

Canadian Fixed-Income Forum

Toronto, 7 October 2015



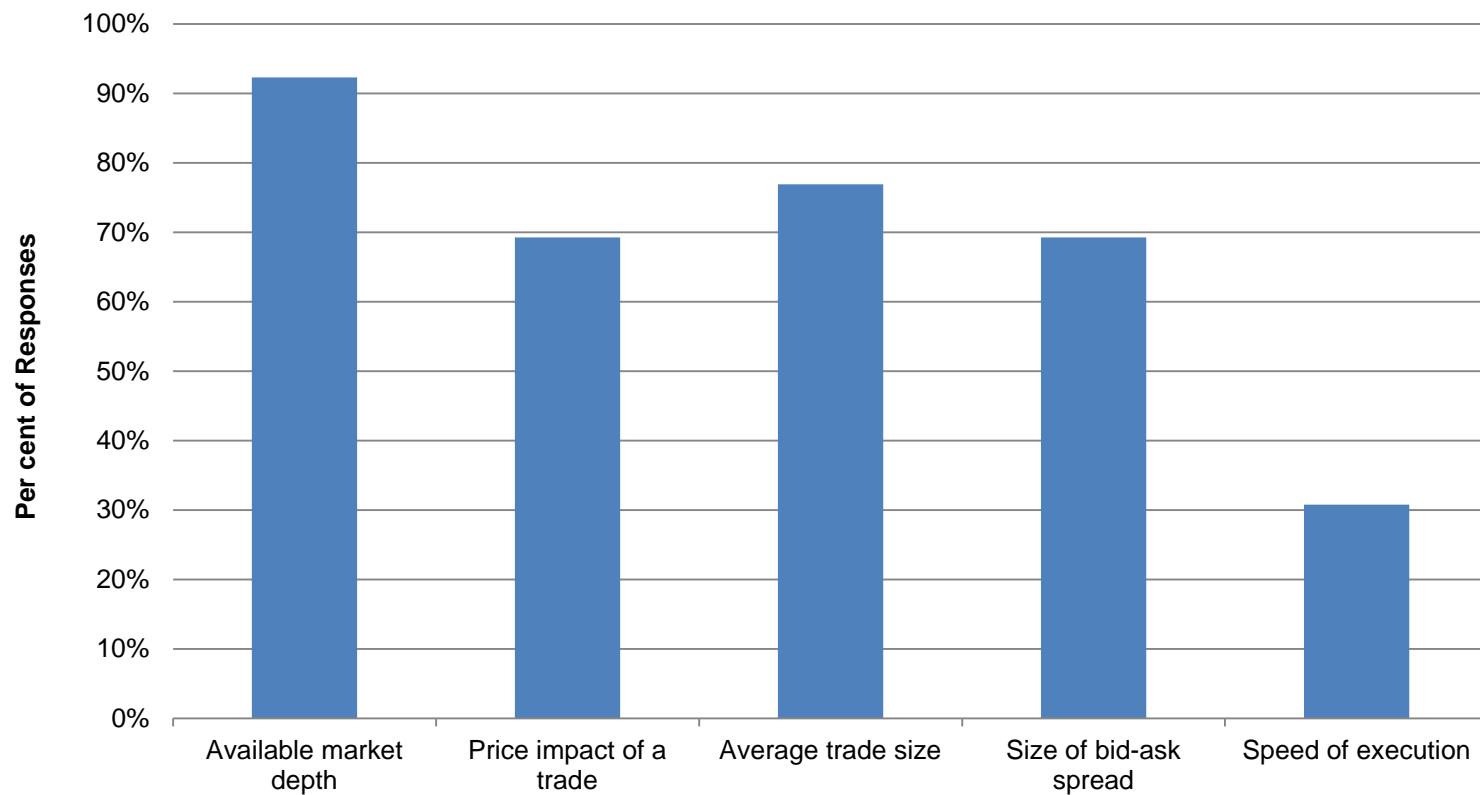
Liquidity in the Canadian Fixed-Income Market



Market Liquidity Survey Results¹

¹ Survey results represent the views of the Forum's private sector members.

Most important market liquidity attributes



Liquidity assessment by bond instrument

Bonds	Illiquid	Somewhat illiquid	Somewhat liquid	Liquid	Not applicable
Government of Canada bonds					
GoC Benchmark (on-the-run bonds)	0%	0%	8%	92%	0%
GoC Non-benchmark (off-the-run bonds)	8%	8%	77%	8%	0%
Canada Mortgage Bonds	0%	31%	23%	46%	0%
NHA-MBS	23%	54%	15%	0%	8%
Provincial bonds	0%	23%	31%	46%	0%
Corporate bonds	15%	46%	38%	0%	0%
High Yield bonds	54%	31%	0%	0%	15%

Liquidity assessment by fixed-income derivative type

Derivatives	Illiquid	Somewhat illiquid	Somewhat liquid	Liquid	Not applicable
Long-term interest rate futures (e.g. CGB)	0%	8%	23%	62%	8%
Short-term interest rate futures (i.e. BAX futures)	0%	0%	23%	69%	8%
Interest rate swaps-OTC	8%	8%	15%	54%	15%
Overnight index swaps-OTC	15%	8%	23%	23%	31%
Fixed-income options-OTC	31%	15%	23%	0%	31%

Liquidity assessment by money market instrument

Money Market Instruments	Illiquid	Somewhat illiquid	Somewhat liquid	Liquid	Not applicable
Repo					
Federal government securities	0%	0%	15%	77%	8%
Provincial government securities	0%	8%	69%	15%	8%
Corporate securities	31%	38%	0%	0%	31%
Securities Lending					
Federal government securities	0%	8%	8%	62%	23%
Provincial government securities	8%	0%	54%	15%	23%
Corporate securities	8%	46%	8%	8%	31%
Money Market Securities					
Federal government securities	8%	0%	0%	92%	0%
Provincial government securities	8%	0%	46%	46%	0%
Corporate securities	15%	31%	38%	8%	8%

Change in bond market liquidity over the last two years

Bonds	Reduced significantly	Reduced somewhat	Largely unchanged	Improved somewhat	Improved significantly	Not applicable
Government of Canada bonds						
GoC Benchmark (on-the-run bonds)	8%	54%	31%	0%	8%	0%
GoC Non-benchmark (off-the-run bonds)	31%	54%	15%	0%	0%	0%
Canada Mortgage Bonds	38%	46%	15%	0%	0%	0%
NHA-MBS	15%	62%	0%	15%	0%	8%
Provincial bonds	15%	77%	8%	0%	0%	0%
Corporate bonds	62%	38%	0%	0%	0%	0%
High Yield bonds	31%	54%	0%	0%	0%	15%

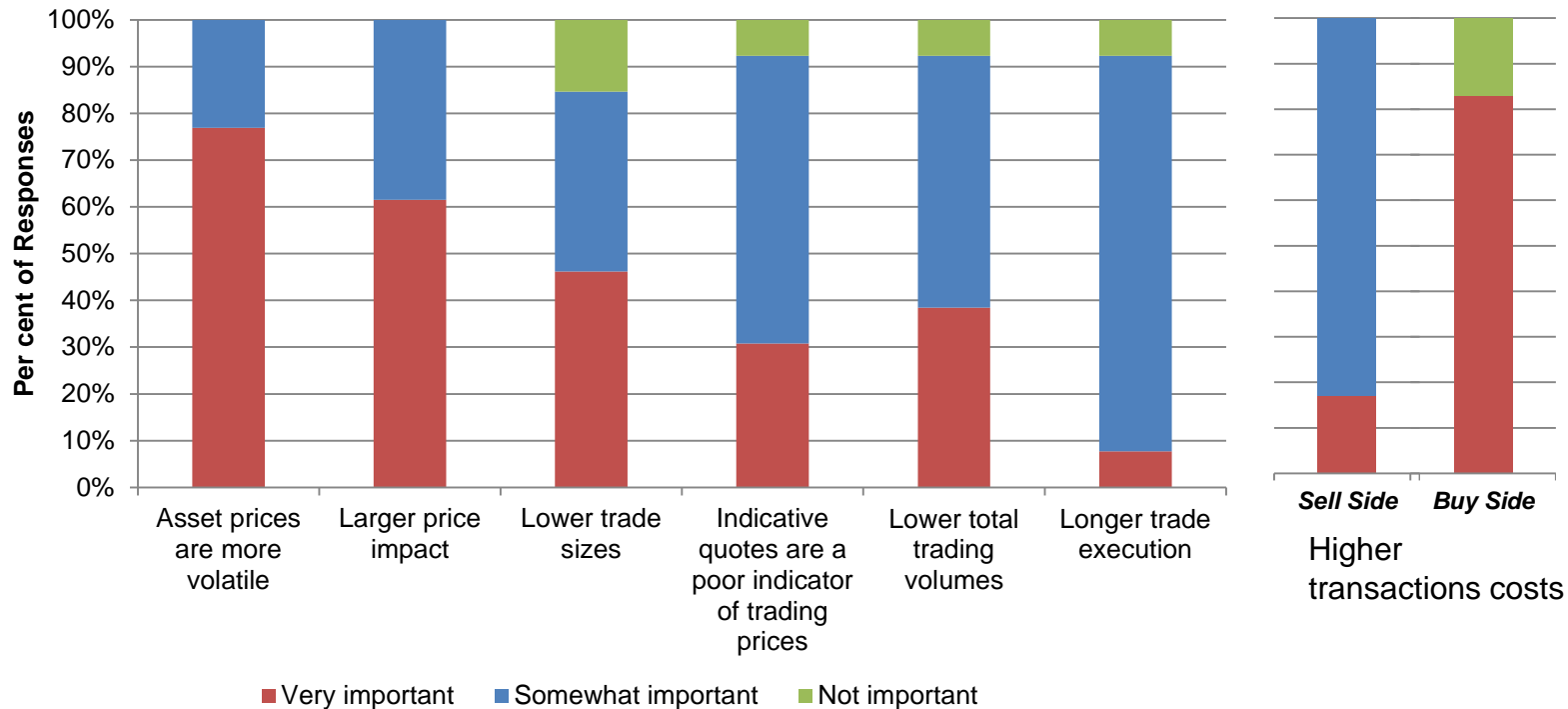
Change in derivative liquidity over the last two years

Derivatives	Reduced significantly	Reduced somewhat	Largely unchanged	Improved somewhat	Improved significantly	Not applicable
Long-term interest rate futures (e.g. CGB)	0%	31%	46%	8%	8%	8%
Short-term interest rate futures (i.e. BAX futures)	0%	54%	31%	8%	0%	8%
Interest rate swaps-OTC	8%	46%	23%	8%	0%	15%
Overnight index swaps-OTC	15%	31%	8%	8%	0%	38%
Fixed-income options-OTC	8%	31%	23%	8%	0%	31%

Change in money market liquidity over the last two years

	Reduced significantly	Reduced somewhat	Largely unchanged	Improved somewhat	Improved significantly	Not applicable
Money Market Instruments						
Repo						
Federal government securities	0%	62%	31%	0%	0%	8%
Provincial government securities	0%	69%	23%	0%	0%	8%
Corporate securities	0%	42%	17%	17%	0%	25%
Securities Lending						
Federal government securities	8%	38%	31%	0%	0%	23%
Provincial government securities	0%	54%	23%	0%	0%	23%
Corporate securities	0%	46%	15%	8%	0%	31%
Money Market Securities						
Federal government securities	0%	38%	62%	0%	0%	0%
Provincial government securities	8%	62%	31%	0%	0%	0%
Corporate securities	8%	69%	15%	0%	0%	8%

