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Bank of Canada Monthly Research Update

March 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

In-Press

Camous, Antoine & Matveev, Dmitry, "Furor over the Fed: A President's Tweets and Central Bank Independence", CESifo Economic Studies, Vol 67(1): 106-127, March 2021

Birinci, Serdar & Karahan, Fatih & Mercan, Yusuf & See, Kurt, "Labor market policies during an epidemic", Journal of Public Economics, Vol 194(104348): 1-15, February 2021

Adam, Klaus & Matveev, Dmitry & Nagel, Stefan, "Do survey expectations of stock returns reflect risk adjustments?", Journal of Monetary Economics, Vol 117: 723-740, January 2021

Hommes, Cars, "Behavioral and Experimental Macroeconomics and Policy Analysis: A Complex Systems Approach", Journal of Economic Literature, Vol 59(1): 149-219, March 2021

Forthcoming

Allen, Jason & Clark, Robert & Li, Shaoteng & Vincent, Nicolas, "Debt-Relief Programs and Money Left on the Table: Evidence from Canada's Response to COVID-19", Canadian Journal of Economics

Cabral, Luis & Xu, Lei, "Seller Reputation and Price Gouging: Evidence from the COVID-19 Pandemic", Economic Inquiry

Chapman, James & Desai, Ajit, "Using Payments Data to Nowcast Macroeconomic Variables During the Onset of COVID-19", Journal of Financial Market Infrastructures

Perez-Saiz, Hector & Xiao, Hongyu, "Cultural Affinity, Regulation and Market Structure: Evidence from the Canadian Retail Banking Industry", American Economic Journal: Microeconomics

Harding, Martin & Klein, Mathias, "Monetary policy and household net worth", Review of Economic Dynamics

Ho, Anson T. Y. & Morin, Leeland & Paarsch, Harry J. & Huynh, Kim P., "Consumer Credit Usage in Canada during the Coronavirus Pandemic", Canadian Journal of Economics

Kosse, Anneke, "An Empirical Analysis of Bill Payment Choices", The Journal of Financial Market Infrastructures - Special Issue on Big Data

Molnar, Jozsef & Welte, Angelika, "The Market for Acquiring Card Payments from Small and Medium-Sized Canadian Merchants", Business Economics

STAFF WORKING PAPERS

Jiang, Janet Hua & Zhu, Yu, “Monetary Policy Pass-Through with Central Bank Digital Currency”, Bank of Canada Staff Discussion Paper 2021-10

Jang, Youngsoo & Lee, Soyoung, “A Generalized Endogenous Grid Method for Default Risk Models”, Bank of Canada Staff Discussion Paper 2021-11

Li, Jiaqi “Imperfect Banking Competition and Macroeconomic Volatility: A DSGE Framework”, Bank of Canada Staff Discussion Paper 2021-12

STAFF DISCUSSION PAPERS

Dong, Wei & Dunbar, Geoffrey R. & Friedrich, Christian & Matveev, Dmitry & Priftis, Romanos & Shao, Lin, “Complementarities Between Fiscal Policy and Monetary Policy—Literature Review”, Bank of Canada Staff Discussion Paper 2021-4

Swarbick, Jonathan, “Occasionally Binding Constraints in Large Models: A Review of Solution Methods”, Bank of Canada Staff Discussion Paper 2021-5

Chen, Heng & Engert, Walter & Huynh, Kim & Nicholls, Gradon & Zhu, Julia, “Cash and COVID-19: The Effects of Lifting Containment Measures on Cash Demand and Use”, Bank of Canada Staff Discussion Paper 2021-3

ABSTRACTS

Furor over the Fed: A President's Tweets and Central Bank Independence

We illustrate how financial market data are informative about the interactions between monetary and fiscal policy. Federal funds futures are private contracts that reflect investor's expectations about future monetary policy decisions. By relating price movements of these contracts with President Trump's tweets on monetary policy, we explore how financial market participants have perceived attempts by the President to influence monetary policy decisions. Our results indicate that market participants expected the Federal Reserve Bank to adjust monetary policy in the direction suggested by President Trump.

Labor market policies during an epidemic

We study the positive and normative implications of labor market policies that counteract the economic fallout from containment measures during an epidemic. We incorporate a standard epidemiological model into an equilibrium search model of the labor market to compare unemployment insurance (UI) expansions and payroll subsidies. In isolation, payroll subsidies that preserve match capital and enable a swift economic recovery are preferred over a cost-equivalent UI expansion. When considered jointly, however, a cost-equivalent optimal mix allocates 20 percent of the budget to payroll subsidies and 80 percent to UI. The two policies are *complementary*, catering to different rungs of the productivity ladder. The small share of payroll subsidies is sufficient to preserve high-productivity jobs, but it leaves room for social assistance to workers who face inevitable job loss.

