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Research Update

Research and Statistics Group www.newyorkfed.org/research

New Study Offers Guidelines on the Use of the Yield Curve as a Forecasting Tool

The last twenty years have seen the emergence of an extensive literature documenting the close relationship between the slope of the yield curve—the difference, or spread, between long- and short-term interest rates—and subsequent economic activity. In particular, researchers have noted that the yield curve has inverted (the term spread has turned negative) in advance of every recession since 1968.

While these historical correlations have been amply discussed in the literature, considerably less has been written about the use of the yield curve as a forecasting tool in real time. In "The Yield Curve as a Leading Indicator: Some Practical Issues" (***Current Issues in Economics and Finance***, vol. 12, no. 5), Arturo Estrella and Mary R. Trubin seek to fill this gap by offering practical guidance on the construction of the yield curve indicator and the interpretation of this measure in real time.

The study presents a statistical model designed to translate the steepness of the yield curve at present into the probability of a recession twelve months ahead. Estrella and Trubin assess several measures of steepness and conclude that the best results are obtained by using the spread between two Treasury rates: the ten-year constant maturity rate and the secondary market three-month rate expressed on a bond-equivalent basis. In addition, the authors show that the level of the term spread—as opposed to the change in the spread—provides the most accurate signal of a coming recession.

Specific guidelines on interpreting the indicator are also presented. A persistent negative term spread—one observed at a monthly or quarterly average frequency—is a meaningful recession indicator, the authors suggest, even if the inversion is slight. Moreover, the performance of the yield curve in predicting recessions does not depend on the movements of the long-term rate.

While Estrella and Trubin caution that the predictive power of the yield curve is a statistical result that offers no guarantees, they view its consistent past performance as persuasive evidence of its usefulness as a leading indicator. ■

New Editors for *Current Issues, Economic Policy Review*

The Research Group is pleased to announce the appointment of new editors for our main research publications, ***Current Issues in Economics and Finance*** and the ***Economic Policy Review***.

Leonardo Bartolini and Charles Steindel will edit ***Current Issues***; Kenneth Garbade is editor of the ***Review***, assisted by editorial board members Adam Ashcraft, Paolo Pesenti, Asani Sarkar, and Argia Sbordone.

Leonardo Bartolini is a senior vice president in our International Research area. He has written on international macroeconomic topics and on issues related to interbank markets and the implementation of monetary policy. Leo is an associate editor of *Research in Economics*, serves on the advisory board of *International Finance*, and is an adjunct associate professor at Columbia University.

Charles Steindel is a senior vice president in our Macroeconomic and Monetary Studies area. His research has focused on consumer spending and saving and productivity growth. Charlie has served as president of the Money Marketeers of New York University and the Forecasters Club of New York and is a member of the Board of Directors of the National Association for Business Economics.

Kenneth Garbade is a vice president in Capital Markets. He is the author of *Securities Markets* (McGraw Hill, 1982), *Fixed Income Analytics* (MIT Press, 1996), and *Pricing Corporate Securities as Contingent Claims* (MIT Press, 2001), as well as articles in scholarly journals. Previously, Ken was on the faculty of NYU's Stern School of Business and an officer of Bankers Trust Company. ■

Publications and Papers

The Research and Statistics Group produces a wide range of publications:

- ***The Economic Policy Review***—a policy-oriented journal focusing on economic and financial market issues.
- ***EPR Executive Summaries***—online versions of selected ***Economic Policy Review*** articles, in abridged form.
- ***Current Issues in Economics and Finance***—concise studies of topical economic and financial issues.
- ***Second District Highlights***—a regional supplement to ***Current Issues***.
- ***Staff Reports***—technical papers intended for publication in leading economic and finance journals, available only online.
- ***Publications and Other Research***—an annual catalogue of our research output.

New Titles in the *Staff Reports* Series

The following new Staff Reports are available at **www.newyorkfed.org/research/staff_reports**.

