with investors about whether regulators should require the disclosure of stress test information.

22 Stein (2010) and Hanson, Kashyap, and Stein (2011) suggest the possible regulation of the percentage of AAA securities from a collateral pool.

the intermediate tranche before any tranche of the securitization can be issued.²³

Repo Markets and Haircuts

The lower the haircuts in repo markets the higher is the leverage that can be taken on, and the greater is the effective credit granted by the repo lender. Conversely, the higher the haircuts the lower is the leverage that can be taken on, and the lower is the effective credit granted by the repo lender. In boom times, haircuts are low, leverage is high, and credit granted is high; the converse pertains when stressed times or crises arise – for example, haircuts fell during the boom period and then rose significantly during the financial crisis.²⁴ Geanakoplos (2010) has shown that, when there is a continuum of beliefs about the underlying fundamental price, the greater the leverage, the greater is the volatility in asset prices. Brunnermeier and Pedersen (2009) show that movements in repo haircuts are a key part of the liquidity-margin-leverage spiral.

To dampen such procyclicality, several authors (CGFS 2010b; Geanakoplos 2010; Longworth 2010) have argued that minimum haircuts on repo should be regulated.²⁵ These minimums would be calculated in such a way as to take into account various economic conditions, including periods of financial stress – that is, so-called through-the-cycle methodology. In practice, this would mean the use of price volatility over a long historical period that included stressed market conditions.

Furthermore, it would be important to include the possibility of a countercyclical add-on to haircuts in boom times, which could depend on either the growth of credit financing through repos or the narrowing of interest rate spreads on government bonds. Basel III already regulates the leverage of banks, but the regulation of minimum haircuts on repos would help to limit the leverage of non-bank financial institutions.

Although some authors, such as Stein (2010), have focused only on haircuts on securitized products, procyclical behaviour in financial markets appears pervasive. It is exacerbated by declines in haircuts, which have often been set using value-at-risk calculations based on very short periods of a year or two. The extensive recommendations made by the CGFS (2010b) and elaborated on by Longworth (2010) therefore cover all fixed income products.

Minimum through-the-cycle haircuts – with the possibility of countercyclical add-ons in boom times – would be achieved by adjusting the current Basel Committee process for calculating capital requirements on exposures, which would be applied to both banks and broker dealers. Only minimum haircuts would be regulated, as all institutions would be free to exceed the minimum when they believe it is not large enough to cover their risks. Central counterparties for repo clearing systems – including the new one in Canada – should also have to respect minimum haircuts calculated on a through-the-cycle basis.

23 Gorton and Metrick (2010) take a different tack on the regulation of securitization, arguing that “narrow funding banks” be established to regulate securitized products. This would be done by requiring that all securitized products be sold to such banks. At the same time, the banking regulator would determine which types of securitized products could be purchased and “portfolio criteria with respect to proportions of asset classes in the portfolio and their ratings.” Narrow funding banks would be permitted only to purchase mortgage-backed securities and to issue liabilities. These liabilities would be eligible repo collateral for banks and non-banks alike. Gorton and Metrick combine their recommendations on securitization with the regulation of repo markets, including minimum haircuts.

24 The behaviour of haircuts has been documented by CGFS (2009, 2010b); Copeland, Martin, and Walker (2010, 2011); Krishnamurthy, Nagel, and Orlov (2011); and Gorton and Metrick (2012).

25 Regulation could also be justified by some of the findings of Brumm et al. (2011) and Gai, Haldane, and Kapadia (2011).

Table 2: Proposed Policies for the Regulation of the Shadow Banking System

Part of Shadow Banking System	Associated Key Market Failure or Problem	Proposed Policies
Finance companies	<ul style="list-style-type: none"> finance companies may be special to their customers 	<ul style="list-style-type: none"> possibly convert some finance companies to banks
Asset-backed commercial paper	<ul style="list-style-type: none"> informational contagion: significant maturity transformation with non-transparent assets; relies on bank liquidity lines 	<ul style="list-style-type: none"> transparency regulation; appropriate capital charges on bank liquidity lines
Financial commercial paper	<ul style="list-style-type: none"> possibility of illiquidity becoming contagious 	<ul style="list-style-type: none"> discourage large short-term wholesale liabilities of banks by liquidity regulation
Money market funds	<ul style="list-style-type: none"> informational contagion and runs: constant NAV is not time consistent 	<ul style="list-style-type: none"> restrict to treasury bills, requirement for capital and liquidity, or requirement to convert to non-constant NAV
Securitization	<ul style="list-style-type: none"> poor underwriting of sub-prime mortgages in some countries no “skin in game” lack of transparency poor risk delineation among tranches and poor ratings by credit-rating agencies banks have potential liabilities against which they do not hold capital 	<ul style="list-style-type: none"> ensure appropriate underwriting standards regulate “skin in game” increase transparency code of conduct for credit-rating agencies; require some of the intermediate tranche to be held by knowledgeable parties accounting regulations that require banks that retain residual responsibilities to hold securitizations on balance sheet
Repo	<ul style="list-style-type: none"> procyclicality of haircuts and financial asset prices; exacerbation of interconnections and contagion 	<ul style="list-style-type: none"> “through-the-cycle” haircuts with potential for countercyclical add-ons in booms

Canada should seek international agreement on the regulation of haircuts, but, in the absence of such agreement, haircuts for Canadian dollar fixed-income products set by any international bank should follow such regulation (Longworth 2010).

CONCLUDING COMMENTS

The international regulatory community has focused until now on the priorities for reducing the probability of future significant financial instability. This has meant an emphasis on tougher capital

and liquidity regulations for banks and greater transparency for financial products, and greater regulation of financial infrastructure such as central counterparties, trade repositories, and the clearing of over-the-counter derivatives.

Regulatory work has also turned recently to the shadow banking sector. The nature and importance of this sector vary greatly across countries; furthermore, in many countries, including Canada and the United States, the regulatory authority is divided among a number of regulators at both the national and subnational levels. Although this



division of responsibility complicates matters, it is important that, in Canada, provincial securities regulators and the federal government make progress in dealing with the systemic risks of the shadow banking system.

Some of the regulations proposed in this *Commentary* could affect the profitability of the

shadow banking system and inhibit its growth, at least in the short term. To the extent that these regulations would reduce systemic risk and the probability of future periods of financial stress, however, a stronger and more stable overall financial system should emerge, for the benefit of the Canadian economy.

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