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Households, Institutions, and Financial Markets

John Y. Campbell*

Economists studying asset pricing have begun to grapple seriously with the extraordinary diversity of financial market participants. Investors, including both households and financial institutions, differ in their overall resources, current and future labor income, housing and other assets that are expensive to trade, tax treatment, access to credit, attitudes towards risk, time horizons, and sophistication about financial markets. My recent research measures and models this heterogeneity, with a particular focus on time horizons and financial sophistication.

Behavioral finance emphasizes that some investors are likely to be more sophisticated about financial markets than others. Early behavioral models emphasized a distinction between “noise traders” and sophisticated arbitrageurs, the former trading randomly and creating profits for the latter.¹ This of course raises the question of who can be described as a noise trader. Discussions at conferences are sometimes reminiscent of the old verse “It isn’t you, it isn’t me, it must be that fellow behind the tree.” Recent literature has argued that institutional investors act as arbitrageurs, while the household sector as a whole may play the role of noise traders.

Identifying Institutional Trading Activity

To test this idea, one would like to be able to measure institutional trading

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at relatively high frequency to see if institutions arbitrage well-known anomalies in asset returns. In the United States, large institutional investors are required to report their equity positions to the Securities and Exchange Commission quarterly in 13-F filings. Numerous papers have aggregated these reports and have looked at the implied quarterly positions of institutional investors.² Household positions can then be treated as the complement, if one interprets households broadly to include small institutions and certain foreign investors.

An alternative approach is to look at trades of different sizes. It is often assumed that large trades are carried out by institutions while small trades more likely reflect individual buying or selling. The Trade and Quotes (TAQ) database allows researchers to measure each trade in each stock, and to classify trades as buys and sells based on their relation to previous quotes. Several researchers have found that large trades appear to exploit phenomena such as price and earnings momentum.³

It is natural to ask whether these two approaches are consistent. In quarters where a stock has been subject to a high volume of large buy orders, does the stock end up with higher institutional ownership at the end of the quarter? In joint work with Tarun Ramadorai and Allie Schwartz, I have studied this question in data from the late 1990s and have found that both unusually large and unusually small trades appear to indicate institutional activity.⁴ This does not necessarily mean that small trades are more likely to be institutional; rather, it may reflect a tendency for small trades to accompany large institutional trades so that small

trades increase the probability that large ones are indeed institutional.

Using the estimated relation between trades of different sizes and institutional ownership, Ramadorai, Schwartz, and I construct daily institutional flows in individual stocks and find that they have several interesting characteristics. Daily institutional trades are highly persistent and respond positively to recent daily returns but negatively to longer-term past daily returns. Institutional trades, particularly sales, generate short-term losses but longer-term profits. One source of these profits is that institutions anticipate both earnings surprises and post-earnings-announcement drift (the tendency for stock prices to continue moving in the same direction after an earnings surprise).

These results suggest that institutional investors do exploit certain well-known patterns in stock returns, but in doing so they trade urgently and move prices against themselves, causing prices to rise temporarily when they buy and, even more noticeably, to fall temporarily when they sell. As prices return to normal a day or two after institutional trading, institutions appear to make losses but in the longer run they earn profits from their abilities to pick stocks.

How do Institutions Perceive Risks?

If institutional investors understand anomalous patterns in the cross-section of stock returns and trade to exploit them, why are these patterns not arbitrated away entirely? One possibility is that institutions are deterred by perceived risks in certain stocks.

A long-standing anomaly in stock returns is the value effect. Stocks with low ratios of their market values to their book values (value stocks) generally outperform stocks with high market-book ratios (growth, or glamour stocks). This is true even though in recent decades growth stocks have had higher betas with the market as a whole and thus, according to the standard Capital Asset Pricing Model (CAPM), should have delivered higher average returns.

