SELECTED READINGS

Focus on: James H. Stock and Mark W. Watson

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INTRODUCTION

James Harold Stock is an economist and a professor of economics at Harvard University.

Stock graduated with a B.S. in physics in 1978 from Yale University. He received a master's degree in statistics and a doctoral degree in economics from the University of California at Berkeley.

Prof. Stock is interested in the use and development of time series analysis methodologies, especially in application to economic forecasting. He is also interested in econometric methodology and monetary economics.

His research is focused on economic forecasting related to monetary policy. More specifically, identifying and analyzing factors in U.S. macroeconomic growth and the relationship between macroeconomic cyclical stability and long-run economic expansion. He also works on the prediction of short-term economic growth, using indexes of leading and coincident economic indicators.

He is a member of various professional boards, including the Academic Advisory Board of the Federal Reserve Bank of Boston.

Mark W. Watson is the Howard Harrison and Gabrielle Snyder Beck Professor of Economics and Public Affairs at Princeton University and a research associate at the National Bureau of Economic Research. He is a fellow of the American Academy of Arts and Sciences and of the Econometric Society. Mark Watson is also a visiting scholar in the Research Department at the Federal Reserve Bank of Richmond. He has served as a consultant for the Federal Reserve Bank of Chicago.

Prior to coming to Princeton in 1995, Watson served on the economics faculty at Harvard and Northwestern. He did his undergraduate work at Pierce Junior College and California State University at Northridge, and completed his Ph.D. at the University of California at San Diego.

Mark Watson, along with Tim Bollerslev, is widely regarded as carrying forward the work of the Nobel Prize-winning economist, Robert F. Engle, including by Engle himself. His research focuses on time-series econometrics, empirical macroeconomics, and macroeconomic forecasting. He has published articles in these areas and is the author with James Stock of Introduction to Econometrics, a leading undergraduate textbook. Watson has served on the editorial board of several journals including the American Economic Review, Journal of Applied Econometrics, Econometrica, the Journal of Business and Economic Statistics, the Journal of Monetary Economics, and Macroeconomic Dynamics. He currently serves as a Co-Editor of the Review of Economics and Statistics.

The following list is a non-exhaustive, subjective selection of James H. Stock's and Mark W. Watson's publications.

More information can be found at:

- The address of James H. Stock's homepage at:

http://www.hks.harvard.edu/about/faculty-staff-directory/james-stock

- The address of Mark W. Watson's homepage at:

http://www.princeton.edu/~mwatson/

Contact point: GianLuigi Mazzi, "Responsible for Euro-indicators and statistical methodology", Estat - D5 "Key Indicators for European Policies" gianluigi.mazzi@ec.europa.eu.

1 WORKING PAPERS AND ARTICLES

1.1 Ulrich K. Müller and James H. Stock, 2011. "Forecasts in a Slightly Misspecified Finite Order VAR," NBER Working Papers 16714, National Bureau of Economic Research.

We propose a Bayesian procedure for exploiting small, possibly long-lag linear predictability in the innovations of a finite order autoregression. We model the innovations as having a log-spectral density that is a continuous mean-zero Gaussian process of order $1/\sqrt{T}$. This local embedding makes the problem asymptotically a normal-normal Bayes problem, resulting in closed-form solutions for the best forecast. When applied to data on 132 U.S. monthly macroeconomic time series, the method is found to improve upon autoregressive forecasts by an amount consistent with the theoretical and Monte Carlo calculations.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w16714.pdf

1.2 James H. Stock and Mark W. Watson, 2010. "Estimating Turning Points Using Large Data Sets," NBER Working Papers 16532, National Bureau of Economic Research.

Dating business cycles entails ascertaining economy-wide turning points. Broadly speaking, there are two approaches in the literature. The first approach, which dates to Burns and Mitchell (1946), is to identify turning points individually in a large number of series, then to look for a common date that could be called an aggregate turning point. The second approach, which has been the focus of more recent academic and applied work, is to look for turning points in a few, or just one, aggregate. This paper examines these two approaches to the identification of turning points. We provide a nonparametric definition of a turning point (an estimand) based on a population of time series. This leads to estimators of turning points, sampling distributions, and standard errors for turning points based on a sample of series. We consider both simple random sampling and stratified sampling. The empirical part of the analysis is based on a data set of 270 disaggregated monthly real economic time series for the U.S., 1959-2010.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w16532.pdf

1.3 James H. Stock and Mark W. Watson, 2010. "Modeling Inflation after the Crisis," NBER Working Papers 16488, National Bureau of Economic Research.

In the United States, the rate of price inflation falls in recessions. Turning this observation into a useful inflation forecasting equation is difficult because of multiple sources of time variation in the inflation process, including changes in Fed policy and credibility. We propose a tightly parameterized model in which the deviation of inflation from a stochastic trend (which we interpret as long-term expected inflation) reacts stably to a new gap measure, which we call the unemployment recession gap. The short-term response of inflation to an increase in this gap is stable, but the long-term response depends on the resilience, or anchoring, of trend inflation. Dynamic simulations (given the path of unemployment) match the paths of inflation during post-1960 downturns, including the current one.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w16488.pdf

1.4 James H. Stock and Mark W. Watson, 2008. "Phillips Curve Inflation Forecasts," NBER Working Papers 14322, National Bureau of Economic Research.

This paper surveys the literature since 1993 on pseudo out-of-sample evaluation of inflation forecasts in the United States and conducts an extensive empirical analysis that recapitulates and clarifies this literature using a consistent data set and methodology. The literature review and empirical results are gloomy and indicate that Phillips curve forecasts (broadly interpreted as forecasts using an activity variable) are better than other multivariate forecasts, but their performance is episodic, sometimes better than and sometimes worse than a good (not naïve) univariate benchmark. We provide some preliminary evidence characterizing successful forecasting episodes.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w14322.pdf

1.5 James H. Stock and Mark W. Watson, 2006. "Why Has U.S. Inflation Become Harder to Forecast?," NBER Working Papers 12324, National Bureau of Economic Research.

Forecasts of the rate of price inflation play a central role in the formulation of monetary policy, and forecasting inflation is a key job for economists at the Federal Reserve Board. This paper examines whether this job has become harder and, to the extent that it has, what changes in the inflation process have made it so. The main finding is that the univariate inflation process is well described by an unobserved component trend-cycle model with stochastic volatility or, equivalently, an integrated moving average process with time-varying parameters; this model explains a variety of recent univariate inflation forecasting puzzles. It appears currently to be difficult for multivariate forecasts to improve on forecasts made using this time-varying univariate model.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w12324.pdf

1.6 James H. Stock and Mark W. Watson, 2006. "Heteroskedasticity-Robust Standard Errors for Fixed Effects Panel Data Regression," NBER Technical Working Papers 0323, National Bureau of Economic Research.

The conventional heteroskedasticity-robust (HR) variance matrix estimator for cross-sectional regression (with or without a degrees of freedom adjustment), applied to the fixed effects estimator for panel data with serially uncorrelated errors, is inconsistent if the number of time periods T is fixed (and greater than two) as the number of entities n increases. We provide a bias-adjusted HR estimator that is (nT)1/2 - consistent under any sequences (n, T) in which n and/or T increase to %.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0323.pdf

1.7 Donald W.K. Andrews and James H. Stock, 2005. "Inference with Weak Instruments," Cowles Foundation Discussion Papers 1530, Cowles Foundation for Research in Economics, Yale University.

This paper reviews recent developments in methods for dealing with weak instruments (IVs) in IV regression models. The focus is more on tests (and confidence intervals derived from tests) than estimators. The paper also presents new testing

results under "many weak IV asymptotics," which are relevant when the number of IVs is large and the coefficients on the IVs are relatively small. Asymptotic power envelopes for invariant tests are established. Power comparisons of the conditional likelihood ratio (CLR), Anderson-Rubin, and Lagrange multiplier tests are made. Numerical results show that the CLR test is on the asymptotic power envelope. This holds no matter what the relative magnitude of the IV strength to the number of IVs.

Full text available at:

http://cowles.econ.yale.edu/P/cd/d15a/d1530.pdf

1.8 Massimiliano Marcellino, James Stock and Mark Watson, 2005. "A Comparison of Direct and Iterated Multistep AR Methods for Forecasting Macroeconomic Time Series," Working Papers 285, IGIER (Innocenzo Gasparini Institute for Economic Research), Bocconi University.

