

Toward More Resilient Markets: Over-the-Counter Derivatives Reform in Canada

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- Over-the-counter derivatives (OTCD) markets are important for the financial system because they facilitate the transfer and management of risk. However, during the 2007–09 financial crisis they propagated and amplified shocks. In response, leaders of the G20 countries agreed to make reforms to these markets, and Canadian authorities are implementing the reforms in a manner appropriate for the Canadian market.
- Implementation of the reforms is leading to improvements in risk-management practices. For example, the required central clearing of standardized trades and margin requirements for non-centrally cleared derivatives are reducing counterparty credit risk and, hence, the risk of contagion. As well, mandatory trade reporting has increased regulatory transparency.
- Despite these benefits, the reforms could lead to higher market concentration and fragmentation and could increase the cost of accessing OTCD markets, especially for smaller participants.
- As the implementation of the OTCD reforms nears completion, it is critical that authorities evaluate the effect on market functioning and make further refinements, if needed.

Introduction

Over-the-counter derivatives (OTCD) markets are an important component of the Canadian and global financial systems because they allow risks to be efficiently transferred and managed (*italicized terms are defined in Table 1*). OTCD markets facilitate access to cross-border funding and allow market participants to take on and manage exposures. For example, OTCD contracts enable buy-side institutions such as pension funds to enhance their investment returns.

In Canada, the markets for OTC *interest rate* and *foreign exchange* (FX) *derivatives* are of systemic importance because of their size and centrality, as well as the risk exposures they create and help manage for market participants

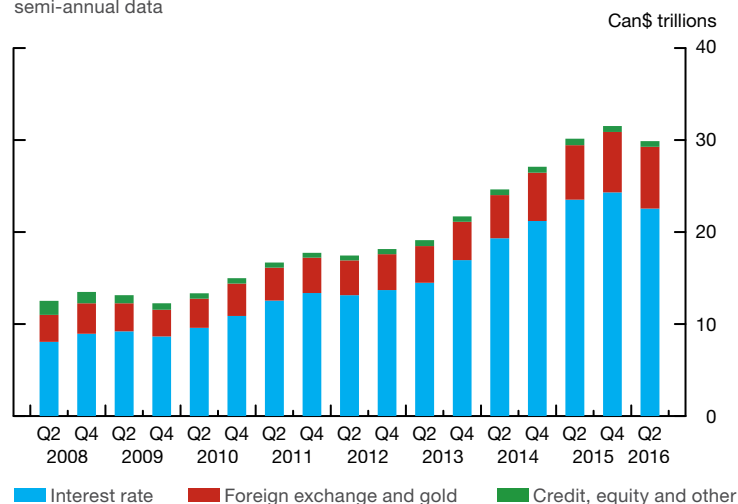
¹ We would like to thank the Ontario Securities Commission and, in particular, Shaun Olson and Yani Wu for compiling and sharing aggregate OTCD trade repository data. We also thank James Pinnington for his research assistance and help with the charts in this article.

Table 1: Selected derivatives terminology

Key term	Definition
Over-the-counter derivative (OTCD)	A derivative that is not traded on a formal exchange but is directly negotiated between the counterparties. OTCDs are often intermediated by dealers who make markets in these instruments. In Canada, the Big Six banks are large derivatives dealers; the five biggest are also registered swap dealers in the United States. The term <i>swap</i> is often used as a synonym for an OTCD.
Central counterparty (CCP)	A clearinghouse that stands between clearing participants. The CCP becomes the counterparty to every transaction between the clearing participants and thereby manages counterparty credit risk.
Interest rate derivative	A derivative whose payment flows are tied to levels of interest rates. The <i>interest rate swap</i> , in its simplest form, exchanges a fixed-rate for a floating-rate payment. Interest rate derivatives are used to manage duration and to hedge interest rate risk.
Foreign exchange (FX) derivative	A derivative whose payments are linked to the exchange rates between different currencies. The <i>FX forward</i> promises to exchange one currency for another at a predetermined exchange rate in the future. The <i>FX swap</i> is an exchange of currencies at one date that is reversed at a later date, again at predetermined exchange rates. It is a popular tool for companies looking to access funding in foreign currencies.
Notional amount	The <i>face value</i> of the derivative contract. The notional amount is not usually exchanged but is used to calculate payments owed by counterparties.
Trade repository (TR)	An infrastructure that collects, stores and disseminates records of OTCD transactions.