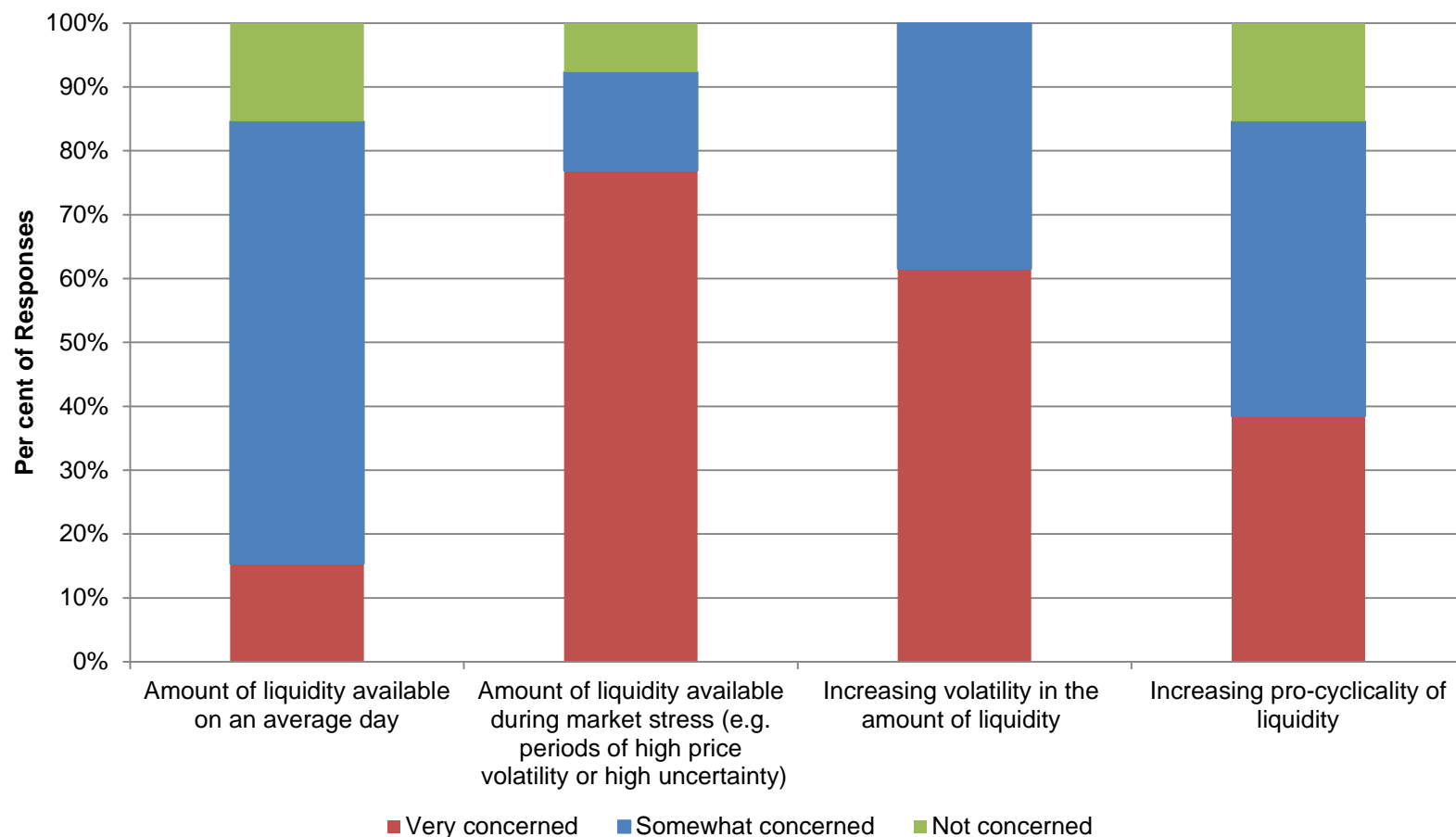
Most important impacts of lower bond market liquidity



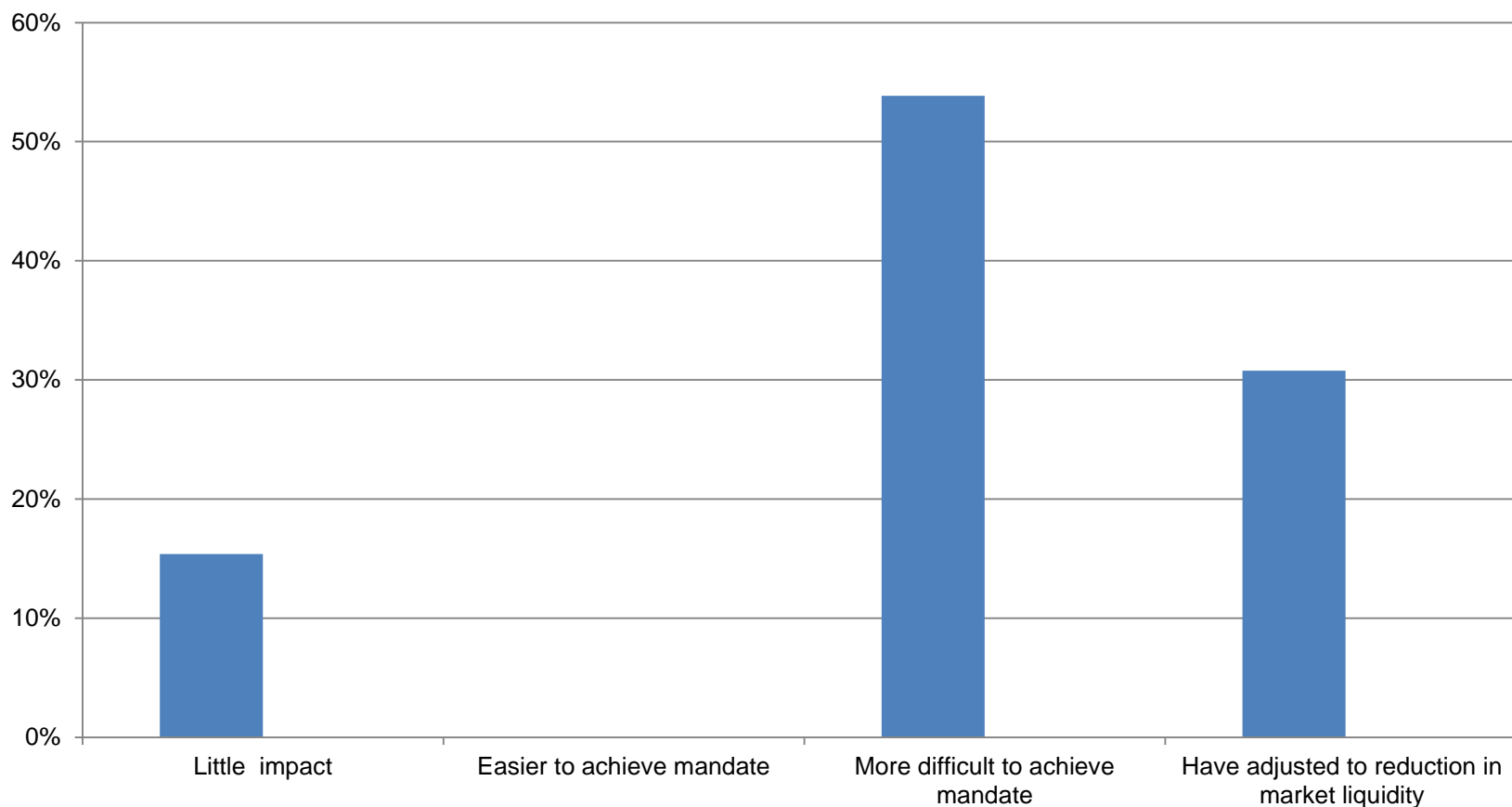
Drivers for the reduction in fixed-income liquidity

	Significant driver	Driver	Insignificant driver	Not a driver
Basel III	54%	46%	0%	0%
OTC derivatives regulations (clearing, margins and platforms)	15%	69%	0%	15%
Volcker rule	23%	69%	8%	0%
Changes in capacity or willingness of non-dealer market participants to arbitrage mispricing	31%	38%	23%	8%
Reduced dealer market making capacity	85%	8%	8%	0%
More stringent internal risk management practices	31%	31%	23%	15%
Changes in pre and post trade transparency	15%	46%	15%	23%
Electronification of trading	15%	23%	23%	38%
Growing presence of HFT	8%	23%	38%	31%
Growing popularity of ETFs	0%	0%	38%	62%
Growing presence of foreign buy and hold investors	31%	46%	15%	8%
Substitution of derivative for cash exposure	0%	31%	38%	31%
Uncertainty surrounding economic conditions	0%	31%	38%	31%
Low interest rate environment	8%	54%	31%	8%

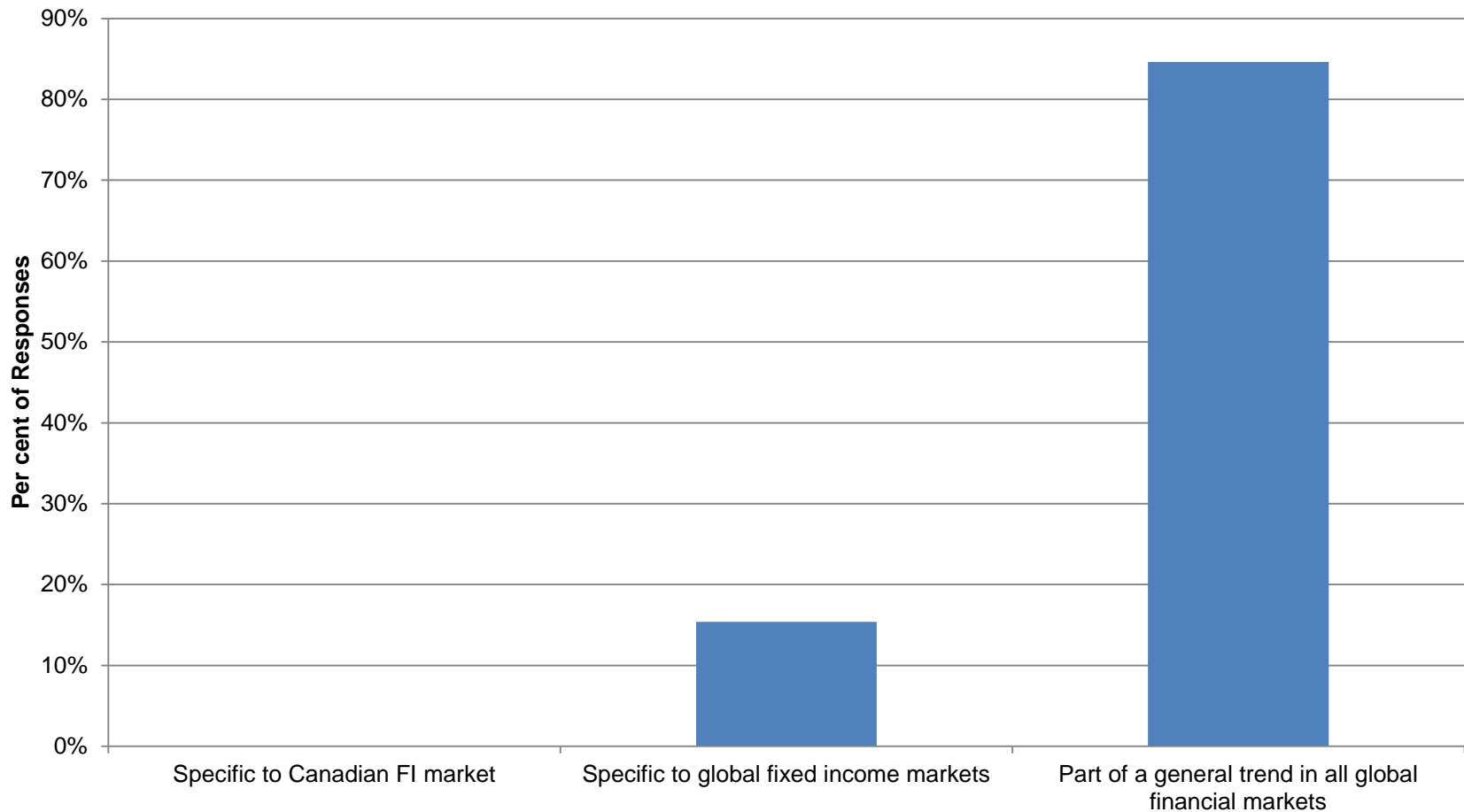
Key concerns from recent changes in liquidity



