

# From Visionary to Innovator

Paolo Mauro profiles **Robert J. Shiller**

**R**OBERT J. SHILLER has often been described as a visionary. In some of his best-selling books, *Macro Markets* and *The New Financial Order*, he has made the case for creating new financial markets in which individuals would be able to diversify away the most important risks affecting them, such as income or house prices. He refers to this as the democratization of finance, or making financial markets work for the benefit of the common person.

With two patents for financial innovation to his name, in recent years Shiller has started turning his vision into reality: in 2006, futures on home prices for 10 U.S. metropolitan areas, as well as an average nationwide price, started trading on the Chicago Mercantile Exchange. Shiller's reputation as a visionary in finance and macroeconomics is probably even better established with the general public for his work on irrational behavior in financial markets—especially for his admirable ability to identify “irrational exuberance” and speculative bubbles at an early stage, for both the stock market and housing prices.

Of course Shiller remains, first and foremost, a highly respected academic (he is the Arthur M. Okun Professor of Economics at Yale University and Professor of Finance at the Yale School of Management). But he is as close to a celebrity as it gets within the field of economics: his books on financial markets and the subprime crisis have made him a household name, and he has appeared in a series of full-page retirement-planning advertisements in the U.S. popular press.

## **Irrational exuberance**

First, the facts on Shiller's ability to identify asset price bubbles. In 1996, he noted that the price/earnings ratio on the stock market was at a historical peak, and argued (admittedly, four years too early) that the stock market was overvalued and likely to crash. He articulated this view in the impeccably timed first edition of *Irrational Exuberance*, published in March 2000, just as the dot-com bubble burst: in particular, he provided a cogent analysis of the psychological factors underlying the formation of speculative bubbles.

In a 2003 *Brookings Papers* study with Karl Case and in the second edition of *Irrational Exuberance* (2005), Shiller showed that house prices had begun looking like a “rocket taking off,”

despite the absence of developments in fundamental factors such as building costs, population, or interest rates that could explain the takeoff. Indeed, using a data series of home prices spanning a century that had not previously been assembled, Shiller showed that home prices were rising faster than ever before as a ratio of housing rents or personal income.

Shiller's view of why bubbles arise is much influenced by psychology. He credits Virginia, his wife of three decades and a PhD clinical psychologist, with introducing him to the field of psychology at an early stage in his career, and adds that "in a healthy marriage, you tend to come to a shared worldview." Thus at the origin of financial bubbles, according to Shiller, is the fact that "humans are social animals, and we influence each other," resulting in "social contagion." In times when asset price bubbles are growing, stock prices rise because of "new era" stories; similarly, sustained house price increases reinforce the collective belief that house prices can only rise, thereby perpetuating a seemingly inevitable upward trend. As Shiller emphasizes, this is not to say that fundamentals don't matter. On the contrary, he considers the efficient markets hypothesis to be essentially valid in the sense that a sufficiently important change in fundamentals will eventually lead to changes in asset prices. But, depending on what people happen to be focusing on, it may take a long time for asset prices to respond to fundamentals.

As everybody knows, home prices in the United States have fallen dramatically since 2006. In this regard, Shiller has been called a Cassandra—unfairly, he thinks, because, although the recent decline in housing prices has imposed massive costs on financial institutions and the economy more generally, under more normal circumstances most people would usually be happy when homes become more affordable.

#### Box 1

##### **True origins of the term "irrational exuberance"**

Shiller did not coin the term "irrational exuberance"—the title of one of his best-selling books—but came pretty close. The term was used by Alan Greenspan, chairman of the Federal Reserve Board, at a black-tie dinner speech in Washington on December 5, 1996. Greenspan asked: "But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade?" He added that "We as central bankers need not be concerned if a collapsing financial asset bubble does not threaten to impair the real economy, its production, jobs, and price stability." Immediately after he said this, the stock market in Tokyo fell sharply and closed down 3 percent. Markets around the world took a hit. Shiller (along with his colleague John Campbell) had testified before the Federal Reserve Board and had lunch with Greenspan only two days earlier. He testified that markets were irrational, but has no recollection of using the word "exuberance." For his part, Greenspan states in his autobiography that "the concept of irrational exuberance came to me in the bathtub one morning as I was writing a speech."

