New Perspectives on Asset Price Bubbles: Theory, Evidence, and Policy

EDITED BY DOUGLAS D. EVANOFF,
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CHAPTER 11

Asset Bubbles

INSIGHTS FROM BEHAVIORAL FINANCE

Werner De Bondt

A decade ago most economists paid almost no attention to the complex cognitive and motivational factors that shape financial decision-making. Economic psychology and behavioral finance were ignored. The meltdown of the Internet bubble and the world financial crisis that followed the housing crash in the United States have made this conventional way of thinking untenable. In these remarks, I comment on (1) the current malaise in the United States and elsewhere; (2) past research on speculative asset price bubbles and overconfidence, in particular, the 2003 article authored by Jose Scheinkman and Wei Xiong; and (3) financial reform and bubble control.

1. The Current Malaise

Many people believed until a few years back that better monetary policy, improvements in risk management, and deregulation had permanently lessened macroeconomic volatility. Soon, the business cycle would be a relic of the past.

The crash in U.S. housing followed by the banking crisis and the global economic downturn changed all that. Early in 2011, the U.S. economy shows new signs of strain. The economic recovery is sluggish, to say the least, and we may well slide back into recession. A big problem is the downward spiral in real estate. Its severity is comparable to what happened during the Great Depression. Housing prices are hitting new lows.[1] With the 2012 presidential election in sight, the Obama administration has a stake in accentuating the positive, of course, but rising oil and food prices and high joblessness squeeze consumer spending. Both fiscal and monetary policy are tapped out. The stalemate between Democrats and Republicans over taxes and social spending may lead to a government debt crisis. (How much longer can we "stay the course" and close our eyes to the mountain of debt?) Though some investments in infrastructure are sorely needed and would pay for themselves, there is little appetite for another fiscal stimulus package. At the same time, interest rates are already very low by historical standards. As it looks now, the Federal Reserve may keep them low for many months to come.[2]

The world economy is also faltering. While the euro zone was a relative anchor of stability until mid-2011, several nations on the periphery of the European Union struggle with budget deficits and rising government debt. The austerity measures designed to bring back investor confidence are contractionary, surely in the short run. Governments in Ireland, Portugal, Spain, and Greece are weak. There are mass protests and riots in Athens. Some top officials in France and Germany seek a deeper political union in exchange for economic rescue (Trichet 2011). Outside of Europe, the Japanese economy remains feeble—even more so after the earthquake, tsunami, and nuclear catastrophe in March 2011. Hikes in interest rates intended to cool inflation are also moderating growth in China. On top of intense economic uncertainty, the Arab awakening, the continuing violence in a long list of Islamic countries (Afghanistan, Bahrain, Iraq, Libya, Pakistan, Syria, and Yemen), and the drug wars in Mexico and Central America add significant geopolitical risk.

Global imbalances and political conflict wrecked the international economy between the world wars. We should never fail to remember that with globalization the interests of nations are intertwined. Today, de facto, no single nation has absolute control of its destiny. Many countries are in crisis because of the unsound policies of others. Successful economic coordination, however, requires a degree of policy consensus that does not exist at the moment.[3]

In sum, we live in exceptionally uncertain and unhappy times. From the viewpoint of academic study, however, the bursting of the latest asset price bubble unlocks unusual opportunities for research on public opinion and sentiment. We can examine consumer, investor, worker, business, and voter sentiment. That is only a start. The potential is huge. An important aspect of opinion research has to do with understanding people's hopes and fears, and the confidence expressed in intuitive forecasts. Naïve forecasts, and the confidence in forecasts, are key variables for many economic models. Above all, spontaneous optimism ("animal spirits") and uncertainty play a major role in Keynesian economics.[4] What differentiates *behavioral* from other economic research is that it is not automatically assumed that agents' expectations are "rational." Instead, this conjecture is empirically investigated and refined.

Needless to say, the range of mental processes that economic psychologists look at extends far beyond prediction. It includes how people look at today's social and economic environment. Voters are "cynical" and "angry," we are told. They are "tired" of the squabbling and posturing in Washington. Less than 25% think that the country is moving in the right direction. There is an "erosion" of trust. Gretchen Morgenson and Joshua Rosner (2011) declare that "the American people realize that they've been robbed. They're just not sure by whom." A lot of hostility is directed against Wall Street. Bankers are seen as innately greedy and dishonest. (These emotions tie in with the resentment about the bailout, the revolving door between corporate boardrooms and government agencies, and bankers' pay.) For instance, Goldman Sachs is accused of "massively" shorting the mortgage market

while selling securities based on home loans. Some Europeans think that Goldman was also disloyal to Greece. Note that in the beginning bankers were accused of recklessness. Now they are held to be excessively cautious. Likewise, the legend of Alan Greenspan, the maestro who was in the public eye for decades, has been tarnished. In hindsight, Greenspan's "blunders" in terms of monetary and regulatory policy are thought to be self-evident. More gravely, some charge Greenspan with looking out for the wealthy and leaving workers' interests behind.