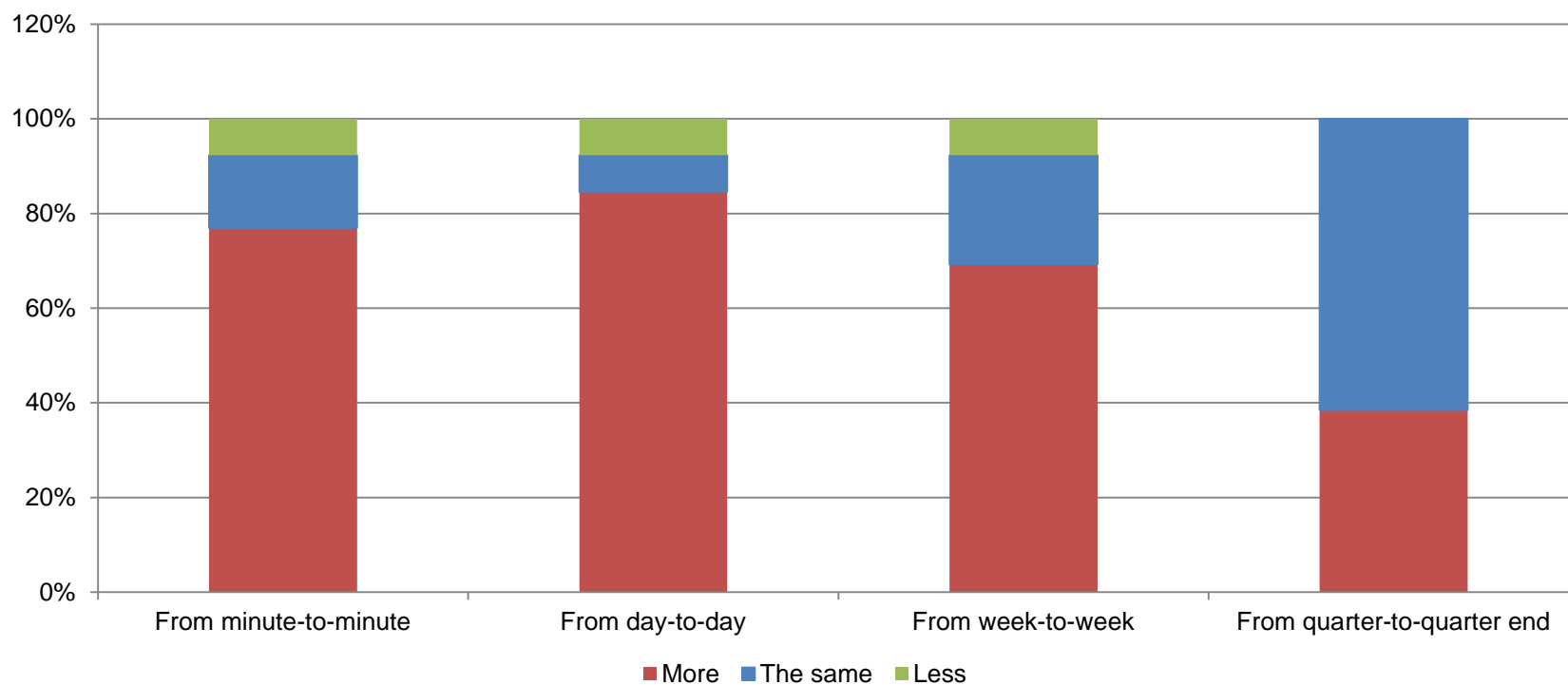
Impact on ability to fulfill funds/firms' mandate from reduced liquidity



Impact of global factors on Canadian fixed-income liquidity



Changes in variability of liquidity over the last two years



Summary of Survey Findings

- ❖ Most Canadian fixed-income instruments have experienced a reduction in liquidity over the last two years (most pronounced in corporate bonds).
- ❖ Regulation and reduced dealer market making capacity have been cited as some of the most significant drivers of declining liquidity.
- ❖ Liquidity has become more volatile. Participants are concerned about the lack of liquidity during market events.
- ❖ The reduction in liquidity does not appear to be a Canada specific issue and is linked to a general trend in all global financial markets.

Findings Consistent with takeaways from BoC Conference

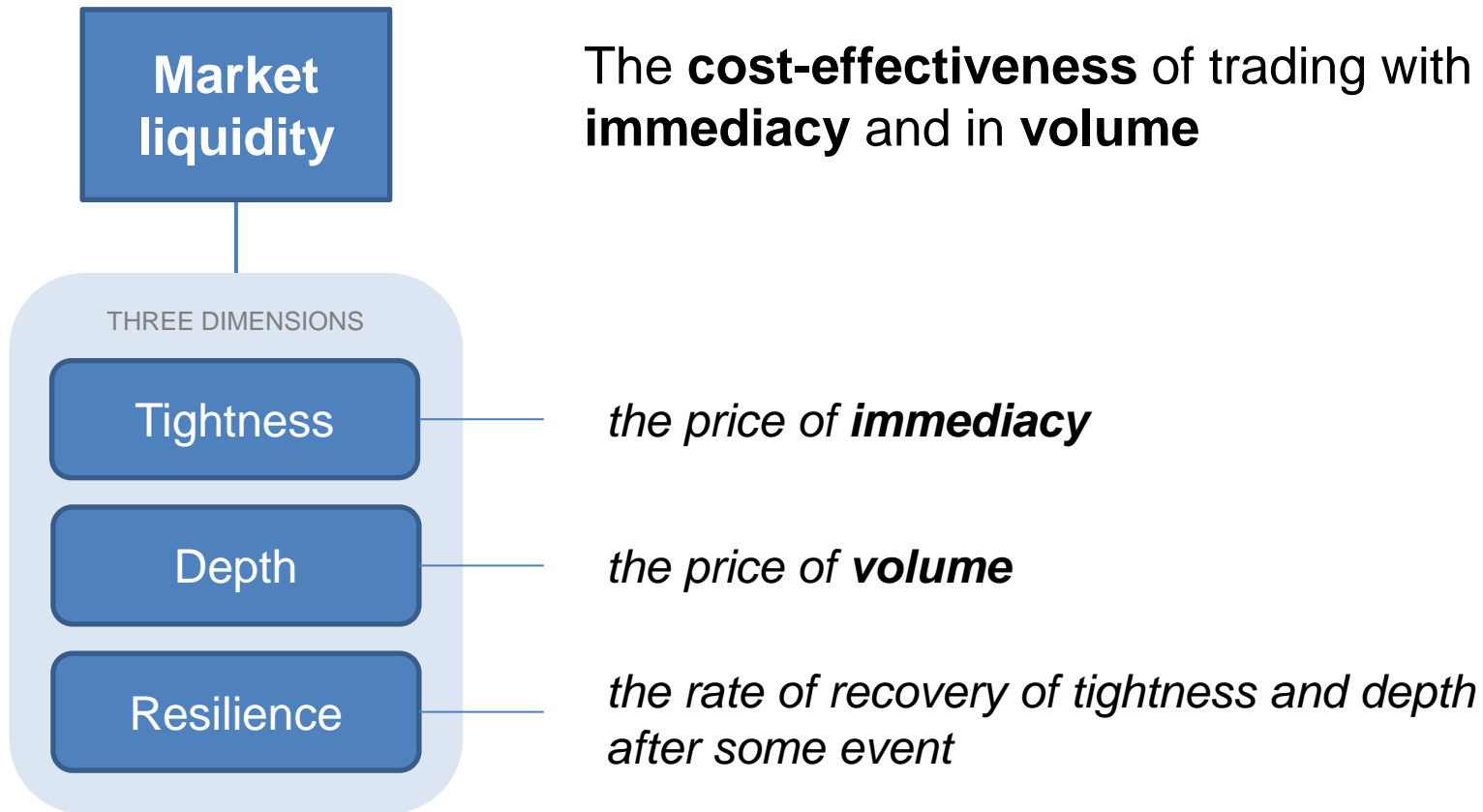
Survey findings are consistent with the takeaways from the market participant panel on Changes in Liquidity Dynamics from the BoC co-sponsored Liquidity Risk in Asset Management Conference in Toronto (September 10-11, 2015).

- ❖ What should be the right level of liquidity?
 - Comparing current liquidity conditions against 2006-07 may not be appropriate
- ❖ Liquidity is more bifurcated – remains good in sovereign bonds and associated derivatives but has declined in corporate bonds:
 - Impacted the way that participants transact
 - Mispricing caused by illiquidity provides potential opportunities for active managers with balance sheet capacity
 - Liquidity risk has been transferred to some degree from the dealer to the investor
 - How should credit spreads adjust to reflect the lower liquidity in some assets?
- ❖ Growth in the relative size of bond mutual funds and ETFs has increased the price risk from redemption
- ❖ Bid offer spreads are not a good proxy for liquidity – depth of market is