In two recent papers, with Tuomo Vuolteenaho and with Christopher Polk and Vuolteenaho, I have argued that long-term rational investors who hold an equity portfolio may perceive value stocks as relatively risky despite their low market betas.⁵ Long-term rational investors care not about short-term fluctuations in the value of their holdings, but about volatility in the income stream that is generated by those holdings over the long term. To the extent that stock prices are subject to both permanent movements, attributable to changing expected corporate cash flows, and temporary movements, driven by changes in the discount rates applied to those cash flows, long-term rational investors will perceive the former movements as riskier than the latter.⁶ This point is particularly relevant for institutions with long investment horizons such as pension funds.

Vuolteenaho and I find that value stocks have a stronger tendency to co-vary with permanent movements in stock prices, while growth stocks have a stronger tendency to co-vary with temporary movements. These patterns imply that sufficiently conservative long-term investors should avoid value stocks even though they offer higher average returns and lower short-term risks than growth stocks. Pension funds, for example, may be reluctant to exploit the value effect and this may help to explain its persistence in equilibrium.

An important question is why value and growth stocks respond so differently to permanent and temporary movements in the aggregate market. Some authors have suggested that growth stocks are merely those stocks that are currently

avored by irrational investors; if these investors become optimistic and bid up the market as a whole, they disproportionately drive up the prices of their favored growth or “glamour” stocks.⁷ Polk, Vuolteenaho, and I show, however, that not only the prices of growth stocks but also their profits are particularly sensitive to temporary changes in aggregate stock prices. This implies that in order to understand the value-growth anomaly, one must look at the underlying businesses of value and growth stocks to understand how their profits respond to investor sentiment and other economic forces.

Are Some Households More Sophisticated than Others?

While institutions do appear to trade profitably with households, it is also natural to suppose that some households are more sophisticated investors than others. To investigate this hypothesis requires detailed microeconomic data on household financial behavior along with variables such as wealth, income, and education that might proxy for financial sophistication. Several papers have used survey data to show that richer and more educated households are both more likely to participate in risky financial markets, and to participate more aggressively.⁸ These findings are consistent with the idea that less sophisticated households are uncomfortable with risky investment opportunities and fail to take advantage of them; however, they are also consistent with greater risk aversion among poorer households and the existence of fixed costs for stock market investing.

One would like to go beyond asset allocation decisions to look at the ability of households to diversify their portfolios. This is difficult to do using survey data, because surveys rarely ask questions about individual asset holdings. The need to keep up participation rates forces survey designers to keep their questions fairly general and easy to answer. Some researchers have looked at data from account providers, but account-level data reveal the positions of a non-random sub-

set of the population and may be incomplete even for these households, who may also have accounts with other financial institutions.

In Sweden the government levies a wealth tax and, in order to collect it, assembles records of financial assets, mutual funds, and real estate, down to the individual security and property level, using statements from financial institutions that are verified by taxpayers. The dataset also provides information on the income, demographic composition, education, and location of all households. Laurent Calvet, Paolo Sodini, and I have used the Swedish data to analyze the financial behavior of the entire population of an industrialized country.⁹

Many Swedish households appear to be quite well diversified. Under the assumption that the efficient stock market investment is a currency-hedged global stock market index, we find that the median household loses about 1.2 percent in average portfolio return, or \$130 per year, relative to a fully efficient investment strategy with the same volatility. The losses are much smaller—one quarter the size—relative to a global stock market index without currency hedging, an investment strategy that is more readily available to Swedish households through global equity mutual funds.

For a minority of households, however, the losses from under-diversification are much larger: we find that 5 percent of households lose over 5 percent in average portfolio return or \$2,200 per year. Poorer households with less education are more likely to invest inefficiently, earning only a small reward for the risk they take. They are also more likely to invest cautiously, which limits their losses from under-diversification but may deprive them of the chance to earn higher returns through intelligent risktaking.