From a societal perspective, the factor that perhaps deserves most attention is the suffering associated with long-term unemployment. By now, the crisis has irrevocably ruined the lives of many middle-aged blue-collar workers. Their anguish is genuine and seems justified by past events. Since 1980, rising labor productivity no longer translates into rising real wages. Frank Levy and Thomas Kochan (2011) document that the average high-school-educated, middle-aged man earns about 10% less than his counterpart did in 1980. (High-school-educated minority men have experienced even slower wage growth.) It is important to take note of the fact that whites who did not finish college remain the backbone of the labor market. College-educated whites total one-fifth of the workforce, while minorities account for one-third. A March 2011 survey released by the Pew Charitable Trusts' Economic Mobility Project clearly shows that blue-collar whites are gloomy about the future. For example, asked whether they expect to be better off financially in 10 years than they are today, 55% of college-educated whites and two-thirds of blacks and Hispanics say yes, but only 44% of noncollege whites agree. One-third of noncollege whites say that their children will live better than they do. (A comparable number think their kids will not match their standard of living.)[5]

A related concern is high youth unemployment. In a tough labor market, people look for a secure bet and many trust that a university education (or other added training) is one of the best ways "to win the future." This orthodox position, I believe, is largely correct. Yet it may well be that we expect too much and that our present enthusiasm for more education and training, like our past obsession with housing, is exaggerated. Peter Thiel, a high-tech billionaire with large investments in PayPal and Facebook, definitely thinks so. He has mounted a hard-hitting public relations campaign arguing that university education in the United States is wildly overpriced. Thiel predicts that the "education bubble" will pop (Sarah Lacy 2011). (He encourages young people to self-educate and to become entrepreneurs.) Over the last 30 years, college tuition has risen ten times faster than inflation and three times faster than health-care costs (James Altucher 2011). As a result, a university education has become in essence unaffordable for large segments of the population. Various studies suggest that income and wealth, not brainpower, are the key factor in the decision to attend college. Still, most people go ahead and pay up. The statistics are frightening. Perhaps as many as 40% of college students do not graduate in six years. Nearly half of 2009 graduates are either unemployed or hold jobs that do not require a university degree. For the first time ever, total student debt in the United States exceeds credit-card debt. Tens of thousands of young people are holding over $100,000 in debt. According to Thiel, we are graduating "a generation of indentured servants." Then again, it is also true that the jobless rate for college graduates is a fraction what it is for high-school educated workers.[6]

Richard Taffler (2011) analyzes investment frenzies in terms of "phantastic objects." Modern research in neurobiology, he argues, is beginning to validate insights that go back to Sigmund Freud. According to Taffler, a phantasm is an idea which fulfills an individual's deepest desires. The ultimate phantasm has magical attributes such as exclusive access, originality, technical complexity, a larger-than-life identity, or the promise of exceptionally high returns. Even though investors may not be fully aware of it, many are in perpetual pursuit of phantastic objects. This never-ending chase, Taffler believes, accounts for the mystique of gold, technology stocks, London real estate, or hedge funds run by celebrities like John Paulson, James Simons, and Bernard Madoff.

Taffler's theory strikes a chord. We do not have to agree with everything he says to imagine that right now the phantastic object for America's middle class is education. For the wealthy it may be investments in high-tech social media or frontier emerging markets (see, e.g., Robert Farzad 2010).

2. Past Research on Asset Bubbles and Overconfidence

It is important to see beyond the current troubles and to keep a historical perspective. The past has often witnessed asset bubbles. Indeed, episodes of rampant market speculation followed by collapse are almost the norm. As everyone knows, famous "first" bubbles include the tulip mania (The Netherlands, 1637), the South Sea bubble (England, 1711), the railway mania (Britain, 1845), and the stock market crash of 1929 followed by the Great Depression. Charles Kindleberger (1978) and Carmen Reinhart and Kenneth Rogoff (2009) review this evidence and much more.

Nonetheless, a generation ago, most financial economists were in agreement that capital markets are extremely efficient and that news is immediately and accurately incorporated into asset prices. Theorists had developed the efficient market hypothesis in order to make sense of the "random walk." If prices quickly reflect all available information, then tomorrow's price change would only echo the part of tomorrow's news that is unpredictable today. Eugene Fama (1970) spoke candidly about this. Research, he said, "did not begin with the development of a theory of price formation which was then subjected to empirical tests. Rather, the impetus... came from the accumulation of evidence... that the behavior... of speculative prices could be well approximated by a random walk. Faced with the evidence, economists felt compelled to offer some rationalization. In short, there existed a large body of experimental results in search of a rigorous theory."

Beginning in the 1980s, however, new empirical research discovered a series of stock market anomalies including (1) predictable reversals in stock prices over

two-year to five-year horizons; (2) predictable trends as far as one year into the future; (3) predictable momentum reversals. All three price patterns are seen in my 1985 paper coauthored with Richard Thaler. Our paper emphasized the reversals since they agreed with what we were looking for based on a psychological theory of market overreaction, itself suggested by the experimental work of Daniel Kahneman, Paul Slovic, and Amos Tversky (1982) on heuristics and biases.[7]