Shiller's most recent book on the problems that originated in the housing and mortgage markets, *The Subprime Solution*, has been criticized by some commentators as a hastily written draft, rushed to the publishers to ensure topical appeal. Nevertheless, the book provides a substantive analysis of why a housing price bubble emerged, a careful history of the major new institutions set up by the U.S. government in the 1930s to get the housing market and the economy out of the Great Depression, and creative proposals to reduce the likelihood of similar bubbles emerging in the future.

Shiller emphasized from an early stage the key role of major bailouts—a necessary if regrettable component of a strategy to get the markets back on their feet. But he is at his most imaginative when putting forward suggestions for the future: providing subsidized financial advice to all; creating standard mortgage contracts that envisage default options under pre-agreed conditions, such as a rapid decline in incomes in the borrower's occupational category; new financial products, such as securities indexed to gross domestic product or housing prices; and new financial markets for home equity insurance and insurance against occupational loss. He also endorses proposals by legal scholar Elizabeth Warren to set up a financial product safety commission.

Indeed, throughout his career, the same Shiller who has argued that financial markets behave irrationally has also proposed more—not less—finance as part of the solution. He asserts that the way forward involves "more finance, more innovative finance, more democratic finance [accessible to all], and finance under an improved institutional setting."

##### **No vision without perspiration**

Shiller's vision is grounded in much substantive scholarly research, often including a mix of theory, empirical analysis, and an impressive amount of careful data collection and design of appropriate measures to capture the economic phenomena being studied.

Shiller's early work is decidedly academic and technical. His first publication, in *Econometrica*, was on "a distributed lag estimator derived from smoothness priors." He says that he was very interested in nonparametric econometrics and Bayesian statistics, probably as a result of a physical science orientation in his studies. His first major breakthrough capturing the attention of many colleagues in academia was "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" (*American Economic Review*, 1981). This was an enormously influential paper (and is still Shiller's most cited article, according to Google Scholar). Under standard finance theory, a company's stock price should equal the sum of the dividends (in net present value) the company is expected to pay out in the future. But, as the title of Shiller's paper suggests, he showed that stock prices fluctuate too much to be justified by any reasonable expectations of what the future dividends are likely to be. Expressed in the jargon of the field, the volatility of stock prices far exceeds the volatility of the expected net present discounted value of all future dividends. An important ingredient in this paper was the collection of long-run historical data on dividends, going back

a century, which allowed him to compute the fundamental value of stock prices for a period sufficiently long to conduct his analysis. Shiller's collection of reliable historical series on asset prices, often going back a century, is a theme that would recur throughout his career.

The paper was received with interest, but occasionally also with hostility, because it struck a nerve—it was seen as challenging well-established notions of investor rationality. Given Shiller's early emphasis on the role of psychological factors in finance, should he be considered a founding father of behavioral finance (that is, finance from a broader social science perspective, including psychology and sociology), which is all the rage now in academic circles? Yes and no. Although he clearly established that markets are too volatile for their movement to be entirely driven by fundamentals, his work has not focused on explaining or predicting the *direction* of deviations of asset prices from fundamentals.

That said, from the early stages of his career Shiller did point to the importance of psychological factors, and he now visibly takes pleasure in recalling his role as organizer of two important National Bureau of Economic Research workshops: on behavioral finance, with Richard Thaler, since 1991; and on macroeconomics and individual decision making, with George Akerlof, since 1994. He says that one of his regrets is that although behavioral finance is clearly a happening field, fewer graduate students have thus far been willing to take the risk of deviating from standard utility theory in the context of macroeconomics.

