

Bank of Canada Monthly Research Update

February 2022

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

Jonathan Chiu, “Book Review of “Blockchain Technologies, Applications and Cryptocurrencies: Current Practice and Future Trends””, *Journal of Economic Literature*

Kerem Tuzcuoglu, “Composite Likelihood Estimation of an Autoregressive Panel Ordered Probit Model with Random Effects”, *Journal of Business & Economic Statistics*

STAFF WORKING PAPERS

Xing Guo & Pablo Ottonello & Diego Perez, “Monetary Policy and Redistribution in Open Economies”, *Bank of Canada Staff Working Paper 2022-6*

Christian Friedrich & Peter Selcuk, “The Impact of Globalization and Digitalization on the Phillips Curve”, *Bank of Canada Staff Working Paper 2022-7*

STAFF DISCUSSION PAPERS

Felipe Alves & Christian Bustamante & Xing Guo & Katya Kartashova & Soyoung Lee & Thomas Michael Pugh & Kurt See & Yaz Terajima & Alexander Ueberfeldt, “Heterogeneity and Monetary Policy: A Thematic Review”, *Bank of Canada Staff Discussion Paper 2022-2*

Francisco Rivadeneyra & Nellie Zhang, “Payment Coordination and Liquidity Efficiency in the New Canadian Wholesale Payments System”, *Bank of Canada Staff Discussion Paper 2022-3*

Joel Wagner & Tudor Schlanger & Yang Zhang, “A Horse Race of Alternative Monetary Policy Regimes Under Bounded Rationality”, *Bank of Canada Staff Discussion Paper 2022-4*

ABSTRACTS

Book Review of "Blockchain Technologies, Applications and Cryptocurrencies: Current Practice and Future Trends"

Composite Likelihood Estimation of an Autoregressive Panel Ordered Probit Model with Random Effects

Modeling and estimating autocorrelated discrete data can be challenging. In this paper, we use an autoregressive panel ordered probit model where the serial correlation in the discrete variable is driven by the autocorrelation in the latent variable. In such a nonlinear model, the presence of a lagged latent variable results in an intractable likelihood containing high-dimensional integrals. To tackle this problem, we use composite likelihoods that involve a much lower order of integration. However, parameter identification might potentially become problematic since the information employed in lower dimensional distributions may not be rich enough for identification. Therefore, we characterize types of composite likelihoods that are valid for this model and study conditions under which the parameters can be identified. Moreover, we provide consistency and asymptotic normality results for two different composite likelihood estimators and conduct Monte Carlo studies to assess their finite-sample performances. Finally, we apply our method to analyze corporate bond ratings.

Monetary Policy and Redistribution in Open Economies

This paper examines how monetary policy affects the asymmetric effects of globalization. We build an open-economy heterogeneous-agent New Keynesian model (HANK) in which households differ in their income, wealth, and real and financial integration with international markets. We use the model to reassess classic questions in international macroeconomics, but from a distributional perspective: What are the effects of monetary policy and external shocks in open economies? And how do alternative exchange-rate regimes compare? Our analysis yields two main takeaways. First, heterogeneity in households' international integration is a central dimension that drives the inequality in the consumption responses to external shocks more so than do income and wealth. Second, households' heterogeneity reveals the presence of a stabilization-inequality trade-off for the conduct of monetary policy in open economies, with fixed exchange-rate regimes leading to amplified but less unequal consumption responses to external shocks.

The Impact of Globalization and Digitalization on the Phillips Curve

In this paper, we examine the impact of globalization and digitalization on the Phillips curve in a sample of 18 advanced economies over two decades. Using industry-level data from the World and EU KLEMS databases, we first estimate country-industry-specific Phillips curves for each decade by relating the growth rate of output prices to lagged inflation and an employment gap. We then assess the relative impact of globalization and digitalization on the slope coefficients of these Phillips curves, which represent the sensitivity of inflation to economic slack. We measure globalization by increases in trade and financial integration and digitalization by the use of industrial robots as a share of a country's population. We find that globalization significantly reduces the slope of the Phillips curve, while digitalization has the opposite effect. We also find some evidence that globalization decreases the intercept of the Phillips curve and that digitalization increases it. Evidence for the impact of both trends on employment is less conclusive. When investigating the associated transmission channels for both trends in the context of our slope analysis, we find that the negative impact of globalization on the slope coefficient of the Phillips curve is muted in industries that experience a high growth rate of total factor productivity and that the positive impact of digitalization is muted in industries that have seen high investments in IT capital in the past.