Do survey expectations of stock returns reflect risk adjustments?

To reconcile the disconnect between survey expectations of stock returns and rational expectations, researchers have hypothesized that survey participants may confound beliefs and preferences by (i) reporting risk-neutral forecasts of future returns; or (ii) reporting pessimistically-tilted forecasts reflecting ambiguity aversion or robustness concerns. We find that these hypotheses are strongly rejected by the data, albeit for different reasons: Inconsistent with hypothesis (i), survey return forecasts are reliably much higher than risk-free interest rates and survey expected excess returns are predictably time-varying. Inconsistent with (ii), agents are not always pessimistic about future returns, but often predictably optimistic and unconditionally unbiased.

Behavioral and Experimental Macroeconomics and Policy Analysis: A Complex Systems Approach

This survey discusses behavioral and experimental macroeconomics, emphasizing a complex systems perspective. The economy consists of boundedly rational heterogeneous agents who do not fully understand their complex environment and use simple decision heuristics. Central to our survey is the question of under which conditions a complex macro-system of interacting agents may or may not coordinate on the rational equilibrium outcome. A general finding is that under positive expectations feedback (strategic complementarity)—where optimistic (pessimistic) expectations can cause a boom (bust)—coordination failures are quite common. The economy is then rather unstable, and persistent aggregate fluctuations arise strongly amplified by coordination on trend-following behavior leading to (almost-)self-fulfilling equilibria. Heterogeneous expectations and heuristics switching models match this observed micro and macro behavior surprisingly well. We also discuss policy implications of this coordination failure on the perfectly rational aggregate outcome and how policy can help to manage the self-organization process of a complex economic system.

Debt-Relief Programs and Money Left on the Table: Evidence from Canada's Response to COVID-19

This paper analyzes the effectiveness of debt-relief programs targeting short-run household liquidity constraints implemented in Canada in response to the COVID-19 pandemic. These programs allowed individuals to push off mortgage and credit card payments and cut in half interest rates on credit card debt. Using credit bureau data, we document that, despite potential savings above $4 billion, enrollment was limited: 24% for mortgages and 7% for credit cards. By exploiting the richness of our data set, we provide evidence that close to 80% of individuals were unaware of the credit card relief program while others faced important fixed nonmonetary costs preventing uptake.

Seller Reputation and Price Gouging: Evidence from the COVID-19 Pandemic

From mid January to mid-March 2020, 3 M masks sold on Amazon by third party sellers were priced 2.4 times higher than Amazon's 2019 price. However, this price increase was not uniform across sellers. We estimate that when Amazon is stocked out (one of our measures of scarcity) new (entrant) sellers increase price by 178%, whereas the continuing sellers' increase is limited to 56.7%. This is consistent with the idea that seller reputation limits the extent of profitable price gouging. Similar results are obtained for Purell hand sanitizer and for other measures of scarcity. We also explore policy implications of our results.

Using Payments Data to Nowcast Macroeconomic Variables During the Onset of COVID-19

The COVID-19 pandemic and the resulting public health mitigation have caused large-scale economic disruptions globally. During this time, there is an increased need to predict the macroeconomy’s short-term dynamics to ensure the effective implementation of fiscal and monetary policy. However, economic prediction during a crisis is challenging because of the unprecedented economic impact, which increases the unreliability of traditionally used linear models that use lagged data. We help address these challenges by using timely retail payments system data in linear and nonlinear machine learning models. We find that compared to a benchmark, our model has a roughly 15 to 45% reduction in Root Mean Square Error when used for macroeconomic nowcasting during the global financial crisis. For nowcasting during the COVID-19 shock, our model predictions are much closer to the official estimates.

Cultural Affinity, Regulation and Market Structure: Evidence from the Canadian Retail Banking Industry

We estimate a perfect information static entry game to study the effect of cultural entry barriers on entry and competition in the retail banking industry. Canada provides a favorable setting for analysis due to its high linguistic diversity, concentrated market, and regulatory entry barriers. We find that cultural affinity between customers and financial institutions that share a common cultural origin plays an important role in explaining the comparative advantages of these institutions in certain markets. Using several counterfactual experiments and additional empirical evidence, we show that the effectiveness of regulations intended to foster competition are significantly limited by cultural barriers, which is a key determinant that shapes the competitive landscape of the industry.