### **New indices, new markets**

The role of careful measurement and data collection—the mark of a truly academic, empirically oriented researcher—that underlies Shiller's more visionary contributions is probably best exemplified by his work on housing prices. Although the total value of houses in the United States is of the same order of magnitude as the total value of companies' stocks, until recently a historical series of housing prices was simply not available. Shiller (with colleague Karl Case) provided an analysis of the properties of price indices, and then went on to collect a historical series for housing prices in the United States and 10 U.S. metropolitan areas.

The price index Shiller developed with Case is a value-weighted arithmetic, repeat-sale index that tracks the sale price of the same houses, so as to avoid changes in average prices that would result from the general upward trend in the size and quality of homes through time. The objective is to provide estimates of the price of a standard, unchanging house, so that the price index would represent the outcome of an investment in a house—not unlike the outcome of investment in stocks tracked through a stock market index that is based on the same, unchanging shares observed when they are bought and sold at different times. Obtaining the prices of the same house bought and sold many years apart, for several thousand houses, involves solving practical challenges—including writing programs to match street addresses, dropping from the sample houses whose owners built large extensions, and so on.

Armed with a reliable, high-quality measure of housing prices, Shiller and his colleagues were then able to persuade the Chicago Mercantile Exchange to start a market for futures in housing prices in May 2006. The volume of trade grew quickly for a year but subsequently sagged with the decline in housing prices. The cumulative volume of trade since the market's inception is now in the hundreds of millions of U.S. dollars—sizeable, but far from spectacular for a financial market. Shiller readily admits that, so far, jump-starting new financial markets has not been more lucrative than writing best-selling books, though he adds that he did pretty well out of the sale of his company that collects housing price data and computes the Standard & Poor's Case-Shiller index. Nevertheless, the new markets exist, and it will be interesting to see whether they revive when housing prices eventually stop falling.

Another market spearheaded by Shiller is for “macro-shares,” exchange-traded securities that enable investors to express a bullish or bearish view on the value of fundamentally important asset classes and economic interests (anything measured by an index). Macro-shares are fully collateralized with short-term U.S. treasury securities and cash. They are issued for up to 20 years, in pairs: for example, assume that “up oil” and “down oil” are initially issued at \$100 each at a time when that is the current market price of oil. A dealer will initially buy both, and sell them separately. Investors betting on an increase in oil prices will purchase “up oil” and those betting on a decline will purchase “down oil.” When the price of oil rises to \$120, “up oil” is worth \$120 and “down oil” is worth \$80. The dealer is fully hedged, and neither investor faces a counterparty risk. The cumulative volume of trade here has been well in excess of \$1 billion, and Shiller hopes

#### Box 2

### **Surveys and inflation indexation**

One way to find out about why some innovations are welcome with the public, whereas others are not, is simply to ask people about their attitudes toward the proposed innovations. Shiller did exactly that through a number of surveys of popular attitudes toward inflation indexation in different countries. This work, undertaken prior to 1997, was ultimately aimed at understanding why inflation indexation had not become more prevalent in the United States. The use of surveys—instead of more sophisticated theory or mathematical models—probably did not impress many of Shiller's colleagues in academia. But he felt that “this is what tenure is for: I do not have to do the same things others are doing,” and that to understand what motivates people's behavior, sometimes the simplest option may be to ask them why they do what they do. Even if one cannot take survey answers at face value, they may still be informative about people's focus of attention while they were making choices. Over the years, Shiller applied the use of surveys not only to indexation and financial innovation, but also to the factors underlying major changes in asset prices, such as the October 1987 stock market crash.

that macro-shares will be traded also for housing prices, GDP, and other macroeconomic variables.

### **Mystery of financial innovation**

Why do some financial innovations succeed, whereas others do not? This remains a bit of a mystery. As Shiller points out, it was unfortunate that housing prices began declining around the time of the introduction of the new market for

**“This is what tenure is for: I do not have to do the same things others are doing.”**

futures on housing. Indeed, futures prices on housing were in backwardation (lower than current prices)—thus indicating an expected decline in housing prices—from the early days of the new market. The financial difficulties experienced by a number of players in the sector clearly did not help, nor did the decline in prices itself. Some say that there are too few news items related to housing and that, in particular, data on housing price indices are released only once a month, implying that there is too little action to motivate trades on a market for housing price indices. Shiller disagrees: he points out that there is plenty of news in the form of not only individual houses being bought and sold, but also many factors that ultimately have an impact on housing demand (such as incomes and availability of infrastructure) and supply (interest rates and construction costs).