The diversification of Swedish households in part reflects their reliance on broadly diversified mutual funds. In effect households are relying on fund managers to handle the diversification problem. In ongoing research, however, Calvet, Sodini, and I look at household decisions

to rebalance their portfolios, decisions that are rarely delegated.¹⁰ We find that more educated and richer households rebalance more aggressively, offsetting stock market gains by selling to trim the share of risky assets in the portfolio, and offsetting losses by buying. The median household trades actively enough to offset about two thirds of the change in the risky portfolio share that would occur if the household failed to trade.

Differences in household sophistication also appear to be important in mortgage markets. In the United States, the most common type of mortgage offers a long-term fixed rate with an option to refinance at any time. The refinancing decision is difficult to manage because refinancing incurs fixed costs and interest rates are random. Even when interest rates fall to the level at which interest savings cover the fixed cost of refinancing, it may still be advantageous to wait to obtain greater savings with a single refinancing. Historically, a few households have refinanced aggressively, but many others have failed to refinance when it is clearly advantageous to do so. Using data from the American Housing Survey, I have found that less educated and poorer households are less likely to refinance during times of falling interest rates, and more likely to pay higher mortgage rates, even controlling for financial circumstances that may limit their access to credit.¹¹

Financial Innovation and Unsophisticated Households

Given the complexity of the household financial optimization problem, it may not be surprising that some households make investment mistakes. What is perhaps surprising is that simple financial products have not driven out complicated ones that households find difficult to use. One possible explanation is that sophisticated households, who are the natural early adopters of any financial innovation, benefit from existing products that offer them a cross-subsidy from unsophisticated households. Conventional fixed-rate mortgages, for example, are

cheaper because some households do not refinance when it is advantageous to do so, giving mortgage lenders profits that they pass on to consumers through competitive mortgage pricing. An automatically refinancing mortgage would benefit an unsophisticated household but would be more expensive for any household that understands how to refinance a conventional mortgage. If it is costly to explain the benefits of an automatically refinancing mortgage, particularly to an unsophisticated household, then such a product may not be able to gain a foothold in the market.¹²

Recent decades have seen many financial innovations that are relatively easy for households to use, including indexed mutual funds and life-cycle funds that adjust asset allocation as retirement approaches. Other financial innovations, notably sub-prime mortgages, appear much more difficult for unsophisticated households to understand. Important tasks for financial economists are to promote the development of innovative financial products that make decisionmaking easier for unsophisticated households, and to understand the circumstances under which financial regulation may be a necessary part of consumer protection.

¹ J. B. DeLong, A. Shleifer, L.H. Summers, and R.J. Waldmann, "Noise Trader Risk in Financial Markets", *Journal of Political Economy* 98, pp. 703–38 (1990).

² See for example P.A. Gompers and A. Metrick, "Institutional Investors and Equity Prices", *Quarterly Journal of Economics* 116, pp. 229–60 (2001), and R. Cohen, P.A. Gompers, and T.O. Vuolteenaho, "Who Underreacts to Cashflow News? Evidence from Trading Between Individuals and Institutions", *Journal of Financial Economics* 66, pp. 409–62 (2002).

³ See for example S. Hvidkjaer, "A Trade-Based Analysis of Momentum", forthcoming *Review of Financial Studies* (2007), or U. Malmendier and D. Shanthikumar, "Are Small Investors Naïve About Incentives?" forthcoming

Journal of Financial Economics (2007).

⁴ The first version of this paper appeared as J. Campbell, T. Ramadorai, and T. Vuolteenaho, "Caught on Tape: Institutional Order Flow and Stock Returns", NBER Working Paper No. 11439, June 2005. A substantial revision is J. Campbell, A. Schwartz, and T. Ramadorai, "Caught on Tape: Institutional Trading, Stock Returns, and Earnings Announcements" (June 2007).

