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## **REAL-TIME DATA ANALYSIS: A LOOK AT RESEARCH TO DATE**

This paper describes the existing research (as of February 2008) on real-time data analysis, divided into five areas: (1) data revisions; (2) forecasting; (3) monetary policy analysis; (4) macroeconomic research; and (5) current analysis of business and financial conditions. In each area, substantial progress has been made in recent years, with researchers gaining insight into the impact of data revisions. In addition, substantial progress has been made in developing better real-time data sets around the world. Still, additional research is needed in key areas, and research to date has uncovered even more fruitful areas worth exploring.

*Working Paper 08-4, "Frontiers of Real-Time Data Analysis," Dean Croushore, University of Richmond, and Visiting Scholar, Federal Reserve Bank of Philadelphia*

## **INSTITUTIONAL FORM AND CENTRAL BANK PERFORMANCE: SOME EMPIRICAL EVIDENCE**

Over the last decade, the legal and institutional frameworks governing central banks and financial market regulatory authorities throughout the world have undergone significant changes. This has created new interest in better understanding the roles played by organizational structures, accountability, and transparency, in increasing the efficiency and effectiveness of central banks in achieving their objectives and ultimately yielding better economic

outcomes. Although much has been written pointing out the potential role institutional form can play in central bank performance, little empirical work has been done to investigate the hypothesis that institutional form is related to performance. This paper attempts to help fill this void.

*Working Paper 08-5, "Central Bank Institutional Structure and Effective Central Banking: Cross-Country Empirical Evidence," Iftekhar Hasan, Rensselaer Polytechnic Institute and Bank of Finland, and Loretta J. Mester, Federal Reserve Bank of Philadelphia and The Wharton School, University of Pennsylvania*

## **FLUCTUATIONS IN UNEMPLOYMENT AND VACANCIES**

In a reasonably calibrated Mortensen and Pissarides matching model, shocks to average labor productivity can account for only a small portion of the fluctuations in unemployment and vacancies (Shimer (2005a)). In this paper, the author argues that if vintage-specific shocks rather than aggregate productivity shocks are the driving force of fluctuations, the model does a better job of accounting for the data. She adds heterogeneity in jobs (matches) with respect to the time the job is created in the form of different embodied technology levels. The author also introduces specific capital that, once adapted for a match, has less value in another match. In the quantitative analysis, she shows that shocks to different vintages of entrants are able to account for fluctuations in unemployment and vacancies and that,

in this environment, specific capital is important to decreasing the volatility of the destruction rate of existing matches.

*Working Paper 08-6, "Specific Capital and Vintage Effects on the Dynamics of Unemployment and Vacancies," Burcu Eyigungor, Federal Reserve Bank of Philadelphia*

## **OPTIMAL POLICY IN A CHANNEL SYSTEM**

Channel systems for conducting monetary policy are becoming increasingly popular. Despite its popularity, the consequences of implementing policy with a channel system are not well understood. The authors develop a general equilibrium framework of a channel system and study the optimal policy. A novel aspect of the channel system is that a central bank can "tighten" or "loosen" its policy without changing its policy rate. This policy instrument has so far been overlooked by a large body of the literature on the optimal design of interest-rate rules.

*Working Paper 08-7, "Monetary Policy in a Channel System," Aleksander Berentsen, University of Basel, and Cyril Monnet, Federal Reserve Bank of Philadelphia*

## **EXAMINING REVISIONS TO PCE INFLATION RATES**

This paper examines the characteristics of the revisions to the inflation rate as measured by the personal consumption expenditures price index both including and excluding food and energy prices. These data series play a major role in the Federal Reserve's analysis of inflation.

The author examines the magnitude and patterns of revisions to both PCE inflation rates. The first question he poses is: What do data revisions look like? The author runs a variety of tests to see if the data revisions have desirable or exploitable properties. The second question he poses is related to the first: Can we forecast data revisions in real time? The answer is that it is possible to forecast revisions from the initial release to August of the following year. Generally, the initial release of inflation is too low and is likely to be revised up. Policymakers should account for this predictability in setting monetary policy.

*Working Paper 08-8, "Revisions to PCE Inflation Measures: Implications for Monetary Policy," Dean Croushore, University of Richmond, and Visiting Scholar, Federal Reserve Bank of Philadelphia*

## **COMBINING CPI AND PCE INFLATION MEASURES: BETTER FORECASTS?**

Two rationales offered for policymakers' focus on core measures of inflation as a guide to underlying inflation are that core inflation omits food and energy prices, which are thought to be more volatile than other components, and that core inflation is thought to be a better predictor of total inflation over time horizons of import to policymakers. The authors' investigation finds little support for either rationale. They find that food and energy prices are not the most volatile components of inflation and that depending on which inflation measure is used, core inflation is not necessarily the best predictor of total inflation. However, they do find that combining CPI and PCE inflation measures can lead to statistically significant more accurate forecasts of each inflation measure, suggesting that each measure includes independent information that can be exploited to yield better forecasts.