Chart 1: Interest rate and foreign exchange derivatives are the largest component of Canadian over-the-counter derivatives markets

Notional value of OTCD held by Canadian banks, by underlying asset class, semi-annual data



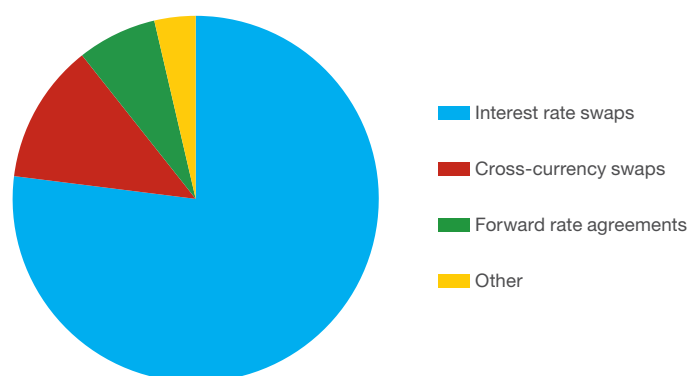
Sources: Regulatory filings of Canadian banks

Last observation: 2016Q2

(Chande, Labelle and Tuer 2010). Since 2008, the total size of the Canadian OTCD market has more than doubled, driven mainly by growth in interest rate derivatives. Measured in terms of outstanding *notional amounts*, the interest rate derivatives market is the largest segment, at about \$23 trillion, followed by the FX derivatives market, at about \$7 trillion as of the second quarter of 2016 (Chart 1). Credit, equity and other derivatives constitute a much smaller segment. The most widely used OTC interest rate derivative is the interest rate swap, while the most widely used OTC FX derivatives are forwards and swaps

Chart 2: Interest rate swaps are the most common interest rate derivatives

Notional amount of interest rate derivatives outstanding, by derivative type

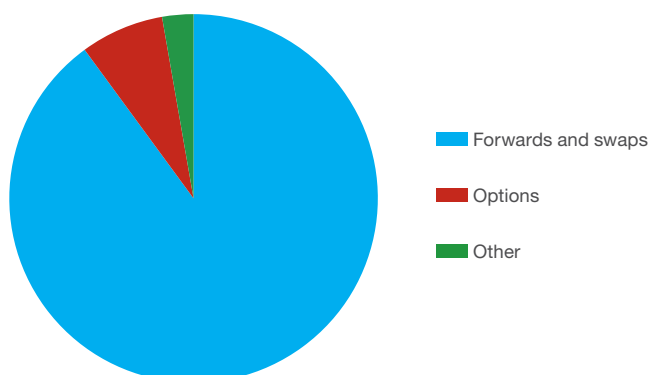


Source: Ontario Securities Commission

Last observation: 2016Q2

Chart 3: Forwards and swaps are the most widely used foreign exchange derivatives

Notional amount of foreign exchange derivatives outstanding, by derivative type



Source: Ontario Securities Commission

Last observation: 2016Q2

(Chart 2 and Chart 3).^{2,3} A disruption in one of these markets could affect the financial system and the broader economy by impeding access to funding and the hedging of risks for financial institutions. In extreme cases, counterparty defaults could be triggered.

The Canadian OTCD market is globally connected. Chart 4 shows the location of counterparties to OTCD trades reported in Canada: Canadian entities trade heavily with counterparties in the United States and the European Union, especially in the United Kingdom, Germany and France.

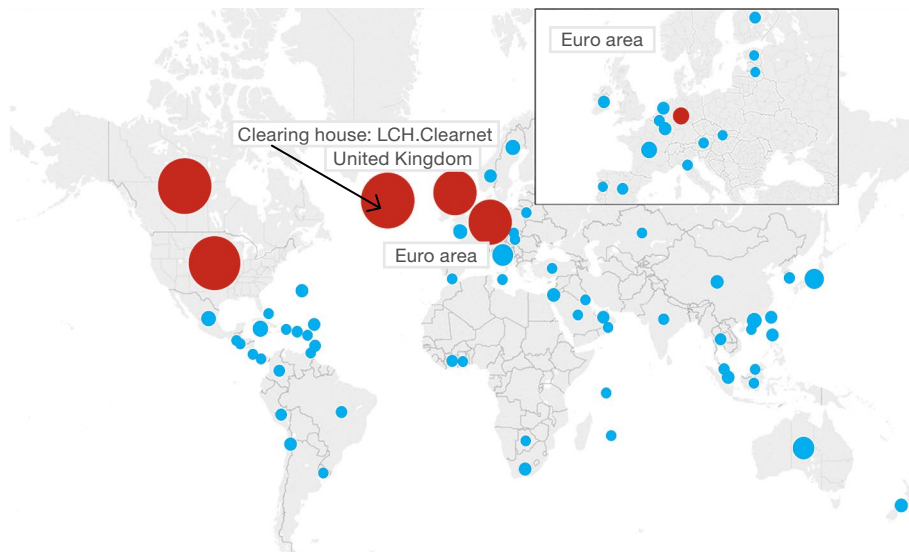
OTCD markets have the potential to transmit and amplify shocks to the financial system, as they did during the 2007–09 global financial crisis. When mortgage defaults began to mount in the United States in 2008, financial

² A number of charts in this report are compiled using trade repository data reported pursuant to Ontario reporting rules. These data capture a large share of the Canadian market and include both centrally cleared and bilateral transactions. Chart 2 and Chart 3 exclude over-reported transactions where the clearing house is the non-reporting counterparty. Double counting may exist in which cleared transactions between Ontario counterparties were novated into two new transactions.