Monetary policy and household net worth

This paper investigates the interrelation between household balance sheets, collateral constraints, and monetary policy. Using data on the U.S. economy, we estimate a monetary DSGE model with financial frictions and occasionally binding borrowing constraints. The model implies stronger effects of monetary policy interventions when the borrowing constraint is binding compared to situations when it turns slack. In a prediction analysis we find that, out of a set of alternative plausible endogenous model variables, the level of household net worth is the single best predictor of the tightness of the borrowing constraint, which implies that monetary policy is more effective when household net worth is low. We test this model prediction in the data and provide robust empirical evidence on asymmetric effects of monetary policy across the household net worth cycle that validates the model predictions. A contractionary monetary policy shock leads to a large and significant fall in economic activity during periods of low household net worth. In contrast, monetary policy shocks have only small and mostly insignificant effects when net worth is high.

Consumer Credit Usage in Canada during the Coronavirus Pandemic

The recent COVID-19 pandemic has devastated economies worldwide. Using detailed, monthly data from a major consumer credit reporting agency in Canada, we have examined individuals' use of credit cards and home-equity lines-of-credit (HELOCs). We found a dramatic leftward shift in the distribution of credit-card and HELOC outstanding balances, providing evidence for a widespread reduction in credit usage. Our findings suggest that, during the COVID-19 recession, Canadian consumers were able to meet their financial needs without increasing their debt burdens. These results complement other findings concerning a decline in consumer spending and the results of government assistance programs, and imply that the economic consequences are very different from those in other recessions.

An Empirical Analysis of Bill Payment Choices

The aim of this paper is to examine which payment instruments Canadians use for paying bills and to assess the factors driving their bill payment behavior. I use 2019 survey data collected among over 4,000 Canadians and estimate a set of binomial and multinomial regressions to assess the factors influencing consumers' use and perception of different bill payment options. I find that there is no single dominant payment method for all consumer groups. Demographics, financial situation, new technology adoption and POS payment habits play a significant role in the usage of bill payment methods as well as in consumers' stated reasons and barriers of use. Moreover, I demonstrate that consumers' bill payment behavior strongly varies by bill type. The conclusions are useful for policy makers, authorities and payment service providers intending to stimulate the uptake and use of digital payments and to encourage a migration away from paper-based payment methods. Moreover, the results are helpful for policy discussions on how to accommodate end-user needs when (re)designing retail payments systems.

The Market for Acquiring Card Payments from Small and Medium-Sized Canadian Merchants

This article builds on industry data and a unique dataset of small and medium-sized merchants to provide insights into the acquirer-merchant market in Canada. Three main findings are presented. First, smaller merchants pay their acquirer more for every dollar of card payment than larger merchants. Second, this finding is mainly explained by high fixed costs. Third, the acquiring market in Canada is concentrated and has remained fairly stable since 2010. These findings could be relevant for other countries with mature card payments systems such as the US and Australia.

Monetary Policy Pass-Through with Central Bank Digital Currency

This paper investigates how the introduction of an interest-bearing central bank digital currency (CBDC) that serves as a perfect substitute for bank deposits as an electronic means of payment affects monetary policy pass-through. When the deposit market is not fully competitive, the CBDC tends to weaken the pass-through of the interest on reserves. The interest on CBDC impacts the deposit market more directly compared with the interest on reserves. The CBDC rate can also have stronger pass-through to the loan market; however, the effect can be dampened by the policy on the interest on reserves. Therefore, coordination between the two policy rates is needed to effectively achieve policy goals

A Generalized Endogenous Grid Method for Default Risk Models

Default risk models have been widely employed to assess the ability of households and sovereigns to insure themselves against shocks. Grid search has often been used to solve these models because the complexity of the problem prevents the use of faster but less general methods. In this paper, we propose an extension of the endogenous grid method for default risk models, which is faster and more accurate than grid search. In particular, we find that our solution method leads to a more accurate bond price function, thus making substantial differences in the model's main predictions. When applied to Arellano's (2008) model, our approach predicts a standard deviation of the interest rate spread one-third lower and defaults 3 to 5 times less frequently than does the conventional approach. On top of that, our method is efficient. It is approximately 4 to 7 times faster than grid search when applied to a canonical model of Arellano (2008) and 19 to 27 times faster than grid search when applied to the richer model of Nakajima and Ríos-Rull (2014). Finally, we show that our method is applicable to a broad class of default risk models by characterizing sufficient conditions.

Imperfect Banking Competition and Macroeconomic Volatility: A DSGE Framework

This paper studies the impact of imperfect banking competition on aggregate fluctuations using a DSGE framework that features a Cournot banking sector. The paper highlights a new propagation mechanism of imperfect banking competition that operates via the dynamics of the expected marginal product of capital. Since capital is partly financed by bank loans, a higher expected return on capital implies that firms are more willing to borrow to invest in capital, making their capital and thus loan demand more inelastic. Market power enables banks to take advantage of the lower loan demand elasticity by charging a higher loan rate markup. Given that different shocks affect the dynamics of the expected return on capital differently, this paper finds that while the loan rate markup after a contractionary monetary policy shock increases and thus amplifies aggregate fluctuations, the impact of imperfect banking competition after a productivity shock is less clear and depends on the persistence of the shock.

