BANK OF CANADA
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Bank of Canada Monthly Research Update

August 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

Uzeda, Luis, "State Correlation and Forecasting: A Bayesian Approach Using Unobserved Components Models", Advances in Econometrics (Essays in Honor of Fabio Canova)

Danielsson, Jon & Macrae, Robert & Uthemann, Andreas, "Artificial Intelligence and Systemic Risk", Journal of Banking and Finance

Somnath, Chatterjee & Chiu, Ching-Wai (Jeremy) & Duprey, Thibaut & Hoke, Sinem Hacioglu, "Systemic Financial Stress and Macroeconomic Amplifications in the United Kingdom", Oxford Bulletin of Economics and Statistics

Krohn, Ingomar & Sushko, Vladyslav, "FX spot and swap market liquidity spillovers", Journal of International Money and Finance

STAFF WORKING PAPERS

Brunner, Felix & Hipp, Ruben, "Estimating Large-Dimensional Connectedness Tables: The Great Moderation Through the Lens of Sectoral Spillovers", Bank of Canada Staff Working Paper 2021-37

Kuncl, Martin & Ueberfeldt, Alexander, "Monetary Policy and the Persistent Aggregate Effects of Wealth Redistribution", Bank of Canada Staff Working Paper 2021-38

Allen, Jason & Wittwer, Milena, "Centralizing Over-the-Counter Markets?", Bank of Canada Staff Working Paper 2021-39

Jin, Haofeng & Lu, Zhentong, "Measuring the Effectiveness of Salespeople: Evidence from a Cold-Drink Market", Bank of Canada Staff Working Paper 2021-40

Hanson, Madeline & Hauser, Daniela & Priftis, Romanos, "Fiscal Spillovers: The Case of US Corporate and Personal Income Taxes", Bank of Canada Staff Working Paper 2021-41

STAFF DISCUSSION PAPERS

Dorich, José & Mendes, Rhys R. & Zhang, Yang, "The Bank of Canada's "Horse Race" of Alternative Monetary Policy Frameworks: Some Interim Results from Model Simulations", Bank of Canada Staff Discussion Paper 2021-13

ABSTRACTS

State Correlation and Forecasting: A Bayesian Approach Using Unobserved Components Models

Implications for signal extraction from specifying unobserved components (UC) models with correlated or orthogonal innovations have been well investigated. In contrast, the forecasting implications of specifying UC models with different state correlation structures are less well understood. This paper attempts to address this gap in light of the recent resurgence of studies adopting UC models for forecasting purposes. Four correlation structures for errors are entertained: orthogonal, correlated, perfectly correlated innovations, and a new approach that combines features from two contrasting cases, namely, orthogonal and perfectly correlated innovations. Parameter space restrictions associated with different correlation structures and their connection with forecasting are discussed within a Bayesian framework. As perfectly correlated innovations reduce the covariance matrix rank, a Markov Chain Monte Carlo sampler, which builds upon properties of Toeplitz matrices and recent advances in precision-based algorithms, is developed. Our results for several measures of U.S. inflation indicate that the correlation structure between state variables has important implications for forecasting performance as well as estimates of trend inflation.

Artificial Intelligence and Systemic Risk

Artificial intelligence (AI) is rapidly changing how the financial system is operated, taking over core functions for both cost savings and operational efficiency reasons. AI will assist both risk managers and the financial authorities. However, it can destabilize the financial system, creating new tail risks and amplifying existing ones due to procyclicality, unknown-unknowns, the need for trust, and optimization against the system.

Systemic Financial Stress and Macroeconomic Amplifications in the United Kingdom

In this paper we develop an index to monitor the intensity of financial stress in the UK over a period of 45 years. By aggregating various market-based indicators of financial stress from six major markets, we allow each indicator to be assessed in terms of its systemic importance. This enables the index to capture the interconnectedness of financial markets. The index successfully captures three episodes of heightened stress in UK financial history. We also attempt to determine how much a financial shock to the UK economy is amplified in a period of stress vis-à-vis a tranquil period. It involves exploring the dynamic relationship of the index with the UK real economy by two specifications of threshold vector auto-regression models. We find empirical evidence for the existence of feedback loops in the shock propagation between the real and the financial sector in the United Kingdom.

FX spot and swap market liquidity spillovers

We study the joint evolution of foreign exchange (FX) spot and swap market liquidity. Trading in FX swaps exceeds that of spot, yet this market segment has been largely ignored in prior research on FX market liquidity. We find strong co-movement in spot and swap market liquidity conditions and a robust link between FX funding and market liquidity, as gleaned from the pricing of both instruments. This link has strengthened over time with changes in dealers' market participation. Some of the largest dealers periodically pull back from pricing FX swaps and wider spreads attract smaller dealers. At the same time, liquidity in FX swaps remains impaired, which leads to illiquidity spillovers to the spot market. Our findings suggest that funding liquidity has become a more important driver of spot market liquidity than it used to be.

Estimating Large-Dimensional Connectedness Tables: The Great Moderation Through the Lens of Sectoral Spillovers

We estimate sectoral spillovers around the Great Moderation with the help of forecast error variance decomposition tables. Obtaining such tables in high dimensions is challenging since they are functions of the estimated vector autoregressive coefficients and the residual covariance matrix. In a simulation study, we compare various regularization methods for both and conduct a comprehensive analysis of their performance. We show that standard estimators of large connectedness tables lead to biased results and high estimation uncertainty, which can both be mitigated by regularization. To explore possible causes for the Great Moderation, we apply a cross-validated estimator on sectoral spillovers of industrial production in the US from 1972 to 2007. We find that a handful of sectors considerably decreased their outgoing links, which hints at a complimentary explanation for the Great Moderation.

