

NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

Visit: www.nber.org

SPRING 1997

In This Issue

Program Report:
Asset Pricing 1

Research Summaries:

Economic Analysis of Law 5
Sunk Investments, The Churn,
and Macroeconomics 9
Making Sense of the
Medical System 12
Education, the Wage Structure, and
Technological Change: Learning about
the Present through the Past 15

NBER Profiles 19
Conferences 22
Bureau News 31
Bureau Books 43
Current Working Papers 44

WWW.NBER.ORG

Our web site
features a searchable
index to over 5000
NBER Working Papers
issued since 1978.

It also includes searchable
indexes to all NBER books and
to all current NBER Research
Associates and Faculty Research
Fellows.

In addition, our web site has
the NBER Macroeconomic History
Database (3500 different
time series), the Penn-World
Tables of country data, and
other items.

Program Report

Asset Pricing

John Y. Campbell*

Asset pricing — the study of markets for financial assets including stocks, bonds, foreign currencies, and derivatives — is a field in which there is an intense and fruitful interaction between empirical and theoretical research. The work of economists associated with the NBER Asset Pricing Program illustrates this interaction particularly well. NBER economists have been studying many different phenomena, including the high rewards that investors have received for holding stocks in general and “value stocks” in particular, the apparent predictability of stock and bond returns at long horizons, and unusual patterns in option prices. In each area, empirical puzzles have stimulated new thinking about investor behavior and the functioning of capital markets.

Financial markets are, of course, changing rapidly. NBER economists have been following these developments, and in some cases have tried to anticipate or influence them. There has been much research on international capital markets and the opportunities they present for risksharing across countries; other work has discussed new types of securities, including inflation-indexed bonds, which were issued for the first time by the U.S. Treasury in January 1997.

Cross-Sectional Patterns in Stock Returns

Historically, investors have received handsome rewards for bearing the risk of investments in equity markets. Economists have found it difficult to rationalize the size of this “equity premium.”¹

Recent research on individual U.S. stocks has uncovered facts that make this puzzle even more challenging. First, the average excess returns on value stocks — stocks whose prices are low relative to their book values, earnings,

*Campbell is director of the NBER's Program on Asset Pricing and a professor of economics at Harvard University.

NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH

The National Bureau of Economic Research is a private, nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers and board of directors are:

President and Chief Executive Officer—*Martin Feldstein*
Director of Finance—*Sam Parker*

BOARD OF DIRECTORS

Chairman—*John H. Biggs*
Vice Chairman—*Carl F. Christ*
Treasurer—*Gerald A. Polansky*

DIRECTORS AT LARGE

| | | |
|---------------------|--------------------|----------------------|
| Peter Aldrich | Martin Feldstein | Peter G. Peterson |
| Elizabeth E. Bailey | George Hatsopoulos | Richard N. Rosett |
| John Herron Biggs | Karen N. Horn | Bert Seidman |
| Andrew Brimmer | Lawrence R. Klein | Kathleen P. Utgoff |
| Don R. Conlan | Leo Melamed | Donald S. Wasserman |
| Kathleen B. Cooper | Merton H. Miller | Marina V. N. Whitman |
| Jean A. Crockett | Michael H. Moskow | John O. Wilson |
| George C. Eads | Robert T. Parry | |

DIRECTORS BY UNIVERSITY APPOINTMENT

| | |
|---|---|
| George Akerlof, <i>California, Berkeley</i> | Joel Mokyr, <i>Northwestern</i> |
| Jagdish W. Bhagwati, <i>Columbia</i> | Andrew Postlewaite, <i>Pennsylvania</i> |
| William C. Brainard, <i>Yale</i> | Nathan Rosenberg, <i>Stanford</i> |
| Glen G. Cain, <i>Wisconsin</i> | Harold T. Shapiro, <i>Princeton</i> |
| Franklin Fisher, <i>MIT</i> | Craig Swan, <i>Minnesota</i> |
| Saul H. Hymans, <i>Michigan</i> | David B. Yoffie, <i>Harvard</i> |
| Marjorie B. McElroy, <i>Duke</i> | Arnold Zellner, <i>Chicago</i> |