"Iterated" multiperiod ahead time series forecasts are made using a one-period ahead model, iterated forward for the desired number of periods, whereas "direct" forecasts are made using a horizon-specific estimated model, where the dependent variable is the multi-period ahead value being forecasted. Which approach is better is an empirical matter: in theory, iterated forecasts are more efficient if correctly specified, but direct forecasts are more robust to model misspecification. This paper compares empirical iterated and direct forecasts from linear univariate and bivariate models by applying simulated out-of-sample methods to 171 U.S. monthly macroeconomic time series spanning 1959 – 2002. The iterated forecasts typically outperform the direct forecasts, particularly if the models can select long lag specifications. The relative performance of the iterated forecasts improves with the forecast horizon.

Full text available at:

ftp://ftp.igier.uni-bocconi.it/wp/2005/285.pdf

1.9 James H. Stock and Mark W. Watson, 2005. "Implications of Dynamic Factor Models for VAR Analysis," NBER Working Papers 11467, National Bureau of Economic Research.

This paper considers VAR models incorporating many time series that interact through a few dynamic factors. Several econometric issues are addressed including estimation of the number of dynamic factors and tests for the factor restrictions imposed on the VAR. Structural VAR identification based on timing restrictions, long

run restrictions, and restrictions on factor loadings are discussed and practical computational methods suggested. Empirical analysis using U.S. data suggest several (7) dynamic factors, rejection of the exact dynamic factor model but support for an approximate factor model, and sensible results for a SVAR that identifies money policy shocks using timing restrictions.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w11467.pdf

1.10 Donald W.K. Andrews, Marcelo J. Moreira and James H. Stock, 2004. "Optimal Invariant Similar Tests for Instrumental Variables Regression," Cowles Foundation Discussion Papers 1476, Cowles Foundation for Research in Economics, Yale University.

This paper considers tests of the parameter on endogenous variables in an instrumental variables regression model. The focus is on determining tests that have some optimal power properties. We start by considering a model with normally distributed errors and known error covariance matrix. We consider tests that are similar and satisfy a natural rotational invariance condition. We determine tests that maximize weighted average power (WAP) for arbitrary weight functions among invariant similar tests. Such tests include point optimal (PO) invariant similar tests. The results yield the power envelope for invariant similar tests. This allows one to assess and compare the power properties of existing tests, such as the Anderson-Rubin, Lagrange multiplier (LM), and conditional likelihood ratio (CLR) tests, and new optimal WAP and PO invariant similar tests. We find that the CLR test is quite close to being uniformly most powerful invariant among a class of two-sided tests. A new unconditional test, P*, also is found to have this property. For one-sided alternatives, no test achieves the invariant power envelope, but a new test -- the one-sided CLR test -- is found to be fairly close. The finite sample results of the paper are extended to the case of unknown error covariance matrix and possibly non-normal errors via weak instrument asymptotics. Strong instrument asymptotic results also are provided because we seek tests that perform well under both weak and strong instruments.

Full text available at:

http://cowles.econ.yale.edu/P/cd/d14b/d1476.pdf

1.11 James H. Stock and Mark W. Watson, 2003. "oj," Instructional Stata datasets for econometrics oj, Boston College Department of Economics.

Instructional dataset, accompanying Introduction to Econometrics, James H. Stock and Mark W. Watson, Pearson Education, Inc. (c) 2003. Data on the frozen orange juice component of processed foods and feeds group of the producer price index (PPI), collected by the U.S. Bureau of Labor Statistics. 642 observations.

Data is available at:

http://fmwww.bc.edu/ec-p/data/stockwatson

1.12 James H. Stock and Mark W. Watson, 2003. "Understanding Changes in International Business Cycle Dynamics," NBER Working Papers 9859, National Bureau of Economic Research.

The volatility of economic activity in most G7 economies has moderated over the past forty years. Also, despite large increases in trade and openness, G7 business cycles have not become more synchronized. After documenting these twin facts, we interpret G7 output data using a structural VAR that separately identifies common international shocks, the domestic effects of spillovers from foreign idiosyncratic shocks, and the effects of domestic idiosyncratic shocks. This analysis suggests that, with the exception of Japan, the widespread reduction in volatility is in large part associated with a reduction in the magnitude of the common international shocks. Had the common international shocks in the 1980s and 1990s been as large as they were in the 1960s and 1970s, G7 business cycles would have been substantially more volatile and more highly synchronized than they actually were.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w9859.pdf

1.13 James H. Stock and Mark W. Watson, 2003. "Caschool," Instructional Stata datasets for econometrics caschool, Boston College Department of Economics.

Instructional dataset, accompanying Introduction to Econometrics, James H. Stock and Mark W. Watson, Pearson Education, Inc. (c) 2003. Data on test performance, school characteristics and student demographic backgrounds for California school districts, 1998-1999. 420 observations.

Data is available at:

http://fmwww.bc.edu/ec-p/data/stockwatson

1.14 James H. Stock and Mark W. Watson, 2003. "Has the Business Cycle Changed and Why?," NBER Chapters, in: NBER Macroeconomics Annual 2002, Volume 17, pages 159-230 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c11075.pdf

1.15 James H. Stock and Motohiro Yogo, 2002. "Testing for Weak Instruments in Linear IV Regression," NBER Technical Working Papers 0284, National Bureau of Economic Research.

Weak instruments can produce biased IV estimators and hypothesis tests with large size distortions. But what, precisely, are weak instruments, and how does one detect them in practice? This paper proposes quantitative definitions of weak instruments based on the maximum IV estimator bias, or the maximum Wald test size distortion, when there are multiple endogenous regressors. We tabulate critical values that enable using the first-stage F-statistic (or, when there are multiple endogenous regressors, the Cragg-Donald (1993) statistic) to test whether given instruments are weak. A technical contribution is to justify sequential asymptotic approximations for IV statistics with many weak instruments.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0284.pdf

1.16 James H. Stock and Mark W. Watson, 2001. "Forecasting output and inflation: the role of asset prices," Proceedings, Federal Reserve Bank of San Francisco, issue Mar.

This paper examines old and new evidence on the predictive performance of asset prices for inflation and real output growth. We first review the large literature on this topic, focusing on the past dozen years. We then undertake an empirical analysis of quarterly date on up to 38 candidate indicators (mainly asset prices) for seven OECD countries for a span of up to 41 years (1959 - 1999). The conclusions from the literature review and the empirical analysis are the same. Some asset prices predict

either inflation or output growth in some countries in some periods. Which series predicts what, when and where is, however, itself difficult to predict: good forecasting performance by an indicator in one period seems to be unrelated to whether it is a useful predictor in a later period. Intriguingly, forecasts produced by combining these unstable individual forecasts appear to improve reliably upon univariate benchmarks.

Full text available at:

http://www.frbsf.org/economics/conferences/0103/conf7.pdf

1.17 Douglas Staiger, James H. Stock and Mark W. Watson, 2001. "Prices, Wages and the U.S. NAIRU in the 1990s," NBER Working Papers 8320, National Bureau of Economic Research.

Using quarterly macro data and annual state panel data, we examine various explanations of the low rate of price inflation, strong real wage growth, and low rate of unemployment in the U.S. economy during the late 1990s. Many of these explanations imply shifts in the coefficients of price and wage Phillips curves. We find, however, that once one accounts for the univariate trends in the unemployment rate and in the rate of productivity growth, these coefficients are stable. This suggests that many explanations, such as persistent beneficial supply shocks, changes in firms' pricing power, changes in price expectations arising from shifts in Fed policy, and changes in wage setting behavior miss the mark. Rather, we suggest that explanations of movements of wages, prices and unemployment over the 1990s, and indeed over the past forty years, must focus on understanding the univariate trends in the unemployment rate and in productivity growth and, perhaps, the relation between the two.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w8320.pdf

1.18 Michael Kremer, Alexei Onatski and James Stock, 2001. "Searching for Prosperity," NBER Working Papers 8250, National Bureau of Economic Research.