Heterogeneity and Monetary Policy: A Thematic Review

The heterogeneity of businesses and households impacts aggregate economic fluctuations and, in turn, is shaped by aggregate fluctuations. This view has emerged over the last decade with strong implications for the transmission and conduct of monetary policy. Our thematic review focuses on key aspects of this new theory as well as its underlying assumptions. We place the insights in a Canadian context using relevant microeconomic and macroeconomic data.

Payment Coordination and Liquidity Efficiency in the New Canadian Wholesale Payments System

A new wholesale payments system will launch in Canada in 2021. This real-time gross settlement system called Lynx will have two types of settlement mechanisms, one allowing offsetting and the other not. This paper studies the decision problem of the Bank of Canada: which of the two settlement mechanisms should it use to send its payments. Using extensive simulation, we show that, mainly due to the benefits of liquidity pooling, Lynx would achieve its highest liquidity efficiency—even better than that of the current Large Value Transfer System (LVTS)—if all payments (urgent and non-urgent) from all participants were sent to the mechanism allowing offsetting. The minimum amount of liquidity required to settle all payments by critical deadlines is approximately \$10 billion, around half the amount of collateral that LVTS participants allocate (pre-COVID-19). Since time-critical payments sent to the offsetting mechanism could experience a delay, the high level of liquidity efficiency is accompanied by an increase in the number of participants' operational interventions (to pledge more collateral or to alter payment priorities) to ensure that those time-critical payments are never delayed. When coordination does not occur, liquidity efficiency can be far lower than in the LVTS. The results highlight that the Bank of Canada helping with coordination is more important than the specific choice of mechanism.

A Horse Race of Alternative Monetary Policy Regimes Under Bounded Rationality

We introduce bounded rationality, along the lines of Gabaix (2020), in a canonical New Keynesian model calibrated to match Canadian macroeconomic data since Canada's adoption of inflation targeting. We use the model to provide a quantitative assessment of the macroeconomic impact of flexible inflation targeting and some alternative monetary policy regimes. These alternative monetary policy regimes are average-inflation targeting, price-level targeting and nominal gross domestic product level targeting. We consider these regimes' performance with and without an effective lower bound constraint. Our results suggest that the performance of history-dependent frameworks is sensitive to departures from rational expectations. The benefits of adopting history-dependent frameworks over flexible inflation targeting gradually diminish with a greater degree of bounded rationality. This finding is in line with laboratory

experiments that show flexible inflation targeting remains a robust framework to stabilize macroeconomic fluctuations.

UPCOMING EVENTS

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

Kyle Herkenhoff (University of Minnesota)
Organizer: FMD / FSD EFR Seminar Series
Date: 10 March 2022

Isabelle Mejean (Sciences Po)
Organizer: EFR CEA/INT Seminar Series
Date: 11 March 2022

Yuriy Gorodnichenko (UC Berkeley)
Organizer: EFR CEA/INT Seminar Series
Date: 18 March 2022

Giovanno Compiani (Booth School of Business)
Organizer: BAP Virtual Speaker Series
Date: 21 March 2022

David Evans (University of Oregon)
Organizer: FMD / FSD EFR Seminar Series
Date: 24 March 2022

Daphne Skandalis (University of Copenhagen)
Organizer: EFR CEA/INT Seminar Series
Date: 1 April 2022

Maxi Guennewig (University of Bonn)
Organizer: BAP Virtual Speaker Series
Date: 4 April 2022

John Cochrane (Hoover Institution, Stanford University)
Organizer: EFR CEA/INT Seminar Series
Date: 8 April 2022

Nora Traum (HEC Montréal)
Organizer: EFR CEA/INT Seminar Series
Date: 22 April 2022