³ Chart 3 does not distinguish between FX swaps and forwards because the swap legs may be reported as two forwards.

Chart 4: Canadian institutions trade in a global OTCD market

Notional amount outstanding, by location of Canadian entities' counterparties



Note: This chart is based on open position data in interest rate, FX, equity and credit asset classes as at 30 June 2016. "Canadian entities" means entities headquartered in Canada. The circles denote aggregate notional amounts; notionals in excess of \$1 trillion are shown in red.

Source: Ontario Securities Commission

Last observation: 30 June 2016

institutions around the world began suffering losses from exposures to derivatives that referenced mortgage securitizations.⁴ These losses, coupled with widespread uncertainty around the size of institutions' exposures to derivatives, raised concerns about the ability of counterparties to meet their other obligations. This uncertainty led to a reluctance to provide funding and, over the course of 2008, contributed to the failure (or near-failure) of Bear Stearns, Lehman Brothers and American International Group (AIG). In addition, the opaque nature of OTCD markets meant that regulators had insufficient information to respond to and resolve the circumstances that precipitated the crisis (Duffie 2011).

In response, at the September 2009 Pittsburgh Summit the leaders of the G20 countries committed to reform OTCD markets. The reform agenda had three fundamental goals: improve the transparency of the OTCD market, mitigate systemic risk and protect against market abuse (G20 2009). To achieve these goals, the G20 set out to strengthen the infrastructure for OTCD markets, including trade repositories, central counterparties and trading platforms. The G20 also mandated higher capital requirements for non-centrally cleared OTCDs and, in 2011, required that margins be used to secure these transactions.

This report follows up on Wilkins and Woodman (2010) and OTC Derivatives Working Group (2010). It provides an overview of the goals of the G20 reforms and their implementation in Canada and reviews the effects of the reforms on OTCD markets.

⁴ These derivatives include credit default swaps, which were often not secured with collateral.

Implementing OTCD Reforms in Canada

Internationally, no jurisdiction has completely implemented all the reform requirements to date. In Canada, implementation progress in most reform areas is in line with that of jurisdictions hosting the largest OTCD markets.⁵

Implementing the OTCD reforms in Canada touches on many different parts of the financial system and is carried out through close co-operation between federal and provincial authorities.⁶ The approach adopted by regulatory authorities takes into account the Canadian market's small size on a global scale, its liquidity characteristics, the prevalence of interest rate and FX derivatives, and market participants' reliance on cross-border transactions. These market characteristics underpin the decision made by Canadian authorities to allow the existing global infrastructure to be used for central clearing and trade reporting, judging that such use would be more efficient and less costly than building a domestic infrastructure. However, using foreign entities also presents some challenges. For example, to be effective, the cross-border supervision of global infrastructures requires close collaboration across jurisdictions (Chande et al. 2012).

Table 2 summarizes the goals of the G20 reform agenda and outlines Canada's progress in each area. Consistent with international standards and the approaches of other jurisdictions, FX derivatives are mostly beyond the scope of the clearing and margining requirements, despite the size of those markets and their global importance. One reason for this exclusion is that payments related to FX derivatives transactions are subject to a high degree of settlement risk that cannot yet be fully managed by a *central counterparty* (CCP). Nevertheless, many of these transactions currently settle through CLS Bank, which mitigates settlement risk.⁷

Effects of the Reforms to Date

The G20 reforms were designed to improve the resilience of OTCD markets; they also raise the costs of risk transfer and other financial services (BIS 2013). In this section, we discuss the intended benefits of the reforms for the financial system and identify the impact of the regulatory changes to date. Many of these changes have only recently come into effect, and not all market participants have completely adjusted to the new requirements. Assessing the full impact on the market will therefore take more time.

Trade reporting and risk assessment

Trade repository (TR) reporting allows public sector authorities to monitor vulnerabilities and conduct in OTCD markets and, when necessary, to take preventive action through policy adjustments such as changes to the scope of derivatives regulation. Although the analysis of TR data is still at an early stage, Canadian securities regulators are already using it to enhance their understanding of OTCD markets. TR data analysis was used as an input to

⁵ Progress in individual commitment areas varies across jurisdictions; for detailed information, see the most recent Financial Stability Board progress report (FSB 2016).