Liquidity Metrics in the GoC Bond Market

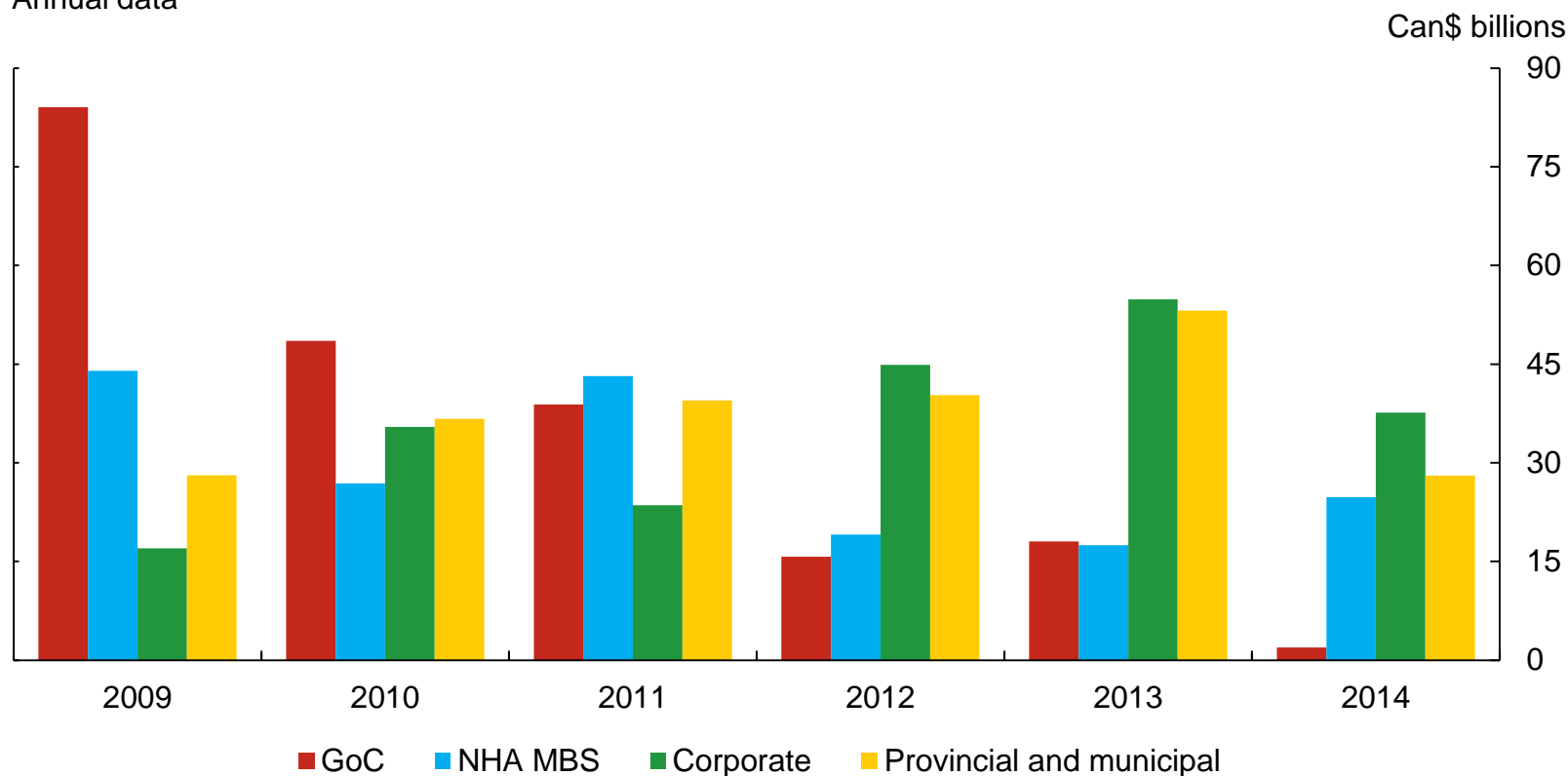
Let's get on the same page on market liquidity



Bond issuance in Canada is changing

Net new security issues placed in Canada

Annual data



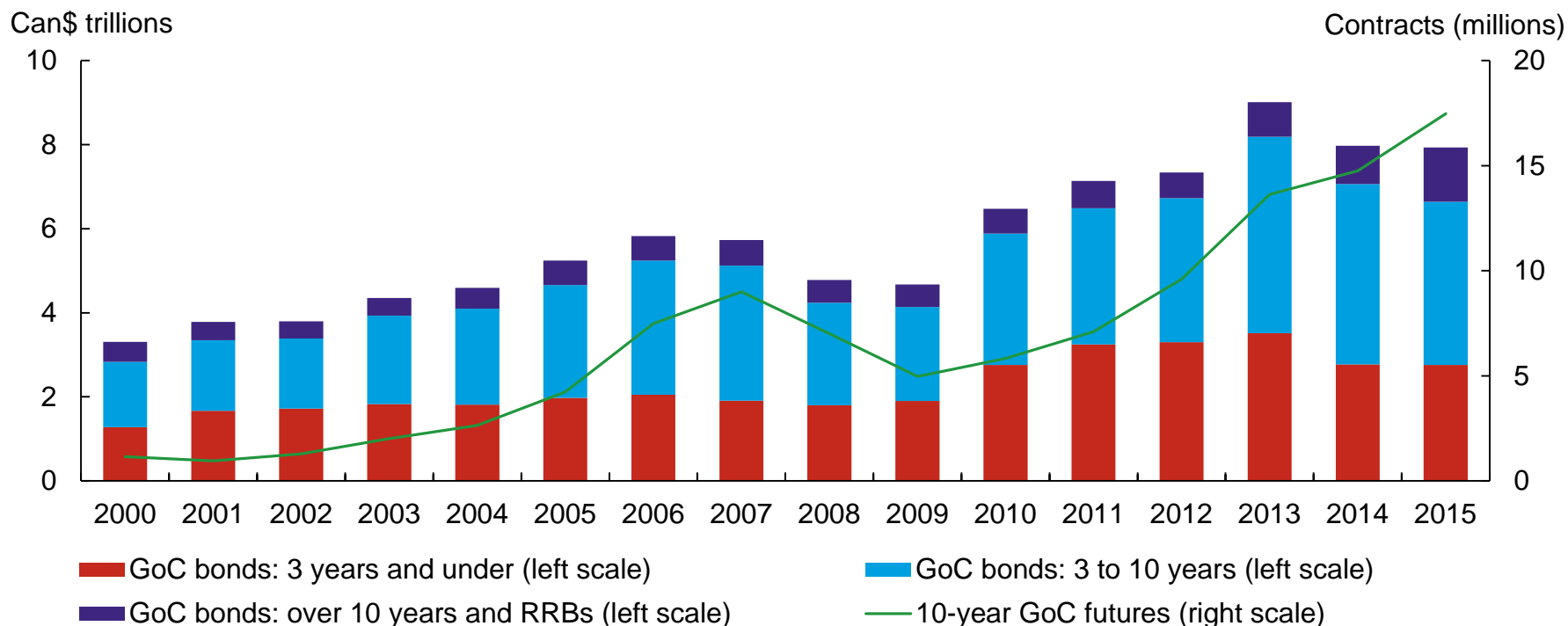
Sources: Statistics Canada and Bank of Canada (including calculations)

Last observation: 2014

Trading volumes continue to rise

Trading volumes of Government of Canada instruments

Annual data, 2015 volumes pro rata



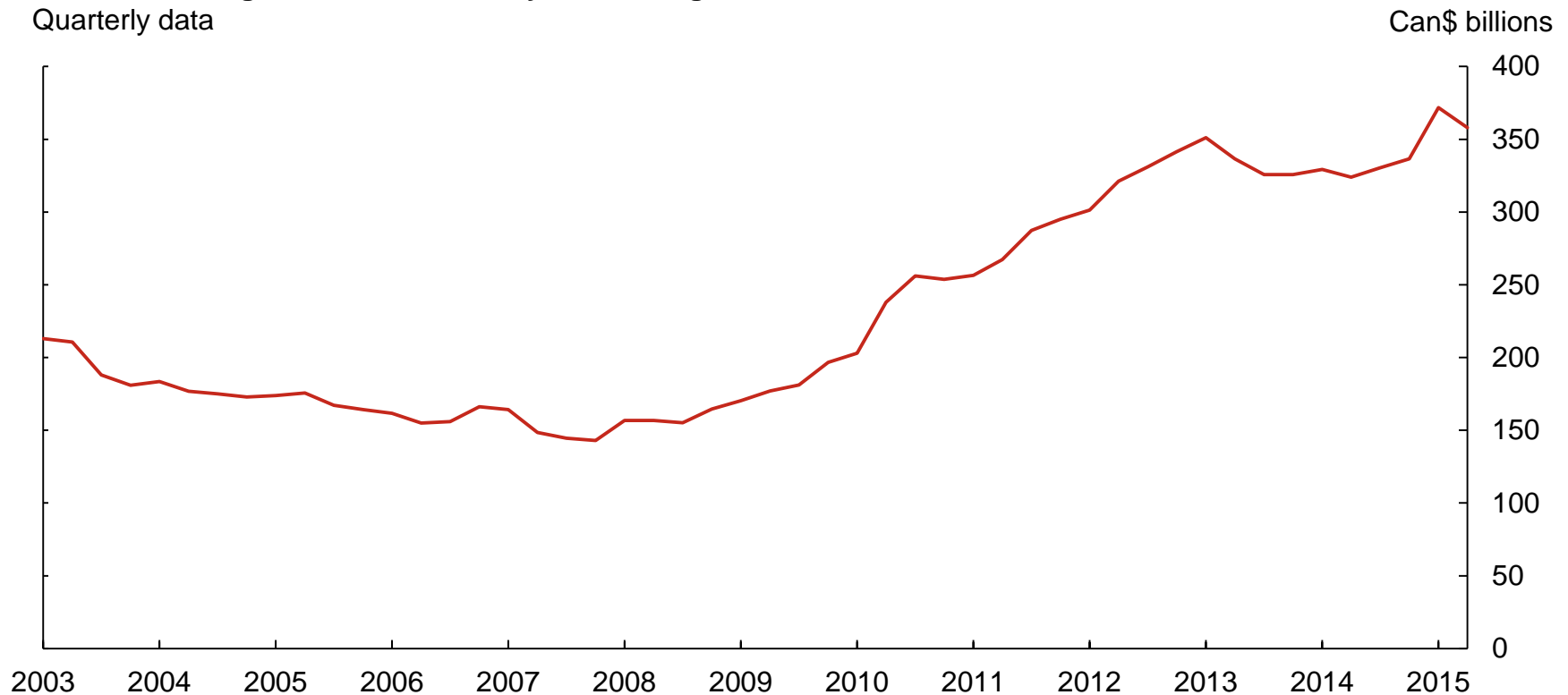
Sources: Bloomberg, MTRS and Bank of Canada calculations

Last observation: 2015 pro rata

Foreign flows in Canadian bonds: **historically high** **and slowing down**

External holdings of bonds issued by Canadian government entities

Quarterly data



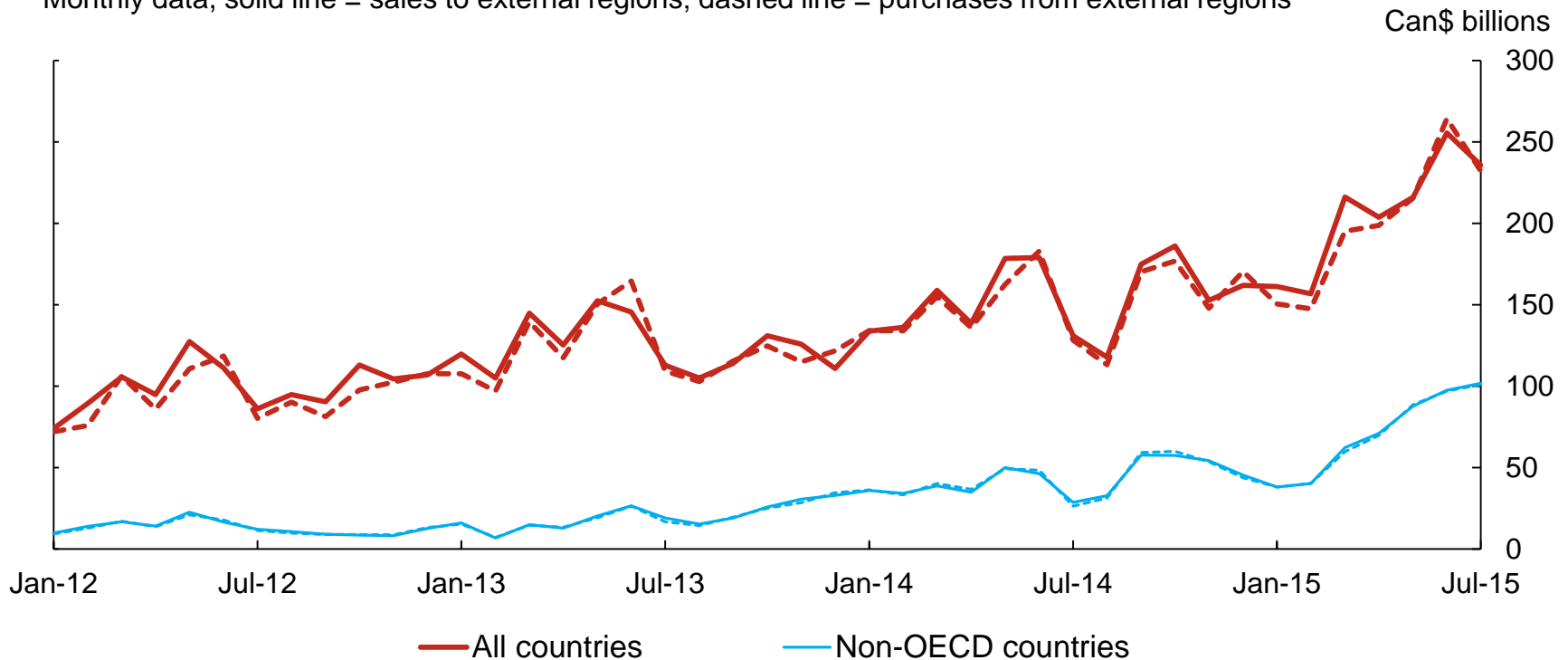
Source: Statistics Canada

Last observation: 2015 Q2

Trading activity by foreign bondholders increasing

International transactions of Canadian public and private bonds

Monthly data, solid line = sales to external regions; dashed line = purchases from external regions