DIRECTORS BY APPOINTMENT OF OTHER ORGANIZATIONS

Marcel Boyer, *Canadian Economics Association*
Mark Drabentstott, *American Agricultural Economics Association*
William C. Dunkelberg, *National Association of Business Economists*
Richard A. Easterlin, *Economic History Association*
Gail Fosler, *The Conference Board*
A. Ronald Gallant, *American Statistical Association*
Robert S. Hamada, *American Finance Association*
Rudolph A. Oswald, *American Federation of Labor and Congress of Industrial Organizations*
Gerald A. Polansky, *American Institute of Certified Public Accountants*
John J. Siegfried, *American Economic Association*
Josh S. Weston, *Committee for Economic Development*

Contributions to the National Bureau are tax deductible. Inquiries concerning contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

The *Reporter* is issued for informational purposes and has not been reviewed by the Board of Directors of the NBER. It is not copyrighted and can be freely reproduced with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Preparation of the *NBER Reporter* is under the supervision of Donna Zerwitz. Requests for subscriptions, changes of address, and cancellations should be sent to *Reporter*, National Bureau of Economic Research, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. Please include the current mailing label.

or dividends — are even higher than the average excess returns on stocks in general. Second, there seems to be a “momentum effect”: stocks that have outperformed the market during the last few months tend to outperform the market during subsequent months.

There is an active debate about how to interpret these phenomena. Eugene Fama and Kenneth French have proposed that value stocks deliver higher average returns because they are riskier.² Other NBER economists have challenged this view. Craig MacKinlay argues that it requires an implausibly high reward for bearing risk,³ while Rafael La Porta, Josef Lakonishok, Andrei Shleifer, and Robert Vishny suggest that investors underprice value stocks because they are too pessimistic about the earnings of these companies. They show that as much as one third of the excess return on value stocks occurs in the few days around earnings announcements, suggesting that investors are on average favorably surprised by the earnings of value stocks.⁴ Louis Chan, Narasimhan Jegadeesh, and Lakonishok document a similar tendency for the excess return on momentum stocks to occur near earnings announcements, suggesting that for these stocks also investors tend to have incorrect earnings expectations.⁵

Nicholas Barberis, Shleifer, and Vishny have built an explicit model of investors' irrational expectations that can generate excess returns on both momentum stocks and value stocks. In their model, earnings growth cannot be forecast, so the best forecast of future earnings is just the current level of earnings. Investors normally expect earnings to revert to some long-run average level, which leads them to underprice stocks that have experienced recent earnings growth (momentum stocks). A series of positive or nega-

tive earnings surprises, however, can lead investors to expect continued positive or negative earnings growth; this leads them to underprice stocks that have performed extremely badly (value stocks).⁶

Time-Variation in the Reward for Risk

Financial ratios of stock prices to book values, earnings, or dividends also are used in time-series studies of the stock market as a whole. These ratios, along with other variables including yield spreads between long- and short-term or between low- and high-quality bonds, have some ability to forecast aggregate stock and bond returns.⁷

Shmuel Kandel and Robert Stambaugh have explored the implications of this evidence for optimal portfolio choice. Using a Bayesian framework to allow for uncertainty about the degree of predictability in returns, they show that an investor with constant risk aversion and a short investment horizon should try to "time the market," adjusting the portfolio share in stocks in response to changes in the financial ratios that predict returns. In a similar spirit, Luis Viceira and I have derived the optimal market-timing portfolio strategy for an investor with constant risk aversion and a long horizon.⁸

This work takes predictable variation in returns as given. Other NBER research asks where that variation comes from, and whether it can persist in the face of market-timing responses by investors. John Cochrane and I, building on the work of George Constantinides, have argued that typical investors do not have a constant aversion to risk; instead their risk aversion tends to fall when the economy is strong, because they judge their well-being by reference to recent standards of living and feel more comfortable taking risks when

their consumption is well above recent average levels. This "habit-formation" model implies that investors do not try to profit from predictable variation in returns because it is during periods of unusually low stock returns that investors are unusually willing to take on risk.⁹ Jiang Wang has explored the possibility that different investors have different levels of risk aversion; when they trade with one another, the equilibrium reward for bearing risk can vary over time.¹⁰