⁶ Canadian authorities coordinate the implementation of OTCD reforms through the interagency Canadian OTC Derivatives Working Group (OTCD WG), which is chaired by the Bank of Canada. Authorities represented on the OTCD WG include the Office of the Superintendent of Financial Institutions, the Department of Finance Canada, the Ontario Securities Commission, the Quebec Autorité des marchés financiers, the British Columbia Securities Commission and the Alberta Securities Commission.

⁷ CLS Bank is a global payment system for the settlement of foreign exchange transactions, including those involving the Canadian dollar. It is supervised by the US Federal Reserve Board and is overseen by the CLS Oversight Committee, which is composed of central banks, including the Bank of Canada, whose currencies are covered by the CLS arrangements.

Table 2: Canada's progress in implementing the G20 reforms

	Reform goals	Implementation by Canada	Status
Trade reporting	1. Allow regulators to ▪ monitor the buildup of risks ▪ act to mitigate these risks ▪ enforce market conduct regulations 2. Make OTCD markets more transparent to authorities, market participants and the public	▪ All over-the-counter derivatives transactions (except certain commodity derivatives) need to be reported to a recognized trade repository (TR).^a ▪ Three US-domiciled TRs are currently authorized by Canadian securities regulators to receive Canadian data.^b ▪ Starting in early 2017, certain transactional data (including on price and size) will be made public within two days of a transaction.	COMPLETE
Capital	1. Increase banks' capital buffers against derivatives exposures 2. Create incentives for central clearing	▪ Basel III capital rules, which raise banks' capital requirements for OTCD exposures, have been in place since 2014. ▪ Bilateral transactions require more capital than centrally cleared transactions and are thus costlier.	COMPLETE
Central clearing	1. Reduce counterparty credit risk by subjecting standardized trades to a CCP's risk management, including netting, risk mutualization, margin requirements and standard default-management procedures 2. Reduce market complexity 3. Make OTCD markets more transparent	▪ The Office of the Superintendent of Financial Institutions (OSFI) expects federally regulated financial institutions to centrally clear standardized OTCD trades, when practicable.^c ▪ Provincial securities regulators will have a clearing mandate in force in 2017 for certain interest rate derivatives denominated in Canadian dollars, US dollars, British pounds sterling and euros. The mandate is intended to apply to large derivatives participants as the most important contributors to systemic risk. ▪ Eight CCPs are currently authorized by provincial regulators to offer clearing services in Canada. The largest, LCH.Clearnet Limited's SwapClear Service, is designated by the Bank of Canada as systemically important and therefore subject to ongoing regulatory oversight.	NEARLY COMPLETE
Margining	1. Reduce counterparty credit risk through the exchange of collateral for uncleared trades 2. Create incentives for standardization and central clearing	▪ OSFI requires the mandatory exchange of collateral for trades not centrally cleared.^d This requirement came into force on 1 September 2016 and is being phased in according to an internationally agreed timeline. ▪ In 2017, provincial securities regulators will put in place comparable rules for entities that are not federally regulated.	NEARLY COMPLETE
Platform trading	1. Increase pre-trade transparency 2. Improve regulatory oversight by moving trades to regulated platforms	▪ Canadian securities regulators have published a consultation paper describing options for implementing a platform trading mandate. ▪ An open question is whether the relatively small Canadian OTCD market is suitable for mandatory platform trading.	UNDER CONSIDERATION

a. As per Ontario Securities Commission, Autorité des marchés financiers and Manitoba Securities Commission Rule 91-507, Trade Repositories and Derivatives Data Reporting; Multilateral Instrument 96-101, Trade Repositories and Derivatives Data Reporting; and OSFI Guideline B-7: Derivatives Sound Practices

b. DTCC Data Repository (U.S.) LLC ("DDR"); ICE Trade Vault, LLC; and Chicago Mercantile Exchange Inc.

c. OSFI Guideline B-7: Derivatives Sound Practices

d. OSFI Guideline E-22: Margin Requirements for Non-Centrally Cleared Derivatives

the decision on which products and market participants should be subject to mandatory central clearing and margin requirements and how information should be publicly disseminated without identifying specific market participants. Other early assessments include the size and concentration of subsets of the OTCD market, the proportion of transactions with foreign counterparties and the interconnectedness of market participants. **Box 1** provides a more detailed description of the potential uses of TR data for systemic risk assessments.

Numerous challenges still need to be addressed, however, before trade reporting will achieve its full benefits. OTCDs are traded globally, and a full understanding of the market requires a global perspective. But, with more than 30 TRs currently receiving reports in various jurisdictions, data need to be shared and aggregated across TRs, either by individual authorities

Box 1

Using Trade Repository Data to Monitor Systemic Risks

Trade repositories (TRs) collect detailed transaction-level data on derivatives from market participants and can therefore provide a wealth of information on the use of over-the-counter derivatives (OTCD) contracts and on the structure of OTCD markets. This information can help authorities understand how OTCD markets can create, amplify and propagate financial shocks in ways that may create systemic risks. Once it has obtained access to TR data, the Bank of Canada can also use the data in its assessment of vulnerabilities and risks in the *Financial System Review*.