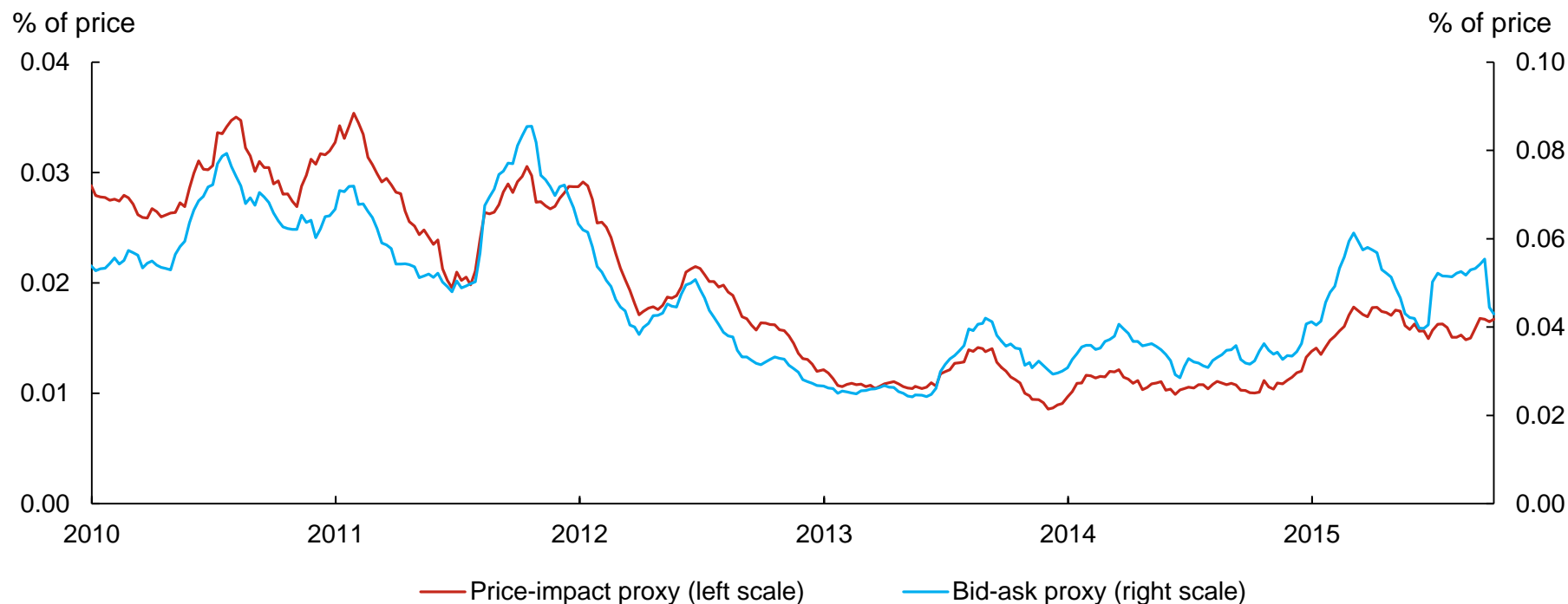
Source: Statistics Canada

Last observation: July 2015

Average GoC liquidity historically good though recently worsened

Liquidity measures for Government of Canada bonds

Aggregated across all bond transactions; percentage of price
Weekly data, 12-week moving average



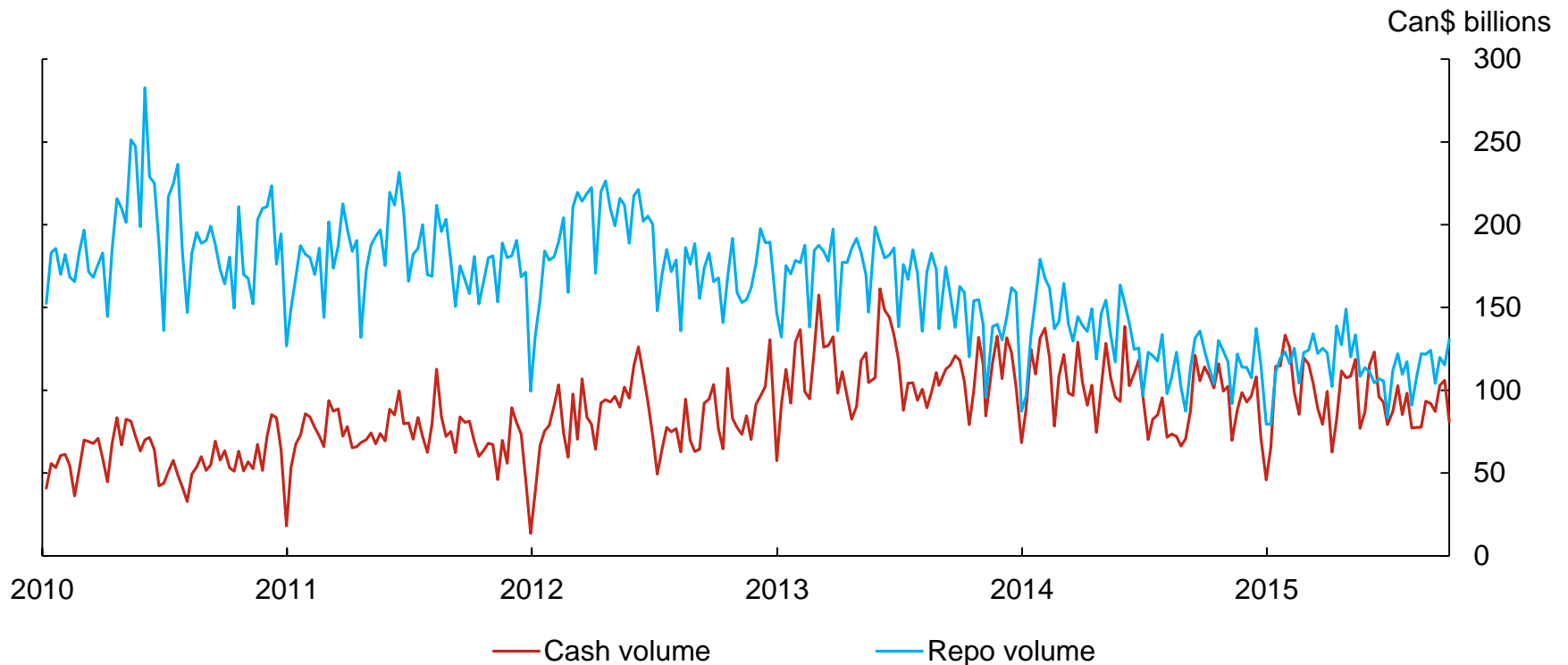
Sources: CDS and Bank of Canada calculations