MACROECONOMICS AND GROWTH

No. 256, August 2006
U.S. Wage and Price Dynamics: A Limited Information Approach
Argia M. Sbordone

This paper analyzes the dynamics of prices and wages using a limited information approach to estimation. Sbordone estimates a two-equation model for the determination of prices and wages derived from an optimization-based dynamic model. The estimation procedure is a two-step minimum distance estimation that exploits the restrictions imposed by the model on a time series representation of the data. The distance function summarizes the cross-equation restrictions between the model and the time series representation of the data. The author then estimates the parameters of interest by minimizing a quadratic function of that distance. She finds that the estimated dynamics of prices and wages track actual dynamics quite well and that the estimated parameters are consistent with the observed length of nominal contracts.

No. 258, August 2006
Endogenous Productivity and Development Accounting
Roc Armenter and Amartya Lahiri

Cross-country data reveal that the per capita incomes of the richest countries exceed those of the poorest by a factor of thirty-five. Armenter and Lahiri formalize a model with embodied technical change in which newer, more productive vintages of capital coexist with older, less productive ones. A reduction in the cost of investment raises both the quantity and productivity of capital simultaneously. The model induces a simple relationship between the relative price of investment goods and per capita income. Using cross-country data on the prices of investment goods, the authors find that the model does fairly well in quantitatively accounting for the observed dispersion in world income. For the baseline parameterization, the model generates thirty-five-fold income gaps and six-fold productivity differences between the richest and poorest countries in the sample.

INTERNATIONAL

No. 255, August 2006
The Internationalization of the Dollar and Trade Balance Adjustment
Linda S. Goldberg and Cédric Tille

This paper argues that a depreciation of the dollar would have asymmetric effects on flows between the United States and its trading partners. With low exchange rate pass-through to U.S. import prices and high exchange rate pass-through to the local prices of countries consuming U.S. exports, the effect of a dollar depreciation on real trade flows is dominated by an adjustment in U.S. export quantities, which increase as U.S. goods become cheaper in the rest of the world. Real U.S. imports are affected less because U.S. prices are more insulated from exchange rate movements, and the price effects on the U.S. terms of trade are limited. Movements in dollar exchange rates also affect the international trade transactions of countries invoicing some of their trade in dollars.

No. 261, September 2006
Pass-Through of Exchange Rates to Consumption Prices: What Has Changed and Why
José Manuel Campa and Linda S. Goldberg

Campa and Goldberg use cross-country and time series evidence to argue that retail price sensitivity to exchange rates may have increased over the past decade. They highlight three reasons for the change in pass-through into the retail prices of goods: pass-through may have declined at the level of import prices; there has been a large expansion of imported input use across sectors; and there may have been changing sectoral expenditures on distribution services, negatively correlated with pass-through into final consumption prices. The authors find that this channel has not systematically changed in recent years. On balance, these effects support increased sensitivity of consumption prices to exchange rates, even if exchange rate pass-through into import prices has declined for some types of goods.

BANKING AND FINANCE

No. 254, July 2006
Stock Returns and Volatility: Pricing the Short-Run and Long-Run Components of Market Risk
Tobias Adrian and Joshua Rosenberg

Adrian and Rosenberg decompose the time series of equity market risk into short- and long-run volatility components. Both components have negative and highly significant prices of risk in the cross-section of equity returns. A three-factor model with the market return and the two volatility components compares favorably with benchmark models. The authors show that the short-run component captures market skewness risk, while the long-run component captures business cycle risk. Furthermore, short-run volatility is the more important cross-sectional risk factor, even though its average risk premium is smaller than the premium of the long-run component.

No. 257, August 2006
On the Market Discipline of Informationally Opaque Firms: Evidence from Bank Borrowers in the Federal Funds Market
Adam Ashcraft and Hoyt Bleakley

Using plausibly exogenous variation in demand for federal funds created by daily shocks to reserve balances, Ashcraft and Bleakley identify the supply curve facing a bank borrower in the interbank market and study how access to overnight credit is affected by changes in public and private measures of borrower creditworthiness. They find that although lenders respond to adverse changes in public information about credit quality by restricting access to the market in a fashion consistent with market discipline, borrowers respond to adverse changes in private information about credit quality by increasing leverage as if to offset the future impact on earnings. The authors document evidence suggesting that banks exploit private information about loan portfolio quality to smooth future earnings and to manage the real information content of these disclosures.

