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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

Baumeister, Christiane and Gert Peersman, "Time-Varying Effects of Oil Supply Shocks on the U.S. economy", American Economic Journal: Macroeconomics 5(4) October 2013, 1-29.

Brunetti, Celso, Bahattin Büyükşahin, Michel A. Robe and Kirsten R. Soneson, "OPEC "Fair Price" Pronouncements and the Market Price of Crude Oil", The Energy Journal, Volume 34/4 November 2013

Forthcoming

Büyükşahin, Bahattin and Michel A. Robe, "Speculators, Commodities and Cross Market Linkages", Journal of International Finance

Halaburda, Hanna and Joshua Gans, "Some Economics of Private Digital Currency", Economics of Digitization: An Agenda, A. Goldfarb, S. Greenstein and C. Tucker (eds), NBER

Jiang, Janet Hua and Mei Dong, "Money and Price Posting under Private Information", Journal of Economic Theory

Jo, Soojin, "The Effect of Oil Price Uncertainty on Global Real Economic Activity", Journal of Money, Credit, and Banking

Li, Fuchun, "Testing for Financial Contagion Based on a Nonparametric Measure of the Cross-Market Correlation", Review of Financial Economics

Shao, Enchuan and Pedro Silos, "Accounting for the Cyclical Dynamics of Income Shares", Economic Inquiry

WORKING PAPERS

Baumeister, Christiane and Lutz Kilian, "Forecasting the Real Price of Oil in a Changing World: A Forecast Combination Approach", Bank of Canada Working Paper 2013-28

Baumeister, Christiane, Lutz Kilian and Xiaoqing Zhou, "Are Product Spreads Useful for Forecasting? An Empirical Evaluation of the Verleger Hypothesis", Bank of Canada Working Paper 2013-25

Bi, Huixin and Eric M. Leeper, "Analyzing Fiscal Sustainability", Bank of Canada Working Paper 2013-27

Chaker, Selma, "Volatility and Liquidity Costs", Bank of Canada Working Paper 2013-29

ABSTRACTS

Time-Varying Effects of Oil Supply Shocks on the U.S. economy

We investigate how the dynamic effects of oil supply shocks on the US economy have changed over time. We first document a remarkable structural change in the oil market itself, i.e. a considerably steeper, hence, less elastic oil demand curve since the mid-eighties. Accordingly, a typical oil supply shock is currently characterized by a much smaller impact on world oil production and a greater effect on the real price of crude oil, but has a similar impact on US output and inflation as in the 1970s. Second, we find a smaller role for oil supply shocks in accounting for real oil price variability over time, implying that current oil price fluctuations are more demand driven. Finally, while unfavorable oil supply disturbances explain little of the "Great Inflation", they seem to have contributed to the 1974/75, early 1980s and 1990s recessions but also dampened the economic boom at the end of the millennium.

OPEC "Fair Price" Pronouncements and the Market Price of Crude Oil

OPEC producers, individually or collectively, often make statements regarding the “fair price” of crude oil. In some cases, the officials commenting are merely affirming the price prevailing in the crude oil market at the time. In many cases, however, we document that they explicitly disagree with the contemporaneous futures price. A natural question is whether these “fair price” pronouncements contain information not already reflected in market prices. To find the answer, we collect the “fair price” statements made from 2000 to 2009 by officials from OPEC or OPEC member countries. Visually, the “fair price” series looks like a sampling discretely drawn (with a lag) from the daily futures market price series. Formally, we use several methodologies to establish that “fair price” pronouncements have little influence on the market price of crude oil and that they supply little or no new news to oil futures market participants.

Speculators, Commodities and Cross Market Linkages

We use a unique, non-public dataset of individual trader positions in 17 U.S. commodity futures markets to provide novel evidence on

those markets' financialization in the past decade. We then show that the correlation between the rates of return on commodities and equities rises amid greater participation by speculators generally, hedge funds especially, and funds that trade in both equity and commodity markets in particular. We find no such relationship for other kinds of commodity futures traders. The predictive power of hedge fund positions is weaker in periods of generalized financial market stress. Our results indicate that who trades helps predict the joint distribution of commodity and equity returns.

Some Economics of Private Digital Currency

This paper reviews some recent developments in digital currency focusing on platform-sponsored currencies such as Facebook Credits. In a model of platform management, we find that it will not likely be profitable for such currencies to expand to become fully convertible competitors to state-sponsored currencies.

Money and Price Posting under Private Information

We study price posting with undirected search in a search-theoretic monetary model with divisible money and divisible goods. Ex ante homogeneous buyers experience match-specific preference shocks in bilateral trades. The shocks follow a continuous uniform distribution, and the realizations of the shocks are private information. We show that there exists a unique monetary equilibrium for generic values of the inflation rate. In equilibrium, each seller posts a continuous pricing schedule that exhibits quantity discounts. Buyers may spend nothing, a fraction or all of their money holdings, depending on the realizations of the preference shock. Inflation reduces the extent of non-linear pricing. The model also captures the hot-potato effect of inflation along both the extensive margin, as an increase in the trading probability, and the intensive margin, as higher fractions of spending for all buyers and rising trading volumes for some buyers.

The Effect of Oil Price Uncertainty on Global Real Economic Activity

This paper investigates the effect of oil price uncertainty on global real economic activity using a quarterly vector autoregressive model with stochastic volatility in mean. Stochastic volatility allows oil price uncertainty to vary separately from changes in the level of oil prices, and allows one to incorporate an extraneous indicator of oil price uncertainty such as realized volatility that greatly improves the

precision of the estimated uncertainty series. The estimation results show that an oil price uncertainty shock has negative effects on world industrial production all else equal. For example, it is shown that a doubling of oil price volatility is associated with a cumulative decline as high as 0.3 percentage points in world industrial production.