Quah's [1993a] transition matrix analysis of world income distribution based on annual data suggests an ergodic distribution with twin peaks at the rich and poor end of the distribution. Since the ergodic distribution is a highly non-linear function of the underlying transition matrix estimated extremely noisily. Estimates over the

foreseeable future are more precise. The Markovian assumptions underlying the analysis are much better satisfied with an analysis based on five-year transitions than one-year transitions. Such an analysis yields an ergodic distribution with 72% of mass in the top income category, but a prolonged transition, during which some inequality measures increase. The rosy ergodic forecast and prolonged transition arise because countries' relative incomes move both up and down at moderate levels, but once countries reach the highest income category, they rarely leave it. This is consistent with a model in which countries search among policies until they reach an income level at which further experimentation is too costly. If countries can learn from each other's experience, the future may be much brighter than would be predicted based on projecting forward the historical transition matrix.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w8250.pdf

1.19 Thomas Knox, James H. Stock and Mark W. Watson, 2000. "Empirical Bayes Forecasts of One Time Series Using Many Predictors," Econometric Society World Congress 2000 Contributed Papers 1421, Econometric Society.

We consider the problem of forecasting a single time series, y(t+1), using a linear regression model with k predictor variables, X(t), when each predictor makes a small but nonzero marginal contribution to the forecast. It is well known that OLS is inadmissible when k is at least 3. Although Bayes estimators are admissible, the associated forecasts are unappealing because they can have large (frequentist) risk for some parameter values. We therefore consider Empirical Bayes estimators of the regression coefficients and their associated forecasts, when both the prior and regression error distributions are unknown. To focus attention on large k, we adopt a nesting where k is proportional to the sample size (T), and focus on the asymptotic properties of the true Bayes, Empirical Bayes, and OLS forecasts. We consider Bayes estimators that are functions of the OLS estimates, and propose a nonparametric Empirical Bayes estimator that is asymptotically optimal, in the sense that it achieves the Bayes risk of the best infeasible Bayes estimator when the true error distribution is normal. This result suggests that the Empirical Bayes estimator will have desirable frequentist risk as well. Both nonparametric and parametric Empirical Bayes estimators are examined in a Monte Carlo experiment, with results that are

encouraging from both a Bayes and frequentist risk perspective. The new estimators are then applied to the problem of forecasting a few monthly postwar aggregate U.S. economic time series using the first 146 principal components from a large panel of predictor variables.

Full text available at:

http://fmwww.bc.edu/RePEc/es2000/1421.pdf

1.20 Alexei Onatski and James H. Stock, 2000. "Robust Monetary Policy Under Model Uncertainty in a Small Model of the U.S. Economy," NBER Working Papers 7490, National Bureau of Economic Research.

This paper examines monetary policy in Rudebusch and Svensson's (1999) two equation macroeconomic model when the policymaker recognizes that the model is an approximation and is uncertain about the quality of that approximation. It is argued that the minimax approach of robust control provides a general and tractable alternative to the conventional Bayesian decision theoretic approach. Robust control techniques are used to construct robust monetary policies. In most (but not all) cases, these robust policies are more aggressive than the optimal policies absent model uncertainty. The specific robust policies depend strongly on the formation of model uncertainty used, and we make some suggestions about which formulation is most relevant for monetary policy applications.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w7490.pdf

1.21 James H. Stock and Mark W. Watson, 1999. "Forecasting Inflation," NBER Working Papers 7023, National Bureau of Economic Research.

This paper investigates forecasts of U.S. inflation at the 12-month horizon. The starting point is the conventional unemployment rate Phillips curve, which is examined in a simulated out of sample forecasting framework. Inflation forecasts produced by the Phillips curve generally have been more accurate than forecasts based on other macroeconomic variables, including interest rates, money and commodity prices. These forecasts can however be improved upon using a generalized Phillips curve based on measures of real aggregate activity other than

unemployment, especially a new index of aggregate activity based on 61 real economic indicators.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w7023.pdf

1.22 James H. Stock and Mark W. Watson, 1998. "A Comparison of Linear and Nonlinear Univariate Models for Forecasting Macroeconomic Time Series," NBER Working Papers 6607, National Bureau of Economic Research.

A forecasting comparison is undertaken in which 49 univariate forecasting methods, plus various forecast pooling procedures, are used to forecast 215 U.S. monthly macroeconomic time series at three forecasting horizons over the period 1959 - 1996. All forecasts simulate real time implementation, that is, they are fully recursive. The forecasting methods are based on four classes of models: autoregressions (with and without unit root pretests), exponential smoothing, artificial neural networks, and smooth transition autoregressions. The best overall performance of a single method is achieved by autoregressions with unit root pretests, but this performance can be improved when it is combined with the forecasts from other methods.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w6607.pdf

1.23 James H. Stock and Mark W. Watson, 1998. "Diffusion Indexes," NBER Working Papers 6702, National Bureau of Economic Research.

This paper considers forecasting a single time series using more predictors than there are time series observations. The approach is to construct a relatively few indexes, akin to diffusion indexes, which are weighted averages of the predictors, using an approximate dynamic factor model. Estimation is discussed for balanced and unbalanced panels. The estimated dynamic factors are (uniformly) consistent, even in the presence of time varying parameters and/or data contamination, and forecasts based on the estimated factors are efficient. In an application to forecasting U.S. inflation and industrial production using 224 monthly time series, these forecasts outperform various state-of-the-art benchmark models.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w6702.pdf

1.24 James H. Stock and Mark W. Watson, 1998. "Business Cycle Fluctuations in U.S. Macroeconomic Time Series," NBER Working Papers 6528, National Bureau of Economic Research.

This paper examines the empirical relationship in the postwar United States between the aggregate business cycle and various aspects of the macroeconomy, such as production, interest rates, prices, productivity, sectoral employment, investment, income, and consumption. This is done by examining the strength of the relationship between the aggregate cycle and the cyclical components of individual time series, whether individual series lead or lag the cycle, and whether individual series are useful in predicting aggregate fluctuations. The paper also reviews some additional empirical regularities in the U.S. economy, including the Phillips curve and some long-run relationships, in particular long-run money demand, long-run properties of interest rates and the yield curve, and the long-run properties of the shares in output of consumption, investment and government spending.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w6528.pdf

1.25 Douglas Staiger, James H. Stock and Mark W. Watson, 1996. "How Precise are Estimates of the Natural Rate of Unemployment?," NBER Working Papers 5477, National Bureau of Economic Research.

This paper investigates the precision of conventional and unconventional estimates of the natural rate of unemployment (the 'NAIRU'). The main finding is that the NAIRU is imprecisely estimated: a typical 95% confidence interval for the NAIRU in 1990 is 5.1% to 7.7%. This imprecision obtains whether the natural rate is modeled as a constant, as a slowly changing function of time, as an unobserved random walk, or as a function of various labor market fundamentals; it obtains using other series for unemployment and inflation, including additional supply shift variables in the Phillips curve, using monthly or quarterly data, and using various measures for expected inflation. This imprecision suggests caution in using the NAIRU to guide monetary policy.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w5477.pdf

1.26 James H. Stock and Mark W. Watson, 1996. "Asymptotically Median Unbiased Estimation of Coefficient Variance in a Time Varying Parameter Model," NBER Technical Working Papers 0201, National Bureau of Economic Research.

This paper considers the estimation of the variance of coefficients in time varying parameter models with stationary regressors. The maximum likelihood estimator has large point mass at zero. We therefore develop asymptotically median unbiased estimators and confidence intervals by inverting median functions of regression-based parameter stability test statistics, computed under the constant-parameter null. These estimators have good asymptotic relative efficiencies for small to moderate amounts of parameter variability. We apply these results to an unobserved components model of trend growth in postwar U.S. GDP: the MLE implies that there has been no change in the trend rate, while the upper range of the median-unbiased point estimates imply that the annual trend growth rate has fallen by 0.7 percentage points over the postwar period.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0201.pdf

1.27 James H. Stock and Jonathan Wright, 1996. "Asymptotics for GMM Estimators with Weak Instruments," NBER Technical Working Papers 0198, National Bureau of Economic Research.