Last observation: 30 September 2015

Repo and bond markets **work together**

Aggregate trading volume of GoC securities by transaction type

Weekly data

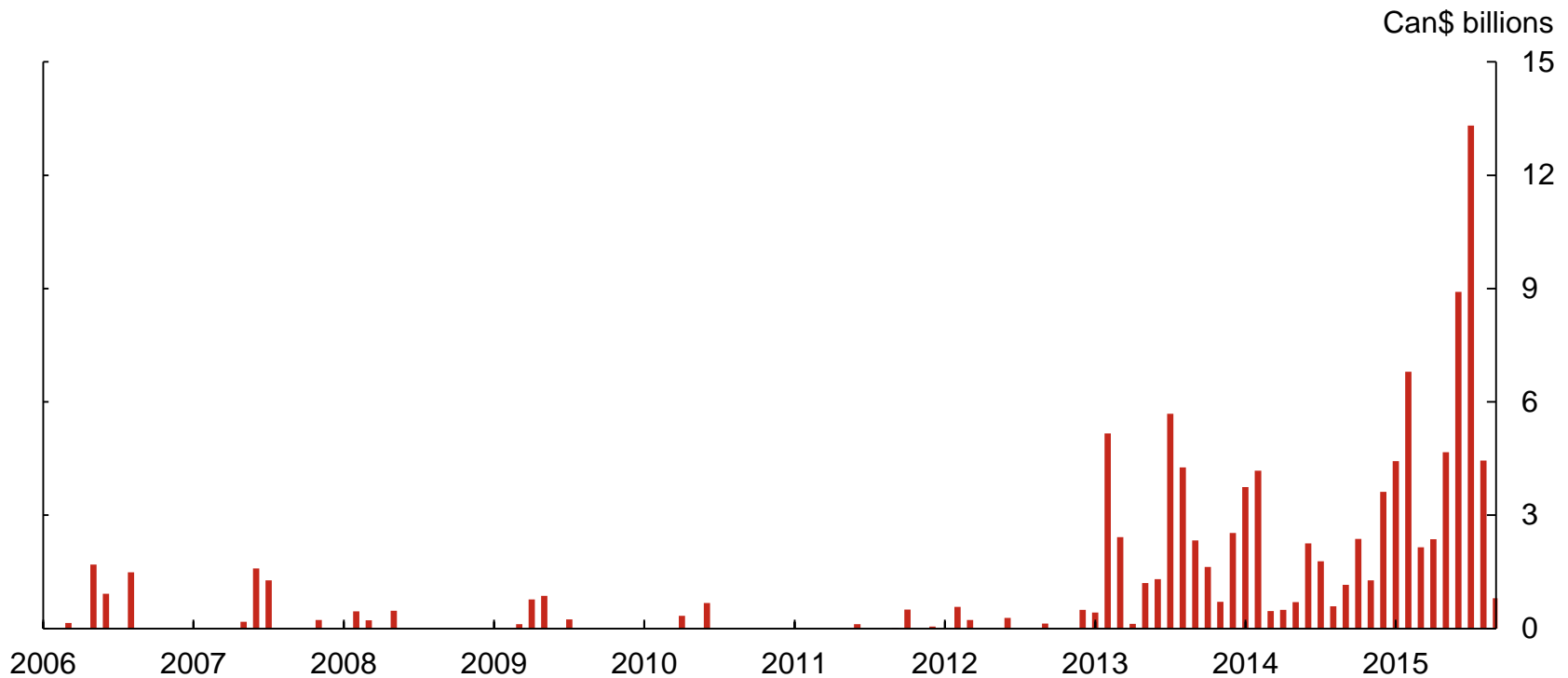


Sources: CDS and Bank of Canada calculations

Last observation: 30 September 2015

BoC securities lending much more frequent

Government of Canada bonds lent by the Bank of Canada
Monthly data



Source: Bank of Canada

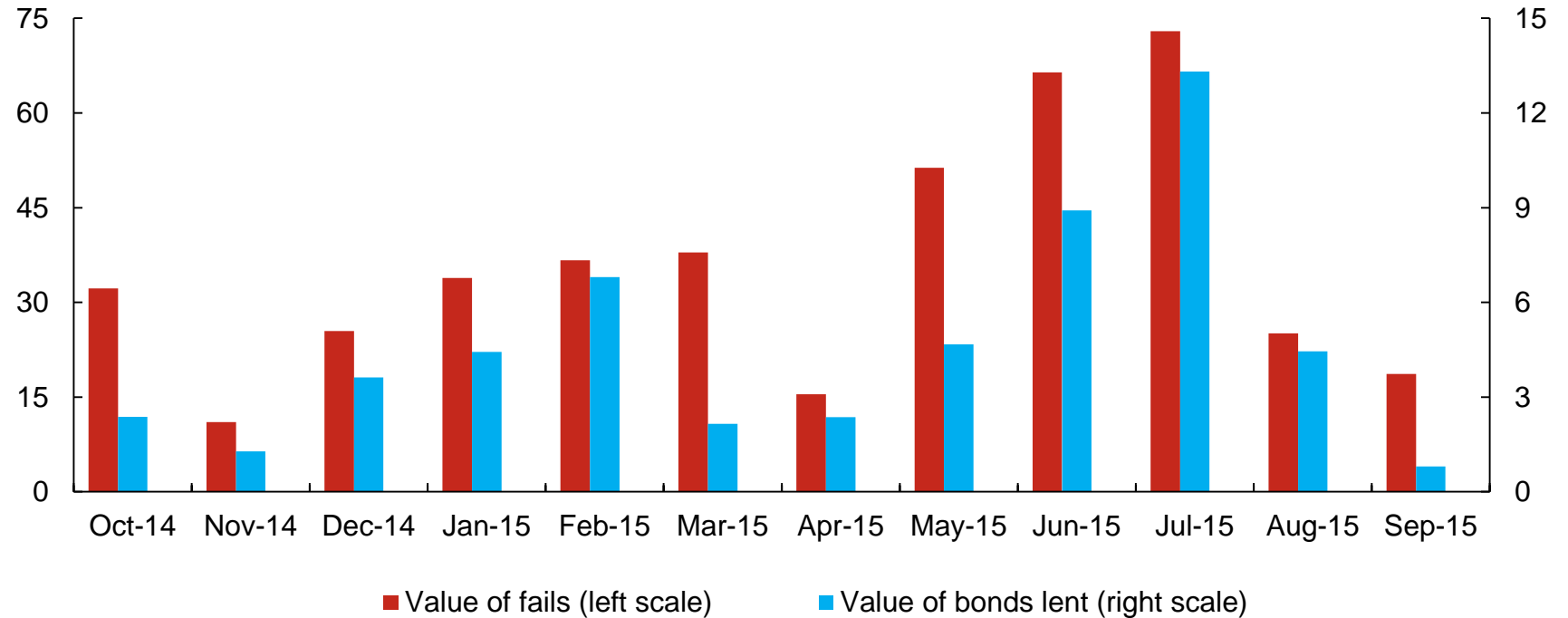
Last observation: September 2015

Settlement fails also more prevalent

Government of Canada bonds: settlement fails and value lent by the Bank of Canada

Monthly data

Can\$ billions



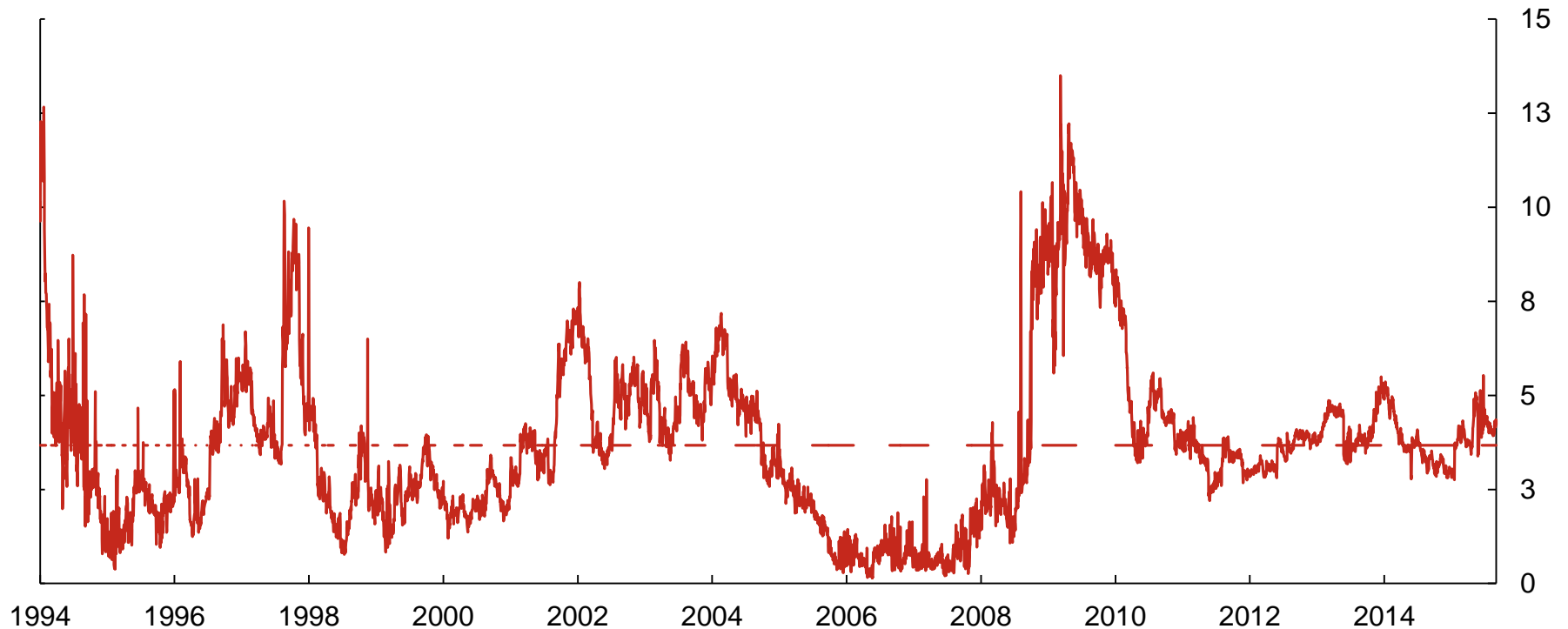
Change of methodology by CDS on 1 May 2015
Sources: CDS and Bank of Canada calculations

Last observation: September 2015

Dispersion along the yield curve is **normal**

Deviations from relative value arbitrage relationship (RMS)

Daily data, dotted line = average level since 1994



Sources: DEX and Bank of Canada calculations

Last observation: 4 September 2015

Points for discussion

❖ How is market liquidity affected by...

- Banking regulations
- Low interest rates and low-for-long
- Post-trade transparency
- Changing investor types (e.g. foreign buy-and-hold investors)
- Repo market functioning

❖ What has been the impact (if any) of trends such as...

- Electronification
- Futurization

Appendix A

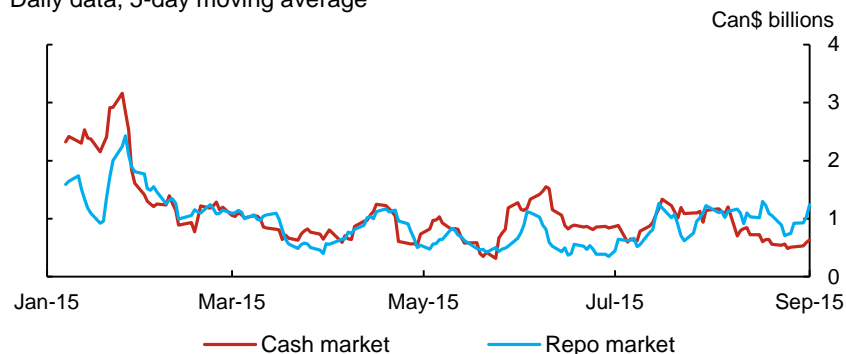


Canadian Fixed-Income Market Metrics

Metrics for 2.5% June 2024 bond

Trading volumes

Daily data, 5-day moving average

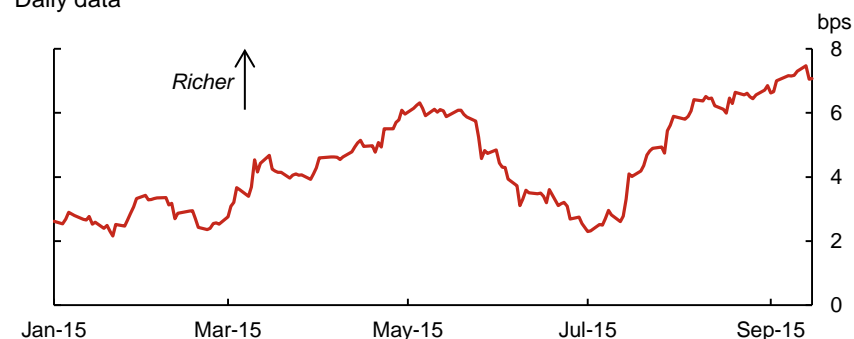


Sources: CDS and Bank of Canada calculations

Last observation: 2 September 2015

Deviations from relative value arbitrage relationship

Daily data

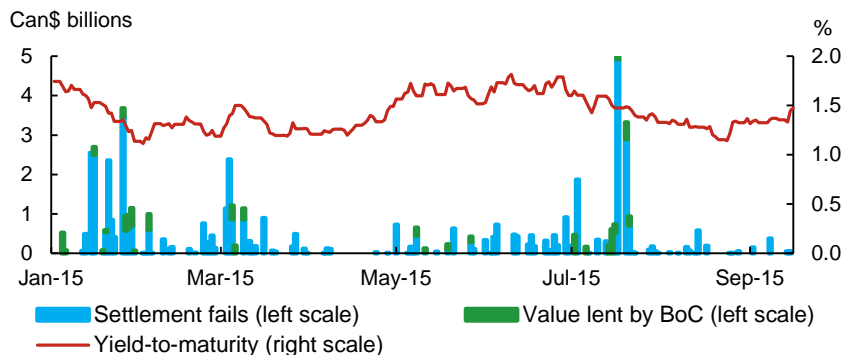


Sources: DEX and Bank of Canada calculations

Last observation: 16 September 2015

Settlement fails and yield-to-maturity

Daily data



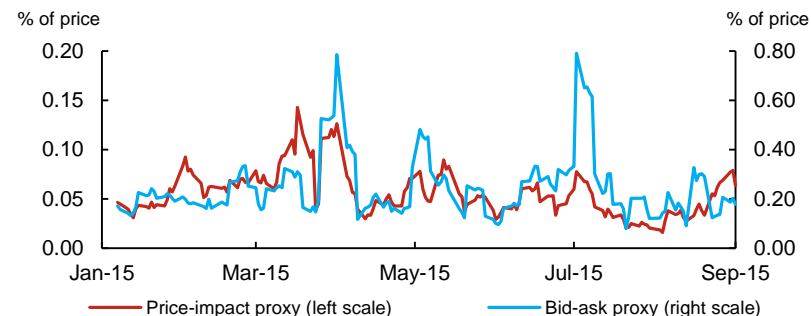
Sources: CDS, DEX and Bank of Canada (including calculations)