Shleifer and Vishny have pointed out that even when there is no equilibrium justification for time-variation in stock returns, so that the time-variation represents mispricing of stocks, it may be difficult for rational speculators to trade aggressively enough to eliminate the mispricing. This is particularly true when an initial pricing error increases; then rational speculators who have bet on a correction of the error lose money and are forced to the sidelines. Thus stabilizing speculation tends to be weakest precisely when mispricing is most severe.¹¹

In a study of the foreign exchange market, Blake LeBaron has shown that intervention by monetary authorities is one possible source of mispricing. He finds that technical trading rules produce profits only in periods of intervention, when monetary authorities are trading to influence exchange rates and are willing to lose money in pursuit of their objectives.¹²

Option Prices, Changing Volatility, and Market Microstructure

Option markets offer economists a fascinating look at investors' expectations. By combining different options on a given underlying security, it is possible to construct a derivative security that pays off only if the

underlying price is in a particular narrow range: for example, only if the S&P 500 index is between 800 and 801 on a particular date in the future. Thus option prices can reveal the probabilities (adjusted for risk) that investors place on each possible level of the S&P 500 index.

Yacine Ait-Sahalia and Andrew Lo have developed a nonparametric econometric method for estimating risk-adjusted probabilities. They show that recent prices for S&P 500 index options imply high risk-adjusted probabilities of a large decline in the S&P 500 index.¹³ David Bates has compared two possible explanations for this finding. Investors could anticipate that a decline in stock prices would increase volatility, so that over several months a large decline in the market is more likely than an equally large increase; or they could fear a "crash," an instantaneous large drop in the market. Because the risk-adjusted probabilities of a large decline in the index are high even for very short-term options, Bates concludes that investors do indeed fear a stock market crash.¹⁴

Other researchers have studied changing volatility, a pervasive phenomenon in stock and bond markets that shifts the risk-adjusted probability distributions implied by option prices. Torben Andersen and Tim Bollerslev have argued that volatility follows a complex time-series process; there are short-lived bursts of volatility within the trading day, but there are also highly persistent movements in volatility that affect asset markets for several months.¹⁵ Robert Engle and Joshua Rosenberg, and Bernard Dumas, Jeff Fleming, and Robert Whaley, have shown how models of changing volatility can be used to explain the behavior of option prices.¹⁶

Studies of volatility within the trading day lead naturally to a new fron-

tier in financial economics, the study of transaction-level data. In recent years, data have become available on all trades and quotes for listed and some over-the-counter U.S. stocks. These data are stimulating the development of new econometric methods,¹⁷ and they make it possible to study the properties of alternative systems for trading stocks and other assets.¹⁸ A new "Market Microstructure Research Group" will meet for the first time at the 1997 NBER Summer Institute to provide a forum for empirical research in this area.

Diversification, Risk-Sharing, and New Financial Markets

A striking fact about international financial markets is that investors tend to concentrate heavily in the stocks and bonds of their own country. This "home bias" is diminishing only slowly, and it is costly because investors give up the opportunity to diversify internationally.¹⁹

One factor that may contribute to home bias is that investors are better informed about assets in their own country than about foreign assets. Consistent with this explanation, Jun-Koo Kang and René Stulz have shown that foreign investors in Japan tend to concentrate in large stocks, which presumably are better-known overseas; while Jeffrey Frankel and Sergio Schmukler have shown that Mexican stock prices declined more rapidly in the peso crisis of December 1994 than did prices of Mexican closed-end funds traded in the United States, suggesting that Mexican investors were better-informed than U.S. investors.²⁰

In a series of papers, Robert Shiller has argued that unexploited opportunities for diversification justify the establishment of new financial markets. Shiller and Stefano Athanassoulis, Shiller and Ryan Schneider,

and Shiller and Allan Weiss have proposed securities that could be used to trade international income risk, occupational income risk, and real estate price risk, respectively.²¹

While these markets do not yet exist, the U.S. Treasury has recently created a potentially important new market by issuing inflation-indexed bonds. Shiller and I have summarized the arguments that many economists have made in favor of indexing bonds and other contracts to inflation, while David Barr and I have studied the U.K. experience with inflation-indexed bonds.²² Niko Canner, N. Gregory Mankiw, and David Weil have criticized the conventional wisdom that conservative investors should hold bonds rather than stocks; they point out that nominal bonds are risky in real terms. Inflation-indexed bonds offer stable real returns and thus should appeal to conservative investors with long horizons.²³

¹ See J.Y. Campbell, "Consumption and the Stock Market: Interpreting International Evidence," NBER Working Paper No. 5610, June 1996, for a survey. W.N. Goetzmann and P. Jorion, "A Century of Global Stock Markets," NBER Working Paper No. 5901, January 1997, cautions that equity returns may be overstated by looking only at successful stock markets.

