

# Bank of Canada Monthly Research Update

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July 2021

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

- Ichihashi, Shota, "The economics of data externalities", Journal of Economic Theory
- Jin, Ginger Zhe & Lu, Zhentong & Zhou, Xiaolu & Li Chunxiao, "The Effects of Government Licensing on E-commerce: Evidence from Alibaba", Journal of Law and Economics
- Salle, Isabelle, "Comment on "No firm is an island? How industry conditions shape firms' expectations" by Philippe Andrade, Olivier Coibion, Erwan Gautier and Yuriy Gorodnichenko", Journal of Monetary Economics
- Carvalho, Carlos & Kryvtsov, Oleksiy, "Price selection", Journal of Monetary Economics

## STAFF WORKING PAPERS

- Acharya, Sushant & Benhabib, Jess & Huo, Zhen, "The Anatomy of Sentiment-Driven Fluctuations", Bank of Canada Staff Working Paper 2021-33
- Acharya, Sushant & Dogra, Keshav, "The Side Effects of Safe Asset Creation", Bank of Canada Staff Working Paper 2021-34
- Halaj, Grzegorz & Priazhkina, Sofia, "Stressed but not Helpless: Strategic Behaviour of Banks Under Adverse Market Conditions", Bank of Canada Staff Working Paper 2021-35
- Matveev, Dmitry & Ruge-Murcia, Francisco, "Tariffs and the Exchange Rate: Evidence from Twitter", Bank of Canada Staff Working Paper 2021-36

## STAFF DISCUSSION PAPERS

- Zhang, Yang & Suchanek, Lena & Swarbrick, Jonathan & Wagner, Joel & Schlanger, Tudor, "Sequencing Extended Monetary Policies at the Effective Lower Bound", Bank of Canada Staff Discussion Paper 2021-10
- Usher, Andrew & Reshidi, Edona & Rivadeneyra, Francisco & Hendry, Scott, "The Positive Case for a CBDC", Bank of Canada Staff Discussion Paper 2021-11

Chen, Heng & Engert, Walter & Felt, Marie-Hélène & Huynh, Kim & Nicholls, Gradon & O'Habib, Daneal & Zhu, Julia, "[Cash and COVID-19: The impact of the second wave in Canada](#)", Bank of Canada Staff Discussion Paper 2021-12

## ABSTRACTS

### *The economics of data externalities*

A firm buys data from consumers to learn about some uncertain state of the world. There are data externalities, whereby data of some consumers reveal information about other consumers' data. I characterize data externalities that maximize or minimize consumer surplus and the firm's profit. I use the result to solve an information design problem in which the firm chooses what information to buy from consumers, balancing the value and price of information. The firm collects no less information than the efficient amount. In some cases we can solve the firm's data collection problem with a two-step concavification method.

### *The Effects of Government Licensing on E-commerce: Evidence from Alibaba*

Using proprietary data from Alibaba, we examine how the 2015 Food Safety Law (FSL) affects e-commerce in China. The FSL requires most food sellers on e-commerce platforms to obtain a valid online license for retail food handling. Because the FSL was rolled out progressively, we have a rare opportunity to observe a gradual transition from voluntary certification to partial licensing and mandatory licensing. Data summary shows that, conditional on sellers with valid licensing information, those that had a better online reputation and more online food sales before the FSL tend to display their FSL license earlier on the platform, and buyers are more willing to transact with a seller after she displays her FSL license. This positive response is stronger for younger and less reputable sellers, suggesting that the license provides useful information in addition to what consumers observe on the platform. To identify the causal impact of the FSL, we compare food and non-food categories via synthetic control matching. We find that the average quality of surviving food sellers has improved after partial and mandatory licensing, partly because those who are unwilling to obtain the FSL license must exit the platform. Despite an increase in seller concentration, the platform's gross merchandise value in the food category did not decline post FSL, nor did the average sales price increase significantly one year into the full enforcement of the FSL. This suggests that the FSL does not hamper the long-run performance of the regulated market, probably because it has enhanced seller quality and market transparency on the platform.

*Comment on “No firm is an island? How industry conditions shape firms’ expectations” by Philippe Andrade, Olivier Coibion, Erwan Gautier and Yuriy Gorodnichenko*

Andrade et al. analyze the data from a large panel of firms and show how sector-specific shocks erroneously influence firms’ outlooks about the aggregate economy. This paper is part of a broader research agenda that has extensively documented the existence of information rigidities using data from large-scale surveys of households and firms. This comment discusses the implications of this research agenda for central banking in light of a complementary empirical method, namely laboratory experiments, and their use in informing macroeconomic policies.

*Price selection*

*Price selection* is a simple, model-free measure of selection in price setting. It exploits comovement between inflation and the level from which adjusting prices departed. Prices that increase from lower-than-usual levels tend to push inflation above average. Using micro data for the United Kingdom, the United States, and Canada, we find strong price selection at disaggregate levels. Price selection is stronger for goods with less frequent price changes or with larger average price changes. Aggregate price selection is considerably weaker. A multisector sticky-price model accounts well for this evidence and demonstrates a monotone relationship between price selection and monetary non-neutrality.