Last observation: 16 September 2015

Liquidity metrics

Aggregated across all transactions; percentage of price

Daily data, 5-day moving average



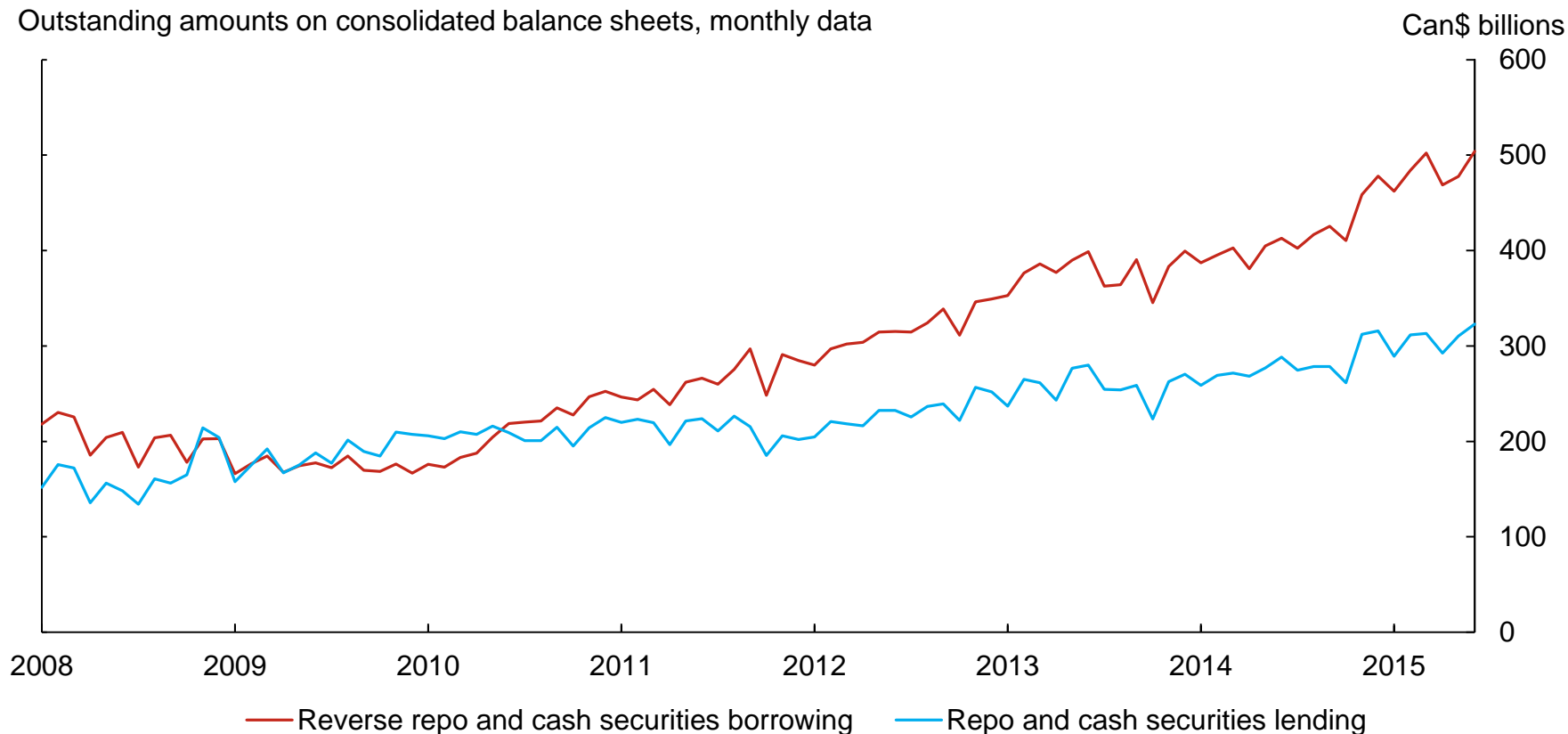
Sources: CDS and Bank of Canada calculations

Last observation: 2 September 2015

D-SIBs financing activity is still growing

The Big Six are net borrowers of securities

Outstanding amounts on consolidated balance sheets, monthly data



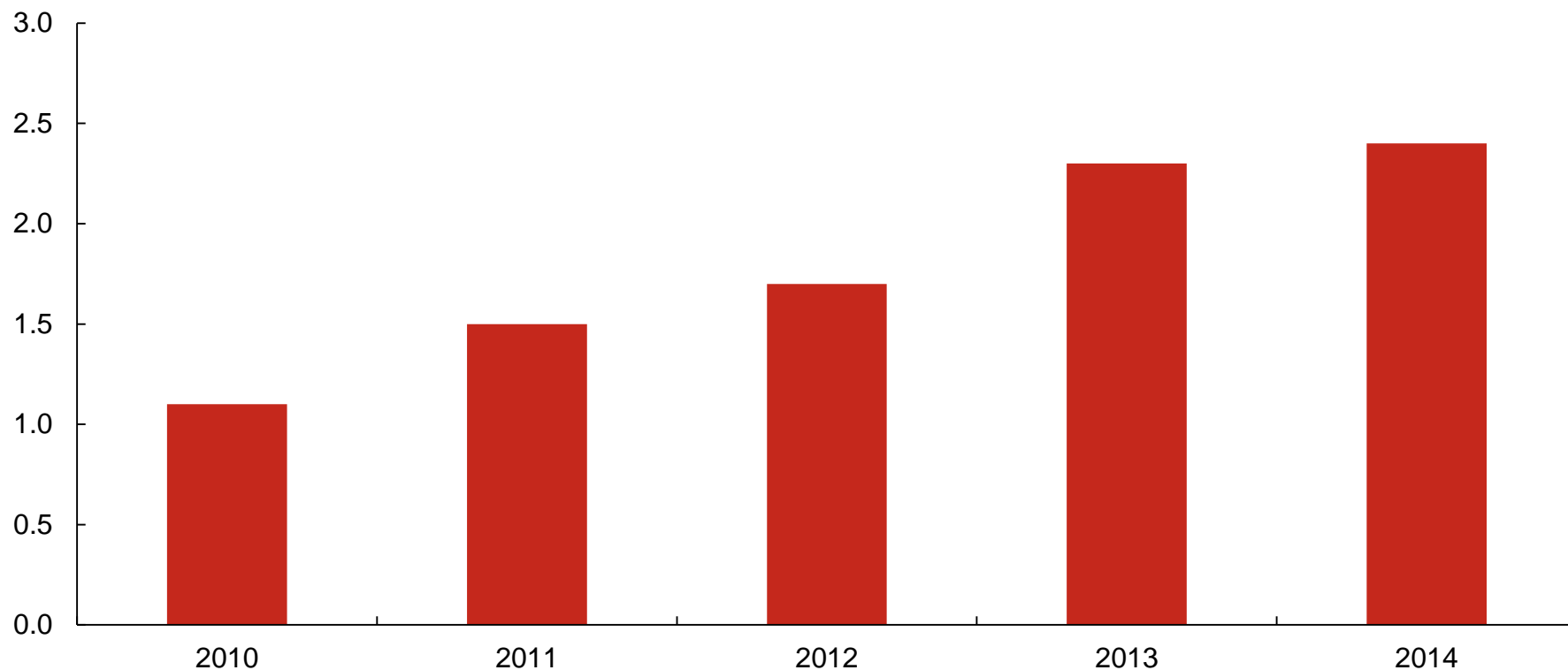
Source: Banks' regulatory filings (M4)