² E.F. Fama and K.R. French, "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics* 33, 3–56.

³ A.C. MacKinlay, "Multifactor Models do not Explain Deviations from the CAPM," *Journal of Financial Economics* 38, 3–28, 1995.

⁴ R. La Porta, J. Lakonishok, A. Shleifer, and R.W. Vishny, "Good News for Value Stocks: Further Evidence on Market Efficiency," NBER Working Paper No. 5311, October 1995.

⁵ L.K.C. Chan, N. Jegadeesh, and J. Lakonishok, "Momentum Strategies," NBER Working Paper No. 5375, December 1995.

⁶ N. Barberis, A. Shleifer, and R.W. Vishny, "A Model of Investor Sentiment," NBER

Working Paper No. 5926, February 1997.

⁷ A.W. Lo and A.C. MacKinlay, "Maximizing Predictability in the Stock and Bond Markets," NBER Working Paper No. 5027, February 1995, documents predictability for the aggregate U.S. market and for selected portfolios of U.S. stocks. W.E. Ferson and C.R. Harvey, "Fundamental Determinants of National Equity Market Returns: A Perspective on Conditional Asset Pricing," NBER Working Paper No. 5860, December 1996, presents similar evidence for stock portfolios from different countries. C. Engel, "The Forward Discount Anomaly and the Risk Premium: A Survey of Recent Evidence," NBER Reprint No. 1089, November 1996, and *Journal of Empirical Finance* 3, 123–192, 1996, reviews evidence for predictability in international bond markets.

⁸ S. Kandel and R.F. Stambaugh, "On the Predictability of Stock Returns: An Asset-Allocation Perspective," NBER Working Paper No. 4997, January 1995, and J.Y. Campbell and L. Viceira, "Consumption and Portfolio Decisions when Expected Returns are Time Varying," NBER Working Paper No. 5857, December 1996.

⁹ G. Constantinides, "Habit Formation: A Resolution of the Equity Premium Puzzle," *Journal of Political Economy* 98, 519–543, 1990, and J.Y. Campbell and J.H. Cochrane, "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior," NBER Working Paper No. 4995, January 1995. See also M. Boldrin, L.J. Christiano, and J.D.M. Fisher, "Asset Pricing Lessons for Modeling Business Cycles," NBER Working Paper No. 5262, September 1995.

¹⁰ J. Wang, "The Term Structure of Interest Rates in a Pure Exchange Economy with Heterogeneous Investors," NBER Working Paper No. 5172, July 1995.

¹¹ A. Shleifer and R.W. Vishny, "The Limits of Arbitrage," NBER Working Paper No. 5167, July 1995.

¹² B. LeBaron, "Technical Trading Rule Profitability and Foreign Exchange Intervention," NBER Working Paper No. 5505, March 1996.

¹³ Y. Ait-Sahalia and A.W. Lo, "Nonparametric Estimation of State-Price Densities Implicit in Financial Asset Prices," NBER Working Paper No. 5351, November 1995. Ait-Sahalia has taken a similar nonparametric approach to interest-rate derivatives in "Nonparametric Pricing of Interest Rate Derivative Securities," NBER Working Paper No. 5345, November 1995.

¹⁴ D.S. Bates, "Testing Option Pricing Models," NBER Working Paper No. 5129, May 1995, and "Post-'87 Crash Fears in S&P 500 Futures Options," NBER Working Paper No. 5894, January 1997.

¹⁵ T.G. Andersen and T. Bollerslev, "Heterogeneous Information Arrivals and Return Volatility Dynamics: Uncovering the Long Run in High Frequency Returns," NBER Working Paper No. 5752, September 1996, and "DM-Dollar Volatility: Intraday Activity Patterns, Macroeconomic Announcements, and Longer Run Dependencies," NBER Working Paper No. 5783, October 1996.