This paper develops asymptotic distribution theory for generalized method of moments (GMM) estimators and test statistics when some of the parameters are well identified, but others are poorly identified because of weak instruments. The asymptotic theory entails applying empirical process theory to obtain a limiting representation of the (concentrated) objective function as a stochastic process. The general results are specialized to two leading cases, linear instrumental variables regression and GMM estimation of Euler equations obtained from the consumption-based capital asset pricing model with power utility. Numerical results of the latter model confirm that finite sample distributions can deviate substantially from

normality, and indicate that these deviations are captured by the weak instrument asymptotic approximations.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0198.pdf

1.28 Robin L. Lumsdaine, James H. Stock and David A. Wise, 1996. "Why Are Retirement Rates So High at Age 65?," NBER Chapters, in: Advances in the Economics of Aging, pages 61-82 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7318.pdf

1.29 Douglas Staiger and James H. Stock, 1994. "Instrumental Variables Regression with Weak Instruments," NBER Technical Working Papers 0151, National Bureau of Economic Research.

This paper develops asymptotic distribution theory for instrumental variable regression when the partial correlation between the instruments and a single included endogenous variable is weak, here modeled as local to zero. Asymptotic representations are provided for various instrumental variable statistics, including the two-stage least squares (TSLS) and limited information maximum- likelihood (LIML) estimators and their t-statistics. The asymptotic distributions are found to provide good approximations to sampling distributions with just 20 observations per instrument. Even in large samples, TSLS can be badly biased, but LIML is, in many cases, approximately median unbiased. The theory suggests concrete quantitative guidelines for applied work. These guidelines help to interpret Angrist and Krueger's (1991) estimates of the returns to education: whereas TSLS estimates with many instruments approach the OLS estimate of 6%, the more reliable LIML and TSLS estimates with fewer instruments fall between 8% and 10%, with a typical confidence interval of (6%, 14%).

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0151.pdf

1.30 James H. Stock and Mark W. Watson, 1994. "Evidence on Structural Instability in Macroeconomic Time Series Relations," NBER Technical Working Papers 0164, National Bureau of Economic Research.

An experiment is performed to assess the prevalence of instability in univariate and bivariate macroeconomic time series relations and to ascertain whether various adaptive forecasting techniques successfully handle any such instability. Formal tests for instability and out-of-sample forecasts from sixteen different models are computed using a sample of 76 representative U.S. monthly postwar macroeconomic time series, constituting 5700 bivariate forecasting relations. The tests indicate widespread instability in univariate and bivariate autoregressive models. However, adaptive forecasting models, in particular time varying parameter models, have limited success in exploiting this instability to improve upon fixed-parameter or recursive autoregressive forecasts.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0164.pdf

1.31 James H. Stock and Martin Feldstein, 1994. "Measuring Money Growth When Financial Markets Are Changing," NBER Working Papers 4888, National Bureau of Economic Research.

This paper examines the problem of measuring the growth of a monetary aggregate in the presence of innovations in financial markets and changes in the relationship between individual assets and output. We propose constructing a monetary aggregate so that it is a good leading indicator of nominal GDP; in general the weights on its components vary over time. We investigate two specific procedures: one in which sub aggregates discretely switch in and out, and one in which the growth of the aggregate is a time-varying weighted average of the growth of the sub aggregates, where the weights follow a random walk. These procedures are used to construct aggregates which potentially augment M2 with stock and/or bond mutual funds. Over 1960-1991, the time-varying aggregates look much like M2, but during 1992-93 the time-varying aggregates outperform M2.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w4888.pdf

1.32 Robin L. Lumsdaine, James H. Stock and David A. Wise, 1996. "Retirement Incentives: The Interaction between Employer-Provided Pensions, Social Security, and Retiree Health Benefits," NBER Chapters, in: The Economic Effects of Aging in the United States and Japan, pages 261-293 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c8469.pdf

1.33 Martin Feldstein and James H. Stock, 1994. "The Use of a Monetary Aggregate to Target Nominal GDP," NBER Chapters, in: Monetary Policy, pages 7-69 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c8328.pdf

1.34 Elliott Graham and Stock James H., 1994. "Inference in Time Series Regression When the Order of Integration of a Regressor is Unknown," Econometric Theory, Cambridge University Press, vol. 10(3-4), pages 672-700, August.

The distribution of statistics testing restrictions on the coefficients in time series regressions can depend on the order of integration of the regressors. In practice, the order of integration is rarely known. We examine two conventional approaches to this problem — simply to ignore unit root problems or to use unit root pretests to determine the critical values for second-stage inference—and show that both exhibit substantial size distortions in empirically plausible situations.

We then propose an alternative approach in which the second-stage critical values depend continuously on a first-stage statistic that is informative about the order of integration of the regressor. This procedure has the correct size asymptotically and good local asymptotic power.

Full text available at:

http://journals.cambridge.org/action/displayAbstract?fromPage=onlineandaid=3177644

1.35 James H. Stock and Mark W. Watson, 1993. "A Procedure for Predicting Recessions with Leading Indicators: Econometric Issues and Recent Experience," NBER Chapters, in: Business Cycles, Indicators and Forecasting, pages 95-156 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7190.pdf

1.36 James H. Stock, 1992. "Deciding Between I(1) and I(0)," NBER Technical Working Papers 0121, National Bureau of Economic Research.

This paper proposes a class of procedures that consistently classify the stochastic component of a time series as being integrated either of order zero (l(0» or one (l(1» for general 1(0) and 1(1) processes. These procedures entail the evaluation of the asymptotic likelihoods of certain statistics under the 1(0)and 1(1) hypotheses. These likelihoods do not depend on nuisance parameters describing short-run dynamics and diverge asymptotically, so their ratio provides a consistent basis for classifying a process as 1(1) or 1(0). Bayesian inference can be performed by placing prior mass only on the point hypotheses "1(0)" and "1(1)" without needing to specify parametric priors within the classes of 1(0) and 1(1) processes; the result is posterior odds ratios for the 1(0) and 1(1) hypotheses. These procedures are developed for general polynomial and piecewise linear detrending. When applied to the Nelson-Plosser data with linear detrending, they largely support the original Nelson-Plosser inferences. With piecewise-linear detrending these data are typically uninformative, producing Bayes factors that are close to one.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0121.pdf

1.37 Robin L. Lumsdaine, James H. Stock and David A. Wise, 1992. "Three Models of Retirement: Computational Complexity versus Predictive Validity," NBER Chapters, in: Topics in the Economics of Aging, pages 21-60 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7097.pdf

1.38 Robin L. Lumsdaine, James H. Stock and David A. Wise, 1992. "Pension Plan Provisions and Retirement: Men and Women, Medicare, and Models," NBER Working Papers 4201, National Bureau of Economic Research.

The ongoing analysis of the effects of pension plan provisions on retirement is pursued in this paper. A primary objective of this paper is to test the validity of models previously developed and estimated with data from a Fortune 500 company, here using data from a second large company. The evidence confirms that changes in the retirement rates by age correspond closely to provisions of the firm pension plan. There is essentially no difference in the retirement behavior of men and women. As in previous work, it is found that simpler "option value model" of retirement yields very similar results to the considerably more complex stochastic dynamic programming specification. Both fit the data well and predict rather well the effect on retirement of a special retirement window plan, Some consideration is also given to the effects of firm health insurance and median coverage on retirement.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w4201.pdf

1.39 Graham Elliott, Thomas J. Rothenberg and James H. Stock, 1992. "Efficient Tests for an Autoregressive Unit Root," NBER Technical Working Papers 0130, National Bureau of Economic Research.

This paper derives the asymptotic power envelope for tests of a unit autoregressive root for various trend specifications and stationary Gaussian autoregressive disturbances. A family of tests is proposed, members of which are asymptotically similar under a general 1(1) null (allowing nonnormality and general dependence) and which achieve the Gaussian power envelope. One of these tests, which is asymptotically point optimal at a power of 50%, is found (numerically) to be approximately uniformly most powerful (UMP) in the case of a constant deterministic term, and approximately uniformly most powerful invariant (UMPI) in the case of a linear trend, although strictly no UMP or UMPI test exists. We also examine a modification, suggested by the expression for the power envelope, of the Dickey-

Fuller (1979) t-statistic; this test is also found to be approximately UMP (constant deterministic term case) and UMPI (time trend case). The power improvement of both new tests is large: in the demeaned case, the Pitman efficiency of the proposed tests relative to the standard Dickey-Fuller t-test is 1.9 at a power of 50%. A Monte Carlo experiment indicates that both proposed tests, particularly the modified Dickey-Fuller t-test, exhibit good power and small size distortions in finite samples with dependent errors.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0130.pdf

1.40 James H. Stock, 1991. "Confidence Intervals for the Largest Autoresgressive Root in U.S. Macroeconomic Time Series," NBER Technical Working Papers 0105, National Bureau of Economic Research.