Last observation: June 2015

Volumes at CanDeal are growing

CanDeal yearly trading volume

Can\$ trillions



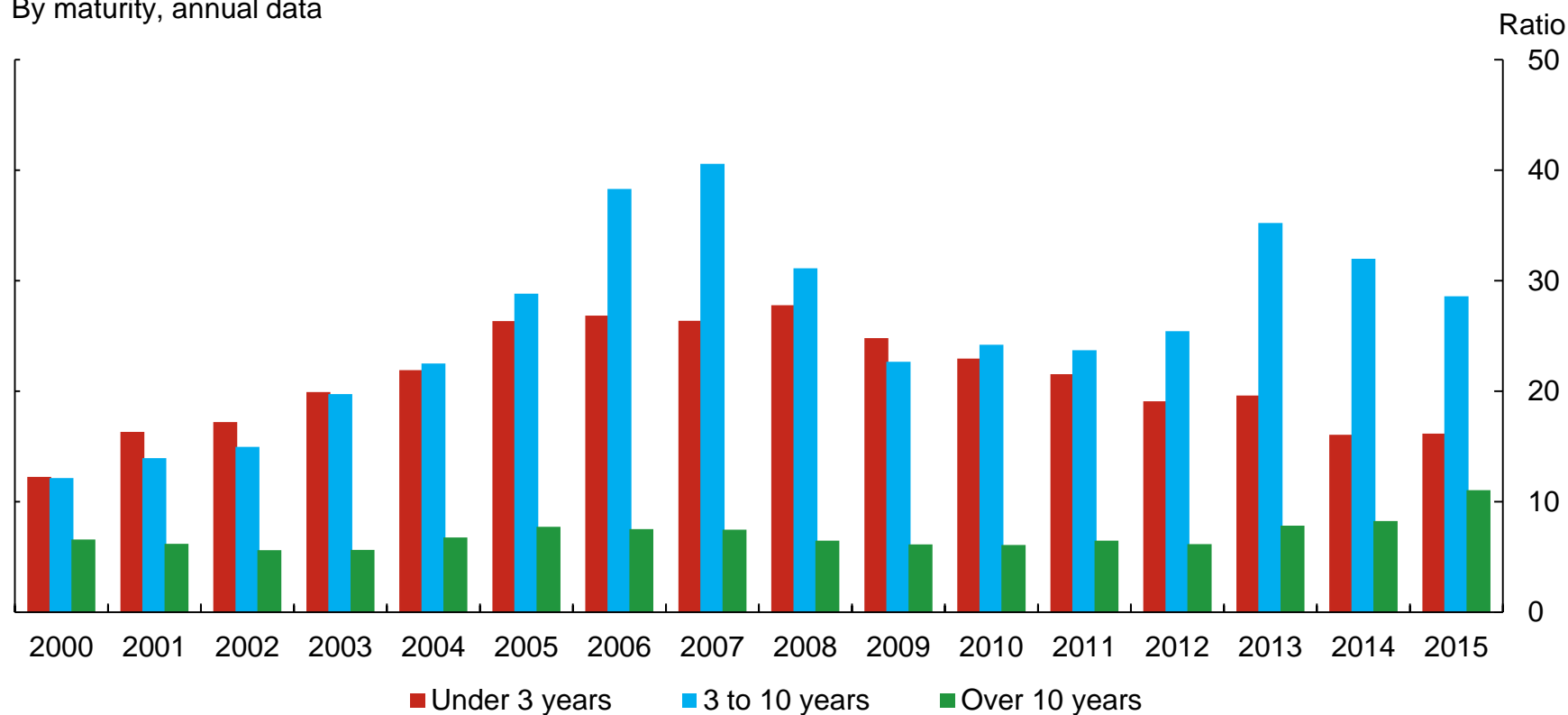
Source: CanDeal

Last observation: 2014

GoC turnover

Annualized Government of Canada bond turnover ratio

By maturity, annual data



Sources: MTRS and Bank of Canada calculations

Last observation: 2015

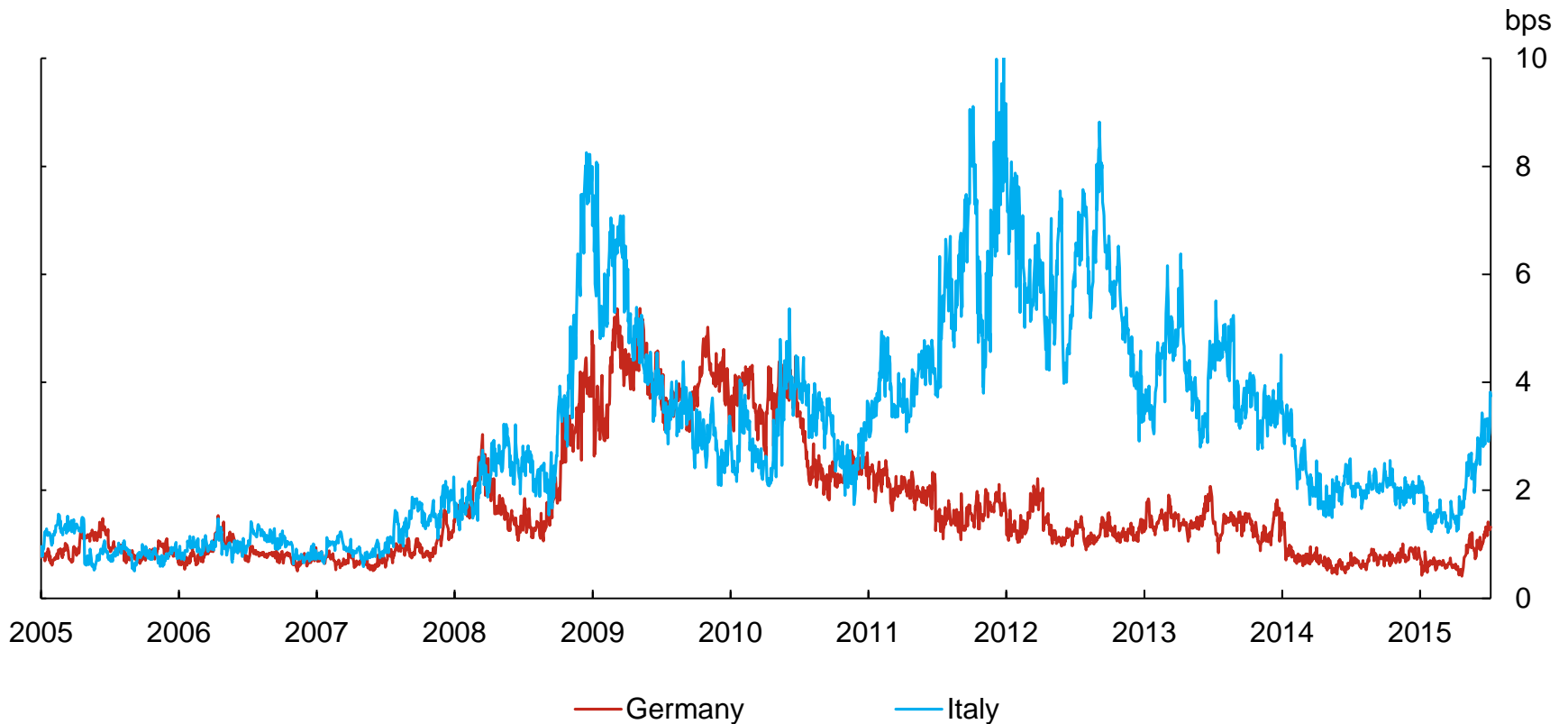
Appendix B



International Fixed-Income Market Metrics

Euro area bond price dispersion

Deviations from relative value arbitrage relationship (RMS)
Daily data



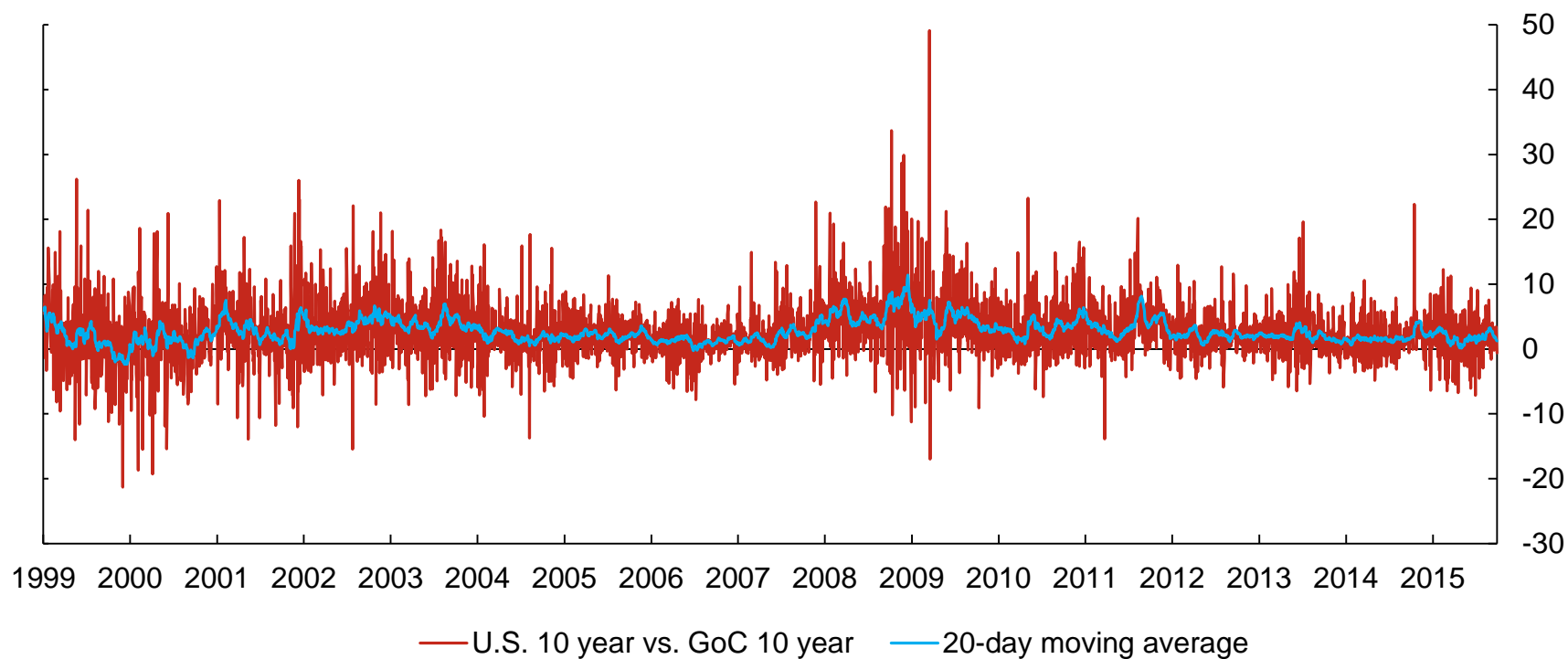
Sources: DEX and Bank of Canada calculations

Last observation: 9 July 2015

US trading range much higher than in Canada

Excess daily trading range of U.S. 10-year notes over daily trading range of GoC 10-year notes

Daily data

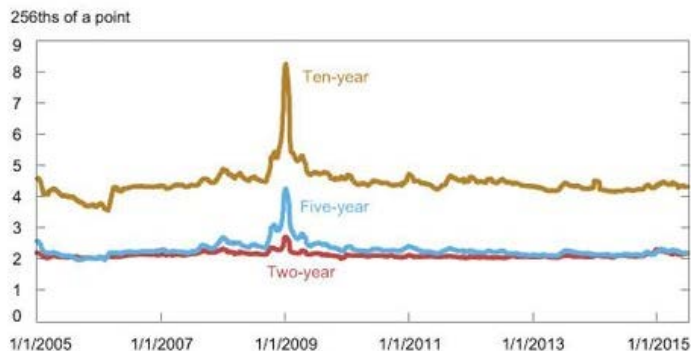


Sources: Bloomberg and Bank of Canada calculations

Last observation: 28 September 2015

U.S. Treasury liquidity (New York Fed)

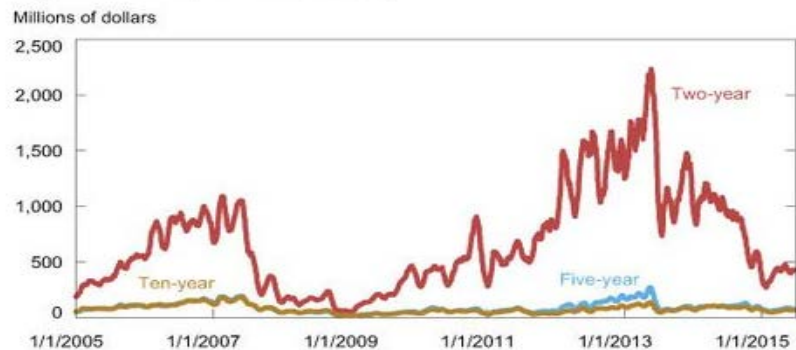
Bid-ask spreads are narrow and stable



Source: Authors' calculations, based on data from BrokerTec.

Notes: The chart plots the twenty-one-day moving average for on-the-run notes. Price is per \$100 par. Increments are measured in 256ths of a point.

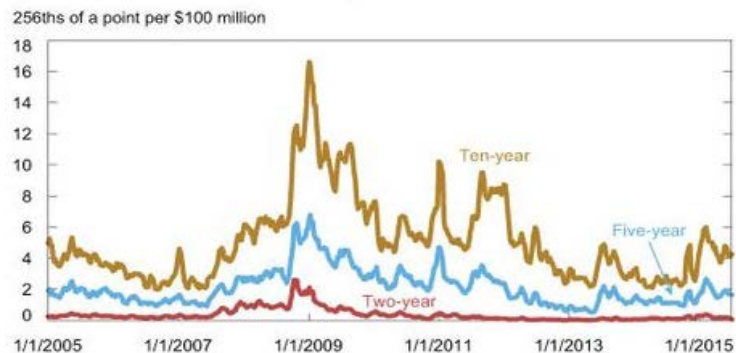
Depth has declined from recent highs



Source: Authors' calculations, based on data from BrokerTec.

Notes: This chart plots the twenty-one-day moving average for on-the-run notes. Data are for order book depth at the inside tier, summed across the bid and offer sides.

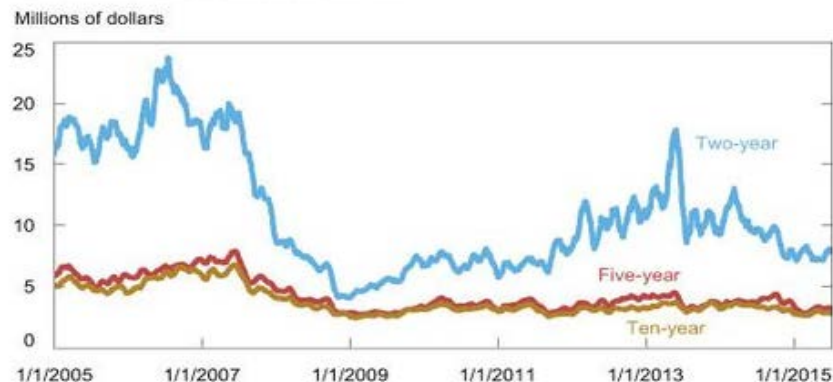
Price impact of trades has recently risen



Source: Authors' calculations, based on data from BrokerTec.

Notes: This chart plots the four-week moving average of slope coefficients from weekly regressions of five-minute price changes on five-minute net order flow for the on-the-run notes. Price is per \$100 par.

Trade size has declined over time



Source: Authors' calculations, based on data from BrokerTec.

Note: The chart plots the twenty-one-day moving average for on-the-run notes.