¹⁶ R.F. Engle and J.V. Rosenberg, "Hedging Options in a GARCH Environment: Testing the Term Structure of Stochastic Volatility Models," NBER Working Paper No. 4958, December 1994, and "GARCH Gamma," NBER Working Paper No. 5128, May 1995, and B. Dumas, J. Fleming, and R.E. Whaley, "Implied Volatility Functions: Empirical Tests," NBER Working Paper No. 5500, March 1996.

¹⁷ R.F. Engle and J.R. Russell, "Forecasting Transaction Rates: The Autoregressive Conditional Duration Model," NBER Working Paper No. 4966, December 1994, and R.F. Engle, "The Econometrics of Ultra-High Frequency Data," NBER

Working Paper No. 5816, November 1996.

¹⁸ The Industrial Organization and Regulation of the Securities Industry, A.W. Lo ed., Chicago: University of Chicago Press, 1996, contains several papers on this topic.

¹⁹ K.K. Lewis, "What Can Explain the Apparent Lack of International Consumption Risk Sharing?," NBER Working Paper No. 5203, August 1995, and "Consumption, Stock Returns, and the Gains from International Risk Sharing," NBER Working Paper No. 5410, January 1996, explore some possible explanations for the home bias puzzle and compare alternative measures of the welfare cost of home bias. G. Bekaert and M.S. Urias, "Diversification, Integration, and Emerging Market Closed-End Funds," NBER Reprint No. 2066, September 1996, and Journal of Finance 51, 835-869, July 1996, shows how closed-end funds that hold shares in emerging markets can be used for international diversification.

²⁰ J.-K. Kang and R.M. Stulz, "Why Is There a Home Bias? An Analysis of Foreign Portfolio Equity Ownership in Japan," NBER Working Paper No. 5166, July 1995, and J.A. Frankel and S.L. Schmukler, "Country Fund Discounts,

Asymmetric Information, and the Mexican Crisis of 1994: Did Local Residents Turn Pessimistic Before International Investors?," NBER Working Paper No. 5714, August 1996.

²¹ R.J. Shiller and S. Athanasoulis, "World Income Components: Measuring and Exploiting International Risk Sharing Opportunities," NBER Working Paper No. 5095, April 1995; R.J. Shiller and R. Schneider, "Labor Market Indices Designed for Use in Contracts Promoting Income Risk Management," NBER Working Paper No. 5254, September 1995; and R.J. Shiller and A.N. Weiss, "Home Equity Insurance," NBER Working Paper No. 4830, August 1994.

²² J.Y. Campbell and R.J. Shiller, "A Scorecard for Indexed Government Debt," NBER Macroeconomics Annual 11, 155-197, 1996, and D.G. Barr and J.Y. Campbell, "Inflation, Real Interest Rates, and the Bond Market: A Study of UK Nominal and Index-Linked Government Bond Prices," NBER Working Paper No. 5821, November 1996.

²³ N. Canner, N.G. Mankiw, and D.N. Weil, "An Asset Allocation Puzzle," NBER Working Paper No. 4857, September 1994.

Research Summaries

Economic Analysis of Law

Lucian A. Bebchuk*

My general interest is in using economics to analyze the effects of legal rules and institutions. In this article, I describe my current and recent work in the economics of four areas in which legal rules and institutions play a major role: corporate control and structure, bankruptcy, contracts, and litigation and settlement.

*Bebchuk is a research associate in the NBER's Program in Law and Economics and a professor at Harvard Law School. His profile appears later in this issue.

Corporate Control and Structure

While much of my earlier work in corporate control focused on takeover bids for companies with dispersed shareholders, my more recent research has focused on companies in which there is a controlling shareholder. In many public companies — both in the United States and (even more so) in other countries — a significant number of shares are concentrated in the hands of a controlling shareholder.¹

One part of my research has focused on the decisions of controllers about selling their control

blocks. In a recent article, I have shown that such decisions often might be distorted.² The efficiency costs produced by these distortions should be regarded as arising from having a controlling shareholder structure.

A central feature of the model of control transfers that I have developed is that controllers may differ from each other in two respects: their ability to manage and produce value; and their ability to capture private benefits of control. My analysis shows that, under the existing regime in the United States, inefficient transfers may take place; this will happen when the potential new controller