BANK OF CANADA
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Bank of Canada Monthly Research Update

February 2020

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

In-Press

Xu, Lei & Nian, Tingting & Cabral, Luis, "What Makes Geeks Tick? A Study of Stack Overflow Careers", Management Science, Vol 66(2): 587-604, February 2020

Forthcoming

Bulusu, Narayan & Gungor, Sermin, "The life-cycle of trading activity and liquidity of Government of Canada bonds: Evidence from cash, repo, and securities lending markets", Canadian Journal of Economics

Davoodalhosseini, Mohammad, "Adverse Selection with Heterogeneously Informed Agents", International Economic Review

Kahn, Charles M. & Rivadeneyra, Francisco & Wong, Tsz-Nga, "Should the central bank issue e-money?", Journal of Financial Market Infrastructures

STAFF WORKING PAPERS

Chen, Heng & Strathearn, Matthew, "A Spatial Model of Bank Branches in Canada", Bank of Canada Staff Working Paper 2020-4

STAFF DISCUSSION PAPERS

Carter, Thomas J. & Mendes, Rhys R., "The Power of Helicopter Money Revisited: A New Keynesian Perspective", Bank of Canada Staff Discussion Paper 2020-1

ABSTRACTS

What Makes Geeks Tick? A Study of Stack Overflow Careers

Many online platforms rely on users to voluntarily provide content. What motivates users to contribute content for free, however, is not well understood. In this paper, we use a revealed-preference approach to show that career concerns play an important role in user contributions to Stack Overflow, the largest online question-and-answer community. We investigate how activities that can enhance a user's reputation vary before and after the user finds a new job. We contrast this reputation-generating activity with activities that do not improve a user's reputation. After finding a new job, users contribute 23.7% less in reputation-generating activity; by contrast, they reduce their non–reputation-generating activity by only 7.4%. These findings suggest that users contribute to Stack Overflow in part because they perceive such contributions as a way to improve future employment prospects. We provide direct evidence against alternative explanations such as integer constraints, skills mismatch, and dynamic selection effects.

The life-cycle of trading activity and liquidity of Government of Canada bonds: Evidence from cash, repo, and securities lending markets

This paper documents stylized facts about the life-cycle of trading activity and trading cost (i.e., market liquidity) of Government of Canada (GoC) bonds. Using a unique data set from the cash, repo and securities lending markets, we document three stylized facts. First, the trading activity of all GoC bonds follows an inverse-U shape across all three markets, with activity peaking during the benchmark (on-the-run) phase. Second, the level of activity exhibits considerable heterogeneity across bonds with different maturities: shorter-term bonds are more actively traded in the cash and repo markets, while longer-term bonds are more active in the securities lending market. Finally, in contrast to the conventional notion that a bond becomes less liquid as it ages, our trade-based measures indicate that the transaction cost of a GoC bond remains low in the later stages of its life-cycle.

Adverse Selection with Heterogeneously Informed Agents

A model of over-the-counter markets is proposed. Some asset buyers are informed in that they can identify high quality assets.

Heterogeneous sellers with private information choose what type of buyers they want to trade with. When the measure of informed buyers is low, there exists a unique and stable equilibrium, and interestingly, price, trading volume and welfare typically decrease with more informed buyers. When the measure of informed buyers is intermediate, multiple equilibria arise, and price, trading volume and welfare may decrease or increase with more informed buyers, depending on the equilibrium being played. A switch from one equilibrium to another can lead to large drops in liquidity, price, trading volume and welfare, like a financial crisis. The measure of informed buyers is then endogenized by allowing buyers to invest in a technology that enables them to identify high quality assets. In this case, the model features endogenous strategic complementarity in acquiring the information technology. Multiple equilibria still exist, with different measures of informed buyers, but a scheme of tax/subsidy on information acquisition sometimes leads to the unique equilibrium.

Should the central bank issue e-money?

Should a central bank take over the provision of e-money, a circulable electronic liability? We discuss how e-money technology changes the tradeoff between public and private provision, and the tradeoff between e-money and a central bank's existing liabilities like bank notes and reserves. The tradeoffs depend on i) the technological setup of the e-money system (as a token or an account; centralized or decentralized); ii) the potential improvement in the implementation and transmission of monetary policy; iii) the risks to safety and privacy from cyber attacks; and iv) the uncertain impact on banks' efficiency and financial stability. The most compelling argument for central banks to issue e-money is to address competition problems in the banking sector.

A Spatial Model of Bank Branches in Canada

This research aims to empirically analyze the spatial distribution of bank-branch networks in Canada. We study the market structure (both industrial and geographic concentrations) within the networks' own or adjacent postal areas. Our empirical framework considers branch density (the ratio of the total number of branches to the area size) by employing a spatial two-way fixed-effects model. Our main finding is that there are no effects associated with market structure; however, there are strong spatial socioeconomic effects from the networks' own and nearby areas. In addition, we also study the effect

of spatial competition from rival banks: we find that large banks and small banks tend to avoid markets dominated by their competitors.