This paper provides asymptotic confidence intervals for the largest autoregressive root of a time series when this root is close to one. The intervals are readily constructed either graphically or using tables in the Appendix. When applied to the Nelson-Plosser (1982) data set, the main conclusion is that the confidence intervals typically are wide. The conventional emphasis on testing for whether the largest root equals one fails to convey the substantial sampling variability associated with this measure of persistence.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0105.pdf

1.41 Matthew Richardson and James H. Stock, 1990. "Drawing Inferences From Statistics Based on Multi-Year Asset Returns," NBER Working Papers 3335, National Bureau of Economic Research.

The possibility of mean reversion in stock prices recently has been examined using statistics based on multi-year returns. Previous researchers have noted difficulties in drawing inferences about these statistics because of poor performance of the usual approximating asymptotic distributions. We therefore develop an alternative asymptotic distribution theory for statistics involving multi-year returns. These distributions differ markedly from those implied by the conventional theory. This alternative theory provides substantially better approximations to the relevant finite-

sample distributions. It also leads to empirical inferences much less at odds with the hypothesis of no mean reversion.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w3335.pdf

1.42 James H. Stock and David A. Wise, 1990. "The Pension Inducement to Retire: An Option Value Analysis," NBER Chapters, in: Issues in the Economics of Aging, pages 205-230 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7118.pdf

1.43 James H. Stock and Mark W. Watson, 1990. "Business Cycle Properties of Selected U.S. Economic Time Series, 1959-1988," NBER Working Papers 3376, National Bureau of Economic Research.

This paper catalogs the business cycle properties of 163 monthly U.S. economic time series over the three decades from 1959 through 1988. Two general sets of summary statistics are reported. The first set measures the comovement of each individual time series with a reference series representing real economic activity. These statistics focus on comovements at business cycle horizons. The second set of statistics examines the predictive content of each of the series for aggregate activity, relative to different sets of conditioning (or predictive) variables. These statistics are constructed and presented in a way that facilitates comparisons across series and across conditioning sets. They also provide new lists of leading indicators based on predictive content for overall economic activity. Some of the results confirm previously recognized empirical regularities, while others provide new or different insights into the business cycle properties of various series.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w3376.pdf

1.44 Robin L. Lumsdaine, James H. Stock and David A. Wise, 1990. "Efficient Windows and Labor Force Reduction," NBER Working Papers 3369, National Bureau of Economic Research.

Recently many U.S. firma have offered "window" plans that provide bonuses to a group of workers if the worker retires within a specified short time span. This paper examines a window plan at a Fortune 500 firm, and addresses two main issues. First, what was the effect of the window plan on departures? Second, assuming a variety of possible firm objectives, what would be the design of an efficient window plan? These questions are addressed using the retirement model in Stock and Wise [1988a, 1988b]. The model, estimated using data for an earlier year, predicts well out-of-sample the subsequent large increase in retirements under the window plan. We find that while the firm successfully maximized departures, if its goal was to minimize either expected future wage payments or the current cost per induced retirement, the firm could have saved more with efficient plans constructed using the model. One interpretation is that the firm was primarily interested in reducing the overall size of the labor force or in retiring older employees to allow promotion of younger employees.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w3369.pdf

1.45 James H. Stock and Mark W. Watson, 1989. "New Indexes of Coincident and Leading Economic Indicators," NBER Chapters, in: NBER Macroeconomics Annual 1989, Volume 4, pages 351-409 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c10968.pdf

1.46 James H. Stock and Mark W. Watson, 1989. "A Simple MLE of Cointegrating Vectors in Higher Order Integrated Systems," NBER Technical Working Papers 0083, National Bureau of Economic Research.

An MLE of the unknown parameters of co integrating vectors is presented for systems in which some variables exhibit higher orders of integration, in which there might be

deterministic components, and in which the co integrating vector itself might involve variables of differing orders of integration. The estimator is simple to compute: it can be calculated by running GLS for standard regression equations with serially correlated errors. Alternatively, an asymptotically equivalent estimator can be computed using OLS. Usual Wald test statistics based on these MLE's (constructed using an autocorrelation robust covariance matrix in the case of the OLS estimator) have asymptotic x2 distributions.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/t0083.pdf

1.47 James H. Stock and Kenneth D. West, 1987. "Integrated Regressors and Tests of the Permanent Income Hypothesis," NBER Working Papers 2359, National Bureau of Economic Research.

We use recent research on estimation and testing in the presence of unit roots to argue that Hall's (1978) t and F tests of whether consumption is predicted by lagged income, or by lags of consumption beyond the first, are asymptotically valid. A Monte Carlo experiment suggests that the asymptotic t and F distributions provide a good approximation to the actual finite sample distribution.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w2359.pdf

1.48 James H. Stock and David A. Wise, 1988. "Pensions, The Option Value of Work, and Retirement," NBER Working Papers 2686, National Bureau of Economic Research.

The paper develops a model of retirement based on the option value of continuing to work. Continuing to work maintains the option of retiring on more advantageous terms later. The model is used to estimate the effects on retirement of firm pension plan provisions. Typical defined benefit pension plans in the United States provide very substantial incentives to remain with the firm until some age, often the early retirement age, and then a strong incentive to leave the firm thereafter. (This may be a major reason for the rapidly declining labor force participation rates of older workers in the United States.) The model fits firm retirement data very well; it captures very closely the sharp discontinuous jumps in retirement rates at specific ages. The model is used to simulate the effect on retirement of potential changes in pension plan

provisions. Increasing the age of early retirement from 55 to 60, for example, would reduce firm departure rates between ages 50 and 59 by almost forty percent.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w2686.pdf

1.49 James H. Stock and Mark W. Watson, 1988. "A Probability Model of The Coincident Economic Indicators," NBER Working Papers 2772, National Bureau of Economic Research.

The Index of Coincident Economic Indicators, currently compiled by the U.S. Department of Commerce, is designed to measure the state of overall economic activity. The index is constructed as a weighted average of four key macroeconomic time series, where the weights are obtained using rules that dare to the early days of business cycle analysis. This paper presents an explicit rime series model (formally, a dynamic factor analysis or "single index" model) that implicitly defines a variable that can be thought of as the overall state of the economy. Upon estimating this model using data from 1959-1987, the estimate of this unobserved variable is found to be highly correlated with the official Commerce Department series, particularly over business cycle horizons. Thus this model provides a formal rationalization for the traditional methodology used to develop the Coincident Index. Initial exploratory exercises indicate that traditional leading variables can prove useful in forecasting the short-run growth in this series.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w2772.pdf

1.50 Jeffrey A. Frankel and James H. Stock, 1983. "A Relationship Between Regression Tests and Volatility Tests of Market ncy," NBER Working Papers 1105, National Bureau of Economic Research.

Volatility tests are an alternative to regression tests for evaluating the joint null hypothesis of market efficiency and risk neutrality. A comparison of the power of the two kinds of tests depends on what the alternative hypothesis is taken to be. By considering tests based on conditional volatility bounds, we show that if the alternative is that one could "beat the market" using a linear combination of known variables, then the regression tests are at least as powerful as the conditional volatility tests. If the application is to spot and forward markets, then the most powerful

conditional volatility test turns out to be equivalent to the analogous regression test in terms of asymptotic power. In other applications, the volatility test will be less powerful than regression tests against our chosen alternative. However, these results are not inconsistent with the observation that volatility tests may be more powerful against other alternative hypotheses, such as that risk-averse investors are rationally maximizing the present discounted utility of future consumption, with a time-varying discount rate.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w1105.pdf

1.51 James H. Stock and Mark W. Watson, 1987. "Interpreting Evidence on Money-Income Causality," NBER Working Papers 2228, National Bureau of Economic Research.

Previous authors have reached puzzlingly different conclusions about the usefulness of money for forecasting real output based on closely related regression-based tests. An examination of this and additional new evidence reveals that innovations in M1 have statistically significant marginal predictive value for industrial production, both in a bivariate model and in a multivariate setting including a price index and an interest rate. This conclusion follows from focusing on the trend properties of the data, both stochastic and deterministic, and from drawing inferences using asymptotic theory that explicitly addresses the implications of these trends for the distributions of the various test statistics.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w2228.pdf

1.52 Charles W. Calomiris, R. Glenn Hubbard and James H. Stock, 1986. "Growing in Debt: The 'Farm Crisis' and Public Policy," NBER Working Papers 2085, National Bureau of Economic Research.