Table 1-A describes the types of characteristics authorities can examine using TR data to monitor and manage systemic risks in OTCD markets. Two examples of specific uses of TR data in systemic risk analysis are discussed below.

Concentration of exposures

Concentrated exposures of Canadian institutions to domestic and international entities are a potential source of systemic risk. The calculation of exposures should incorporate the value of the collateral that is exchanged between counterparties, which is currently not required to be reported to a TR. But it is possible to identify the relative size of the activities and the positions of market participants. Combined with an analysis of the role of various Canadian institutions in certain market segments, this type of analysis allows authorities to understand how concentration could affect the transmission of shocks through the financial system.

Concentration varies widely across asset classes: among interest rate derivatives, concentration is highest in forward rate agreements and interest rate swaps. For example, four counterparties constitute more than three-quarters of the market for forward rate agreements. Conversely, the FX derivatives market is generally less concentrated than the interest rate derivatives market. Across both interest rate and FX product categories, the Big Six banks are consistently among the largest counterparties.

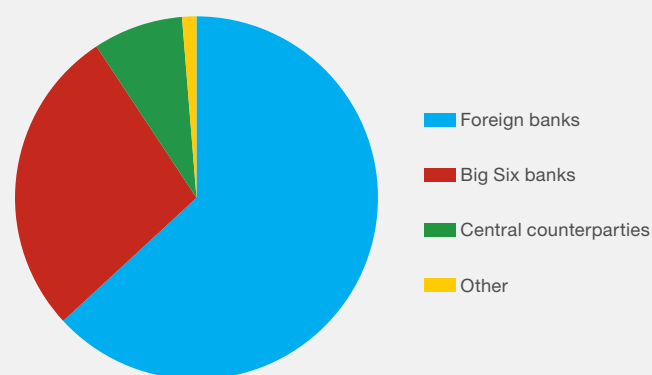
Interlinkages among Canadian financial institutions

While linkages among the domestic systemically important banks (the Big Six) are relatively well understood, only limited data exist to help us understand the interlinkages between the Big Six and other domestic institutions, including pension funds, life insurers and smaller banks, as well as foreign financial institutions.¹ TR data should assist authorities in mapping how shocks could be transmitted within or to the Canadian financial system and which entities can be viewed as key points for the transmission of shocks. For example, Chart 1-A indicates that Canadian pension funds trade mainly with foreign banks.² TR data can show the extent to which Canadian banks and pension funds are exposed to a specific foreign bank.

(continued...)

Chart 1-A: Canadian pension funds trade widely with foreign banks

Counterparties of domestic pension funds, by share of notional exposures



Source: Ontario Securities Commission

Last observation: 2016Q2

- 1 Data on certain end-users of derivatives, such as frequent corporate borrowers, are also limited.
- 2 Chart 1-A includes interest rate, FX, equity and credit asset classes. When a transaction is cleared, the original counterparties to the pension funds are unknown.

Table 1-A: Useful market characteristics for monitoring systemic risk

Characteristic	Description	Use in monitoring systemic risk
Size	▪ size of positions and exposures of financial institutions	▪ helps assess the possible severity of vulnerabilities
Concentration	▪ relative importance of individual or groups of financial institutions within a market segment	▪ identifies buildup of large volumes or positions and common exposures in defined populations
Interconnectedness	▪ the nature, scale and scope of obligations that arise among institutions	▪ describes the network of links across participants within a segment of the OTCD market and across different segments
Market structure	▪ analysis of liquidity provision and pricing of counterparty credit risk, and monitoring the well-functioning of trade and post-trade infrastructure	▪ determines how effectively risk is transferred and managed in the market

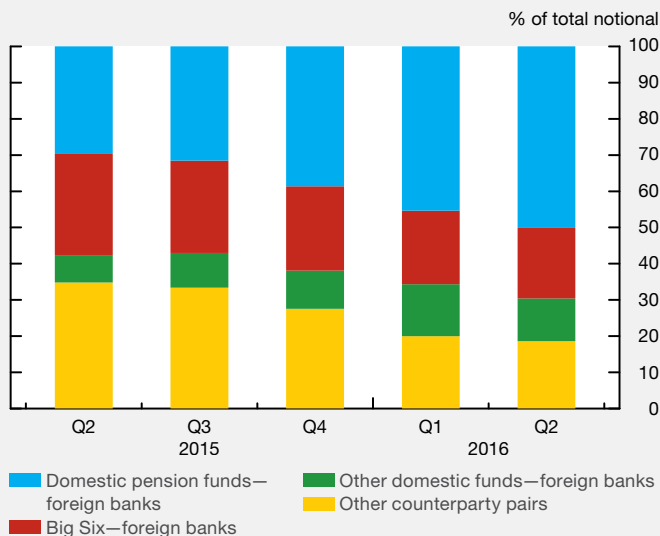
Box 1 (continued)

This type of analysis can also be done by asset class.