⁵ J. Campbell and T. Vuolteenaho, "Bad Beta, Good Beta", NBER Working Paper No. 9509, February 2003, and *American Economic Review* 94, pp. 1249–75 (2004). J. Campbell, C. Polk, and T. Vuolteenaho, "Growth or Glamour? Fundamentals and Systematic Risk in Stock Returns", NBER Working Paper No. 11389, June 2005.

⁶ The seminal work on risk for long-term investors is R. Merton, "An Intertemporal Capital Asset Pricing Model", *Econometrica* 41, pp. 867–87 (1973). Vuolteenaho and I work with a discrete-time, empirically estimable version of Merton's model developed in J. Campbell, "Intertemporal Asset Pricing without Consumption Data", *American Economic Review* 83, pp. 487–512 (1993). We show that the beta of the CAPM can be broken into two components, the permanent or "bad" beta and the temporary or "good" beta. In a model with a representative investor with risk aversion γ , the price of risk for bad beta should be γ times higher than the price of risk for good beta.

⁷ N. Barberis, A. Shleifer, and J. Wurgler, "Comovement", *Journal of Financial Economics* 75, pp. 283–317 (2005).

⁸ See for example C. Carroll, "Portfolios of the Rich", in L. Guiso, M. Haliassos, and T. Jappelli eds. *Household Portfolios*, MIT Press (2002), or J. Heaton and D. Lucas, "Portfolio Choice and Asset Prices: The Importance of Entrepreneurial Risk", *Journal of Finance* 55, pp. 1163–98 (2000). These results are surveyed in my presidential address to the American Finance Association, J. Campbell, "Household Finance", NBER Working Paper No. 12149, April 2006,

and *Journal of Finance* 61, pp. 1553-1604.

⁹ L. Calvet, J. Campbell, and P. Sodini, "Down or Out: Assessing the Welfare Costs of Household Investment Mistakes", NBER Working Paper No. 12030, February 2006.

¹⁰ L. Calvet, J. Campbell, and P. Sodini,

"Fight or Flight? Portfolio Rebalancing by Individual Investors", unpublished paper, March 2007.

¹¹ J. Campbell, "Household Finance". See also A. Schwartz, "Household Refinancing Behavior in Fixed Rate Mortgages", unpublished paper, Harvard University (2007).

¹² A formal model is developed in X. Gabaix and D. Laibson, "Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets", *Quarterly Journal of Economics* 121, pp. 505-40. J. Campbell, "Household Finance", applies the model to mortgages.

NBER Profile: John Y. Campbell

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Campbell grew up in Oxford, England, and received a B.A. from Oxford in 1979. He came to the United States to attend graduate school, earning his Ph.D. from Yale in 1984. He spent the next ten years teaching at Princeton, moving to Harvard in 1994.

Campbell has published over 70 articles on various aspects of finance and macroeconomics, including fixed-income securities, equity valuation, and portfolio choice. His two books, *The Econometrics of Financial Markets* (with Andrew Lo and Craig MacKinlay, Princeton University Press, 1997) and *Strategic Asset Allocation: Portfolio Choice for Long-Term Investors* (with Luis Viceira, Oxford University Press, 2002),

have both won Paul Samuelson Awards for Outstanding Scholarly Writing on Lifelong Financial Security from TIAA-CREF.

Campbell has co-edited the *American Economic Review* and the *Review of Economics and Statistics*. He is a Fellow of the Econometric Society and the American Academy of Arts and Sciences, and served as President of the American Finance Association in 2005. At Harvard, Campbell helps to oversee the investment of the endowment as a board member of the Harvard Management Company. He is also a founding partner of Arrowstreet Capital, LP, a Cambridge-based quantitative asset management firm that manages over \$20 billion in equities for large institutional clients.

Campbell and his wife, Susanna Peyton, live in Lexington, Massachusetts, where they busily facilitate the comings and goings of their four children. Campbell finds a little time for his long-time interest of choral singing, and often rides a red tandem bicycle with his oldest son.