U.S. farms, and with them agricultural lending institutions, are currently experiencing their most severe stress since the 1930s. As international trade in farm products has expanded, so has the sensitivity of farm incomes to fluctuations in domestic and world economic conditions. Thus, while price stabilization, acreage reduction, and related policies in place since the 1930s were relatively successful in stabilizing farm income

during the 1950s and 1960s, they are likely to be less effective in achieving this goal in the future. Our analysis of state-level panel data indicates that disruptions in agricultural credit markets can have real effects on farm output. That finding is consistent with the conventional wisdom that, unlike credit markets for large firms or for firms for which monitoring is less costly, agricultural financial markets require close customer arrangements. Local financial institutions, for which such relationships are best developed, are often unable for institutional reasons to diversify their loan risks either within agriculture or across other geographically separated activities. The deviations from perfect markets indicate an economic rationale -- in addition to the usual political, social, and national defense rationales -- for government intervention in agricultural credit markets. Our empirical evidence supports the view that maintaining customer relationships in agricultural finance is important. Because of the Farm Credit System's ability to pool agricultural loan risks nationally and its access to national capital markets, it will continue to be an important lender in agricultural credit markets.

Access to the full text is generally limited to series subscribers:

http://www.nber.org/papers/w2085.pdf

1.53 Powell James L., Stock James H. and Stoker Thomas M., 1986. "Semiparametric estimation of weighted average derivatives," Working papers 1793-86, Massachusetts Institute of Technology (MIT), Sloan School of Management.

No abstract is available for this item.

Full text available at:

http://dspace.mit.edu/handle/1721.1/2144

1.54 Massimiliano Marcellino, James H. Stock and Mark W. Watson, 2001. "Macroeconomic Forecasting in the Euro Area: Country Specific versus Area-Wide Information," Working Papers 201, IGIER (Innocenzo Gasparini Institute for Economic Research), Bocconi University.

No abstract is available for this item.

Full text available at:

ftp://ftp.igier.uni-bocconi.it/wp/2001/201.pdf

2 ARTICLES

2.1 Hausman Jerry, Stock James H. and Yogo Motohiro, 2005. "Asymptotic properties of the Hahn-Hausman test for weak-instruments," Economics Letters, Elsevier, vol. 89(3), pages 333-342, December.

This paper provides weak-instrument asymptotic representations of tests for instrument validity by Hahn and Hausman's (HH) [Hahn, J., Hausman, J., 2002. A new specification test for the validity of instrumental variables. Econometrica 70, 163–189.], and uses these representations to compute asymptotic power against weak or irrelevant instruments. The HH tests were proposed as pretests, and the asymptotic properties of post-test inferences, conditional on the tests failing to reject instrument validity, are also examined.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6V84-4H2PJCR-3/2/8d6dbe24c0b8826cc4899f0ac8d12e62

2.2 Mark W. Watson and James H. Stock, 2004. "Combination forecasts of output growth in a seven-country data set," Journal of Forecasting, John Wiley and Sons, Ltd., vol. 23(6), pages 405-430.

This paper uses forecast combination methods to forecast output growth in a seven-country quarterly economic data set covering 1959-1999, with up to 73 predictors per country. Although the forecasts based on individual predictors are unstable over time and across countries, and on average perform worse than an autoregressive benchmark, the combination forecasts often improve upon autoregressive forecasts. Despite the unstable performance of the constituent forecasts, the most successful combination forecasts, like the mean, are the least sensitive to the recent performance of the individual forecasts. While consistent with other evidence on the success of simple combination forecasts, this finding is difficult to explain using the theory of combination forecasting in a stationary environment.

Access to the full text is generally limited to series subscribers:

http://onlinelibrary.wiley.com/doi/10.1002/for.928/abstract;jsessionid=4BC379A257350677417BA3018DF80A95.d01t02

2.3 James H. Stock, 2004. "Structural Stability and Models of the Business Cycle," De Economist, Springer, vol. 152(2), pages 197-209, 06.

Ever since the pioneering work of Jan Tinbergen, econometric modelers have been aware of the danger that their models can be unstable over time and across policy environments. Work over the past fifteen years has produced a set of statistical procedures for identifying and modeling structural instability. This essay summarizes some of those procedures, uses them to discuss changes in the U.S. business cycle over the past four decades, and surveys some new research that tackles the widespread challenge of structural instability.

Full text available at:

http://www.springerlink.com/content/100260/

2.4 James H. Stock and Mark M. Watson, 2003. "How did leading indicator forecasts perform during the 2001 recession?," Economic Quarterly, Federal Reserve Bank of Richmond, issue Sum, pages 71-90.

No abstract is available for this item.

Full text available at:

http://www.richmondfed.org/publications/research/economic_quarterly/2003/summer/pdf/stockwatsonsummer03.pdf

2.5 James H. Stock and Francesco Trebbi, 2003. "Who Invented Instrumental Variable Regression?," Journal of Economic Perspectives, American Economic Association, vol. 17(3), pages 177-194, Summer.

The instrumental variables estimator first appeared explicitly in Appendix B of The Tariff on Animal and Vegetable Oils by Philip G. Wright (1928). It has been suggested that this appendix was written by Philip's son Sewall Wright, then already an important genetic statistician. To find out who wrote Appendix B, we use stylometric statistics to compare it to other texts known to have been written solely by the father and son. The sharp results are consistent with contextual and historical evidence on the authorship of Appendix B and on the origination of the idea of IV estimation.

Access to the full text is generally limited to series subscribers:

http://www.aeaweb.org/jep/index.php

2.6 James H. Stock and Mark W. Watson, 2003. "Has the business cycle changed?," Proceedings, Federal Reserve Bank of Kansas City, pages 9-56.

No abstract is available for this item.

Full text available at:

http://www.kc.frb.org/Publicat/sympos/2003/pdf/Stock-Watson.0902.2003.pdf

2.7 Stock James H., 2001. "Macro-econometrics," Journal of Econometrics, Elsevier, vol. 100(1), pages 29-32, January.

No abstract is available for this item.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6VC0-41WSBV9-7/2/d7ab0e86c21c932ddb4df3de0bd4258b

2.8 Elliott Graham and Stock James H., 2001. "Confidence intervals for autoregressive coefficients near one," Journal of Econometrics, Elsevier, vol. 103(1-2), pages 155-181, July.

Often we are interested in the largest root of an autoregressive process. Available methods rely on inverting t-tests to obtain confidence intervals. However, for large autoregressive roots, t-tests do not approximate asymptotically uniformly most powerful tests and do not have optimality properties when inverted for confidence intervals. We exploit the relationship between the power of tests and accuracy of confidence intervals, and suggest methods which are asymptotically more accurate than available interval construction methods. One interval, based on inverting the PT or QT statistic, has good asymptotic accuracy and is easy to compute.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6VC0-436FD85-5/2/61ef571835a1c6047509aa76464adb1d

2.9 Kremer Michael, Onatski Alexei and Stock James, 2001. "Searching for prosperity," Carnegie-Rochester Conference Series on Public Policy, Elsevier, vol. 55(1), pages 275-303, December.

Quah's [1993a] transition matrix analysis of world income distribution based on annual data suggests an ergodic distribution with twin peaks at the rich and poor end of the distribution. Since the ergodic distribution is a highly non-linear function of the underlying transition matrix, it is estimated extremely noisily. Estimates over the foreseeable future are more precise. However, the Markovian assumptions underlying the analysis are much better satisfied with an analysis based on five-year transitions than one-year transitions. Such an analysis yields an ergodic distribution with 72% of mass in the top income category, but a prolonged transition, during which some inequality measures increase.

The rosy ergodic forecast and prolonged transition arise because countries' relative incomes move both up and down at moderate levels, but once countries reach the highest income category, they rarely leave it. This is consistent with a model in which countries search among policies until they reach an income level at which further experimentation is too costly. If countries can learn from each other's experience, the future may be much brighter than would be predicted based on projecting forward the historical transition matrix.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6V8D-454738H-D/2/57185bbb17030a5b7de91c5d77f95d0e

2.10 James H. Stock and Mark W. Watson, 2001. "Vector Autoregressions," Journal of Economic Perspectives, American Economic Association, vol. 15(4), pages 101-115, Fall.