Chart 1-B shows that, in Canada, credit derivative transactions between pension funds and foreign banks have been growing in relative terms.³ These transactions now constitute the biggest share of the credit derivatives market, and a large percentage of credit derivatives are traded without the participation of Canadian banks. Conversely, interest rate and FX derivatives generally involve one of the Big Six banks.

Chart 1-B: Credit derivative transactions, by counterparties

Share of credit derivatives outstanding, by counterparty pair and notional amount



³ They have also grown in absolute terms.

Source: Ontario Securities Commission

Last observation: 2016Q2

or by a common international aggregation mechanism.⁸ This has not yet been accomplished.⁹ Legal barriers frequently prevent authorities from accessing TR data, both across borders and within jurisdictions.¹⁰ In some jurisdictions, legal barriers also prohibit market participants from reporting complete transaction information, including counterparty identifiers.

In addition, there are multiple technical challenges in using data held in individual TRs and aggregating data across TRs. Rules, definitions of data fields and reporting standards can differ across jurisdictions and even across TRs in the same jurisdiction. As well, reported data are sometimes incomplete, inconsistent or inaccurate. For these reasons, tracing trades over their life cycle, identifying and removing duplicate reports, and disguising identities to satisfy confidentiality standards is proving to be difficult. Moreover, some important gaps in the data persist. For example, most jurisdictions do not require the reporting of information necessary for calculating exposures—specifically, pledged collateral and netting sets. The international regulatory community is working to resolve the legal and technical barriers so TR data can be fully used for assessments of vulnerabilities and risks.¹¹ Key initiatives to facilitate effective data aggregation include setting standards that will help improve data quality and harmonizing reporting requirements across jurisdictions. But even in a best-case scenario, fully addressing the outstanding issues will likely require an extended period of time and coordinated efforts by authorities, market participants and infrastructure providers.

⁸ For further information on sharing and assessing TR data across multiple jurisdictions, see CPSS-IOSCO (2013) and FSB (2014).

⁹ Provincial securities regulators can aggregate data reported under their respective rules across the three recognized TRs.

¹⁰ The US Congress removed the main barrier to foreign authorities' access to TR data from US legislation. Once the US Commodities Futures and Trading Commission has adopted these changes in their rules, Canadian federal authorities may gain access to Canadian TR data that is reported to authorized TRs in the United States.

¹¹ For further information on the extent of reporting across jurisdictions, legal barriers and other challenges to reporting, see FSB (2015).

Improving transparency in the OTCD market also requires that information about traded derivatives be made available to the public, although there is no international consensus on the appropriate level of public transparency. Beginning in January 2017, public dissemination of information on transaction-level quantity and price details will enhance post-trade transparency across Canada.

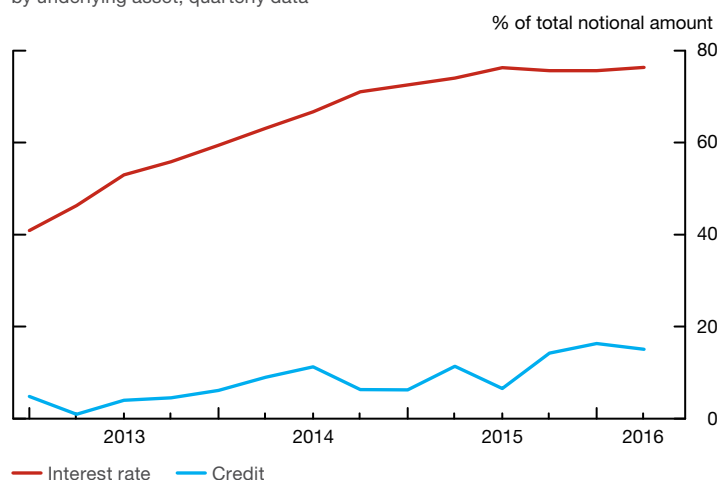
Counterparty credit risk management

The OTCD reforms improve the management of counterparty credit risk. This not only makes the market more resilient, but also helps to mitigate concerns around “too big to fail” by reducing the impact of the failure of one large market participant on others. Taken together, the reforms to clearing, capital and margin compel large financial entities to clear as many of their OTCD trades as possible. The stability of the financial system benefits from this move toward centrally cleared trades. Central clearing subjects trades to the risk-management frameworks of CCPs, simplifies the network of exposures, reduces exposures through netting, mutualizes default risk and provides an effective mechanism for managing defaults of market participants (Chande, Labelle and Tuer 2010).¹²

Over the past three years, Canadian banks have been clearing an increasing proportion of their OTCD trades, especially those in interest rate derivatives (Chart 5), which form the largest segment of the OTCD market. Approximately 80 per cent of these contracts (as measured by outstanding notional) are now cleared. Roughly 15 per cent of credit derivatives were cleared in Canada in the second quarter of 2016, while clearing in the other, less-standardized or less-liquid asset classes is negligible. Smaller market participants and those not subject to Basel III capital requirements have fewer incentives to centrally clear, but may choose to do so to take advantage of the risk reduction that clearing affords.