Complementarities Between Fiscal Policy and Monetary Policy—Literature Review

This paper reviews and summarizes the literature on the complementary relationship between fiscal policy and monetary policy. We focus on four types of fiscal policy: (1) automatic stabilizers, (2) state-contingent non-discretionary fiscal policy, (3) discretionary fiscal stimulus and (4) government credit policies. The literature shows that automatic fiscal stabilizers can play a role in stabilizing business cycle fluctuation. But because they can have multiple policy objectives, their optimal design remains an open question. An alternative policy framework features state-contingent non-discretionary fiscal expenditures with a pre-committed fiscal spending formula triggered by objective macroeconomic conditions. Such a policy offers the advantage of being timely and easy to communicate; but at the same time, it poses challenges for identifying appropriate triggers and program expenditures with high short-run multipliers. The literature also shows that discretionary fiscal expenditures can support aggregate demand, and some expenditures have short-run multipliers close to, or above, 1. While these expenditures can focus on specific policy priorities that are relevant at the time, their discretionary nature may slow the policy response. When interest rates are close to the effective lower bound (ELB), fiscal stimulus can be particularly effective for complementing the stabilizing efforts of monetary policy. Finally, studies show that government credit policies can mitigate economic downturns that are accompanied by severe financial market distress. However, the effects of scaling up this channel are uncertain.

Occasionally Binding Constraints in Large Models: A Review of Solution Methods

This practical review assesses several approaches to solving medium- and large-scale dynamic stochastic general equilibrium (DSGE) models featuring occasionally binding constraints. In such models, global solution methods are not possible because of the curse of dimensionality. This causes the modeller to look elsewhere for methods that can handle the significant non-linearities and non-differentiable functions that inequality constraints represent. The paper discusses methods—including Newton-type solvers under perfect foresight, the piecewise linear algorithm (OccBin), regime-switching models (RISE) and the news shocks approach (DynareOBC)—and compares the results from a simple borrowing constraints model obtained using projection methods, providing example MATLAB code. The study focuses on the news shocks method, which I find produces higher accuracy than other methods and allows the modeller to study multiple equilibria and determinacy issues.

Cash and COVID-19: The Effects of Lifting Containment Measures on Cash Demand and Use

We conduct a follow-up to Chen et al. (2020) and study demand for and use of cash after the containment measures imposed at the beginning of the COVID-19 pandemic were relaxed during the summer of 2020. We find that bank notes in circulation continued to rise in July due to ongoing cash withdrawals and decreased cash deposits in the Bank Note Distribution System. The probability of consumers using cash for payments increased in July compared with April 2020. As well, consumer cash holdings, measured as the median value of cash on hand, returned to August 2019 levels.

UPCOMING EVENTS

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

Garth Heutel (Georgia State University)
Organizer: FMD / FSD EFR Seminar Series
Date: 15 April 2021

Ariel Burstein (UCLA)
Organizer: EFR CEA/INT Speaker Series
Date: 16 April 2021

Michael Weber (University of Chicago)
Organizer: EFR CEA/INT Speaker Series
Date: 30 April 2021

Nahim Zahur (Queen's University)
Organizer: FMD / FSD EFR Seminar Series
Date: 6 May 2021

Mary Amiti (Federal Reserve Bank of New York)
Organizer: EFR CEA/INT Speaker Series
Date: 7 May 2021

Lindsay Relihan (London School of Economics)
Organizer: CUR EFR Visiting Speaker Series
Date: 10 May 2021

Eric Swanson (University of California, Irvine)
Organizer: FMD / FSD EFR Seminar Series
Date: 13 May 2021

Jennifer La'O (Columbia University)
Organizer: EFR CEA/INT Speaker Series
Date: 14 May 2021

Alessandro Bonatti (Massachusetts Institute of Technology)
Organizer: BAP Virtual Speaker
Date: 17 May 2021

Stijn Van Nieuwerburgh (Columbia University)
Organizer: FMD / FSD EFR Seminar Series
Date: 20 May 2021

Yueran Ma (Chicago Booth)
Organizer: EFR CEA/INT Speaker Series
Date: 21 May 2021

Emi Nakamura (University of California, Berkeley)
Organizer: FMD / FSD EFR Seminar Series
Date: 27 May 2021

Andre Kurmann (Drexel University)
Organizer: EFR CEA/INT Speaker Series
Date: 28 May 2021