A further novelty of our work was that we interpreted *extreme* past price movements in the cross-section of stocks as noisy measures of investor sentiment, not necessarily indicators of changes in fundamental value. Thus, from the start, we assumed the uncoupling of price from value which is the defining characteristic of a price bubble. It would take a separate paper to review all noteworthy findings in this area gathered since 1985 but I am fond of the words of William Stanley Jevons, who said in *The Theory of Political Economy* (1871) that "as a general rule, it is foolish to do just what other people are doing, because there are almost sure to be too many people doing the same thing." This quote nicely captures the initial momentum, likely caused by investor herding, as well as the subsequent price reversals, and it recommends that investors go against the crowd.[8]

BEHAVIORAL FINANCE

How do behavioral scientists think about the study of financial decision-making? While many activities are routine or conventional, behavioral finance agrees with standard finance that by and large people think before they act—especially when they face a new decision problem of some consequence for the first time. People reason and they make an effort to be sensible in what they do. However, their actions do not meet the ideal of *homo economicus*. The rationality of judgment and choice is bounded; for example, it is a struggle for most of us to manage several decision problems at the same time; and we may not pay attention when we really ought to, or we forget things. In addition, emotions and sociopsychological factors (e.g., a concern with how one is perceived by others) may hinder the quality of decisions.

Three elemental building blocks of behavioral theories are the concepts of (1) mental frames, (2) loss aversion, and (3) heuristics. If you want to understand, predict, or influence a decision taken by another individual, your first aim should be to get a glimpse of how that person thinks about the issue. What is his or her mental frame? Frames organize our thinking. They matter in countless ways. For example, frames suggest reference points that affect how people experience outcomes. Because of our strong dislike of below-target results, people choose as if they are risk-averse in the domain of attainable gains (relative to a reference point) and risk-loving in the domain of losses. This is one of the key insights of prospect theory (Kahneman and Tversky 1979). Thus, minor alterations in the decision environment often have a big impact on performance.[9] Judgment under uncertainty also depends on a small number of heuristics, that is, shortcuts in the brain that influence the formation of beliefs. Heuristics are effective most of the time but they may lead us astray. In a classic article, Tversky and Kahneman (1974) describe three heuristics: (1) *representativeness* or judgment by similarity; (2) judgment based on the *availability* of instances and scenarios; and (3) judgment based on *anchoring and adjustment*. In every case, easily accessible information has a lopsided impact on our beliefs—either because it fits a stereotype, or because it is vivid or readily imagined, or because it already left a first impression.

On the whole, mental frames, loss aversion, and heuristics are psychological mechanisms that cause behavior to systematically and predictably deviate from the axioms of rationality. These core concepts also explain everyday decision traps such as overconfidence, unrealistic optimism, or hindsight bias, and they are tied to widespread biases in financial judgment and choice such as the naïve extrapolation of past stock price trends or lack of diversification in retirement portfolios.

The behavioral approach is mostly inductive. Its chief method is to generate financial decision-making "facts" and to arrange these pieces of evidence so that enlightening patterns emerge. The initial facts themselves are inferred from data obtained at three levels: (1) in a controlled laboratory environment and therefore subject to replication; (2) in a natural environment but based on the behavior of individual actors, for example, survey data or trading records; and (3) in a market environment, for example, price and volume data. It is methodological triangulation, also referred to as cross-examination, that makes a behavioral theory truly convincing. For instance, much past research indicates that investors are painfully slow to sell assets that are going down in price. (This is the so-called disposition effect.) Its primary cause, loss aversion, is easily demonstrated in the laboratory. Surveys and trading records confirm that investors detest turning "paper losses" into permanent losses. Lastly, the disposition effect is linked to price momentum and related stock market anomalies.[10]

BEHAVIORAL ASSET PRICING

Since its emergence, behavioral finance has produced three central insights.

1. Intuition is fragile. To repeat, human decision errors are systematic and predictable. Many individuals do not learn basic financial principles from everyday experience.[11]
2. Decision process matters. The secret to high-quality decision-making is a structured, disciplined framework.[12]
3. Market prices are chronically distorted by widely shared, self-reinforcing misconceptions. The delusions are intelligible and to some extent predictable, however. This is all important. Fluctuations in investor sentiment produce risk but they are also a profit opportunity for sophisticated traders.

Behavioral asset pricing theory is based on two major assumptions. First, it is assumed that false beliefs about future cash flows, mistakes in risk perception, or unsteadiness in risk attitudes have an effect on market prices. Second, it is assumed that betting against investor sentiment is costly and risky. As a result, what rational arbitrage can achieve is limited. (Indeed, such arbitrage may be destabilizing.)

The psychological sources of bias may be cognitive, emotional, or sociopsychological. Bernard Baruch said that "what is important in market fluctuations are not the events themselves, but the human reactions to those events." Especially in uncertain times, experts may find it less problematic to forecast the "state of the market" (i.e., the behavior of the crowd) than "the state of the economy." Kindleberger (1978) and others believe that a speculative price bubble usually starts with irrational enthusiasm about the business prospects of an asset or asset class.[13] The bubble expands with the use of leverage and with the entry into the market of less informed newcomers. Besides, many actors have a rational motive (self-interest!) to pump up the market.[14] One challenging aspect of predicting the crowd, stressed by Keynes, is that mass opinion is influenced by what people think others accept as true. For example, individuals who become aware that their personal view is spreading will speak with more confidence than individuals who notice the opposite. This creates a spiral effect.[15] In due course, the bubble becomes unsustainable. For example, in the recent housing bubble, "many people could afford the high prices [of housing] only on the premise that prices would continue to rise" (Posner 2010, 29). When the crash arrives, the sudden and sharp discontinuity in prices is surprising to many traders, and it may cause panic.[16]