Chart 5: Canadian banks' share of cleared interest rate and credit derivatives

Cleared share of over-the-counter derivatives (OTCD) held by selected Canadian banks, by underlying asset, quarterly data



Note: Clearing of foreign exchange and gold OTCD is negligible.

Sources: Regulatory filings of Canadian banks

Last observation: 2016Q2

¹² Pirrong (2014) points out that OTCD reform should not be evaluated in isolation and that attempts to make OTCD markets safer may simply redistribute risks elsewhere in the financial system.

Under the new regulatory regime in Canada, all but the smallest financial entities will have to collateralize trades that are not centrally cleared. Exchanging collateral for these bilateral trades reduces counterparty credit risk: the surviving counterparty can use the posted collateral to cover losses while replacing a defaulted trade. Protecting surviving counterparties from losses reduces the possibility that a default will cause wider stress. Furthermore, since bilateral transactions generally require more margin to be posted than similar cleared trades, the margin requirements for bilateral trades provide additional incentives for market participants to centrally clear OTCD transactions.

Increased central clearing is leading to risks being concentrated in a few global market infrastructures, as authorities expected when they designed the new regulatory regime. The Financial Stability Board (FSB) and international standard-setting bodies are coordinating joint work to address the concentration of risk in CCPs. The work focuses on measures that promote CCPs' resilience to clearing member failures (including margin requirements, default funds and liquidity resources) and on recovery planning and resolvability, as well as on understanding the interdependencies between CCPs and their participants.¹³ The Bank of Canada is contributing to this work and also participates in the oversight college and crisis-management group for LCH.Clearnet (LCH), whose SwapClear service has been designated by the Bank as systemically important. LCH's oversight college is led by the Bank of England, which would be responsible for overseeing the implementation of LCH's recovery plan and—should it ever become necessary—for taking actions to resolve SwapClear. In addition, appropriate arrangements will be developed to support information sharing and coordination among authorities in a resolution event.

The application of margin to both cleared and bilateral OTCD transactions generally mitigates the risk of contagion and reduces systemic risk. But during times of stress, margin requirements can also lead to procyclicality, where an increased frequency of margin calls, coupled with falling collateral values, exacerbates market stress and may ultimately cause funding problems for market participants. One way to partially alleviate procyclicality is to apply through-the-cycle margining, which during normal times sets margin levels high enough that they do not need to be raised in times of stress.¹⁴ Rules for both CCP and bilateral margins require that procyclicality be minimized.

The structure of OTCD markets

The reforms in OTCD markets are leading to noteworthy changes in market structure. The types of participants, the products they use and who they choose to trade with are all adapting to the new environment. Many of these changes are improving the resilience of the market, while also increasing the costs of participating in it. The extent of these cost increases and other negative consequences need to be carefully monitored.

Higher market concentration

Increased costs from higher capital and margin requirements, more demanding compliance regimes and high infrastructure expenditures make trading in OTCD markets more expensive and may increase the returns to scale. This may cause some dealers to exit the market or to cease offering

¹³ The workplan can be viewed at www.fsb.org/wp-content/uploads/Joint-CCP-Workplan-for-2015-For-Publication.pdf. A progress report is available at www.fsb.org/2015/09/progress-report-on-the-ccp-workplan.

¹⁴ The Bank has recently worked with the Canadian Derivatives Clearing Corporation to implement through-the-cycle margining.

certain services. The higher concentration of dealers in some segments as a result of such exits may lower market liquidity and make a failure of one of the remaining dealers more systemically important. Even in the presence of central clearing, a drop in the number of dealer clearing members would reduce the ability of CCPs to effectively handle a dealer default.

Greater product standardization

As intended, relatively higher costs for bilateral trades provide incentives for market participants to standardize contracts, thereby improving their liquidity and moving them to central clearing. Standardized contracts not only facilitate the use of centralized infrastructure, they also enable the market to be more transparent and increase opportunities for competition. At the same time, standardization makes it more expensive to tailor derivatives contracts to the individual needs of market participants, for example, to hedge specific exposures. Standardized OTCD contracts or listed derivatives can still be used as hedges, but a residual basis risk will remain.