Monetary Policy and the Persistent Aggregate Effects of Wealth Redistribution

We identify a sizable wealth redistribution channel which creates a monetary policy trade-off whereby short-term economic stimulus is followed by persistently lower output over the medium term. This trade-off is stronger in economies with more nominal household debt but weakened by a more aggressive monetary policy stance and under price-level targeting. Given this trade-off, low-for-long episodes can lead to persistently depressed output. The medium-term implications of the wealth redistribution channel rely on the presence of labor supply heterogeneity, which we show both analytically and in the context of an estimated New Keynesian general equilibrium model with household heterogeneity.

Centralizing Over-the-Counter Markets?

In traditional over-the-counter (OTC) markets, investors trade bilaterally through intermediaries referred to as dealers. An important regulatory question is whether to centralize OTC markets by shifting trades onto centralized platforms. We address this question in the context of the liquid Canadian government bond market. We document that dealers charge markups even in this market and show that there is a price gap between large investors who have access to a centralized platform and small investors who do not. We specify a model to quantify how much of this price gap is due to platform access and assess welfare effects. The model predicts that not all investors would use the platform even if platform access were universal. Nevertheless, the price gap would close by 32%–47%. Welfare would increase by 9%–30% because more trades are conducted by dealers who have high values to trade.

Measuring the Effectiveness of Salespeople: Evidence from a Cold-Drink Market

Salespeople are widely employed in many industries and are perceived as an effective marketing strategy. However, due to lack of field data, direct empirical evidence on the effectiveness of salespeople is scarce. In this paper, leveraging a unique retail sales data set from a leading Chinese cold-drink manufacturer and information on its implemented salespeople assignment rule, we measure the causal effect of salespeople on product revenue. Our estimation strategy features a non-linear control function approach to address the endogeneity problem in salespeople assignment by exploiting the manufacturer’s internal allocation rules. Our results show that the marginal effect of the first salesperson is 16.2 percent and that of the second is 10.6 percent. We provide some evidence on the incentive issues caused by the manufacturer's compensation plan as a possible explanation for the decreasing effect of an additional salesperson.

Fiscal Spillovers: The Case of US Corporate and Personal Income Taxes

This paper extends the identification of unanticipated changes in average federal corporate and personal income tax rates in the United States, as proposed in Mertens and Ravn (2013), to the end of 2019, and assesses their propagation to economies with tight links to the US economy. While cuts in both taxes lead to significant short-run expansions in the US economy, their spillover effects on other countries differ markedly. A cut in corporate taxes can produce negative spillovers, indicating that the contractionary effects associated to the reallocation of investment and jobs by multinational firms outweigh the potential positive effects of increased demand for country-specific goods through trade with the US. The spillover effects of lower personal income taxes are more heterogeneous across countries but are, on average, expansionary, depending on the country-specific monetary policy stance.

The Bank of Canada's "Horse Race" of Alternative Monetary Policy Frameworks: Some Interim Results from Model Simulations

Since 1991, the Bank of Canada has had an inflation-targeting (IT) framework established by a joint agreement between the Bank and the Government of Canada. The framework is reviewed every five years as part of the process for renewing the inflation-control agreement. This discussion paper summarizes some interim results from Bank staff analysis done for the August 2020 workshop, "Towards the 2021 Renewal of the Bank of Canada's Monetary Policy Framework." The Bank will publish updated analysis later in 2021. The core of the current framework—the 2 percent inflation target—has remained unchanged since 1995. This fact reflects its success. Well-anchored inflation expectations contribute to macroeconomic stability while leaving monetary policy with greater flexibility. The 2021 renewal highlights two key challenges facing Canadian monetary policy: (1) the low neutral rate of interest; and (2) the low interest rates associated with a low neutral rate that may encourage excessive risk taking and debt accumulation To address these challenges, Bank staff are running a “horse race” of alternative monetary policy frameworks (i.e., alternatives to the 2 percent IT framework). Their work evaluates these alternatives using a broad range of qualitative and quantitative criteria and focuses on the macroeconomic performance of the alternative frameworks. The interim results we report in this discussion paper suggest overall that no framework dominates on all margins. As a result, the ranking depends on the relative weight placed on different criteria.

UPCOMING EVENTS

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

Robert Jonhson (University of Notre Dame)
Organizer: INT/CEA EFR Seminar Series
Date: 10 September 2021

Klaus-Peter Hellwig (IMF)
Organizer: INT Research Discussion Space
Date: 21 September 2021

Matthew O. Jackson (Stanford University)
Organizer: FMD / FSD EFR Seminar Series
Date: 23 September 2021

Sarah Zubairy (Texas A&M University)
Organizer: FMD / FSD EFR Seminar Series
Date: 1 October 2021

Stefano Battiston (University of Zurich)
Organizer: FMD / FSD EFR Seminar Series
Date: 7 October 2021

Florin Bilbiie (University of Lausanne)
Organizer: EFR CEA/INT Seminar Series
Date: 8 October 2021

Walker Ray (London School of Economics)
Organizer: FMD / FSD EFR Seminar Series
Date: 14 October 2021

Jose Montiel Olea (Columbia University)
Organizer: EFR CEA/INT Seminar Series
Date: 15 October 2021

Corina Boar (New York University)
Organizer: FMD / FSD EFR Seminar Series
Date: 21 October 2021