This paper critically reviews the use of vector autoregressions (VARs) for four tasks: data description, forecasting, structural inference, and policy analysis. The paper begins with a review of VAR analysis, highlighting the differences between reduced-form VARs, recursive VARs and structural VARs. A three variable VAR that includes the unemployment rate, price inflation and the short term interest rate is used to show how VAR methods are used for the four tasks. The paper concludes that

VARs have proven to be powerful and reliable tools for data description and forecasting, but have been less useful for structural inference and policy analysis.

Access to the full text is generally limited to series subscribers:

http://www.aeaweb.org/jep/index.php

2.11 Stock James H. and Watson Mark W., 1999. "Forecasting inflation," Journal of Monetary Economics, Elsevier, vol. 44(2), pages 293-335, October.

This paper investigates forecasts of US inflation at the 12-month horizon. The starting point is the conventional unemployment rate Phillips curve, which is examined in a simulated out-of-sample forecasting framework. Inflation forecasts produced by the Phillips curve generally have been more accurate than forecasts based on other macroeconomic variables, including interest rates, money and commodity prices. These forecasts can however be improved upon using a generalized Phillips curve based on measures of real aggregate activity other than unemployment, especially a new index of aggregate activity based on 168 economic indicators.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6VBW-3XYG5JB-7/2/04fc0947c8b96582eef7610dfcb39ebd

2.12 Yeung Lewis Chan, James H. Stock and Mark W. Watson, 1999. "A dynamic factor model framework for forecast combination," Spanish Economic Review, Springer, vol. 1(2), pages 91-121.

A panel of ex-ante forecasts of a single time series is modeled as a dynamic factor model, where the conditional expectation is the single unobserved factor. When applied to out-of-sample forecasting, this leads to combination forecasts that are based on methods other than OLS. These methods perform well in a Monte Carlo experiment. These methods are evaluated empirically in a panel of simulated real-time computer-generated univariate forecasts of U.S. macroeconomic time series.

Access to the full text is generally limited to series subscribers:

http://www.springerlink.com/content/f4vecw75uvh9pgn9/

2.13 Bai Jushan and Lumsdaine Robin L and Stock James H, 1998. "Testing for and Dating Common Breaks in Multivariate Time Series," Review of Economic Studies, Blackwell Publishing, vol. 65(3), pages 395-432, July.

This paper develops methods for constructing asymptotically valid confidence intervals for the date of a single break in multivariate time series, including I(0), I(1), and deterministically trending regressors. Although the width of the asymptotic confidence interval does not decrease as the sample size increases, it is inversely related to the number of series that have a common break date, so there are substantial gains to multivariate inference about break dates. These methods are applied to two empirical examples: the mean growth rate of output in three European countries and the mean growth rate of U.S. consumption, investment, and output.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.14 Staiger Douglas and Stock James H. and Watson Mark W., 1997. "The NAIRU, Unemployment and Monetary Policy," Journal of Economic Perspectives, American Economic Association, vol. 11(1), pages 33-49, Winter.

This paper examines the precision of conventional estimates of the NAIRU and the role of the NAIRU and unemployment in forecasting inflation. The authors find that, although there is a clear empirical Phillips relation, the NAIRU is imprecisely estimated, forecasts of inflation are insensitive to the NAIRU, and there are other leading indicators of inflation that are at least as good as unemployment. This suggests deemphasizing the NAIRU in public discourse about monetary policy and instead drawing on a richer variety of leading indicators of inflation.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.15 Rothenberg Thomas J. and Stock James H., 1997. "Inference in a nearly integrated autoregressive model with nonnormal innovations," Journal of Econometrics, Elsevier, vol. 80(2), pages 269-286, October.

Robust tests and estimators based on nonnormal quasi-likelihood functions are developed for autoregressive models with near unit root. Asymptotic power functions and power envelopes are derived for point-optimal tests of a unit root when the

likelihood is correctly specified. The shapes of these power functions are found to be sensitive to the extent of nonnormality in the innovations. Power loss resulting from using least-squares unit-root tests in the presence of thick-tailed innovations appears to be greater than in stationary models.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6VC0-3SX1M2Y-5/2/4b89998846af902ffb3612a7a8820117

2.16 Elliott Graham, Rothenberg Thomas J. and Stock James H., 1996. "Efficient Tests for an Autoregressive Unit Root," Econometrica, Econometric Society, vol. 64(4), pages 813-36, July.

The asymptotic power envelope is derived for point-optimal tests of a unit root in the autoregressive representation of a Gaussian time series. The authors propose a family of tests whose asymptotic power functions are tangent to the power envelope at one point and are never far below. When the series has an unknown mean or linear trend, commonly used tests are found to be dominated by members of the family of point-optimal invariant tests. The authors propose a modified version of the Dickey-Fuller t test which has desirable size properties and substantially improved power when an unknown mean or trend is present.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.17 Feldstein Martin and Stock James H., 1996. "Measuring money growth when financial markets are changing," Journal of Monetary Economics, Elsevier, vol. 37(1), pages 3-27, February.

This article considers constructing monetary aggregates in the presence of financial market innovations and changes in the relationship between individual assets and output. We propose two procedures for constructing a monetary aggregate with the objective of providing a reliable monetary leading indicator of nominal GDP. In the first, sub aggregates discretely switch in and out; in the second, the aggregate's growth is a time-varying weighted average of the growth of the sub aggregates, where the weights follow a multivariate random walk. These procedures are used to examine augmenting M2 with stock and/or bond mutual funds. The alternative aggregates are broadly similar to M2, but during 1992–1993 they outperform M2.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6VBW-3VW1TMF-1/2/03cc5f11bb66780ddb431b95f4cf71c6

2.18 Stock James H., 1994. "Deciding between I(1) and I(0)," Journal of Econometrics, Elsevier, vol. 63(1), pages 105-131, July.

A class of procedures that consistently classify the stochastic component of a time series as being integrated either of order zero [I(1)] or one [I(1)] are proposed for general I(0) or I(1) processes and polynomial or piecewise linear detrending. Large-sample Bayesian inference is free of nuisance parameters describing short-run dynamics and requires specifying priors only on the point hypotheses 'I(1)' and 'I(1)' thereby avoiding problematic choices of parametric priors over roots and nuisance parameters. Applied to the Nelson–Plosser (1982) data with linear detrending, these procedures largely support Nelson and Plosser's original inferences. With piecewise-linear detrending these data are typically uninformative, producing Bayes ratios close to one.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6VC0-4582GY2-24/2/7408c77277bc98fc1997dab3fbf34e94

2.19 Stock James H. and Watson Mark W., 1993. "A Simple Estimator of Cointegrating Vectors in Higher Order Integrated Systems," Econometrica, Econometric Society, vol. 61(4), pages 783-820, July.

Efficient estimators of cointegrating vectors are presented for systems involving deterministic components and variables of differing, higher orders of integration. The estimators are computed using GLS or OLS, and Wald statistics constructed from these estimators have asymptotic x [superscript] 2 distributions. These and previously proposed estimators of cointegrating vectors are used to study long-run U.S. money (M1) demand. M1 demand is found to be stable over 1900-1989; the 95 percent confidence intervals for the income elasticity and interest rate semi elasticity are (0.88, 1.06) and (-0.13, -0.08), respectively. Estimates based on the postwar data alone, however, are unstable, with variances which indicate substantial sampling uncertainty.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.20 Stock James H., 1991. "Bayesian Approaches to the 'Unit Root' Problem: A Comment," Journal of Applied Econometrics, John Wiley and Sons, Ltd., vol. 6(4), pages 403-11, Oct.-Dec.

No abstract is available for this item.

Access to the full text is generally limited to series subscribers:

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2.21 King Robert G., Plosser Charles I., Stock James H. and Watson Mark W., 1991. "Stochastic Trends and Economic Fluctuations," American Economic Review, American Economic Association, vol. 81(4), pages 819-40, September.

Are business cycles mainly the result of permanent shocks to productivity? This paper uses a long-run restriction implied by a large class of real-business-cycle models--identifying permanent productivity shocks as shocks to the common stochastic trend in output, consumption, and investment--to provide new evidence on this question. Econometric tests indicate that this common-stochastic-trend/cointegration implication is consistent with postwar U.S. data. However, in systems with nominal variables, the estimates of this common stochastic trend indicate that permanent productivity shocks typically explain less than half of the business-cycle variability in output, consumption, and investment.

