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INTRODUCTION TO "SPECIAL ISSUE ON THE EMPIRICAL ANALYSIS OF BUSINESS CYCLES, FINANCIAL MARKETS, AND INFLATION: ESSAYS IN HONOR OF CHARLES NELSON"

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Time series analysis of macroeconomic and financial variables requires a deep understanding of many econometric pitfalls if an empirical researcher hopes to avoid making spurious inferences. This understanding is the hallmark of Charles Nelson's research over four decades and it develops out of a healthy skepticism about "conventional wisdom," yet a pragmatic belief that, despite the econometric hurdles, it is possible to learn from data. The papers in this special issue build on Charles Nelson's research legacy to address many important empirical questions related to business cycles, financial markets, and inflation, always with respect for the data, but wary of spurious inferences.

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1. INTRODUCTION

On June 11–13, 2012, a conference was held at the University of Washington in honor of Charles Nelson's research in applied time series econometrics. Most of the papers in this volume were presented at this conference and all of them share

a common approach to empirical analysis in macroeconomics and finance that builds on Charles Nelson's research over four decades. This approach begins with a healthy dose of skepticism about "conventional wisdom," involves respect for data, and seeks to expand knowledge about econometric pitfalls in conducting empirical analysis of macroeconomic and financial variables. The following provides brief summaries of the papers in this volume, noting in each case the influence of Charles Nelson's research legacy on the analysis.

2. SUMMARIES

In the first paper, "A Bayesian Analysis of Weak Identification in Stock Price Decompositions," Nathan Balke, Jun Ma, and Mark Wohar build on Charles Nelson's research on weak identification [e.g., Nelson and Startz (2007)] to consider an unobserved components model of stock prices and dividends. They employ Bayesian methods to demonstrate that the relative importance of expected returns and expected dividends in driving historical stock prices is far less certain than suggested by most earlier studies, which tend to argue strongly that expected returns play the dominant role. Importantly, the authors determine that the source of weak identification is small variances for the persistent components of both returns and dividends. The relative size of these variances is crucial for determining the roles of expected returns and expected dividends. But the variances are so small that there is considerable imprecision in the aggregate data about their relative size. This result is important because a tremendous amount of intellectual effort has been devoted to theoretical models of time-varying expected returns when it could be that time-varying expected dividends are the more relevant target for theoretical analysis in finance.

The second paper, "Trend in Cycle or Cycle in Trend? New Structural Identifications for Unobserved Components Models of U.S. Real GDP" by Mardi Dungey, Jan Jacobs, Jing Tian, and Simon van Norden, considers the question of whether the negative correlation between trend and cycle movements in U.S. real GDP highlighted by Morley et al. (2003) is due to transitory effects of trend shocks or permanent effects of cyclical shocks. Motivated by identification restrictions from the literature on "news" and "noise" shocks in data revisions, they develop unobserved components models of real GDP that correspond to these two possibilities. Contrary to the typical interpretation of a negative correlation as reflecting the transitory effects of trend shocks [e.g., Morley et al. (2003)], the authors are able to reject a model in which real GDP responds sluggishly to trend shocks. In contrast, they are unable to reject a model in which cyclical shocks have delayed, but permanent effects. Their findings raise important questions about the sources of the negative correlation between movements in trend and cycle for real GDP, in particular raising doubts that it is simply due to a slow adjustment of output to technology shocks.

In the next paper, "Business Cycles and Financial Crises: The Roles of Credit Supply and Demand Shocks," James Nason and Ellis Tallman use a long sample

of data ranging from 1890 to 2010 to explore the historical role that credit shocks played during periods of financial and economic crises in the U.S. macroeconomy. To identify these shocks, as well as periods of crises, the authors employ an identified Markov-switching vector autoregression. The model is estimated using Bayesian techniques closely related to those detailed in Kim and Nelson's (1999) textbook. Markov switching is included in the volatility of the model variances, where the switching is between regimes of higher variance, labeled "crises," and regimes of lower variance. They find that high-volatility regimes have occurred throughout the entire sample period. This means that, contrary to much of the conventional wisdom, early episodes of financial and economic crisis were not deemed by the empirical model to be fundamentally different from those that have occurred more recently. The authors also find an important role for credit shocks in generating macroeconomic fluctuations.

In "What Is Driving Financial Dollarization in Transition Economies? A Dynamic Factor Analysis," Kundan Kishor and Kyriakos Neanidis employ a flexible dynamic factor model to investigate the behavior of deposit and loan "dollarization" rates over time for 24 transition economies located in Central and Eastern Europe and the former Soviet Union. Their analysis makes use of a comprehensive dataset compiled from national central bank reports. The dynamic factor model is carefully constructed following the description in the Kim and Nelson (1999) textbook in order to "let the data speak" about the role of being part of the European Union (EU) accession process in driving changes in the proportion of deposits and loans on domestic bank balance sheets held in foreign currency terms. The answer from the data is that "institutional quality," as captured by inclusion in the EU accession process, is a major determinant of dollarization, driving down foreign-denominated deposits, but driving up foreign-denominated loans. This role and effect of institutions is far from given and suggests, on average, much lower currency risk for countries on the road to EU admission than for those that are not.