The Power of Helicopter Money Revisited: A New Keynesian Perspective

We analyze money financing of fiscal transfers (helicopter money) in two simple New Keynesian models: a "textbook" model in which all money is non-interest-bearing (e.g., all money is currency), and a more realistic model with interest-bearing reserves. In the textbook model with only non-interest-bearing money, we find the following:

- A money-financed fiscal expansion can be more stimulative than a debt-financed fiscal expansion of equal magnitude. However, the extra stimulus requires that the central bank abandon its usual feedback rule for an extended period, allowing interest rates to instead be determined by the rate of money creation.
- Moreover, the extra stimulus associated with money financing stems solely from its implications for the path of short-term interest rates and cannot be attributed to an oft-cited Ricardian-equivalence argument that money financing avoids the adverse wealth effects associated with higher taxes under debt financing.
- Because the stimulative effects of money financing are driven by its implications for interest rates, a combination of debt financing and sufficiently accommodative forward guidance can replicate all welfare-relevant outcomes while bypassing the potential political-economic complications associated with helicopter money.
- Apart from these complications, money financing also has the drawback that it would allow money-demand shocks to generate volatility in output and inflation, much as was the case under the money-targeting regimes of the 1970s and 1980s.

In the model with interest-bearing reserves, we find the following:

- The rate of money creation determines the interest rate on reserves, but broader interest rates are invariant across debt- and money-financing regimes.
- As a result, money financing delivers no extra stimulus relative to debt financing.

Overall, results suggest that helicopter money cannot be justified on the grounds that it would allow policy-makers to get more stimulus out of a given fiscal expansion: either money financing has no extra stimulative benefits to offer, or all potential benefits could be pursued more effectively and robustly using alternative policies.

UPCOMING EVENTS

Arvind Krishnamurthy (Stanford University, Graduate School of
    Business)
Organizer: Sermin Gungor (FMD)
Date: 5 March 2020

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

Tarek Hassan (Boston University, Department of Economics)
Organizer: Edouard Djeutem (INT)
Date: 20 March 2020

Martin Uribe (Columbia University, Department of Economics)
Organizer: Julien Bengui (INT)
Date: 27 March 2020

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

Walker Ray (Federal Reserve Bank of San Francisco and the London
    School of Economics)
Organizer: Gonzalo Morales (FBD)
Date: 5 April 2020

Haoxiang Zhu (Massachusetts Institute of Technology, Sloan School
    of Management)
Organizer: Alper Odabasioglu (FSD)
Date: 16 April 2020

JEDC Conference on The Economics of Digital Currencies (at
    Rutgers University)
Organizer: Jonathan Chiu (FBD)
Date: 17 April 2020

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

Andrew Karolyi (Cornell University, SC Johnson College of Business)
Organizer: Jon Witmer (FMD)
Date: 23 April 2020

Debt Management Modelling Workshop
Organizers: Narayan Bulusu & Antonio Diez de los Rios (FBD)
Date: 24 April 2020

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

Rubio Ramirez (Emory University, Department of Economics)
Organizer: Ruben Hipp (FSD)
Date: 29 April 2020

Hanno Lustig (Stanford University, Graduate School of Business)
Organizer: Guihai Zhao (FMD)
Date: 30 April 2020

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

Mad(ison) Money Meeting
Organizers: Yu Zhu & Jonathan Chiu (FBD)
Date: 7 May 2020

Andra Ghent (University of North Carolina at Chapel Hill, Kenan-
        Flagler Business School)
Organizer: Soojin Jo (FSD)
Date: 7 May 2020

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

Jean-Charles Rochet (University of Geneva, Geneva School of
Economics and Management)
Organizer: Toni Ahnert (FSD)
Date: 14 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

Ryan Kellogg (University of Chicago, Harris School of Public Policy)
Organizer: Reinhard Ellwanger (INT)
Date: 5 June 2020

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

Kozo Ueda (Waseda University, School of Political Science and
Economics)
Organizer: Ben Tomlin (INT)
Date: 24 July 2020

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

Vincent Sterk (University College London, Department of Economics)
Organizer: Tom Pugh (FSD)
Date: 3 September 2020

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

Roberto Chang (Rutgers University, Department of Economics)
Organizer: Julien Bengui (INT)
Date: 18 September 2020

Òscar Jordà (Federal Reserve Bank of San Francisco)
Organizers: Jean-Sébastien Fontaine & Bruno Feunou (FMD)
Date: 24 September 2020

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

Daniel Xu (Duke University, Department of Economics)
Organizer: Lin Shao (INT)
Date: 2 October 2020

Kaiji Chen (Emory University, Department of Economics)
Organizer: Lin Shao (INT)
Date: 16 October 2020

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

Ana Maria Santacreu (Federal Reserve Bank of St. Louis)
Organizer: Pat Alexander (INT)
Date: 12 November 2020