Beyond special circumstances and an element of luck, however, it is increasingly recognized that attaining large scale or critical mass quickly is an important factor in whether new financial products or markets succeed. Shiller observes that sometimes a market participant expresses interest in taking a large position on the market for house price futures, but is deterred when it turns out that there are no other big players in that market. Indeed, Shiller compares a new financial market to a party: “People want to go to a party only if they know that other people are going to be there, and that it is going to be lively.” So either everybody goes to the party, and it turns out a success, or nobody shows up, and it is often difficult to predict which scenario will materialize. (In the academic literature, the possibility of such sharply different scenarios is referred to as multiple equilibria, and the mutually reinforcing actions by multiple parties that underlie such uncertainty are labeled as strategic complementarities.)

Shiller also believes that policymakers can play a major role in bringing about financial innovation. For example, a long list of famous economists (including Shiller) at various times over the past century argued in favor of inflation-indexed bonds. But the market for treasury inflation-protected securities was introduced in the United States only in 1997 and, according to Shiller (and others), then Deputy Treasury Secretary Larry Summers played a key role in this innovation. Moreover, the ability to measure the value of underlying assets or quantities is also a necessary condition for mar-

kets to be able to emerge: without the Standard & Poor’s Case-Shiller index of housing prices, the market for futures on housing would probably not have been possible. This said, good measurement is a necessary, but not a sufficient, condition: although GDP data have long been available for the vast majority of countries, the market for Shiller’s proposed securities based on GDP has not (yet) taken off.

### **The visionary’s future**

What is Shiller’s vision for his own professional future? Well, of course, a new book is in the works, this time on behavioral macroeconomics, written with George Akerlof, in which they highlight the role of “animal spirits” and confidence in determining macroeconomic outcomes. This sounds like an unabashedly more scholarly piece: Does Shiller feel that his recent popular books have been a distraction from contributing to the academic literature? Does he miss undertaking the more technical econometric work that he began his academic career with? Shiller reassures that he “can still do that stuff, can still do the math.”

Indeed, he does not view his books as popular books—they may be popularizations “only in the sense that I left the math out.” But Shiller says that now “other things are asked of me.” In particular, he envisages continuing his activities as an advocate and facilitator for financial innovation. He points out that finance is supposed to work for the people, but many existing financial instruments are still “very 19th century.”

The main economic risks that individuals face today are no longer those for which insurance exists. We have fire insurance but, with improved building codes and better fire-fighting, fewer and fewer homes are destroyed by fire today. Many people have life insurance, but the median age at death is no longer 45; fewer and fewer parents die at an age when their children are not yet working. Shiller argues that new financial instruments and markets will need to emerge to protect individuals against declines in incomes or housing prices. May the vision continue turning into reality. ■

*Paolo Mauro is a Division Chief in the IMF’s Fiscal Affairs Department*

---

#### *References:*

- Case, Karl E., and Robert J. Shiller, 2003, “Is There a Bubble in the Housing Market?” *Brookings Papers on Economic Activity*, Vol. 2, pp. 299–342.
- Shiller, Robert J., 1981, “Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?” *American Economic Review*, Vol. 71, pp. 421–36.
- , 1993, *Macro Markets: Creating Institutions for Managing Society’s Largest Economic Risks* (Oxford: Oxford University Press).
- , 2000, *Irrational Exuberance* (Princeton, New Jersey: Princeton University Press).
- , 2003, *The New Financial Order: Risk in the 21st Century*, (Princeton, New Jersey: Princeton University Press).
- , 2008, *The Subprime Solution: How Today’s Global Financial Crisis Happened, and What to Do about It* (Princeton, New Jersey: Princeton University Press).