SCHEINKMAN-XIONG (2003)

There are many ways to rationalize speculative bubbles.[17] Jose Scheinkman and Wei Xiong (2003) go back to some old, venerable ideas to find the origins of market mispricing. Their elegant continuous-time model takes differences in beliefs among traders and short-sales constraints as starting points. Scheinkman and Xiong develop a "marginal opinion theory" of asset prices that is in line with the initial chapters in *The Theory of Investment Value* of John Burr Williams (1938). (A much-quoted paper by Edward Miller, 1977, later extended Williams.)

The early models of Williams and Miller are static but produce results that are analogous to Scheinkman-Xiong. For instance, Williams and Miller show that, among all traders, the investors who are most optimistic about the prospects of an asset will be the ones who own it. So, divergence of opinion tends to cause overpricing and the subsequent return earned by the asset is likely to be inferior. The limits-to-arbitrage assumption is essential, of course. Tangible short-sales constraints or other frictions (for example, the psychological discomfort of trading against majority opinion) prevent that prices fully assimilate negative information.

In Scheinkman-Xiong, fluctuations in heterogeneous beliefs generate trade and people willingly pay a premium (over and above their private appraisal of future dividends) in exchange for the option to resell the asset to investors who are more optimistic than they are themselves. Hence, there exists a speculative component in prices. This interesting result reminds us of the illustrious greater fool theory: *Res tantum valet quantum vendi potest.*

The main contribution of Scheinkman-Xiong is that the authors succeed in rationalizing high prices, high trading volume, and high price volatility within one dynamic framework. The model captures three unmistakable stylized facts of financial history. (In contrast, the static models of Williams and Miller cannot explain high volume since investors never rebalance their positions. There is no trading.) With "overconfidence" in the title of their article, though, Scheinkman and Xiong also leave the impression that there is a strong behavioral aspect to their work. That is not true since the authors only introduce overconfidence to motivate a specific dynamic structure of disagreement among investors.[18]

THE PSYCHOLOGY OF CONFIDENCE

What do we know about confidence in judgment? Excessive confidence and overoptimism are aspects of human nature that philosophers and social scientists have commented upon for centuries. In *The Wealth of Nations* (1776), Adam Smith writes that "the overweening conceit which the greater part of men have of their own abilities, is an ancient evil remarked by the philosophers and moralists of all ages. Their absurd presumption of their own good fortune has been less taken notice of. It is, however, if possible, more universal. There is no man living who, when in tolerable health and spirits, has not some share of it. The chance of gain is by every man more or less overvalued, and the chance of loss is by most men undervalued."

It is not easy to sum up past research on overconfidence in a few paragraphs. A 2010 survey by Markus Glaser and Martin Weber that I recommend finds that since the year 2000 possibly as many as 1,500 research papers have been published on this topic in peer-reviewed journals. The survey itself lists 90 references; about 25 of these articles focus specifically on financial decision-making. Many psychologists look upon overconfidence as the judgment bias that is the most common departure from rationality.

In fact, overconfidence refers to a whole range of phenomena. The main finding is that people often overestimate the precision of their private beliefs. This is called miscalibration. For instance, when they are asked to state 90% confidence intervals for predictions of the Dow Jones one year from today, subjects' hit rates will typically be much lower than 90%, perhaps less than 50%. Overconfidence is widespread but not omnipresent. It depends on (1) task domain and task difficulty (the bias intensifies if people attempt to answer harder questions, for example, if the forecast horizon is extended); (2) the amount of available information (with more data, confidence rises but accuracy does not); (3) individual differences, for example, gender (men are more confident than women) and cultural heritage; (4) the exact measurement method that is used. The evidence is overwhelming that

overconfidence applies to acknowledged "experts" (weather forecasters excluded) as well as amateurs. Alas, we still need more study on the dynamics of overconfidence and the impact of outcome feedback and monetary incentives. Current work indicates that these factors curb but do not smother overconfidence.[19]

Finance theory links investor overconfidence to high trading volume, stock price momentum, excess volatility, and speculative bubbles. Much research develops the conditions under which highly self-confident traders are likely to "survive" in competitive markets. Empirical research broadly confirms that more confident traders (e.g., men) trade more and earn lower returns. The overconfidence of CEOs and CFOs also influences corporate investment decisions.[20]

RISK, UNCERTAINTY, DISAGREEMENT, AND STOCK RETURNS

I conclude my discussion of Scheinkman-Xiong (2003) with some pertinent empirical evidence. Because the results of time-series studies are often fragile, I focus on a few studies that inspect the cross-section of stock returns.[21]

In life risk, uncertainty, and disagreement usually go together. Maybe for this reason, the marginal opinion theory of stock prices is frequently used to make sense of anomalies that have competing explanations, for example, (1) the poor performance of high-beta and volatile stocks; (2) the apparent short-term underpricing and long-term overpricing of IPOs (since disagreement often lessens over time); (3) the finding that "anything that increases investor awareness of a stock will increase its price" (since a security will not be purchased unless it is being noticed).