*Working Paper 08-9, "Core Measures of Inflation as Predictors of Total Inflation," Theodore M. Crone, Swarthmore College; N. Neil K. Khettry, Murray, Devine & Company; Loretta J. Mester, Federal Reserve Bank of Philadelphia, and The Wharton School, University of Pennsylvania; and Jason A. Novak, Federal Reserve Bank of Philadelphia*

## **BUSINESS METHOD PATENTS AND THE FINANCIAL SERVICES INDUSTRY**

A decade after the *State Street* decision, more than 1,000 business method patents are granted each year. Yet only one in 10 are obtained by a financial institution. Most business method patents are also software patents.

Have these patents increased innovation in financial services? To address this question the author constructs new indicators of R&D intensity based on the occupational composition of financial industries. The financial sector appears more research intensive than official statistics would suggest but less than the private economy taken as a whole. There is considerable variation across industries but little apparent trend. There does not appear to be an obvious effect from business method patents on the sector's research intensity.

Looking ahead, three factors suggest that the patent system may affect financial services as it has electronics: (1) the sector's heavy reliance on

information technology; (2) the importance of standard setting; and (3) the strong network effects exhibited in many areas of finance. Even today litigation is not uncommon; we sketch a number of significant examples affecting financial exchanges and consumer payments.

The legal environment is changing quickly. The author reviews a number of important federal court decisions that will affect how business method patents are obtained and enforced. He also reviews a number of proposals under consideration in the U.S. Congress.

*Working Paper 08-10, "Business Method Patents and U.S. Financial Services," Robert M. Hunt, Federal Reserve Bank of Philadelphia*

### **IS THERE A LINK BETWEEN JOBLESS RECOVERIES AND THE GREAT MODERATION?**

This paper uses new data on job creation and job destruction to find evidence of a link between the jobless recoveries of the last two recessions and the recent decline in aggregate volatility known as the Great Moderation. The author finds that the last two recessions are characterized by jobless recoveries that came about through contrasting margins of employment adjustment: a relatively slow decline in job destruction in 1991-92 and persistently low job creation in 2002-03. In manufacturing, he finds that these patterns followed a secular decline in the magnitude of job flows and an abrupt decline in their volatility. A structural VAR analysis suggests that these patterns are driven by a decline in the volatilities of the underlying structural shocks in addition to a shift in the response of job flows to these shocks. The shift in structural responses is broadly consistent with the change in job flow patterns observed during the jobless recoveries.

*Working Paper 08-11, "Job Flows, Jobless Recoveries, and the Great Moderation," R. Jason Faberman, Federal Reserve Bank of Philadelphia*

### **WHAT EXPLAINS THE HOME BIAS IN TRADE?**

A large empirical literature finds that there is too little international trade and too much intra-national trade to be rationalized by observed international trade costs such as tariffs and transport costs. The literature uses frameworks in which goods are assumed to be produced in just one stage. This paper investigates whether the multi-stage nature of production helps

explain the home bias in trade. The author shows that multi-stage production magnifies the effects of trade costs. He then calibrates a multi-stage production model to the U.S. and Canada. He solves the model with measures of trade costs constructed from data on tariffs, transport costs, and wholesale distribution margins. The model can explain about three-eighths of the Canada border effect; this is three times more than what a calibrated one-stage model can explain. The model also explains a good deal of Canada's vertical specialization trade. Finally, a reverse engineering exercise suggests that the unknown or unobserved component of trade costs is smaller than observed trade costs.

*Working Paper 08-12, "Can Multi-Stage Production Explain the Home Bias in Trade?," Kei-Mu Yi, Federal Reserve Bank of Philadelphia*

### **WORKER TURNOVER AND FIRM GROWTH**

The authors use establishment data from the Job Openings and Labor Turnover Survey (JOLTS) to study the micro-level behavior of worker quits and their relation to recruitment and establishment growth. They find that quits decline with establishment growth, playing the most important role at slowly contracting firms. They also find a robust, positive relationship between an establishment's reported hires and vacancies and the incidence of a quit. This relationship occurs despite the finding that quits decline, and hires and vacancies increase, with establishment growth. The authors characterize these dynamics within a labor-market search model with on-the-job search, a convex cost of creating new positions, and multi-worker establishments. The model distinguishes between recruiting to replace a quitting worker and recruiting for a new position and relates this distinction to firm performance. Beyond giving rise to a varying quit propensity, the model generates endogenously determined thresholds for firm contraction (through both layoffs and attrition), worker replacement, and firm expansion. The continuum of decision rules derived from these thresholds produces rich firm-level dynamics and quit behavior that are broadly consistent with the empirical evidence of the JOLTS data.

*Working Paper 08-13, "Quits, Worker Recruitment, and Firm Growth: Theory and Evidence," R. Jason Faberman, Federal Reserve Bank of Philadelphia, and Éva Nagypál, Northwestern University*