No. 259, September 2006
Congestion and Cascades in Payment Systems
Walter E. Beyeler, Robert J. Glass, Morten L. Bech, and Kimmo Soramäki

The authors develop a parsimonious model of the interbank payment system to study congestion and the role of liquidity markets in alleviating congestion. The model incorporates an endogenous instruction arrival process, scale-free topology of payments between banks, fixed total liquidity that limits banks' capacity to process arriving instructions, and a global market that distributes liquidity. The study finds that at low liquidity, the system becomes congested and payment settlement loses correlation with payment instruction arrival, becoming coupled across the network. In the congested regime, settlement takes place in cascades having a characteristic size. A global liquidity market substantially diminishes congestion, requiring only a small fraction of the payment-induced liquidity flow to achieve strong beneficial effects.

No. 260, September 2006

Technology Diffusion within Central Banking: The Case of Real-Time Gross Settlement

Morten L. Bech and Bart Hobijn

Bech and Hobijn examine the diffusion of the real-time gross settlement (RTGS) technology across all 174 central banks. RTGS reduces settlement risk and facilitates financial innovation in the settlement of foreign exchange trades. In 1985, only three central banks had implemented RTGS systems; by year-end 2005, that number had increased to ninety. The authors find that the RTGS diffusion process is consistent with the standard S-curve prediction. Real GDP per capita, the relative price of capital, and trade patterns explain a significant part of the cross-country variation in RTGS adoption. These determinants are remarkably similar to those that seem to drive the cross-country adoption patterns of other technologies.

QUANTITATIVE METHODS

No. 253, July 2006

The Relationship between Expected Inflation, Disagreement, and Uncertainty: Evidence from Matched Point and Density Forecasts

Robert Rich and Joseph Tracy

This paper examines matched point and density forecasts of inflation from the Survey of Professional Forecasters to analyze the relationship between expected inflation, disagreement, and uncertainty. Rich and Tracy extend previous studies through their data construction and estimation methodology. Specifically, they derive measures of disagreement and uncertainty by using a decomposition proposed in earlier research by Wallis and by applying the concept of entropy from information theory. The authors also undertake the empirical analysis within a seemingly unrelated regression framework. The results offer mixed support for the propositions that disagreement is a useful proxy for uncertainty and that increases in expected inflation are accompanied by heightened inflation uncertainty. However, the authors document a robust, quantitatively and statistically significant positive association between disagreement and expected inflation. ■

Papers Presented by Economists in the Research and Statistics Group

"Stock Returns and Volatility: Pricing the Short-Run and Long-Run Components of Market Risk," Tobias Adrian and Joshua Rosenberg. Risk Magazine conference, New York City, July 12.

"Sustainable Monetary Policy and Inflation Expectations," Roc Armenter. Society for Economic Dynamics annual meeting, Vancouver, British Columbia, Canada, July 8.

"Contagion, Cascades, and Disruptions to the Interbank Payment System," Morten Bech. Bank of England Research Forum, London, England, July 20. With Walter E. Beyeler, Robert J. Glass, and Kimmo Soramäki.

"Internal Dynamics in Financial Conglomerates: Evidence from Bank-Pension Fund Common Ownership in Chile," Nicola Cetorelli. Ente Luigi Einaudi–Bank of Italy seminar, Rome, Italy, July 13.

"Personal Bankruptcy and Credit Market Competition," Astrid Dick. European Association for Research in Industrial Economics annual conference, Amsterdam, the Netherlands, August 25. With Andreas Lehnert.

"Great Expectations and the End of the Depression," Gauti Eggertsson. NBER Summer Institute, Cambridge, Massachusetts, July 17.

"The Mistake of 1937: A General Equilibrium Analysis," Gauti Eggertsson. Bank of Japan, Tokyo, Japan, June 2. With Benjamin Pugsley.

"Demographic Trends, Fiscal Policy, and Trade Deficits," Andrea Ferrero. Society for Economic Dynamics annual meeting, Vancouver, British Columbia, Canada, July 8.

"Distribution Margins, Imported Inputs, and the Sensitivity of CPIs to Exchange Rates," Linda Goldberg. NBER International Finance and Macroeconomics Program conference, Cambridge, Massachusetts, July 13. With José Manuel Campa.

"Market Perceptions of the Evolving Credibility of the European Central Bank," Linda Goldberg. NBER Monetary Economics Program conference, Cambridge, Massachusetts, July 10. With Michael Klein.