*The Anatomy of Sentiment-Driven Fluctuations*

We show that sentiments—self-fulfilling changes in beliefs that are orthogonal to fundamentals—can drive persistent aggregate fluctuations under rational expectations in a beauty contest game. Such fluctuations can occur even in the absence of exogenous aggregate fundamental shocks. Moreover, sentiments alter the volatility and persistence of aggregate outcomes in response to fundamental shocks. We provide (i) necessary conditions under which sentiments can affect aggregate outcomes in equilibrium and (ii) conditions under which sentiments drive persistent fluctuations and when they only affect aggregate outcomes contemporaneously. We also show that sentiment equilibria are stable under least-squares learning while the fundamental equilibrium is not.

### *The Side Effects of Safe Asset Creation*

We present an incomplete markets model to understand the costs and benefits of increasing government debt when an increased demand for safety pushes the natural rate of interest below zero. A higher demand for safe assets causes the ZLB to bind, increasing unemployment. Higher government debt satiates the demand for safe assets, raising the natural rate and restoring full employment. However, this entails permanently lower investment, which reduces welfare, since our economy is dynamically efficient even when the natural rate is negative. Despite this, increasing debt until the ZLB no longer binds raises welfare when alternative instruments are unavailable. Higher inflation targets instead allow for negative real interest rates and achieve full employment without reducing investment.

### *Stressed but not Helpless: Strategic Behaviour of Banks Under Adverse Market Conditions*

We model bank management actions in severe stress test conditions using a game-theoretical framework. Banks update their balance sheets to strategically maximize risk-adjusted returns to shareholders given three regulatory constraints and feedback effects related to fire sales, interactions of loan supply and demand, and deteriorating funding conditions. The framework allows us to study the role of strategic behaviors in amplifying or mitigating adverse macrofinancial shocks in a banking system and the role of macroprudential policies in the mitigation of systemic risk. In a macro-consistent stress testing application, we show that a trade-off can arise between banking stability (solvency) and macroeconomic stability (lending) and test whether the release of a countercyclical capital buffer can reduce systemic risk.

### *Tariffs and the Exchange Rate: Evidence from Twitter*

This paper examines the conjecture that an increase in tariffs in a flexible exchange rate regime leads to the appreciation of the local currency. We focus on the reaction of the exchange rate market to tweets by US President Donald Trump regarding possible tariff increases on Canadian and Mexican goods. The anticipation of trade restrictions leads to the US dollar appreciating by 0.023% and 0.051% vis-à-vis the Canadian dollar and Mexican peso within five minutes of the tweet, and comparable percentages for forward rates up to five years ahead. Exchange rate appreciation may mitigate the expenditure-switching intended by the protectionist policy.

### *Sequencing Extended Monetary Policies at the Effective Lower Bound*

In response to the global COVID-19 pandemic, the Bank of Canada aggressively lowered its policy interest rate and provided additional easing using forward guidance and quantitative easing. In this analysis, we use simulations in the Bank of Canada's projection model—the Terms-of-Trade Economic Model—to consider a suite of extended monetary policies (EMPs) to support the economy following the COVID-19 crisis. We focus on the implementation sequencing of three EMP options when the policy rate is at the effective lower bound: credit easing, forward guidance and quantitative easing. We find that the policy mix that delivers the best outcome for the Canadian economy calls for immediately implementing forward guidance and quantitative easing, followed by credit easing when containment measures are lifted. Furthermore, going “full scale” and implementing all available EMP options effectively helps stabilizing the economy because each of these tools reinforces the others. We also quantify the fiscal response needed to offset the gap in gross domestic product created by the effective lower bound, given operational limitations in scaling up EMPs.

### *The Positive Case for a CBDC*

In this paper we discuss the competition and innovation arguments for issuing a central bank digital currency (CBDC). A CBDC could be an effective competition policy tool for payments. On innovation, we argue that a CBDC could be necessary to support the vibrancy of the digital economy by helping solve market failures and fostering competition and innovation in new digital payments markets. Overall, competition and innovation are supporting arguments for issuing a CBDC.

### *Cash and COVID-19: The impact of the second wave in Canada*

We use consumer surveys conducted in April, July and November 2020 to study how the COVID-19 pandemic affected the demand for cash and the use of various methods of payment. Continuing from Chen et al. (2020, 2021), we use data from the Bank Note Distribution System (BNDS) to track how the amount of cash in circulation changed throughout 2020. The November 2020 survey included a three-day payment diary. We compare this diary with similar diaries from 2009, 2013 and 2017 to study long-term trends in cash use and payment methods.

## UPCOMING EVENTS

**\* All onsite conferences and events are suspended until further notice. All events listed below will take place virtually.**

Jing Cynthia Wu (University of Notre Dame, NBER)

Organizer: FMD / FSD EFR Seminar Series

Date: 19 August 2021

Harald Uhlig (University of Chicago)

Organizer: BAP Visiting Speaker Series

Date: 23 August 2021

Daniel Carvalho (Kelley School of Business, Indiana University)

Organizer: FMD / FSD EFR Seminar Series

Date: 26 August 2021

Jonathan Wright (Johns Hopkins University)

Organizer: FMD / FSD EFR Seminar Series

Date: 2 September 2021

Juan Jubio-Ramirez (Emory University)

Organizer: EFR CEA/INT Speaker Series

Date: 3 September 2021

Oliver de Groot (University of Liverpool Management School)

Organizer: FMD / FSD EFR Seminar Series

Date: 9 September 2021

Robert Johnson (University of Notre Dame)

Organizer: INT / CEA EFR Seminar Series

Date: 10 September 2021