BANK OF CANADA
BANQUE DU CANADA

Bank of Canada
Monthly Research Update

May 2016

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

Ho, Anson T.Y., Kim P. Huynh & David T. Jacho-Chávez, "Flexible Estimation of Copulas: An Application to the US Housing Crisis", Journal of Applied Econometrics, May 2016, Volume 31, Issue 3, Pages 603-610

Witmer, Jonathan, "Does the buck stop here? A comparison of withdrawals from money market mutual funds with floating and constant share prices", Journal of Banking & Finance, May 2016, Volume 66, Pages 126-142

Wong, Tsz-Nga, "Monetary exchange and the irreducible cost of inflation", Journal of Economic Theory, July 2016, Volume 164, Pages 218-229

Forthcoming

Huynh, Kim P., David T. Jacho-Chávez & Alexander Lundberg, "Income and Democracy: A Smooth Varying Coefficient Redux", Journal of Applied Econometrics

Haeringer, Guillaume & Hanna Halaburda, "Monotone Strategyproofness", Games and Economic Behavior

Wakamori, Naoki & Angelika Welte, "Why Do Shoppers Use Cash? Evidence from Shopping Diary Data", Journal of Money, Credit and Banking

Welte, Angelika, "Wait a Minute: The Efficacy of Discounting versus Non-Pecuniary Payment Steering", Journal of Financial Market Infrastructures

STAFF WORKING PAPERS

Allen, Jason & Kiana Basiri, "The Impact of Bankruptcy Reform on Insolvency Choice and Consumer Credit", Bank of Canada Staff Working Paper 2016-26

Damar, H. Evren & Miguel Molico, "On the Nexus of Monetary Policy and Financial Stability: Effectiveness of Macroprudential Tools in Building Resilience and Mitigating Financial Imbalances", Bank of Canada Staff Discussion Paper 2016-11

Ferrara, Laurent & Pierre Guérin, "What Are the Macroeconomic Effects of High-Frequency Uncertainty Shocks", Bank of Canada Staff Working Paper 2016-25

Grundl, Serafin & Yu Zhu, "Identification and Estimation of Risk Aversion in First-Price Auctions with Unobserved Auction Heterogeneity", Bank of Canada Staff Working Paper 2016-23

Ho, Anson T. Y. & Jie Zhou, "Housing and Tax-Deferred Retirement Accounts", Bank of Canada Staff Working Paper 2016-24

Januska, Michael & Patricia Palhau Mora, "On the Nexus of Monetary Policy and Financial Stability: Is the Financial System More Resilient?", Bank of Canada Staff Discussion Paper 2016-12

Van Oordt, Maarten & Chen Zhou, "Estimating Systematic Risk Under Extremely Adverse Market Conditions", Bank of Canada Staff Working Paper 2016-22

ABSTRACTS

Flexible Estimation of Copulas: An Application to the US Housing Crisis

Zimmer ('The role of copulas in the housing crisis', *Review of Economics and Statistics* 2012; 94: 607–620) provides an interesting case study of the pitfalls of using parametric copulas to understand the US housing crisis in the latter part of 2000s. The original study by Zimmer (2012) employs a finite-mixture copula to illustrate that the symmetry of the Gaussian copula may not be tenable, especially for US housing price data during the time period from 1975:Q2 to 2009:Q1. We undertake a replication of his study in a wide sense. First, we replicate the study by incorporating revised data and then extending the dataset to include the most recent data. Second, we implement a nonparametric copula estimator recently proposed by Racine ('Mixed data kernel copulas', *Empirical Economics* forthcoming) to the parametrically filtered data used in Zimmer (2012). Our replication finds that the application of the nonparametric copula to the same and extended filtered data provides an alternative flexible specification for copulas. However, the overall cautionary message of the flexible-form copula espoused in Zimmer (2012) remains.

Does the buck stop here? A comparison of withdrawals from money market mutual funds with floating and constant share prices

Recent reform proposals call for an elimination of the constant net asset value (NAV) or “buck” in money market mutual funds to reduce the occurrence of runs. Outside the United States, there are several countries that have money market mutual funds with and without constant NAVs. Using daily data on individual fund flows from these countries, this paper evaluates whether the reliance on a constant NAV is associated with higher fund redemptions. The data suggest that funds with a constant NAV experienced more negative net flows during the period of the run on the Reserve Primary Fund, even after controlling for measures of fund risk and risk aversion. However, I do not find convincing support for the hypothesis that the effect of sponsor strength on fund flows was stronger for constant NAV money market funds.