"Forecasting with Mixed-Frequency Factor Models in the Presence of Common Trends," by Peter Fuleky and Carl Bonham, explores issues related to forecasting using factor models in the empirically relevant case where the variables used in the factor model are of mixed frequency, meaning they are not all sampled at the same time interval. As an example of this, a forecaster may be interested in including real GDP, which is sampled quarterly, in a factor model where the other variables are sampled monthly. The authors' contribution to such models is to consider as well the case where these variables are cointegrated. They show that when they are present, it is important to model these cointegrating relationships in the form of common level factors. Specifically, incorporating the information in the cointegrating relationships yields substantially improved forecasts, both in simulated data and for the purpose of predicting U.S. real GDP growth. The importance of economic indicators at different frequencies has long been an interest of Charles Nelson [see, for example, Nelson (1989)], and this study makes an important contribution to the methods available for analyzing such data.

In "Markov Switching and the Taylor Principle," Christian Murray, Alex Nikolsko-Rzhevskyy, and David Papell employ a Markov-switching model for the Taylor rule with real-time data to investigate when the Taylor principle (i.e., a more than one-for-one response of the nominal interest rate to expected inflation) holds in the U.S. data. Conventional wisdom, as exemplified by the sample splitting in Clarida et al. (2000), suggests that it does not hold in the 1960s and 1970s, but does hold after that, with the split coinciding with Paul Volcker's chairmanship of the Federal Reserve. Orphanides (2004) previously challenged this conventional wisdom by showing that the Taylor principle holds for both subsamples when real-time data available to the Fed when conducting monetary policy at the time are considered. The authors here challenge both results by showing that estimates for their Markov-switching model with real-time data suggest that the Taylor principle did hold for much, but not all of the 1960s and 1970s, whereas it did not hold during the Volcker chairmanship in the early 1980s. Their results argue strongly against exogenously dividing the postwar data into pre-Volcker and post-Volcker samples and support a growing empirical literature that estimates changes in policy reaction functions endogenously, including an early contribution to this literature by Kim and Nelson (2006).

"How Well Does 'Core' Inflation Capture Permanent Price Changes?" by Michael Bradley, Dennis Jansen, and Tara Sinclair, explores the suitability of the so-called "core" consumer price index as a measure of the underlying trend in overall U.S. CPI inflation, where "trend" is defined in the spirit of Beveridge and Nelson (1981) as the permanent component of inflation. Motivated by the work of Morley et al. (2003), the authors employ a bivariate unobserved components model with correlated disturbances to identify the trends of both core and overall CPI inflation. Like much of the literature that follows Morley et al. (2003), they find that the core inflation series is less volatile than its trend component, as well as the trend component of headline inflation, because of a negative correlation between trend and cycle shocks. This provides a challenge to the wide use, based on conventional wisdom, of core inflation as a measure of the trend in overall inflation.

Finally, in "Inflation in the G7: Mind the Gap(s)?," James Morley, Jeremy Piger, and Robert Rasche also use an unobserved components model to investigate the dynamics of inflation. The analysis focuses on the importance of variation in trend and cyclical inflation for overall inflation variation for each of the G7 countries. The estimates for the unobserved components model suggest that both components have been important drivers of inflation variability in all G7 countries over the past half century. Also, consistent with the theoretical predictions of the New Keynesian Phillips Curve, the unemployment gap has been a significant and stable driver of cyclical inflation for each country. Overall, these results provide empirical support for the New Keynesian Phillips Curve, but only when it is augmented with time-varying trend inflation, a finding that Kim et al. (in press) have also recently made for U.S. data using a related approach.

3. CONCLUSION

Time series models serve as useful tools for learning about the behavior of macroeconomic and financial variables. However, if spurious inferences are to be avoided, an empirical researcher must be wary of many econometric pitfalls when considering such data. Building on Charles Nelson's research legacy, the papers in this special issue share a common theme of applying econometric methods carefully to avoid these pitfalls, while at the same time challenging conventional wisdom about important economic questions such as what drives stock prices, real GDP, financial dollarization, interest rates, and inflation. In each case, the analysis provides useful new econometric and economic insights that deepen our understanding of the topic at hand and help motivate future work in empirical macroeconomics and finance.

REFERENCES

Beveridge, S. and C.R. Nelson (1981) A new approach to decomposition of economic time series into permanent and transitory components with particular attention to measurement of the business cycle. *Journal of Monetary Economics* 7, 151–174.

Clarida, Richard, Jordi Gali, and Mark Gertler (2000) Monetary policy rules and macroeconomic stability: Evidence and some theory. *Quarterly Journal of Economics* 115, 147–180.

Kim, C.-J., P. Manopimoke, and C.R. Nelson (in press) Trend inflation and the nature of structural breaks in the New Keynesian Phillips Curve. *Journal of Money, Credit and Banking*.

Kim, C.-J. and C.R. Nelson (1999) *State-Space Models with Regime Switching: Classical and Gibbs-Sampling Approaches with Applications.* Cambridge, MA: MIT Press.

Kim, Chang-Jin and Charles Nelson (2006) Estimation of a forward-looking monetary policy rule: A time-varying parameter model using ex post data. *Journal of Monetary Economics* 53, 1949–1966.

Morley, J.C., C.R. Nelson, and E. Zivot (2003) Why are the Beveridge–Nelson and unobserved components decompositions of GDP so different? *Review of Economics and Statistics* 85, 235–243.

Nelson, C.R. (1989) *The Investor's Guide to Economic Indicators.* New York: Wiley.

Nelson, C.R. and R. Startz (2007) The zero-information-limit condition and spurious inference in weakly identified models. *Journal of Econometrics* 138, 47–62.

Orphanides, Athanasios (2004) Monetary policy rules, macroeconomic stability, and inflation: A view from the trenches. *Journal of Money, Credit and Banking* 36, 151–175.