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2.22 Stock James H., 1991. "Confidence intervals for the largest autoregressive root in U.S. macroeconomic time series," Journal of Monetary Economics, Elsevier, vol. 28(3), pages 435-459, December.

This paper provides asymptotic confidence intervals for the largest autoregressive root of a time series when this root is close to one. The intervals are readily constructed either graphically or using tables in the appendix. When applied to the Nelson-Plosser (1982) data set, the main conclusion is that the confidence intervals typically are wide. The conventional emphasis on testing for whether the largest root equals one

fails to convey the substantial sampling variability associated with this measure of persistence.

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http://www.sciencedirect.com/science/article/B6VBW-45F91P8-5/2/a58e7f31949c4afaaf91f032c48f9cf6

2.23 Sims Christopher A., Stock James H. and Watson Mark W., 1990. "Inference in Linear Time Series Models with Some Unit Roots," Econometrica, Econometric Society, vol. 58(1), pages 113-44, January.

This paper considers estimation and hypothesis testing in linear time series when some or all of the variables have (possibly multiple) unit roots. The motivating example is a vector autoregression with some unit roots in the companion matrix, which might include polynomials in time as regressors. Parameters that can be written as coefficients on mean zero, nonintegrated regressors have jointly normal asymptotic distribution, converging at the rate of T(superscript "one-half") In general, the other coefficients (including the coefficient on polynomials in time), and associated t and F test statistics, have nonstandard asymptotic distributions.

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2.24 Lumsdaine Robin L., Stock James H. and Wise David A., 1990. "Efficient windows and labor force reduction," Journal of Public Economics, Elsevier, vol. 43(2), pages 131-159, November.

No abstract is available for this item.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6V76-458WP02-44/2/22935cfbdea5150c36d2176c87ff567c

2.25 Stock James H. and Wise David A., 1990. "Pensions, the Option Value of Work, and Retirement," Econometrica, Econometric Society, vol. 58(5), pages 1151-80, September.

The effects of firm pension plan provisions on the retirement decisions of older employees are analyzed. The empirical results are based on data from a large firm, with a typical defined benefit pension plan. The "option value" of continued work is

the central feature of the analysis. Estimation relies on a retirement decision rule that is close in spirit to the dynamic programming rule, but is considerably less complex than a comprehensive implementation of that rule, thus greatly facilitating the numerical analysis.

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2.26 Stock James H., 1990. "Unit roots in real GNP: Do we know and do we care? : A comment," Carnegie-Rochester Conference Series on Public Policy, Elsevier, vol. 32(1), pages 63-82, January.

No abstract is available for this item.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B6V8D-45BBYTX-2H/2/338960486e3cd455ed653683a10a9a60

2.27 Stock James H. and Watson Mark W., 1988. "Variable Trends in Economic Time Series," Journal of Economic Perspectives, American Economic Association, vol. 2(3), pages 147-74, Summer.

No abstract is available for this item.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.28 Stock James H., 1987. "Measuring Business Cycle Time," Journal of Political Economy, University of Chicago Press, vol. 95(6), pages 1240-61, December.

The business cycle analysis of Arthur F. Burns and Wesley C. Mitchell and the National Bureau of Economic Research presumed that aggregate economic variables evolve on a time scale defined by business cycle turning points rather than by months or quarters. Do macroeconomic variables appear to evolve on an economic rather than a calendar time scale? Evidence presented here suggests that they do. However, the estimated economic time scales are only weakly related to business cycle time scales, providing evidence against the view underlying traditional business cycle analysis.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.29 Jones Stephen R.G. and Stock James H., 1987. "Demand Disturbances and Aggregate Fluctuations: The Implications of Near Rationality," Economic Journal, Royal Economic Society, vol. 97(385), pages 49-64, March.

The paper investigates some properties of "near rational" models of the cycle, examining two types of framework. In the first, an otherwise classical, competitive economy is shown to respond to demand disturbances when some firms follow a near rational hiring policy. In the second model, a dynamic setting is addressed and a criterion termed "stochastic near rationality" is employed. Simulation results are consistent with recent empirical findings and suggest that further quantitative evaluation is merited.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

2.30 Stock James H., 1987. "Asymptotic Properties of Least Squares Estimators of Cointegrating Vectors," Econometrica, Econometric Society, vol. 55(5), pages 1035-56, September.

Time series variables that stochastically trend together form a cointegrated system. OLS and NLS estimators of the parameters of a cointegrating vector are shown to converge in probability to the true parameter value at the rate T11d for any positive d. These estimators can be written asymptotically in terms of relatively simple nonnormal random matrices which do not depend on the parameters of the system. These asymptotic representations form the basis for simple and fast Monte Carlo calculations of the limiting distributions of these estimators. Asymptotic distributions thus computed are tabulated for several cointegrated processes.

Access to the full text is generally limited to series subscribers:

http://www.jstor.org/

3 CHAPTERS

3.1 Stock James H. and Watson Mark W., 1999. "Business cycle fluctuations in us macroeconomic time series," Handbook of Macroeconomics, in: J. B. Taylor and M. Woodford (ed.), Handbook of Macroeconomics, edition 1, volume 1, chapter 1, pages 3-64 Elsevier.

This chapter examines the empirical relationship in the postwar United States between the aggregate business cycle and various aspects of the macroeconomy, such as production, interest rates, prices, productivity, sectoral employment, investment, income, and consumption. This is done by examining the strength of the relationship between the aggregate cycle and the cyclical components of individual time series, whether individual series lead or lag the cycle, and whether individual series are useful in predicting aggregate fluctuations. The chapter also reviews some additional empirical regularities in the US economy, including the Phillips curve and some long-run relationships, in particular long run money demand, long run properties of interest rates and the yield curve, and the long run properties of the shares in output of consumption, investment and government spending.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B7P5X-4FD73BS-4/2/0fc60af4adc161ceaae891f83758540e

3.2 James H. Stock and Mark W. Watson, 1993. "Introduction to "Business Cycles, Indicators and Forecasting"," NBER Chapters, in: Business Cycles, Indicators and Forecasting, pages 1-10 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7188.pdf

3.3 Robin L. Lumsdaine, James H. Stock and David A. Wise, 1992. "Three Models of Retirement: Computational Complexity versus Predictive Validity," NBER Chapters, in: Topics in the Economics of Aging, pages 21-60 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7097.pdf

3.4 James H. Stock and David A. Wise, 1990. "The Pension Inducement to Retire: An Option Value Analysis," NBER Chapters, in: Issues in the Economics of Aging, pages 205-230 National Bureau of Economic Research.

No abstract is available for this item.

Full text available at:

http://www.nber.org/chapters/c7118.pdf

3.5 Stock James H., 1994. "Unit roots, structural breaks and trends," Handbook of Econometrics, in: R. F. Engle and D. McFadden (ed.), Handbook of Econometrics, edition 1, volume 4, chapter 46, pages 2739-2841 Elsevier.

This chapter reviews inference about large autoregressive or moving average roots in univariate time series, and structural change in multivariate time series regression. The "problem" of unit roots is cast more broadly as determining the order of integration of a series; estimation, inference, and confidence intervals are discussed. The discussion of structural change focuses on tests for parameter stability. Much emphasis is on asymptotic distributions in these nonstandard settings, and one theme is the general applicability of functional central limit theory. The quality of the asymptotic approximations to finite-sample distributions and implications for empirical work are critically reviewed.

Access to the full text is generally limited to series subscribers:

http://www.sciencedirect.com/science/article/B7GX7-4FPWV09-H/2/f94706d466d67da7665f3412448be7f7

4 BOOKS

4.1 Introduction to Econometrics, James Stock and Mark W. Watson, Addison-Wesley, 2003, Second Edition, 2007, Brief Edition, 2008.

4.2 The Collected Works of C.W.J. Granger, edited by Eric Ghysels, Norman Swanson and Mark W. Watson, Cambridge University Press, forthcoming 2001.

4.3 Business Cycles, Indicators, and Forecasting, edited by James H. Stock and Mark W. Watson, University of Chicago Press for the NBER, 1993.