Guohua Jiang et al. (2005) study the link between information uncertainty (which the authors also refer to as "value ambiguity") and stock returns directly. They use four measures of uncertainty. In general, higher value ambiguity is associated with lower returns. This may be because uncertainty is tied to differences of opinion, or because uncertainty makes it more costly to short the stock, or both.

Do the data support asset mispricing by optimists? On balance, the answer appears to be yes. In a prominent paper, Karl Diether, Christopher Malloy, and Anna Scherbina (2002) study the returns of portfolios of stocks sorted by dispersion of analyst one-year earnings forecasts. (This dispersion is interpreted as a measure of disagreement among expert investors.) High-dispersion stocks underperform. Much of the profit of an arbitrage trading strategy based on this notion is generated around earnings announcements. (See also Henk Berkman et al. 2009.) Diether et al. believe that the profit is less in periods when the short-selling constraints are less binding. Recent work by Jialin Yu (2011) shows that the underperformance of high-disagreement stocks is stronger among growth stocks. This is as we would expect since growth stock investors are generally thought to be overly optimistic. Further, Doron Avramov et al. (2009) find that the negative relationship between dispersion and returns is concentrated in highly speculative firms with poor credit ratings, especially in periods of financial distress. It may be that high cross-sectional and increasing time-series uncertainty is systematically mispriced by equity markets. Lastly, Mesrop Janunts (2011) also performs an array of further tests. One troubling finding is that the dispersion trading strategy performed well until the late 1990s but has failed since that time.

3. Behavioral Aspects of Financial Reform

Speculative asset price bubbles misallocate capital and hurt innocent people. The financial instability of the last decade, as well as the economic stagnation, are the principal reasons why there is outward agreement in favor of financial reform and bubble control (see, e.g., De Bondt 2010).

In the United States, there is a continuing conflict of visions, however.[22] One vision of reform says that Washington should get out of the way. Government adds to the climate of uncertainty. It imposes regulatory costs. It is captured by special interests. (Only bureaucrats who want more power to justify their own salaries and positions benefit.) Most significantly, government regulation is no match for self-regulation. Alan Greenspan (1998) said that "the primary source of regulatory effectiveness has always been private traders being knowledgeable of their counterparties. Government regulation can only act as a backup."[23]

The other vision of reform finds unfettered capitalism unacceptable. It says that the increased power of finance, for example, the worship of the goal of shareholder wealth maximization, has led to the breakdown of the social contract. Wall Street governs by panic, it says, and we face a choice between finance and democracy (Robert Skidelsky 2011).[24] This vision seeks a new beginning. It wants public policymakers who do not have reservations about the legitimacy of government intervention; who make full employment their top priority; and who believe that corporations should add to social welfare as well as to shareholder wealth.[25]

Is a compromise solution possible? Is there a third way? Jean-Paul Fitoussi (2011), Raghuram Rajan (2010), and others believe that democracy and capitalism are in fact symbiotic. I agree. On the one hand, democratic government helps to legitimize capitalism by providing a safety net and by avoiding excessive market-based exclusion. On the other hand, the market supports democracy by limiting political control over people's lives. We should not pretend that economics is value-free. If we admit that market outcomes are not natural phenomena but political choices, we can build the society that we want.

What can psychology contribute to this effort? I have three comments. First, it should be clear that behavioral research finds suboptimality in public as well as private decision-making (see, e.g., Jonathan Baron et al. 2006, on the psychology of poor legislation). No one has a monopoly on wisdom.

Second, research shows in a decisive way that *homo economicus* does not exist. While I do not question that education and learning may boost rational decision-

making, it is doubtful that financial literacy programs will ever be very effective in guaranteeing financial security, let alone in preventing future bubbles. It seems better to put our efforts into making financial systems less dependent on the professional capabilities of individual agents and into making financial products consumer-friendly and safe.[26]

My final comment is that, at this critical juncture, we should encourage dialogue even if the conflict of visions that I described earlier is likely to delay decision-making on various controversial aspects of financial reform. Consider consumer financial protection. Thaler and Sunstein (2008) argue persuasively that it is feasible to design helpful default solutions to common decision problems such as saving for retirement or choosing the right mortgage. The crux of their so-called libertarian paternalism is to reflexively "nudge" people toward solutions that a choice architect regards either as socially *desirable* or privately *optimal*. The approach is libertarian in the sense that it avoids direct government coercion. (If people are clearheaded and understand what is happening, they are still able to overrule the default solution. In that sense, they do as they want.) I do not oppose all social engineering on principle, but I do believe specific government interventions in consumer decision processes should always be preceded by comprehensive democratic debate. Much behavioral research indicates that dialogue brings about legitimacy, and that the perception of legitimacy produces trust. No one will dispute, I imagine, that in this era of cynicism and mistrust, trust is more important than ever.

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Notes

1 This creates the risk of a vicious circle. Alan Greenspan (1995) describes the danger as follows: "Consumers are not willing to buy a house unless they are confident they will retain their jobs and that the value of the home will not decline."

