BANK OF CANADA
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Bank of Canada
Monthly Research Update

November 2019

This monthly newsletter features the latest research publications by Bank of Canada economists. The report includes papers appearing in external publications and staff working papers published on the Bank of Canada's website.

PUBLISHED PAPERS

Forthcoming

Bussière, Matthieu & Gaulier, Guillaume & Steingress, Walter, "Global Trade Flows: Revisiting the Exchange Rate Elasticities", Open Economies Review

Calimani, Susanna & Hałajb, Grzegorz & Żochowski, Dawid, "Simulating Fire Sales in a System of Banks and Asset Managers", Journal of Banking & Finance

Chen, Marie & Garriott, Corey, "High-Frequency Trading and Institutional Trading Costs", Journal of Empirical Finance

Davoodalhosseini, Mohammad & Rivadeneyra, Francisco, "A Policy Framework for E-Money: A Report on Bank of Canada Research", Canadian Public Policy

Garriott, Corey & Lefebvre, Sophie & Nolin, Guillaume & Rivadeneyra, Francisco & Walton, Adrian, "Alternative Futures for Government of Canada Debt Management", Journal of Financial Economic Policy

STAFF WORKING PAPERS

Roncoroni, Alan & Battiston, Stefano & D'Errico, Marco & Halaj, Grzegorz & Kok, Christoffer, "Interconnected Banks and Systemically Important Exposures", Bank of Canada Staff Working Paper 2019-44

STAFF DISCUSSION PAPERS

Henry, Christopher & Huynh, Kim & Nicholls, Gradon & Nicholson, Mitchell, "2018 Bitcoin Omnibus Survey: Awareness and Usage", Bank of Canada Staff Discussion Paper 2019-10

Poloz, Stephen S., "Technological Progress and Monetary Policy: Managing the Fourth Industrial Revolution", Bank of Canada Staff Discussion Paper 2019-11

ABSTRACTS

Global Trade Flows: Revisiting the Exchange Rate Elasticities

This paper contributes to the debate on the magnitude of exchange rate elasticities by providing a set of price and quantity elasticities for 51 advanced and emerging-market economies. Specifically, for each of these countries we report the elasticity of trade prices and trade quantities on both the export and on the import sides, as well as the reaction of the trade balance. To that end, we use a large unified database of highly disaggregated bilateral trade flows, covering 5,000 products and more than 160 trading partners. We present a range of estimates using not only standard regression techniques but also generated regressors that aim to address key omitted variable biases, particularly relating to unobserved marginal costs and competitor prices in the importing market. Our results show that quantity elasticities are significantly below one, pass-through is incomplete and export prices react significantly to exchange rate changes. Despite low quantity elasticities, the trade balance reacts positively to a depreciation in all countries because export and import prices adjust. Overall, our findings suggest that changes in the exchange rate can play an important role in addressing global trade imbalances.

Simulating Fire Sales in a System of Banks and Asset Managers

We develop an agent-based model of traditional banks and asset managers to investigate the contagion risk related to fire sales and balance sheet interactions. We take a structural approach to the price formation in fire sales as in Bluhm et al. (2014) and introduce a market clearing mechanism with endogenous formation of asset prices. We find that, first, banks which are active in both the interbank and securities markets act as plague-spreaders during financial distress. Second, higher bank capital requirements may aggravate contagion by creating incentives for banks to increase exposures in the interbank market, which also leads to lower levels of a voluntary capital buffer above the minimum capital requirement. Third, asset managers absorb small liquidity shocks, but they exacerbate contagion when their voluntary liquid buffers are fully utilised. Fourth, a system with larger and more interconnected agents is more prone to contagion risk stemming from funding shocks.

High-Frequency Trading and Institutional Trading Costs

Using bond futures data, we test whether high-frequency trading (HFT) is engaging in back running, a trading strategy that can create costs for financial institutions. We reject the hypothesis of back running and find instead that HFT mildly improves trading costs for institutions. After a rapid increase in the number of HFTs, trading costs as measured by implementation shortfall decrease by 27 basis points for smaller-sized positions ($2–$10 million notional). For larger-sized positions there is no significant effect. We explain the improvement as being the consequence of HFT reducing effective spreads and per-trade price impacts.

A Policy Framework for E-Money: A Report on Bank of Canada Research

We present a policy framework for electronic money and payments. The framework poses a set of positive questions related to the areas of responsibility of central banks: payments systems, monetary policy and financial stability. The questions are posed to four broad forms of e-money: privately or publicly issued, and with centralized or decentralized verification of transactions. This framework is intended to help evaluate the trade-offs that central banks face in the decision to issue new forms of e-money.

Alternative Futures for Government of Canada Debt Management

This paper presents four blue-sky ideas for lowering the cost of the Government of Canada’s debt without increasing the debt’s risk profile. We argue that each idea would improve the secondary-market liquidity of government debt, thereby increasing the demand for government bonds and thus lowering their cost at issuance. The first two ideas would improve liquidity by enhancing the active management of the government’s debt through market operations used to support the liquidity of outstanding bonds. The second two ideas would simplify the set of securities issued by the government, concentrating issuance in a smaller set of bonds that would each be more highly traded. We discuss the ideas and give an account of the political, legal and operational impediments.

