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Bank of Canada
Monthly Research Update

March 2018

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

Bruneau, Gabriel & Christensen, Ian & Meh, Césaire, "Housing Market Dynamics and Macroprudential Policies", Canadian Journal of Economics

Feunou, Bruno & Okou, Cédric, "Risk-Neutral Moment-Based Estimation of Affine Option Pricing Models", Journal of Applied Econometrics

Zhu, Yu, "A Note on Simple Strategic Bargaining for Models of Money or Credit", Journal of Money, Credit, and Banking

STAFF WORKING PAPERS

Alexander, Patrick & Poirier, Louis, "Did U.S. Consumers Respond to the 2014 - 2015 Oil Price Shock? Evidence from the Consumer Expenditure Survey", Bank of Canada Staff Working Paper 2018-13

Bailliu, Jeannine & Han, Xinfen & Kruger, Mark & Liu, Yu-Hsien & Thanabalasingam, Sri, "Can Media and Text Analytics Provide Insights into Labour Market Conditions in China?", Bank of Canada Staff Working Paper 2018-12

Hohberger, Stefan & Priftis, Romanos & Vogel, Lukas, "The Macroeconomic Effects of Quantitative Easing in the Euro Area: Evidence from an Estimated DSGE Model", Bank of Canada Staff Working Paper 2018-11

Pichette, Lise & Robitaille, Marie-Noëlle & Salameh, Mohanad & St-Amant, Pierre, "Dismiss the Gap? A Real-Time Assessment of the Usefulness of Canadian Output Gaps in Forecasting Inflation", Bank of Canada Staff Working Paper 2018-10

St-Amant, Pierre & Tessier, David, "Firm Dynamics and Multifactor Productivity: An Empirical Exploration", Bank of Canada Staff Working Paper 2018-15

Uzeda, Luis, "State Correlation and Forecasting: A Bayesian Approach Using Unobserved Components Models", Bank of Canada Staff Working Paper 2018-14

STAFF DISCUSSION PAPERS

Ahnert, Toni & Forbes, Kristin & Friedrich, Christian & Reinhardt, Dennis, "Macroprudential FX Regulations: Shifting the Snowbanks of FX Vulnerability?", Centre for Economic Policy Research Discussion Paper 12766

ABSTRACTS

Housing Market Dynamics and Macroprudential Policies

In this paper, we analyze the implications of macroprudential and monetary policies for credit cycles, housing market stability and spillovers to consumption. We consider a countercyclical loan-to-value (LTV) policy that responds to a credit-to-income ratio, and we compare its effectiveness with a permanent tightening of the LTV ratio and a monetary policy rule that responds to credit. To this end, we construct a dynamic stochastic general equilibrium model with housing, household debt and collateral constraints, and we estimate it with Canadian data using Bayesian methods. Our study suggests that a countercyclical LTV ratio is a useful policy to reduce spillovers from the housing market into consumption and to lean against housing boom-bust cycles. It performs better than the permanent tightening of the LTV ratio - a policy that has been used in a number of countries - and the monetary policy rule, both in terms of the stabilization of household indebtedness and spillovers into consumption. Monetary policy that leans against the wind is the least desirable due to its large adverse consequences on the real economy.

Risk-Neutral Moment-Based Estimation of Affine Option Pricing Models

This paper provides a novel methodology for estimating option pricing models based on risk-neutral moments. We synthesize the distribution extracted from a panel of option prices and exploit linear relationships between risk-neutral cumulants and latent factors within the continuous time affine stochastic volatility framework. We find that fitting the Andersen, Fusari, and Todorov (2015b) option valuation model to risk-neutral moments captures the bulk of the information in option prices. Our estimation strategy is effective, easy to implement, and robust, as it allows for a direct linear filtering of the latent factors and a quasi-maximum likelihood estimation of model parameters. From a practical perspective, employing risk-neutral moments instead of option prices also helps circumvent several sources of numerical errors and substantially lessens the computational burden inherent in working with a large panel of option contracts.

A Note on Simple Strategic Bargaining for Models of Money or Credit

Many papers on liquidity have bilateral trade with buyers constrained by their money holdings or debt limits. Axiomatic bargaining, typically Nash, determines the terms of trade. However, there are reasons to prefer strategic bargaining. I analyze a bargaining game that is useful in models of liquidity. Advantages include: (1) It has simple microfoundations, both in and out of steady state. (2) It is more tractable than Nash, but the outcomes share interesting features. (3) The benchmark version is consistent with axiomatic approaches in the literature, while another version is not, but can still be used. (4) It is arguably realistic.

Did U.S. Consumers Respond to the 2014 - 2015 Oil Price Shock? Evidence from the Consumer Expenditure Survey

The impact of oil price shocks on the U.S. economy is a topic of considerable debate. In this paper, we examine the response of U.S. consumers to the 2014 - 2015 negative oil price shock using representative survey data from the Consumer Expenditure Survey. We propose a difference-in-difference identification strategy based on two factors, vehicle ownership and gasoline reliance, which generate variation in exposure to oil price shocks across consumers. Our findings suggest that exposed consumers significantly increased their spending relative to non-exposed consumers when oil prices fell, and that the average marginal propensity to consume out of gasoline

savings was above 1. Across products, we find that consumers increased spending especially on transportation goods and non-essential items.

Can Media and Text Analytics Provide Insights into Labour Market Conditions in China?