Monetary exchange and the irreducible cost of inflation

This paper applies a mechanism design approach to construct a lower bound to the welfare cost of inflation that does not depend on quasi-linear preferences or details of how agents trade. An incentive-feasible trading protocol is derived to minimize the welfare loss subject to frictions rendering money essential. The welfare cost of inflation under this optimal protocol is the lower bound over all pairwise trading protocols of monetary exchange. In general, the first-best is *not* implementable, even under the Friedman's rule, patient agents and the optimal mechanism. Thus, the lower bound depends on fundamentals like preferences and technology. Finally, I estimate the irreducible cost of 10% inflation with the U.S. data from 1900 to 2000.

Income and Democracy: A Smooth Varying Coefficient Redux

Acemoglu et al., (`Income and democracy', American Economic Review 2008; 98: 808-842) find no effect of income on democracy when controlling for fixed effects in a dynamic panel model. Work by Moral- Benito and Bartolucci, (`Income and democracy: revisiting the evidence', Economics Letters 2012; 117: 844-847) and Cervellati et al., (`Income and democracy: comment', American Economic Review 2014; 104: 707-19) suggests that the original model might have been misspecified and propose alternative specifications instead. We formally test these parametric specifications by implementing Lee, (`Testing a linear dynamic panel data model against nonlinear alternatives', Journal of Econometrics 2014; 178: 146-166)'s dynamic panel test of linear functional forms against a general class of nonlinear alternatives robustly and reject all these specifications. However, using a more flexible model proposed by Cai and Li., (`Nonparametric estimation of varying coefficient dynamic panel data models', Econometric Theory 2008; 24: 1321-1342) we find that the relationship between income and democracy appears to be mediated by education, but results are not statistically significant.

Monotone Strategyproofness

We propose a way to compare the extent of preference misrepresentation between two strategies. We define a mechanism to be monotone strategyproof when declaring a ``more truthful'' preference ordering in the mechanism dominates--with respect to the true preferences--declaring a less truthful preference ordering. Our main result states that a mechanism is strategyproof if, and only if, it is monotone strategyproof. This result holds for any deterministic social choice function on any domain; for probabilistic social choice functions it holds under a mild assumption on the domain.

Why Do Shoppers Use Cash? Evidence from Shopping Diary Data

Recent studies find that cash remains a dominant payment choice for small-value transactions despite the prevalence of alternative means of payment such as debit and credit cards. For policy makers an important question is whether consumers truly prefer using cash or merchants restrict card usage. Using the Bank of Canada’s 2009 Method of Payment Survey, we estimate a generalized multinomial logit model of payment choices to extract individual heterogeneity (demand-side factors) while controlling for merchants’ acceptance of cards (supply-side factors). Based on a counterfactual exercise where we assume universal card acceptance among merchants, we find that some consumers would decrease their cash usage but the magnitude of this decrease is small. Our results imply that the use of cash in small-value transactions is driven mainly by consumers’ preferences.

Wait a Minute: The Efficacy of Discounting versus Non-Pecuniary Payment Steering

Merchants who accept credit cards face payment processing fees. In most countries, the no-surcharge rule prohibits them from using surcharges to pass these fees on to customers. However, merchants are allowed to steer consumers toward less costly payment methods by offering discounts or using non-pecuniary incentives such as convenience and speed. Drawing upon micro data from a survey of Canadian households, I estimate a discrete choice model of consumers' payment methods to establish merchant costs for both of these strategies. I find that, while discounts are unprofitable because they subsidize a large portion of consumers who are already using cash and debit cards, non-pecuniary steering can be an effective strategy for transactions above $25.

The Impact of Bankruptcy Reform on Insolvency Choice and Consumer Credit

We examine the impact of the 2009 amendments to the Canadian Bankruptcy and Insolvency Act on insolvency decisions. Rule changes steered debtors out of division I proposals and into the more cost-effective division II proposals. This also led to a significant substitution out of bankruptcies and into proposals. Using credit bureau data on credit card limits we test, but do not find, any evidence that this substitution into more creditor-friendly insolvencies had any impact on average lending behavior, either immediately following the amendments or up to six years removed.