Interconnected Banks and Systemically Important Exposures

How do banks' interconnections in the euro area contribute to the vulnerability of the banking system? We study both the direct

interconnections (banks lend to each other) and the indirect interconnections (banks are exposed to similar sectors of the economy). These complex linkages make the banking system more vulnerable to contagion risks.

We use a unique supervisory dataset of the European Central Bank with the 26 largest banks in the euro area. Introducing a new measure of indirect interconnections, we assess to what extent banks are significantly exposed to devaluation risk of commonly held assets.

We find that for small shocks, banks that operate in multiple countries make the banking system more resilient. But for large shocks, international diversification makes the banking system less resilient. While contagion risk is usually ignored in supervisory stress tests, it can have significant impacts on banks' solvency and should influence how supervisors design regulations. However, we find there is no one-size-fits-all solution: the optimal financial architecture depends on the shocks considered and the international diversification.

2018 Bitcoin Omnibus Survey: Awareness and Usage

The Bank of Canada continues to use the Bitcoin Omnibus Survey (BTCOS) to monitor trends in Canadians’ awareness, ownership and use of Bitcoin. The most recent iteration was conducted in late 2018, following an 85 percent decline in the price of Bitcoin throughout the year. In 2017, almost half of Bitcoin adopters reported investing as their primary reason for owning it. This implies that the dramatic price drop could have affected whether Canadians continue to own Bitcoin and, if they do, what they use it for.

The BTCOS has been conducted each year since 2016 with slight changes and improvements in every iteration. For 2018, we added questions on Canadians’ financial literacy, their plans to stop using cash and their preferences over features of online transactions. We also improved our way of calibrating sample estimates to represent the overall Canadian population with respect to demographic composition.

The survey shows that from 2016 to 2018, both the share of Canadians who are aware of Bitcoin and who own bitcoin increased. But the share of past owners also increased, suggesting an influx of Bitcoin owners who sold their holdings after 2017. The main reason for owning Bitcoin continued to be for store of value or investment purposes, though this decreased slightly from 2017. Finally, Bitcoin owners differed from the overall population in two ways: they were

less financially literate and more likely to say they plan to stop using cash.

Technological Progress and Monetary Policy: Managing the Fourth Industrial Revolution

This paper looks at the implications for monetary policy of the widespread adoption of artificial intelligence and machine learning, which is sometimes called the "fourth industrial revolution." The paper reviews experiences from the previous three industrial revolutions, developing a template of shared characteristics:

-new technology displaces workers;
-investor hype linked to the new technology leads to financial excesses;
-new types of jobs are created;
-productivity and potential output rise;
-prices and inflation fall; and
-real debt burdens increase, which can provoke crises when asset prices crash.

The experience of the Federal Reserve during 1995–2006 is particularly instructive. The paper uses the Bank of Canada's main structural model, ToTEM (Terms-of-Trade Economic Model), to replicate that experience and consider options for monetary policy. Under a Taylor rule, monetary policy may allow growth to run as long as inflation remains subdued, easing the burden of adjustment on those workers directly affected by the new technology, while macroprudential policies help check financial excesses. This argues for a family of Taylor rules enhanced by the addition of financial stability considerations.

UPCOMING EVENTS

Sacha Gelfer (Bentley University, Department of Economics)
Organizer: Lin Shao (INT)
Date: 13 December 2019

Raphael Schoenle (Brandeis University, Department of Economics)
Organizer: Daniela Hauser (CEA)
Date: 6 March 2020

Karen Kopecky (Federal Reserve Bank of Atlanta)
Organizer: Youngmin Park (CEA)
Date: 13 March 2020

Todd Clark (Federal Reserve Bank of Cleveland)
Organizer: Luis Uzeda (CEA)
Date: 3 April 2020

Todd Schoellman (Federal Reserve Bank of Minneapolis)
Organizer: Youngmin Park (CEA)
Date: 17 April 2020

Matthias Kehrig (Duke University, Department of Economics)
Organizer: Dmitry Matveev (CEA)
Date: 24 April 2020

Nicolas Crouzet (Northwestern University, Kellogg School of Management)
Organizer: Romanos Priftis (CEA)
Date: 1 May 2020

Edouard Challe (CREST & École Polytechnique, Department of Economics)
Organizer: Dmitry Matveev (CEA)
Date: 8 May 2020

Raquel Fernandez (New York University, Department of Economics)
Organizer: Gabriela Galassi (CEA)
Date: 15 May 2020

Ufuk Akcigit (University of Chicago, Department of Economics)
Organizer: Martin Kuncl (CEA)
Date: 28 May 2020

Karel Mertens (Federal Reserve Bank of Dallas)
Organizer: Daniela Hauser (CEA)
Date: 12 June 2020

Dirk Krueger (University of Pennsylvania, Department of Economics)
Organizer: Katya Kartashova (CEA)
Date: 28 August 2020

Arlene Wong (Princeton University, Department of Economics)
Organizer: Julien Champagne (CEA)
Date: 11 September 2020

Johannes Wieland (University of California San Diego, Department of Economics)
Organizer: Julien Champagne (CEA)
Date: 25 September 2020

Leonardo Melosi (Federal Reserve Bank of Chicago)
Organizer: Romanos Priftis (CEA)
Date: 6 November 2020