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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 working papers published on the Bank of Canada's website.

PUBLISHED PAPERS

In Press

Forthcoming

Allen, Jason, Robert Clark and Jean-François Houde, “[The Effect of Mergers in Search Markets: Evidence from the Canadian Mortgage Industry](#)”, *American Economic Review*

Feunou, Bruno and Jean-Sébastien Fontaine, “[Non-Markov Gaussian Term Structure Models: The Case of Inflation](#)”, *Review of Finance*

Hagiu, Andrei and Hanna Halaburda, “[Information and Two-Sided Platform Profits](#)”, *International Journal of Industrial Organization*

Koenig, Philipp, Anand Kartik and Frank Heinemann, “[Guarantees, transparency and the interdependency between sovereign and bank default risk](#)”, *Journal of Banking and Finance*

WORKING PAPERS

Ahnert, Toni, “[Rollover risk, liquidity, and macro-prudential regulation](#)”, ECB Working Paper 1667

Ahnert, Toni and Christoph Bertsch, “[A wake-up call: information contagion and strategic uncertainty](#)”, Sveriges Riksbank Working Paper 282

Chiu, Jonathan and Tsz-Nga Wong, “[E-Money: Efficiency, Stability and Optimal Policy](#)”, Bank of Canada Working Paper 2014-16

Feunou, Bruno and Jean-Sébastien Fontaine, “[Bond Risk Premia and Gaussian Term Structure Models](#)”, Bank of Canada Working Paper 2014-13

Fung, Ben, Miguel Molico and Gerald Stuber, “[Electronic Money and Payments: Recent Developments and Issues](#)”, Bank of Canada Discussion Paper 2014-2

Raykov, Radoslav, “[Uncertain Costs and Vertical Differentiation in an Insurance Duopoly](#)”, Bank of Canada Working Paper 2014-14

Weber, Warren E., “[The Efficiency of Private E-Money-Like Systems: The U.S. Experience with State Bank Notes](#)”, Bank of Canada Working Paper 2014-15

ABSTRACTS

The Effect of Mergers in Search Markets: Evidence from the Canadian Mortgage Industry

We examine the relationship between concentration and price dispersion using variation induced by a merger in the Canadian mortgage market. Since interest rates are determined through a search and negotiation process, consolidation eliminates a potential negotiation partner, weakening consumers bargaining positions. We combine reduced-form techniques to estimate the mergers distributional impact, with a structural model to

measure market power across consumers with different search costs. Our results show that competition benefits only consumers at the bottom and middle of the transaction price distribution. Estimates from a search and negotiation model attribute these differences to the presence of large search frictions.

Non-Markov Gaussian Term Structure Models: The Case of Inflation

Standard Gaussian macro-finance term structure models impose the Markov property: the conditional mean is a function of the risk factors. We relax this assumption parsimoniously, and consider models where yields are linear in the conditional mean (but not in the risk factors). To illustrate, if inflation is one of the factors, then yields should span expected inflation but not inflation. We confirm that model forecasts match the out-of-sample accuracy of survey forecasts. Second, expected and surprise yield changes can have opposite contemporaneous effects on expected inflation. We confirm the difference empirically. Third, the inflation survey forecasts and the inflation rate can be used consistently within the state equation. These three features are inconsistent with the Markov assumption. Our results hold for the U.S. and for Canada, and the decomposition of nominal yields differs from that of the standard specification.

Information and Two-Sided Platform Profits

We study the effect of different levels of information on two-sided platform profits| under monopoly and competition. One side (developers) is always informed about all prices and therefore forms responsive expectations. In contrast, we allow the other side (users) to be uninformed about prices charged to developers and to hold passive expectations. We show that platforms with more market power (monopoly) prefer facing more informed users. In contrast, platforms with less market power (i.e., facing more intense competition) have the opposite preference: they derive higher profits when users are less informed. The main reason is that price information leads user expectations to be more responsive and therefore amplifies the effect of price reductions. Platforms with more market power benefit because higher responsiveness leads to demand increases, which they are able to capture fully. Competing platforms are affected negatively because more information intensifies price competition.

Guarantees, transparency and the interdependency between sovereign and bank default risk

Bank debt guarantees have traditionally been viewed as costless measures to prevent bank runs. However, as recent experiences in some European countries have demonstrated, guarantees may link the coordination problems of bank and sovereign creditors and induce a functional interdependence between the likelihoods of a government default and bank illiquidity. Employing a global-game approach, we model this link, showing the existence and uniqueness of the joint equilibrium and derive its comparative statics properties. In equilibrium, the guarantee reduces the probability of a bank run, while it increases the probability of a sovereign default. The latter erodes the guarantee's credibility and thus its effectiveness *ex ante*. By setting the guarantee optimally, the government balances these two effects in order to minimize expected costs of crises. Our results show that the optimal guarantee has clear-cut welfare gains which are enhanced through policies that promote greater balance sheet transparency.

Rollover risk, liquidity, and macro-prudential regulation

I study rollover risk in the wholesale funding market when intermediaries can hold liquidity ex-ante and are subject to fire sales ex-post. I demonstrate that precautionary liquidity restores multiple equilibria in a global rollover game. An intermediate liquidity level supports both the usual run equilibrium and an efficient equilibrium. I provide a uniqueness refinement to characterize the privately optimal liquidity choice. Because of fire sales, liquidity holdings are strategic substitutes. Intermediaries free-ride on the liquidity of other intermediaries, causing excessive liquidation. A macro-prudential authority internalizes the systemic nature of liquidity and restores constrained efficiency by imposing a macro-prudential liquidity buffer.