On the Nexus of Monetary Policy and Financial Stability: Effectiveness of Macroprudential Tools in Building Resilience and Mitigating Financial Imbalances

This paper reviews the Canadian and international evidence of the effectiveness of macroprudential policy measures in building resilience and mitigating financial imbalances. The analysis concludes that these measures have broadly achieved their goal of increasing the overall resilience of the financial system to the buildup of imbalances and increasing the financial system's ability to withstand adverse shocks. However, evidence of their effectiveness in providing countercyclical stabilization by curbing credit growth ("leaning against the financial cycle") is limited. Among the different types of macroprudential measures, those that are "sectoral" in nature and/or those that target borrowers are most effective in leaning against the financial cycle. Overall, the observed effectiveness of macroprudential tools in addressing systemic risk implies that these policies can be complementary to monetary policy in achieving the goals of macroeconomic and financial stability.

What Are the Macroeconomic Effects of High-Frequency Uncertainty Shocks

This paper evaluates the effects of high-frequency uncertainty shocks on a set of low-frequency macroeconomic variables that are representative of the U.S. economy. Rather than estimating models at the same common low-frequency, we use recently developed econometric models, which allows us to deal with data of different sampling frequencies. We find that credit and labor market variables react the most to uncertainty shocks in that they exhibit a prolonged negative response to such shocks. When examining detailed investment sub-categories, our estimates suggest that the most irreversible investment projects are the most affected by uncertainty shocks. We also find that the responses of macroeconomic variables to uncertainty shocks are relatively similar across single- and mixed-frequency data models, suggesting that the temporal aggregation bias is not acute in this context.

Identification and Estimation of Risk Aversion in First-Price Auctions with Unobserved Auction Heterogeneity

This paper shows point identification in first-price auction models with risk aversion and unobserved auction heterogeneity by exploiting multiple bids from each auction and variation in the number of bidders. The required exclusion restriction is shown to be consistent with a large class of entry models. If the exclusion restriction is violated, but weaker restrictions hold instead, the same identification strategy still yields valid bounds for the primitives. We propose a sieve maximum likelihood estimator. A series of Monte Carlo experiments illustrate that the estimator performs well in finite samples and that ignoring unobserved auction heterogeneity can lead to a significant bias in risk-aversion estimates. In an application to U.S. Forest Service timber auctions we find that the bidders are risk neutral, but we would reject risk neutrality without accounting for unobserved auction heterogeneity.

Housing and Tax-Deferred Retirement Accounts

Assets in tax-deferred retirement accounts (TDA) and housing are two major components of household portfolios. In this paper, we develop a life-cycle model to examine the interaction between households’ use of TDA and their housing decisions. The model generates life-cycle patterns of home ownership and the composition of net worth that are broadly consistent with the data from the Survey of Consumer Finances. We find that TDA promotes home ownership, as households take advantage of the preferential tax treatments for *both* TDA and home ownership. They substitute TDA assets for home equity by accumulating wealth in TDA and making smaller down payments (taking out bigger mortgages); consequently, they become homeowners earlier in their lives. On the other hand, housing-related policies, such as a minimum down payment requirement and mortgage interest deductibility, affect households' housing decisions more than their use of TDA.

On the Nexus of Monetary Policy and Financial Stability: Is the Financial System More Resilient?

Monetary policy and financial stability are closely intertwined, and the resilience of the financial system carries weight in this relationship. This paper explores whether the financial system is more resilient as a result of the G20's post-crisis agenda for financial regulatory reform. It summarizes the agenda's key measures and implementation schedules, both internationally and in Canada, reviews the effectiveness of the reform measures in preventing and addressing financial imbalances, and outlines outstanding issues. It finds that, to date, there is evidence that the G20's reform measures are increasing financial system resilience globally, especially in the banking sector. Yet, implementation is still ongoing, and it may be too early to judge how the reform measures are interacting with one another. In Canada, the resilience of the financial system is being enhanced by the ongoing implementation of more-rigorous global regulatory and supervisory standards. Consequently, the likelihood and impact of severe financial stress in the future should be reduced, supporting the primary focus of monetary policy on achieving its 2 per cent inflation target.

Estimating Systematic Risk Under Extremely Adverse Market Conditions

This paper considers the problem of estimating a linear model between two heavy-tailed variables if the explanatory variable has an extremely low (or high) value. We propose an estimator for the model coefficient by exploiting the tail dependence between the two variables and prove its asymptotic properties. Simulations show that our estimation method yields a lower mean squared error than regressions conditional on tail observations. In an empirical application we illustrate the better performance of our approach relative to the conditional regression approach in projecting the losses of industry-specific stock portfolios in the event of a market crash.