2 The policy debate is causing a great deal of ill feeling and bitterness. Consider, for instance, how David Stockman (2011) or Paul Krugman (2011) play the blame game.

3 See, e.g., Raghuram Rajan (2010), chapter 10.

4 See, e.g., David Blanchflower (2010) or Richard Posner (2010). Posner's narrative of the economic crisis is fascinating. His latest thinking builds on John Maynard Keynes—but not new Keynesian economics. Inadequate financial regulation, loose monetary policy, and today's policy failures are summarized as "forgetfulness of Keynes" (8). However, "if one idea had to be picked out as central to *The General Theory*, it is the idea of uncertainty," Posner says (288). He discusses "irreducible" Keynesian uncertainty and the role of confidence in shaping the business cycle. Posner disapproves of behavioral as well as real business cycle economics. A bit ominously, he asks whether U.S. political institutions "are adapted to the challenges [of the] crisis" (6).

5 For a general discussion of what is happening in the American workplace, see Steven Greenhouse (2008). In a recent *Wall Street Journal* article that caused a stir, Damian Paletta (2011) reports that Social Security Disability Insurance, which was intended to help people who cannot work, is increasingly becoming an "early retirement plan." Paletta suggests that costs are exploding and bankrupting the system.

6 The student debt problem may escalate over time since President George W. Bush signed a law by which that type of debt is no longer expungeable in bankruptcy. The related quandary of unemployed youth with college degrees is already acute in Portugal, Spain, Italy, and Greece. (Young people are camping out in central Madrid.) One reason is that in these countries university education is heavily subsidized by the state. Finally, many commentators also link the chaos in North Africa and the Middle East to young people with high aspirations but without work.

7 Thus, the evidence agrees with the perspective of Benjamin Graham and David Dodd (1934): "What goes up, must come down." For a summary of contemporary research on heuristics and biases, see Thomas Gilovich et al. (2002).

8 For a collection of recent papers on this topic, see De Bondt (2005).

9 Interestingly, the variations may affect decision processes and outcomes without modifying the underlying "true" preferences (if they exist!). Indeed, this is what choice architecture, a term used by Richard Thaler and Cass Sunstein (2008), is all about.

10 For a comprehensive survey of the disposition effect, see Markku Kaustia (2010).

11 To avoid misreading, I emphasize that fragile means "easily breakable." It does not mean "broken."

12 For an introduction to this literature, see, e.g., Jay Russo and Paul Schoemaker (2002) as well as Thaler and Sunstein (2008).

13 Or, in the words of Alan Greenspan (2002), "bubbles are often precipitated by perceptions of real improvements in the productivity and underlying profitability of the corporate economy. But as history attests, investors then too often exaggerate the extent of the improvement in economic fundamentals" (10).

14 Consider, e.g., misleading accounting practices. This is often linked to the market's obsession with earnings targets. The pressure can be ruinous. Over the last decade, three celebrated winners of CFO Magazine Excellence Awards—Mark Swartz of Tyco, Scott Sullivan of WorldCom, and Andrew Fastow of Enron—faced criminal charges.

15 See, e.g., Elisabeth Noelle-Neumann (1977). Carroll Glynn et al. (2004) and John Zaller (1992) survey the literature on the dynamics of public opinion.

16 Or, in the words of Alan Greenspan (1998), "the history of large swings in investor confidence...counsels caution....[J]ust as a bull stock market feels unending and secure as an economy and stock market move forward, so it can feel when markets contract that recovery is inconceivable. Both, of course, are wrong. But because of the difficulty of imagining a turnabout when such emotions take hold, periods of euphoria and distress tend to feed on themselves."

17 For an introduction to the theoretical literature and further references, see Gadi Barlevy (2007).

18 There are a series of other mechanisms that may plausibly generate disagreement, e.g., some investors may be slow to react to information because they do not pay close attention. This creates a divergence of opinion with traders who do pay attention.

19 Evidently, this evidence on the dynamics of overconfidence is also what we need in order to evaluate the realism of the detailed modeling assumptions in Scheinkman and Xiong (2003).

20 Useful references include Kent Daniel, David Hirshleifer, and Avanidhar Subrahmanyam (1998), Pete Kyle and Albert Wang (1997), Markus Glaser and Martin Weber (2007), and Ulrike Malmendier and Geoffrey Tate (2005).

21 For a much longer survey and more references, see Hong and Stein (2007).

22 An illustration of the ideological split is the contrast between the majority report of the Financial Crisis Inquiry Commission (2011) and the dissent formulated by Peter Wallison (2011).

23 A somewhat longer Greenspan (1997) quote is as follows: "[N]o market is ever truly unregulated in that the self-interest of participants generates private market regulation.... Thus, the real question is not whether a market should be regulated. Rather, it is whether government intervention strengthens or weakens private regulation. Regulation by government unavoidably involves some element of perverse incentives, that is, moral hazard. If...market participants believe that government is protecting their interests, their own efforts to do so will diminish".

24 Robert Fishman (2011) develops this idea with respect to the Portuguese bailout. Helena Smith and Jill Treanor (2011) describe the frustrations of Prime Minister George Papandreou in the battle between the bond rating agencies and Greece.

