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Bank of Canada Monthly Research Update

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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

Allen, Jason, James Chapman, Federico Echenique & Matthew Shum, "Efficiency and Bargaining Power in the Interbank Loan Market", International Economic Review, May 2016, Volume 57, Issue 2,Pages 691-716

Cociuba, Simona, Malik Shukayev & Alexander Ueberfeldt, "Collateralized borrowing and risk taking at low interest rates", European Economic Review, June 2016, Volume 85,Pages 62-83

Ehrmann, Michael & David-Jan Jansen, "It Hurts (Stock Prices) When Your Team is About to Lose a Soccer Match", Review of Finance (2016), Volume 20, Issue 3, Pages 1215-1233

Kyui, Natalia, "Expansion of higher education, employment and wages: Evidence from the Russian Transition", Labour Economics, April 2016, Volume 39, Pages 68-87

Forthcoming

Chen, Heng, Marie-Hélène Felt & Kim P. Huynh, "Retail Payment Innovations and Cash Usage: Accounting for Attrition Using Refreshment Samples", Journal of the Royal Statistical Society

Ehrmann, Michael, Damjan Pfajfar & Emiliano Santoro, "Consumers' Attitudes and their Inflation Expectations", International Journal of Central Banking

Gnocchi, Stefano, Daniela Hauser & Evi Pappa "Housework and fiscal expansions", Journal of Monetary Economics

Suvankulov, Farrukh "Revisiting National Border Effects in Foreign Trade in Goods of Canadian Provinces", The Journal of International Trade & Economic Development

STAFF WORKING PAPERS

Ahnert, Toni, Kartik Anand, Prasanna Gai & James Chapman, "Asset Encumbrance, Bank Funding and Financial Fragility", Bank of Canada Staff Working Paper 2016-16

Ahnert, Toni & Benjamin Nelson, "Opaque Assets and Rollover Risk", Bank of Canada Staff Working Paper 2016-17

Alpanda, Sami & Alexander Ueberfeldt, "Should Monetary Policy Lean Against Housing Market Booms?", Bank of Canada Staff Working Paper 2016-19

Bailliu, Jeannine, Mark Kruger, Argyn Toktamyssov & Wheaton Welbourn, "How Fast Can China Grow? The Middle Kingdom's Prospects to 2030",Bank of Canada Staff Working Paper 2016-15

Baumeister, Christiane & Lutz Kilian, "A General Approach to Recovering Market Expectations from Futures Prices with an Application to Crude Oil", Bank of Canada Staff Working Paper 2016-18

Garriott, Corey & Adrian Walton, "Retail Order Flow Segmentation", Bank of Canada Staff Working Paper 2016-20

Kruger, Mark & Gurnain Pasricha, "What to Expect When China Liberalizes Its Capital Account", Bank of Canada Staff Discussion Paper 2016-10

Li, Fuchun & Hongyu Xiao, "Early Warning of Financial Stress Events: A Credit-Regime-Switching Approach", Bank of Canada Staff Working Paper 2016-21

ABSTRACTS

Efficiency and Bargaining Power in the Interbank Loan Market

Using detailed transactions-level data on interbank loans, we examine the efficiency of an overnight interbank lending market and the bargaining power of its participants. Our analysis relies on the equilibrium concept of the *core*, which imposes a set of no-arbitrage conditions on trades in the market. For Canada's *Large Value Transfer System*, we show that although the market is fairly efficient, systemic inefficiency persists throughout our sample. The level of inefficiency matches distinct phases of both the Bank of Canada's operations as well as phases of the 2007–8 financial crisis. We find that bargaining power tilted sharply toward borrowers as the financial crisis progressed and (surprisingly) toward riskier borrowers.

Collateralized borrowing and risk taking at low interest rates

Empirical evidence suggests financial intermediaries increase risky investments when interest rates are low. We develop a model consistent with this observation and ask whether the risks undertaken exceed the social optimum. Interest rate policy affects risk taking in the model through two opposing channels. First, low policy rates make riskier assets more attractive than safe bonds. Second, low policy rates reduce the amount of safe bonds available for collateralized borrowing in interbank markets. The calibrated model features excessive risk taking at the optimal policy. However, at low

policy rates, collateral constraints tighten and risk taking does not exceed the social optimum.

Retail Payment Innovations and Cash Usage: Accounting for Attrition Using Refreshment Samples

Contactless credit cards and stored-value cards are touted as a fast and convenient method of payment to replace cash at the point-of-sale. Cross-sectional approaches find a large impact of these retail payment innovations on cash usage (around 10 percent). Using a semiparametric panel model that accounts for unobserved heterogeneity and general forms of attrition, we find no significant impact for contactless credit cards and only a 2 percent reduction in cash usage stemming from single-purpose stored-value cards. These results point to the uneven pace of payment innovation diffusion.