The official Chinese labour market indicators have been seen as problematic, given their small cyclical movement and their only-partial capture of the labour force. In our paper, we build a monthly Chinese labour market conditions index (LMCI) using text analytics applied to mainland Chinese-language newspapers over the period from 2003 to 2017. We use a supervised machine learning approach by training a support vector machine classification model. The information content and the forecast ability of our LMCI are tested against official labour market activity measures in wage and credit growth estimations. Surprisingly, one of our findings is that the much-maligned official labour market indicators do contain information. However, their information content is not robust and, in many cases, our LMCI can provide forecasts that are significantly superior. Moreover, regional disaggregation of the LMCI illustrates that labour conditions in the export-oriented coastal region are sensitive to export growth, while those in inland regions are not. This suggests that text analytics can, indeed, be used to extract useful labour market information from Chinese newspaper articles.

The Macroeconomic Effects of Quantitative Easing in the Euro Area: Evidence from an Estimated DSGE Model

This paper estimates an open-economy dynamic stochastic general equilibrium model with Bayesian techniques to analyse the macroeconomic effects of the European Central Bank's (ECB's) quantitative easing (QE) programme. Using data on government debt stocks and yields across maturities, we identify the parameter governing portfolio adjustment in the private sector. Shock decompositions suggest a positive contribution of ECB QE to annual euro area output growth and inflation in 2015-16 of up to 0.3 and 0.6 percentage points (pp) in the linearised version of the model. Allowing for an occasionally binding zero-bound constraint by using piecewise linear solution techniques raises the positive impact to up to 0.7 and 0.8 pp.

Dismiss the Gap? A Real-Time Assessment of the Usefulness of Canadian Output Gaps in Forecasting Inflation

We use a new real-time database for Canada to study various output gap measures. This includes recently developed measures based on models incorporating many variables as inputs (and therefore requiring real-time data for many variables). We analyze output gap revisions and assess the usefulness of these gaps in forecasting total CPI inflation and three newly developed measures of core CPI inflation: CPI-median, CPI-trim and CPI-common. We also study whether labour-input gaps, projected output gaps, and simple combinations of output gaps can add useful information for forecasting inflation. We find that estimates of excess capacity (the extent to which the economy is below potential) were probably too large around the 2008-2009 recession, as they subsequently tended to be revised down. In addition, we find that, when forecasting CPI-common and CPI-trim, some gaps appear to provide information that reduces forecast errors when compared with models that use only lags of inflation. However, forecast improvements are rarely statistically significant. In addition, we find little evidence of the usefulness of output gaps for forecasting inflation measured by total CPI and CPI-median.

Firm Dynamics and Multifactor Productivity: An Empirical Exploration

There are indications that business dynamism has declined in advanced economies. In particular, firm entry and exit rates have fallen, suggesting that the creative destruction process has lost some of its vitality. Meanwhile, productivity growth has slowed. Some believe that lower entry and exit rates partly explain the weaker productivity growth. However, the evidence supporting, or invalidating, this view is scarce. In the present paper, we use multi-horizon causality tests and dynamic simulations with Canadian and US data to examine the following question: Do changes to entry and exit rates provide information about, or Granger-cause, future productivity? We do not find significant evidence that entry rates Granger-cause productivity. But we do find evidence that productivity causes entry rates. Using small models with economy-wide data (but not at the sectoral level), we find some evidence that exit rates cause productivity in both countries. This suggests that the decline in productivity growth is partly caused by a decline in the productivity-based exit selection process. However, when other variables, such as measures of the business cycle and the real effective exchange rate,

are controlled for, the significance of exit rates in explaining productivity tends to fall. Specifically, business-cycle measures appear to cause both productivity and the exit rate. This suggests that firm dynamics are an intermediate, not an ultimate, cause of productivity growth.

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.

Macroprudential FX Regulations: Shifting the Snowbanks of FX Vulnerability?

Can macroprudential foreign exchange (FX) regulations on banks reduce the financial and macroeconomic vulnerabilities created by borrowing in foreign currency? To evaluate the effectiveness and unintended consequences of macroprudential FX regulation, we develop a parsimonious model of bank and market lending in domestic and foreign currency and derive four predictions. We confirm these predictions using a rich dataset of macroprudential FX regulations. These empirical tests show that FX regulations: (1) are effective in terms of reducing borrowing in foreign currency by banks; (2) have the unintended consequence of simultaneously causing firms to increase FX debt issuance; (3) reduce the sensitivity of banks to exchange rate movements, but (4) are less effective at reducing the sensitivity of corporates and the broader financial market to

exchange rate movements. As a result, FX regulations on banks appear to be successful in mitigating the vulnerability of banks to exchange rate movements and the global financial cycle, but partially shift the snowbank of FX vulnerability to other sectors.

UPCOMING EVENTS

Giorgio Primiceri (Northwestern University), 20 April 2018
Organizer: Joel Wagner (CEA)

Regis Barnichon (Federal Reserve Bank of San Francisco), 18 May 2018
Organizer: Julien Champagne (CEA)

Fernanda Nechio (Federal Reserve Bank of San Francisco), 25 May 2018
Organizer: Anthony Landry (CEA)

Martin Ellison (University of Oxford), 15 June 2018
Organizer: Daniela Hauser (CEA), INT

Matthias Kehrig (Duke University), 21 September 2018
Organizer: Dmitry Matveev (CEA)