Testing for Financial Contagion Based on a Nonparametric Measure of the Cross-Market Correlation

The author proposes a new test for financial contagion based on a non-parametric measure of the cross-market correlation. The test does not depend on the assumption that the data are drawn from a given probability distribution; therefore, it allows for maximal flexibility in fitting into the data. Simulation studies show that the test has reasonable size and good power to detect financial contagion, and that Forbes and Rigobon's test (2002) is conservative, suggesting that their test tends not to find evidence of contagion when it does exist. The author's new test is applied to investigate contagion from a variety of recent financial crises to the Canadian banking system. Three empirical results are obtained. First, compared to recent financial crises, including the 1987 U.S. stock market crash, 1994 Mexican peso crisis, and 1997 East Asian crisis, the ongoing 2007 subprime crisis has been having more persistent and stronger contagion impacts on the Canadian banking system. Second, the October 1997 East Asian crisis induced contagion in Asian countries, and it quickly spread to Latin American and G-7 countries. The contagion from the East Asian crisis to the Canadian banking system was not as strong or as persistent as that of the ongoing subprime crisis. However, it had a stronger impact on emerging markets. Third, there is no evidence of contagion from the 1994 Mexican peso crisis to the Canadian banking system. Contagion from that crisis occurred in Argentina, Brazil, and Chile, but the contagion effects of that crisis were limited to the Latin American region.

Accounting for the Cyclical Dynamics of Income Shares

Over the business cycle, labor's share of output is negatively but weakly correlated with output, and it lags output by about four quarters. Profits' share is strongly pro-cyclical. It neither leads nor lags output, and its volatility is about five times that of output. Those assumptions relate to the structure of aggregate technology and the degree of competition in factor markets. Despite much evidence in favor of time-varying income shares, macroeconomics still lacks models that can account for their time series facts. This paper

constructs a model that can replicate those facts. We introduce costly entry of firms in a model with frictional labor markets and find a link between the ability of the model to replicate income shares' dynamics and the ability of the model to amplify and propagate shocks. That link is a weak correlation between the real interest rate and output, a fact in US data but a feature that models of aggregate fluctuations have had difficulty achieving.

Forecasting the Real Price of Oil in a Changing World: A Forecast Combination Approach

The U.S. Energy Information Administration regularly publishes short-term forecasts of the price of crude oil. Traditionally, such out-of sample forecasts have been largely judgmental, making them difficult to replicate and justify, and not particularly successful when compared with naïve no-change forecasts, as documented in Alquist, Kilian and Vigfusson (2013). Recently, a number of alternative econometric oil price forecasting models have been introduced in the literature and shown to be more accurate than the no-change forecast of the real price of oil. We investigate the merits of constructing real-time forecast combinations of six such models with weights that reflect the recent forecasting success of each model. Forecast combinations are promising for four reasons. First, even the most accurate forecasting models do not work equally well at all times. Second, some forecasting models work better at short horizons and others at longer

Are Product Spreads Useful for Forecasting? An Empirical Evaluation of the Verleger Hypothesis

Notwithstanding a resurgence in research on out-of-sample forecasts of the price of oil in recent years, there is one important approach to forecasting the real price of oil which has not been studied systematically to date. This approach is based on the premise that demand for crude oil derives from the demand for refined products such as gasoline or heating oil. Oil industry analysts such as Philip Verleger and financial analysts widely believe that there is predictive power in the product spread, defined as the difference between suitably weighted refined product market prices and the price of crude oil. Our objective is to evaluate this proposition. We derive from first principles a number of alternative forecasting model specifications involving product spreads and compare these models to the no-change forecast of the real price of oil. We show that not all product spread models are useful for out-of-sample forecasting, but some

models are, even at horizons between one and two years. The most accurate model is a time-varying parameter model of gasoline and heating oil spot spreads that allows the marginal product market to change over time. We document mean-squared prediction error reductions as high as 20 per cent and directional accuracy as high as 63 per cent at the two-year horizon, making product spread models a good complement to forecasting models based on economic fundamentals, which work best at short horizons.

Analyzing Fiscal Sustainability

The authors study the implications of fiscal policy behaviour for sovereign risk in a framework that determines a country's fiscal limit, the point at which, for economic or political reasons, taxes and spending can no longer adjust to stabilize debt. A real business cycle model maps the economic environment—expected fiscal policy, the distribution of exogenous disturbances and private agents' behaviour—into a distribution

for the maximum sustainable debt-to-GDP ratio. Default is possible at any point on this fiscal limit distribution. Calibrations of the model to Greek and Swedish data illustrate how the framework can be used to study actual fiscal reforms undertaken by developed economies facing sovereign risk pressures.

Volatility and Liquidity Costs

Observed high-frequency prices are contaminated with liquidity costs or market microstructure noise. Using such data, we derive a new asset return variance estimator inspired by the market microstructure literature to explicitly model the noise and remove it from observed returns before estimating their variance. The returns adjusted for the

estimated liquidity costs are either totally or partially free from noise. If the liquidity costs are fully removed, the sum of squared high-frequency returns – which would be inconsistent for return variance when based on observed returns – becomes a consistent variance estimator when based on adjusted returns. This novel estimator achieves the maximum possible rate of convergence. However, if the liquidity costs are only partially removed, the residual noise is smaller and closer to an exogenous white noise than the original noise. Therefore, any volatility estimator that is robust to noise relies on weaker noise assumptions if it is based on adjusted returns than if it is based on observed returns.