25 In January 2010, President Nicholas Sarkozy of France said in Davos (Switzerland) that the G20 "symbolizes the return of politics whose legitimacy was denied by unregulated globalization." For more discussion, see also Thomas Palley (2009) and Anatole Kaletsky (2010).

26 For more discussion, see Oren Bar-Gill (2009) and Robert Shiller's proposal to humanize and democratize finance (Randall Kroszner and Shiller, 2011). The efforts to build a consumer financial protection agency seem justified. (Jean Monnet said that "nothing is possible without men and women, but nothing is lasting without institutions.")

References

Altucher, James. 2011. "College Is a Scam. So Let's Make Money Off It." *MarketWatch*, May 27.

Avramov, Doron, et al. 2009. "Dispersion in Analysts' Earnings forecasts and Credit Rating." *Journal of Financial Economics* 91, 83–101.

Bar-Gill, Oren. 2009. "The Law, Economics and Psychology of Subprime Mortgage Contracts." *Cornell Law Review* 94, 1074–1151.

Barlevy, Gadi. 2007. "Economic Theory and Asset Bubbles." *Federal Reserve Bank of Chicago Economic Perspectives*, Third Quarter, 44–59.

Baron, Jonathan, Max H. Bazerman, and Katherine Shonk. 2006. "Enlarging the Societal Pie through Wise Legislation: A Psychological Perspective." *Perspectives on Psychological Science* 1(2), 123–132.

Berkman, Henk, et al. 2009. "Sell on the News: Differences of Opinion, Short-Sales Constraints, and Returns around Earnings Announcements." *Journal of Financial Economics* 92, 376–399.

Blanchflower, David G. 2010. "Models Miss Risk of Falling Confidence." *Bloomberg*, July 28.

Daniel, Kent, David Hirshleifer, and Avanidhar Subrahmanyam. 1998. "Investor Psychology and Security Market Under- and Overreactions." *Journal of Finance* 53, 1839–1885.

De Bondt, Werner, ed. 2005. *The Psychology of World Equity Markets*. Northampton, MA: Edward Elgar.

De Bondt, Werner. 2010. "The Crisis of 2008 and Financial Reform." *Qualitative Research in Financial Markets 2(3)*, 137-156.

De Bondt, Werner, and Richard Thaler. 1985. "Does the Stock Market Overreact?" *Journal of Finance* 40, 793–805.

Diether, Karl B., Christopher J. Malloy, and Anna Scherbina. 2002. "Differences of Opinion and the Cross Section of Stock Returns." *Journal of Finance* 57, 2113–2141.

Fama, Eugene F. 1970. "Efficient Capital Markets: A Review of Theory and Empirical work." *Journal of Finance* 25, 383–417.

Farzad, Roben. 2010. "Investing in Frontier Emerging Markets: Your Next Money-Making Opportunity Is in the Last Place You'd Think to Look." *Bloomberg Businessweek*, October 14.

Financial Crisis Inquiry Commission. 2011. *The Financial Crisis Inquiry Report: Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States*. Washington, DC: Financial Crisis Inquiry Commission.

Fishman, Robert M. 2011. "Portugal's Unnecessary Bailout." *New York Times*, April 12.

Fitoussi, Jean-Paul. 2011. "Capitalism, Socialism and Democracy, Once Again." Working paper, Institute for New Economic Thinking.

Gilovich, Thomas, Dale Griffin, and Daniel Kahneman. 2002. *Heuristics and Biases: The Psychology of Intuitive Judgment*. New York: Cambridge University Press.

Glaser, Markus, and Martin Weber. 2007. "Overconfidence and Trading Volume." *Geneva Risk and Insurance Review* 32(1), 1–36.

———. 2010. "Overconfidence." In H. Kent Baker and John R. Nofsinger, eds., *Behavioral Finance: Investors, Corporations, and Markets*. Hoboken, NJ: John Wiley & Sons, Inc.

Glynn, Carroll J., et al. 2004. *Public Opinion*. Boulder, CO: Westview Press.

Graham, Benjamin, and David Dodd. 1934. *Security Analysis*. New York: McGraw-Hill.

Greenhouse, Steven. 2008. *The Big Squeeze: Tough Times for the American Worker*. New York: Alfred A. Knopf.

Greenspan, Alan. 1995. "U.S. Economic Outlook." Testimony before the Senate Budget Committee, U.S. Senate. Washington, D.C., Jan 26.

Greenspan, Alan. 1997. "Remarks to the G-7 economic summit meeting. Presentation at the Spring Meeting of the Institute of International Finance. Washington, D.C. April 29.

Greenspan, Alan. 1998. "The Regulation of OTC Derivatives." Testimony before the Committee on Banking and Financial Services, U.S. House of Representatives. Washington, D.C. July 24.

Greenspan, Alan. 2002. "Opening Remarks at the Bank's 2002 Economic Policy Symposium." *Federal Reserve Bank of Kansas City Economic Review* 87, 4.

Hong, Harrison, and Jeremy C. Stein. 2007. "Disagreement and the Stock Market." *Journal of Economic Perspectives* 21, 109–128.

Janunts, Mesrop. 2010. "Differences of Opinion and Stock Returns." Ph.D. dissertation, Department of Economics, University of Neuchatel, Switzerland.