Client clearing costs

A situation that illustrates how higher costs can lead to undesired effects is the challenge that smaller institutions have in accessing central clearing. Since they cannot directly access CCPs, these institutions must clear indirectly as a client of a clearing member. If client clearing is not cost-effective and widely available, the move to central clearing will be inhibited, or smaller market participants may be forced out of the market (Slive, Wilkins and Witmer 2011). The Basel III leverage ratio can currently increase the cost of providing client clearing services. In some cases, Basel III treats the client's collateral as an exposure and requires the clearing member to hold capital against it. In response, clearing members are reluctant to widely offer clearing services. To alleviate these effects, the Basel Committee on Banking Supervision has included this issue in its ongoing consultation on the Basel III leverage ratio.

Entities that face difficulty accessing client clearing are still able to trade bilaterally. However, the reforms also raise the costs of bilateral trades, and institutions may elect to simply not hedge certain exposures and instead retain those risks on their balance sheet.

Changes in market practice

The clearing and margining reforms and the associated rise in mandatory collateralization require significant changes in market practice. The timely exchange of margin for both cleared and bilateral trades raises the amount of collateral needed and the speed with which it must be mobilized. This makes it increasingly necessary for market participants to pre-fund collateral for OTCD or to hold the collateral at a custodian so that it can be easily moved. International CCPs introduce an additional complication for Canadian clearing members because these CCPs generally limit the amount of foreign collateral they accept. In turn, Canadian clearing members may have to transform collateral denominated in Canadian dollars into foreign-denominated collateral. This exposes Canadian clearing members to shocks in collateral markets denominated in foreign currencies.

Fragmentation caused by complex rules and inadequate harmonization

OTCD markets are largely global in nature, but the actual implementation of the reforms is carried out on a national level. Although significant efforts have been made to harmonize the rules and implementation timelines

across jurisdictions, differing approaches and the complexity of the issues have led to some cross-border conflicts regarding the rules of various jurisdictions. Recent examples are differences in the regulation of trading and clearing infrastructures in the European Union, the United States and certain Asian jurisdictions, or the fact that only three jurisdictions have implemented mandatory margin requirements in line with internationally agreed timelines. In some jurisdictions, regulators apply their rules to market participants in foreign jurisdictions, thereby adding an additional layer of regulation for these participants and potentially creating jurisdictional conflicts. Regulators can mitigate the negative effects by coordinating implementation timelines and recognizing the equivalence of each other's regulatory regimes in terms of outcomes.¹⁵ In the absence of mutual recognition, disparities between the rules of different jurisdictions can contribute to regulatory uncertainty, reduce competition across dealers and fragment liquidity. This was evident when differences in trading rules for European and US electronic platforms led to a reported fragmentation of euro-denominated interest rate swaps.¹⁶

Costs of legal compliance for foreign clients of smaller jurisdictions

Even when the rules do not contradict each other, understanding differences across jurisdictions entails costly legal analysis, which may discourage foreign participation in markets—especially smaller ones. A market participant that has already incurred compliance costs in several jurisdictions may simply avoid trading with a Canadian counterparty (including its foreign branches) rather than invest in understanding and complying with Canadian rules. The pressure is therefore on the smaller jurisdictions to harmonize with the rules of the larger jurisdictions to avoid being excluded from the market. In Canada, where implementing the OTCD reforms is a joint federal-provincial responsibility, it is particularly important for the rules to be uniform and harmonized domestically to reduce regulatory overlap and compliance costs. As much as possible, provincial regulators are using national instruments to ensure that their rules are harmonized across the country.

Conclusion

OTCD reform implementation is nearing its completion in Canada. In addition to international coordination, implementing the reforms has necessitated coordination between Canadian federal and provincial regulators and among market regulators in all of Canada's provinces and territories. To round out the implementation process, it is important that regulators continue to harmonize their approaches both domestically and internationally and recognize each other's rules as equivalent when the outcomes are similar. Doing so should minimize the ancillary costs to market participants, which is particularly important in a small open economy such as Canada, where many transactions are necessarily cross-border.

The focus is now shifting from implementing reforms to monitoring their effects on market functioning and evolution. Regulators are committed to ensuring that the reforms are achieving their intended objectives: to improve transparency, mitigate systemic risk and protect against market abuse. They will also want to understand if the market is affected in unintended ways and take action when appropriate. The new trade repository data enable regulators to better understand OTCD markets so that

¹⁵ An equivalence determination means that, in a cross-border trade, it is sufficient for counterparties to comply with the rules of their home jurisdictions. This significantly reduces the regulatory complexity of cross-border trades.

¹⁶ For more information on the extent of market fragmentation, see ISDA (2016).

in the future the rules can be refined to balance the evolving costs and benefits of the reforms. To improve the usefulness of the reported data for systemic risk analyses, it is important that global standards for the reported data be developed through the ongoing collaboration of market participants, trade repositories and regulators.

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