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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

Granziera, Eleonora, Kirstin Hubrich, and Roger Moon, "A Predictability Test for a Small Number of Nested Models", Journal of Econometrics

Feunou, Bruno, Jean-Sébastien Fontaine, Abderrahim Taamouti, and Roméo Tédongap, "Risk Premium, Variance Premium and the Maturity Structure of Uncertainty", Review of Finance

WORKING PAPERS

Diez de los Rios, Antonio, "A New Linear Estimator for Gaussian Dynamic Term Structure Model", Bank of Canada Working Paper 2013-10

De Resende, Carlos, Ali Dib, René Lalonde, and Nikita Perevalov, "Countercyclical Capital Requirement and Optimized Monetary Policy Rules", Bank of Canada Working Paper 2013-8

Jin, Jianjian, "Jump-Diffusion Long-Run Risks Models, Variance Risk Premium and Volatility Dynamics", Bank of Canada Working Paper 2013-12

Samuels, D. Jon and Rodrigo M. Sekkel, "Forecasting with Many Models: Model Confidence Sets and Forecast Combination", Bank of Canada Working Paper 2013-11

Xu, Shaofeng, "An Equilibrium Analysis of the Rise in House Prices and Mortgage Debt", Bank of Canada Working Paper 2013-9

ABSTRACTS

A Predictability Test for a Small Number of Nested Models

In this paper we introduce Quasi Likelihood Ratio tests for one sided multivariate hypotheses to evaluate the null that a parsimonious model performs equally well as a small number of models which nest the benchmark. We show that the limiting distributions of the test statistics are non standard. For critical values we consider two approaches: (i) bootstrapping and (ii) simulations assuming normality of the mean square prediction error (MSPE) difference. The size and the power performance of the tests are compared via Monte Carlo experiments with existing equal and superior predictive ability tests

for multiple model comparison. We find that our proposed tests are well sized for one step ahead as well as for multi-step ahead forecasts when critical values are bootstrapped. The experiments on the power reveal that the superior predictive ability test performs last while the ranking between the quasi likelihood-ratio test and the other equal predictive ability tests depends on the simulation settings. Last, we apply our test to draw conclusions about the predictive ability of a Phillips type curve for the US core inflation.

Risk Premium, Variance Premium and the Maturity Structure of Uncertainty

Structural or no-arbitrage asset-pricing models emphasize risk factors that cannot be observed directly. We show that the term structure of risk implicit in option prices can reveal these risk factors. Empirically, the variance term structure reveals two predictors of the bond premium, the equity premium, and the variance premium, jointly. Similarly, the term structures of skewness and kurtosis measures also reveal risk factors, but these are subsumed in the predictive content of the variance. The predicted premium is countercyclical and robust to the inclusion of known returns predictors.

A New Linear Estimator for Gaussian Dynamic Term Structure Model

This paper proposes a novel regression-based approach to the estimation of Gaussian dynamic term structure models that avoids numerical optimization. This new estimator is an asymptotic least squares estimator defined by the no-arbitrage conditions upon which these models are built. We discuss some efficiency considerations of this estimator, and show that it is asymptotically equivalent to maximum likelihood estimation. Further, we note that our estimator remains easy-to-compute and asymptotically efficient in a variety of situations in which other recently proposed approaches lose their tractability. We provide an empirical application in the context of the Canadian bond market.

Countercyclical Capital Requirement and Optimized Monetary Policy Rules

Using BoC-GEM-Fin, a large-scale DSGE model with real, nominal and financial frictions featuring a banking sector, we explore the macroeconomic implications of various types of countercyclical bank capital regulations. Results suggest that countercyclical capital

requirements have a significant stabilizing effect on key macroeconomic variables, but mostly after financial shocks. Moreover, the bank capital regulatory policy and monetary policy interact, and this interaction is contingent on the type of shocks that drive the economic cycle. Finally, we analyze loss functions based on macroeconomic and financial variables to arrive at an optimal countercyclical regulatory policy in a class of simple implementable Taylor-type rules. Compared to bank capital regulatory policy, monetary policy is able to stabilize the economy more efficiently after real shocks. On the other hand, financial shocks require the regulator to be more aggressive in loosening/tightening capital requirements for banks, even as monetary policy works to counter the deviations of inflation from the target.

Jump-Diffusion Long-Run Risks Models, Variance Risk Premium and Volatility Dynamics

This paper calibrates a class of jump-diffusion long-run risks (LRR) models to quantify how well they can jointly explain the equity risk premium and the variance risk premium in the U.S. financial markets, and whether they can generate realistic dynamics of risk-neutral and realized volatilities.

Forecasting with Many Models: Model Confidence Sets and Forecast Combination

A longstanding finding in the forecasting literature is that averaging forecasts from different models often improves upon forecasts based on a single model, with equal weight averaging working particularly well. This paper analyzes the effects of trimming the set of models prior to averaging. We compare different trimming schemes and propose a new one based on Model Confidence Sets that take into account the statistical significance of historical out-of-sample forecasting performance. In an empirical application of forecasting U.S. macroeconomic indicators, we find significant gains in out-of-sample forecast accuracy from our proposed trimming method.

An Equilibrium Analysis of the Rise in House Prices and Mortgage Debt

This paper examines the contributions of population aging, mortgage innovation and historically low interest rates to the sharp rise in U.S. house prices and mortgage debt between 1994 and 2005. I construct an overlapping generations general equilibrium housing model and

find that these three factors together account for over half of the increase in house prices and most of the increase in mortgage debt during this period. Population aging contributes to rising house prices and mortgage debt, but it accounts for only a small portion of their observed changes. Meanwhile, mortgage innovation significantly increases the mortgage borrowing of various age cohorts, but it has a trivial effect on house prices because interest rates rise due to higher demand for mortgage loans. This increases households' savings in financial assets and leaves their housing assets nearly unchanged. The observed run-up in house prices can, however, be justified in an open-economy setting where interest rates fall due to a global saving glut. Declining interest rates force households at prime saving ages to reallocate their wealth from financial assets to housing assets, which dramatically drives up house prices.