Jiang, Guohua, Charles M. C. Lee, and Yi Zhang. 2005. "Information Uncertainty and Expected Returns." *Review of Accounting Studies* 10, 185–221.

Kahneman, Daniel, Paul Slovic, and Amos Tversky. 1982. *Judgment under Uncertainty: Heuristics and Biases*. New York: Cambridge University Press.

Kahneman, Daniel, and Amos Tversky. 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica* 47, 263–292.

Kaletsky, Anatole, 2010, *Capitalism 4.0: The Birth of a New Economy in the Aftermath of Crisis*. New York: Public Affairs.

Kaustia, Markku. 2010. "Disposition Effect." In H. Kent Baker and John R. Nofsinger, eds., *Behavioral Finance: Investors, Corporations, and Markets*. Hoboken, NJ: John Wiley & Sons, Inc.

Kindleberger, Charles P. 1978. *Manias, Panics and Crashes: A History of Financial Crises*. New York: Basic Books.

Kroszner, Randall S., and Robert J. Shiller. 2011. *Reforming U.S. Financial Markets: Reflections before and beyond Dodd-Frank*. Cambridge, MA: MIT Press.

Krugman, Paul. 2011. "The Mistake of 2010." *New York Times*, June 2.

Kyle, Albert S., and F. Albert Wang. 1997. "Speculation Duopoly with Agreement to Disagree: Can Overconfidence Survive the Market Test?" *Journal of Finance* 52, 2073–2090.

Lacy, Sarah. 2011. "Peter Thiel. We're in a Bubble and It's Not the Internet. It's Higher Education." *TechCrunch*, April 10.

Levy, Frank, and Thomas Kochan. 2011. "Addressing the Problem of Stagnant Wages." Working paper, Massachusetts Institute of Technology.

Malmendier, Ulrike, and Geoffrey Tate. 2005. "CEO Overconfidence and Corporate Investment Decisions." *Journal of Finance* 60, 2661–2700.

Miller, Edward M. 1977. "Risk, Uncertainty, and Divergence of Opinion." *Journal of Finance* 32, 1151–1168.

Morgenson, Gretchen, and Joshua Rosner. 2011. *Reckless Endangerment: How Outsized Ambition, Greed, and Corruption Led to Economic Armageddon*. New York: Times Books.

Noelle-Neumann, Elisabeth. 1977. "Turbulences in the Climate of Opinion: Methodological Applications of the Spiral of Silence." *Public Opinion Quarterly* 41, 143–158.

Paletta, Damian. 2011. "Disability-Claim Judge Has Trouble Saying 'No.' Near-Perfect Approval Record. Social-Security Program Strained." *Wall Street Journal*, May 19.

Palley, Thomas. 2009. "America's Exhausted Paradigm: Macroeconomic Causes of the Financial Crisis and Great Recession." Working paper, New America Foundation, July.

Posner, Richard A. 2010. *The Crisis of Capitalist Democracy*. Cambridge, MA: Harvard University Press.

Rajan, Raghuram G. 2010. *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton, NJ: Princeton University Press.

Reinhart, Carmen M., and Kenneth S. Rogoff. 2009. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton, NJ: Princeton University Press.

Russo, J. Edward, and Paul J. H. Schoemaker. 2002. *Winning Decisions: Getting It Right the First Time*. New York: Currency Doubleday, Random House.

Scheinkman, José A., and Wei Xiong. 2003. "Overconfidence and Speculative Bubbles." *Journal of Political Economy* 111, 1183–1219.

Smith, Helena, and Jill Treanor. 2011. "Papandreou Slams Rating Agencies 'Trying to Shape Greece's Future.'" *The Guardian*, April 22.

Skidelsky, Robert. 2011. "Democracy or Finance?" April 21. www.project-syndicate.org/commentary.

Stockman, David. 2011. "The End of Sound Money and the Triumph of Crony Capitalism." Henry Hazlitt Memorial Lecture, Austrian Scholar's Conference, March 12.

Taffler, Richard. 2011. "Mortgage Fraud, Consumer Protection, Financial Literacy, and Behavioral Finance." Talk presented at the Annual Meeting of the Midwest Finance Association, Chicago, March 3.

Thaler, Richard H., and Cass R. Sunstein. 2008. *Nudge: Improving Decisions about Health, Wealth and Happiness*. New Haven: Yale University Press.

Trichet, Jean-Claude. 2011. "Building Europe, Building Institutions." Speech by the President of the European Central Bank on receiving the Karlspreis 2011, Aachen, June 2.

Tversky, Amos, and Daniel Kahneman. 1974. "Judgment under Uncertainty: Heuristics and Biases." *Science* 185(4157), 1124–1131.

Wallison, Peter J. 2011. *Dissent from the Majority Report of the Financial Crisis Inquiry Commission*. Washington, DC: American Enterprise Institute.

Williams, John Burr. 1938. *The Theory of Investment Value*. Cambridge, MA: Harvard University Press.

Yu, Jialin. 2011. "Disagreement and Return Predictability of Stock Portfolios." *Journal of Financial Economics* 99, 162–183.

Zaller, John R. 1992. *The Nature and Origins of Mass Opinion*. New York: Cambridge University Press.