"Pass-Through of Exchange Rates to Consumption Prices: What Has Changed and Why?" Linda Goldberg. NBER East Asia Seminar on Economics, Kona, Hawaii, June 21. With José Manuel Campa.

"A Framework for Identifying the Sources of Local-Currency Price Stability with an Empirical Application," Rebecca Hellerstein. Society for Economic Dynamics annual meeting, Vancouver, British Columbia, Canada, July 7. With Pinelopi Goldberg.

"Banking Policy without Commitment: Suspension of Convertibility Taken Seriously," Todd Keister. Econometric Society 2006 North American Summer Meeting, held at the University of Minnesota, Minneapolis, Minnesota, June 25. With Huberto Ennis.

"Expectations and Contagion in Self-Fulfilling Currency Attacks," Todd Keister. Society for Economic Dynamics annual meeting, Vancouver, British Columbia, Canada, July 7.

"Oil Price Movements and the Global Economy: A Model-Based Assessment," Paolo Pesenti. Bank of Canada Workshop on Commodity Price Issues, Ottawa, Ontario, Canada, July 11. With Selim Elekdag, Douglas Laxton, René Lalonde, and Dirk Muir.

"Firm Heterogeneity and Credit Risk Diversification," Til Schuermann. CIRANO-CIREQ Conference on Financial Econometrics, Montreal, Canada, May 6. With Samuel Hanson and M. Hashem Pesaran.

"Macroeconomic Dynamics and Credit Risk: A Global Perspective." Til Schuermann. Riksbank conference, Stockholm, Sweden, May 12. With M. Hashem Pesaran, Björn-Jakob Treutler, and Scott M. Weiner.

"Visible and Hidden Risk Factors for Banks," Til Schuermann and Kevin Stiroh. Conference on Risk Management and Regulation in Banking, cosponsored by the Basel Committee on Banking Supervision, the Centre for Economic Policy Research, and the Journal of Financial Intermediation, held at the Bank for International Settlements, Basel, Switzerland, June 29. Also presented at the 6th Annual Bank Research Conference, cosponsored by the Federal Deposit Insurance Corporation's Center for Financial Research and the Journal of Financial Services Research, Arlington, Virginia, September 14.

"Household Saving and Wealth Accumulation in the United States," Charles Steindel. Irving Fisher Committee conference, Bank for International Settlements, Basel, Switzerland, August 30.

"Information Technology and Productivity Growth in the 2000s," Kevin Stiroh. Institute for Advanced Studies (IHS) conference, Vienna, Austria, September 16. With Matthew Botsch.

"Borrowing without Debt? Interpreting the U.S. International Position," Cédric Tille. National Association for Business Economics 2006 annual meeting, Boston, Massachusetts, September 12. With Matthew Higgins and Thomas Klitgaard.

"Could Capital Gains Smooth a Current Account Rebalancing?" Cédric Tille. Society for Economic Dynamics annual meeting, Vancouver, British Columbia, Canada, July 7. With Michele Cavallo. Also presented at a European Central Bank conference, Frankfurt, Germany, July 18, and the 21st Annual Congress of the European Economic Association, Vienna, Austria, August 26.

"The Empirical Content of Models with Multiple Equilibria," Giorgio Topa. Society for Economic Dynamics annual meeting, Vancouver, British Columbia, Canada, July 8. With Alberto Bisin and Andrea Moro. ■

Recently Published

Astrid Dick. 2006. **"Nationwide Branching and Its Impact on Market Structure, Quality, and Bank Performance."** *Journal of Business* 79, no. 2 (March): 567-92.

Beverly Hirtle. 2006. **"Stock Market Reaction to Financial Statement Certification by Bank Holding Company CEOs."** *Journal of Money, Credit, and Banking* 38, no. 5 (August): 1263-92.

Bart Hobijn and Andrea Tambalotti. 2006. **"Menu Costs at Work: Restaurant Prices and the Introduction of the Euro,"** with Federico Ravenna. *Quarterly Journal of Economics* 121, no. 3 (August): 1103-31.

Antoine Martin. 2006. **"Is Competition in the Financial Sector a Good Thing?"** with Falko Fecht. *Journal of Financial Transformation* 17 (August): 123-9.