It Hurts (Stock Prices) When Your Team is About to Lose a Soccer Match

The end result of major sporting events has been shown to affect next day stock returns through shifts in investor mood. By studying intraday data during the soccer matches that led to the elimination of France and Italy from the 2010 FIFA World Cup, we test whether mood-related pricing effects already materialize as events unfold. We use data for a cross-listed firm, which allows for a straightforward identification of underpricing. During the matches, the firm's stock is underpriced by up to 7 basis points in the country that eventually loses. The probability of underpricing increases as elimination becomes more likely.

Expansion of higher education, employment and wages: Evidence from the Russian Transition

This paper analyzes the effects of an educational system expansion on labor market outcomes, drawing upon a 15-year natural experiment in the Russian Federation. Regional increases in student intake capacities in Russian universities, a result of educational reforms, provide a plausibly exogenous variation in access to higher education. Additionally, the gradual nature of this expansion allows for estimation of heterogeneous returns to education for individuals who successfully took advantage of increasing educational opportunities. Using simultaneous equation models and a non-parametric model with essential heterogeneity, the paper identifies strong positive returns to education in terms of employment and wages. Moreover, marginal returns to higher education are estimated to decline for lower levels of individual unobserved characteristics that positively influence higher education attainment. Finally, the returns to higher education are found to decrease for those who, as a result of the reforms, increasingly pursued higher education.

Consumers' Attitudes and their Inflation Expectations

This paper studies consumers' inflation expectations using micro-level data from the University of Michigan's Surveys of Consumers. It shows that beyond the well-established socio-economic factors such as income, age or gender, inflation expectations are also related to respondents' financial situation, their purchasing attitudes and their expectations about the macroeconomy. Respondents with current or expected financial difficulties and those with pessimistic attitudes about major purchases, income developments or unemployment have a stronger upward bias than other households. However, their bias shrinks by more than that of the average household in response to increasing media reporting about inflation.

Housework and fiscal expansions

In an otherwise-standard business cycle model with housework, calibrated consistently with data on time use, we discipline complementarity between consumption and hours worked and relate its strength to the size of fiscal multipliers. Evidence on the substitutability between home and market goods confirms that complementarity is an empirically relevant driver of fiscal multipliers. However, in a housework model substantial complementarity can be generated without imposing a low wealth effect, which contradicts the microeconomic evidence. Also, explicitly modeling housework matters for assessing the welfare effects of government spending, which are understated by theories that neglect substitutability between home-produced and market goods.

Revisiting National Border Effects in Foreign Trade in Goods of Canadian Provinces

A significant body of empirical studies demonstrates sizable national border effects in foreign trade of Canadian provinces throughout the 1980s and 1990s. This paper revisits and expands the scope of the border effects analysis by estimating the border effect in trade with U.S. states as well as countries in the European Union (EU) and the G-20 using more recent data from 2001–10. Furthermore, we perform the Blinder-Oaxaca nonlinear decomposition (Bauer and Sinning, 2008) to decompose the border effects into various components, including the transaction costs, the tariff and non-tariff measures, and the unexplained component. Results from the Poisson pseudo-maximum likelihood model show that, compared to existing estimates from the 1980s and 1990s, the size of the border effect in trade between Canadian provinces and U.S. states has declined. The border effects for Canada–EU and Canada–G-20 bilateral trade flows sit at somewhat elevated levels. About a third of the border effects in overall trade with EU and G-20 countries can be attributed to the variables related to transaction costs in foreign trade. While the significance of tariffs has declined, the prevalence of non-tariff measures seems to be on a rise. That said, we find that the welfare-changing measures combined—tariff and non-tariff measures—play a limited role in explaining the border effects in comparison with the role of transaction costs and the unexplained component.

Asset Encumbrance, Bank Funding and Financial Fragility

How does asset encumbrance affect the fragility of intermediaries subject to rollover risk? We offer a model in which a bank issues covered bonds backed by a pool of assets that is bankruptcy remote and replenished following losses. Encumbering assets allows a bank to raise cheap secured debt and expand profitable investment, but it also concentrates risk on unsecured debt and thus exacerbates fragility and raises unsecured funding costs. Deposit insurance or wholesale funding guarantees induce excessive encumbrance and fragility. To mitigate such risk shifting, we study prudential regulatory tools, including limits on encumbrance, minimum capital requirements and surcharges for encumbrance.

Opaque Assets and Rollover Risk

We model the asset-opacity choice of an intermediary subject to rollover risk in wholesale funding markets. Greater opacity means investors form more dispersed beliefs about an intermediary’s profitability. The endogenous benefit of opacity is lower fragility when profitability is expected to be high. However, the endogenous cost of opacity is a “partial run,” whereby some investors receive bad private signals about profitability and run, even though the intermediary is solvent. We find that intermediaries choose to be transparent (opaque) when expected profitability is low (high). Intermediaries with less-volatile profitability are also more likely to choose to be opaque.