A wake-up call: information contagion and strategic uncertainty

A financial crisis in one region is a wake-up call for investors in other regions. If the correlation across regional fundamentals is potentially positive but uncertain ex-ante, investors acquire information about this correlation to determine their exposure. Financial contagion can occur in the absence of ex-post exposure, due to elevated strategic uncertainty among informed investors. This novel wake-up call theory of contagion explains how currency crises, bank runs, and debt crises spread across regions without a common investor base, ex-post correlated fundamentals or interconnectedness. Our wake-up call theory generates testable implications for laboratory experiments and new empirical predictions.

E-Money: Efficiency, Stability and Optimal Policy

What makes e-money more special than cash? Is the introduction of e-money necessarily welfare enhancing? Is an e-money system necessarily stable? What is the optimal way to design an efficient and stable e-money scheme? This paper provides a first attempt to develop a micro-founded, dynamic, general-equilibrium model of e-money for investigating these policy issues. We first identify some superior features of e-money which help mitigate informational frictions and enhance social welfare in a cash economy. A model that features both trading frictions and two-sided platforms is then built and used to compare two potential e-money schemes: (i) public provision of e-money with decentralized adoption, and (ii) private monopolistic provision of e-money. We show that, in general, both public and private provision of e-money are inefficient, and we characterize the optimal incentive scheme by addressing four potential sources of inefficiency — market powers in goods trading, network externality, liquidity constraint and monopoly distortion in e-money issuance. We show that the welfare impact of e-money depends critically on whether cash is a viable alternative to e-money as a means of payment. When it is not (e.g., for online payments where usage of money is prohibitively costly), the adoption of e-money is always welfare enhancing, albeit not welfare maximizing. However, when cash is a viable alternative (e.g., in a coffee shop), introducing e-money can sometimes reduce social welfare. Moreover, a system with public provision and decentralized adoption is inherently unstable, while a planner or a private issuer can design a pricing scheme to restore stability. Lastly, we examine an alternative e-money scheme — a hypothetical set-up with public provision through a private platform. We also compare the impact of various provision schemes on central bank seigniorage income. While this scheme may or may not improve efficiency, it can always increase seigniorage income, even though there may exist better policy options such as imposing a cash reserve requirement or collecting a charter fee.

Bond Risk Premia and Gaussian Term Structure Models

Cochrane and Piazzesi (2005) show that (i) lagged forward rates improve the predictability of annual bond returns, adding to current forward rates, and that (ii) a Markovian model for monthly forward rates cannot generate the pattern of predictability in annual returns. These results stand as a challenge to modern Markovian dynamic term structure models (DTSMs). We develop the family of conditional mean DTSMs where the yield dynamics depend on current yields and their history. Empirically, we find that (i) current and past yields generate cyclical risk-premium variations, (ii) the model risk premia offer better returns forecasts, and (iii) the model coefficients are close to Cochrane-Piazzesi regressions of long-horizon returns. Yield decompositions differ significantly from what a standard model suggests — the expectation component decreases less in a recession and increases less in the recovery. A small Markovian factor “hidden” in measurement error (Duffee, 2011) explains some of the differences but is not sufficient to match the evidence.

Electronic Money and Payments: Recent Developments and Issues

The authors review recent developments in retail payments in Canada and elsewhere, with a focus on e-money products, and assess their potential public policy implications. In particular, they study how these developments will affect the demand for bank notes, and the central bank’s balance sheet and its seigniorage revenue, which as a result might affect the central bank’s ability to implement and conduct monetary policy and to promote financial stability. Other public policy issues, such as safety and efficiency, and user protection as well as legal, security and law enforcement, are also considered. While the demise of cash is not imminent, it is important for the central bank to continue to evaluate its potential roles with regard to e-money.

Uncertain Costs and Vertical Differentiation in an Insurance Duopoly

Classical oligopoly models predict that firms differentiate vertically as a way of softening price competition, but some metrics suggest very little quality differentiation in the U.S. auto insurance market. I explain this phenomenon using the fact that risk-averse insurance companies with uncertain costs face incentives to converge to a homogeneous quality. Quality changes are capable of boosting as well as reducing profits, since quality differentiation softens price competition, but also undermines the lower-end firm’s ability to charge the markup commanded by risk aversion. This can make differentiation suboptimal, leading to a homogeneous quality; the outcome depends on consumers’ quality tastes and on how costly quality is. Additional trade-offs between quality costs, profits and profit variances compound this effect, resulting in equilibria at very low quality levels. I argue that this provides one explanation of how insurer competition drove quality down in the nineteenth-century U.S. market for fire insurance.

The Efficiency of Private E-Money-Like Systems: The U.S. Experience with State Bank Notes

In the United States prior to 1863 each bank issued its own distinct notes. E-money shares many of the characteristics of these bank notes. This paper describes some lessons relevant to e-money from the U.S. experience with state bank notes. It examines historical evidence on how well the bank notes — a privately-issued currency system with multiple issuers — functioned with respect to ease of transacting, counterfeiting, safety, overissuance and par exchange. It finds that bank notes made transacting easier and were not subject to overissuance. However, counterfeiting of bank notes was widespread, bank notes were not perfectly safe, and notes of different banks did not exchange at par and rates of exchange were volatile. The paper also examines how bank notes were regulated and supervised and how that regulation and supervision affected the functioning of the system. The U.S. experience with state bank notes suggests that a privately-issued e-money system can operate efficiently but only with appropriate government intervention, regulation, and supervision to minimize counterfeiting and to promote safety and par exchange.