Jonathan McCarthy and Richard Peach. 2006. **"Is There a 'Bubble' in the Housing Market Now?"** In John A. Tatom, ed., *Is Your Bubble About to Burst?* 18-37. Indianapolis, Indiana: Networks Financial Institute.

Simon Potter. 2006. **"Changes in Labor Force Participation in the United States,"** with Chinhui Juhn. *Journal of Economic Perspectives* 20, no. 3 (summer): 27-46.

Simon Potter. 2006. **"The Vector Floor and Ceiling Model,"** with Gary Koop. In Costas Milas, Philip Rothman, and Dick van Dijk, eds., *Nonlinear Time Series Analysis of Business Cycles*, 97-131. Amsterdam: Elsevier B.V.

Ayşegül Şahin. 2006. **"Specialization and Human Capital in Search Equilibrium,"** with Toshihiko Mukoyama. *Journal of the European Economic Association* 4, no. 2-3 (April-May): 503-12.

João Santos. 2006. **"Who Should Act as Lender of Last Resort? An Incomplete Contracts Model: A Comment,"** with Charles M. Kahn. *Journal of Money, Credit, and Banking* 38, no. 4 (June): 1111-8.

Argia Sbordone. 2006. **"U.S. Wage and Price Dynamics: A Limited Information Approach."** *International Journal of Central Banking* 2, no. 3 (September): 155-91.

Til Schuermann. 2006. **"Confidence Intervals for Probabilities of Default,"** with Samuel Hanson. *Journal of Banking and Finance* 30, no. 8 (August): 2281-301.

Til Schuermann. 2006. **"Macroeconomic Dynamics and Credit Risk: A Global Perspective,"** with M. Hashem Pesaran, Björn-Jakob Treutler, and Scott M. Weiner. *Journal of Money, Credit, and Banking* 38, no. 5 (August): 1211-62.

Kevin Stiroh. 2006. **"The Dark Side of Diversification: The Case of U.S. Financial Holding Companies,"** with Adrienne Rumble. *Journal of Banking and Finance* 30, no. 8 (August): 2131-61.

Kevin Stiroh. 2006. **"A Portfolio View of Banking with Interest and Noninterest Activities."** *Journal of Money, Credit, and Banking* 38, no. 5 (August): 1351-62. ■

Forthcoming in the *Economic Policy Review*

Now available on the New York Fed's website: "The Emergence of 'Regular and Predictable' as a Treasury Debt Management Strategy," by Kenneth D. Garbade.

During the 1970s, U.S. Treasury officials revised the framework within which they selected the maturities of new notes and bonds. Previously, they chose maturities on an offering-by-offering basis. By 1982, the Treasury had ceased these "tactical" sales and was selling notes and bonds on a "regular and predictable" schedule.

Garbade describes that key change in the Treasury's debt management strategy. He shows that in 1975, Treasury officials financed an unusually rapid expansion of the federal deficit with a flurry of tactical offerings. Because the timing and maturities of the offerings followed no predictable pattern, the sales sometimes took investors by surprise, disrupting the market. These events led Treasury officials to embrace a more orderly program of regularly scheduled issuance—a program they had been using for decades to auction bills.

The Treasury's switch to regular and predictable issuance of notes and bonds was widely praised for reducing the element of surprise in Treasury offering announcements, facilitating investor planning, and decreasing Treasury borrowing costs. ■

Other New Publications

- *Upstate New York At-a-Glance:* A new publication by the New York Fed's Buffalo Branch. The first issue, "The Aging of Upstate New York," outlines the pattern of aging in the region and suggests implications.

  www.newyorkfed.org/aboutthefed/buffalo/presentation/july_august_update.pdf

- *Research Associate Opportunities for College Graduates:* This online guide describes the job responsibilities of RAs in the Research Group as well as the advantages of working at the New York Fed.

  www.newyorkfed.org/research/research_associates/index.html

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Research and Statistics Group Publications and Papers: July-September 2006

Publications are available at **www.newyorkfed.org/research/publication_annuals/index.html**.

ECONOMIC POLICY REVIEW

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Arturo Estrella and Mary R. Trubin

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Have U.S. Import Prices Become Less Responsive to Changes in the Dollar?
Rebecca Hellerstein, Deirdre Daly, and Christina Marsh

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