Should Monetary Policy Lean Against Housing Market Booms?

Should monetary policy lean against housing market booms? We approach this question using a small-scale, regime-switching New Keynesian model, where housing market crashes arrive with a logit probability that depends on the level of household debt. This crisis regime is characterized by an elevated risk premium on mortgage lending rates, and, occasionally, a binding zero lower bound on the policy rate, imposing large costs on the economy. Using our set-up, we examine the optimal level of monetary leaning, introduced as a Taylor rule response coefficient on the household debt gap. We find that the costs of leaning in regular times outweigh the benefits of a lower crisis probability. Although the decline in the crisis probability reduces volatility in the economy, this is achieved by lowering the average level of debt, which severely hurts borrowers and leads to a decline in overall welfare.

How Fast Can China Grow? The Middle Kingdom's Prospects to 2030

Given its size and importance for global commodity markets, the question of how fast the Chinese economy can grow over the medium term is an important one. This paper addresses this question by examining the evolution of the supply side of the Chinese economy over history and projecting how it will evolve over the next 15 years. Using a Cobb-Douglas production function, we decompose the growth of trend GDP into those of the capital stock, labour, human capital and total factor productivity (TFP) and then forecast trend output growth out to 2030 using a bottom-up approach based on forecasts that we build for each one of these factors. Our paper distinguishes itself from existing work in that we construct a forecast of Chinese TFP growth based on the aggregation of forecasts of its key determinants. Moreover, our analysis is based on a carefully constructed estimate of the Chinese productive capital stock and a measure of human capital – based on Chinese wage survey data – that better reflects the returns to education in China. Our results suggest that Chinese trend output growth will decelerate from around 7% currently to about 5% by 2030, and are consistent with a gradual rebalancing of the Chinese economy characterized by a decline in the investment rate.

A General Approach to Recovering Market Expectations from Futures Prices with an Application to Crude Oil

Futures markets are a potentially valuable source of information about price expectations. Exploiting this information has proved difficult in practice, because time-varying risk premia often render the futures price a poor measure of the market expectation of the price of the underlying asset. Although this expectation in principle may be recovered by adjusting the futures price by the estimated risk premium, a common problem is that there are as many measures of the market expectation as there are estimates of the risk premium. We propose a general solution to this problem that allows us to select the most accurate estimate of the expectation for any set of risk premium estimates. We illustrate this approach by solving the long-standing problem of how to estimate the market expectation of the price of crude oil. We provide a new measure of oil price expectations that is substantially more accurate than the alternatives and more economically plausible. Our analysis has implications for the estimation of economic models of energy-intensive durables, for oil price forecasting and for the measurement of oil price shocks.

Retail Order Flow Segmentation

In August 2012, the New York Stock Exchange launched the Retail Liquidity Program (RLP), a trading facility that enables participating organizations to quote dark limit orders executable only by retail traders. A Hasbrouck (1991) structural vector autoregression shows that the facility increased the information content of the order flow by distinguishing retail trades from relatively more informed trades. A differences-in-differences event study finds that the RLP launch impacted market quality. Stocks with substantial RLP activity experienced mildly improved relative bid-ask spreads, effective spreads, price impacts and return autocorrelations in both the RLP and non-RLP segments.

What to Expect When China Liberalizes Its Capital Account

When China joined the World Trade Organization in December 2001, it marked a watershed for the world economy. Ten years from now, the opening of China’s capital account and the financial integration that will unfold will be viewed as a milestone of similar importance. This paper discusses the benefits, to China and the rest of the world, of deepening China’s capital account liberalization. We assess China’s current level of de jure and de facto integration, in relation to other G20 economies. We update the Pasricha et al. (2015) data on capital control actions to 2015 for China, to assess China's international financial integration. We also look at its relative international investment position to gauge its de facto integration. We then estimate the size and composition of capital flows likely to ensue assuming that China's further capital account liberalization results in its gross international investment position converging to that of the G20 average. In addition, we discuss the risks involved with the further opening of China's capital account and how they can best be managed. We also emphasize the potentially stabilizing effects of residents' flows and the importance of liberalizing inflows and outflows in a balanced way and at the same time.

Early Warning of Financial Stress Events: A Credit-Regime-Switching Approach

We propose an early warning model for predicting the likelihood of a financial stress event for a given future time, and examine whether credit plays an important role in the model as a non-linear propagator of shocks. This propagation takes the form of a threshold regression in which a regime change occurs if credit conditions cross a critical threshold. The in-sample and out-of-sample forecasting performances are encouraging. In particular, the out-of-sample forecasting results suggest that the model based on the credit-regime-switching approach outperforms the benchmark models based on a linear regression and signal extraction approach across all forecasting horizons and all criteria considered.