

## 5. The Late 1990s' US Bubble: Financialization in the Extreme

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### INTRODUCTION TO BUBBLE DYNAMICS

One important aspect of the financialization of the US economy has been the emergence, persistence and collapse of an equity asset price bubble in the late 1990s that proved destabilizing to the US economy. Since equity bubbles do not emerge all the time – they are a latent tendency – the changes in individual behavior and institutional practices, which amplified and prolonged the equity bubble, must be identified. These changes will be explored in the next section. In this section, a brief introduction to the macrodynamics of asset bubbles is outlined.

Rather than being a mere financial sideshow, a prolonged equity bubble can influence private sector portfolio preferences and expenditure decisions in ways that ultimately increase what Hy Minsky termed the ‘financial fragility’ of an economy. Rising asset prices can act as a financial accelerant on investment spending and a financial depressant on the desired household savings rate thereby shifting the investment accelerator function and the consumer expenditure multiplier enough to fuel boom conditions in the economy. Booming economic conditions in turn appear to validate and further inflate the asset price bubble. A self-amplifying feedback loop is introduced, taking portfolio positions and the economy far from a sustainable dynamic equilibrium path.

Simply put, rapid asset price appreciation creates the possibility of a massive swing to private sector deficit spending through channels other than just a rise in collateral values. As private spending persistently exceeds private income, private debt accumulates to finance this deficit spending. As private debt to income ratios rise, debt service commitments are also liable to rise, making the economy increasingly vulnerable to slower income growth and/or rising interest rates in the future.<sup>1</sup> However, the emergence of financial fragility in the private sector requires a certain type of economic set-up. The required configuration is nevertheless fairly common in contemporary economies.

For example, in a private closed economy, the Keynes/Kalecki profit equation shows that any attempt by corporations to deficit spend on capital equipment (under the influence of an equity bubble, perhaps through Tobin's Q effects) could be thwarted by a falling household savings rate.<sup>2</sup> Under such conditions, a surge in the profit share of GDP would accompany rising capacity utilization. This in turn would lead to an improvement in the internal funds available to nonfinancial firms for servicing financial obligations and fueling future capital accumulation. Overindebtedness could still arise within one particular segment of the business sector, but any build-up in financial obligations between the business sector and the household sector would be dampened. The more households increase their proclivity to spend out of their income flows during an equity price bubble, the more planned deficit spending by capacity expanding firms would be thwarted by a profit boom, as more business expenditures would rebound to firms as sales revenues.

Once we move beyond the unrealistic condition of a private closed economy, it is possible for both households and corporations to build up their debt loads at the same time. More specifically, when an economy with a high income elasticity of import demand and some degree of automatic fiscal stabilizers undergoes an economic boom during an equity bubble, the Keynes/Kalecki profit equation shows why the business sector is likely to be locked into a path of rapid debt accumulation. The profit share falls away, despite an investment boom, as fiscal policy becomes more restrictive and the trade balance erodes. When an asset price bubble also reduces household savings preferences, as tends to be the case, this policy configuration ensures that private external debt grows as well. Net deficit spending by firms and households is bled off to foreign producers in the form of foreign profits and to the government sector in the form of public debt reduction. Rising trade deficits and rising fiscal surpluses are leakages from the circular flow of expenditures and income. If sufficiently strong, they can dampen corporate profitability even during an investment boom.

In this manner, the private sector as a whole, through persistent deficit spending, can amass a heavy debt load. A highly indebted private sector can then become susceptible to explosive debt trap dynamics should income growth fall below the prevailing interest rate level. While debt trap analysis is more frequently applied to developed nation public sector debt growth or developing nation external debt growth, the analysis is even more appropriate for private debt dynamics.

Applied to the late 1990s US economy, the policy preference for fiscal surpluses and dollar appreciation surely aggravated private sector financial imbalances along the lines outlined above. In addition, the increasingly asymmetric response of monetary policy to the stock market introduced a moral hazard element that perpetuated bubble dynamics. The rapid reversals

in the Federal funds rate accompanying equity price drops, plus the frequent cheerleading by the Chairman of the Federal Reserve of key economic and financial beliefs supporting the bubble, quickened the shift in portfolio preferences driving the equity bubble. Investor perceptions of risk and return were skewed by what became known as 'the Greenspan Put'. By the late 1990s, many investors came to believe that the Fed treated the equity market as if it fell under the 'too big to fail' umbrella.

The larger danger inherent in bubble episodes becomes evident once bubble dynamics collapse. Traditional policy stimulus responses can be less effective once bubble-inspired financial imbalances are corrected. The desired reduction of private sector deficit spending following a burst bubble in asset prices introduces a stiff headwind for monetary and fiscal policy. Consequently, a more vigorous policy response than usual may be required when the private sector tries to close its financing gap. Until household and corporate balance sheets are repaired, a sustainable economic recovery can prove elusive despite rapid fiscal and monetary ease. As a result, economic policy may need to go beyond conventional bounds: US growth may need to be reoriented toward public investment led initiatives, for example, and the rest of the world may need to emphasize domestic demand-led growth.<sup>3</sup>

To avoid future asset bubbles and their accompanying financial imbalances, a mix of unorthodox tools may need to be employed. These include ratcheted securities transaction taxes, asset-based reserve requirements, capital controls and possibly more direct intervention by monetary authorities in bubbling financial markets. While these proposals may sound utopian from the perspective of policy debates of the past decade, the swift abandonment of the 1990s' lock box perspective on fiscal policy may be instructive of the kinds of discontinuous shifts that become possible in a post-bubble environment. History suggests the revulsion with financial shenanigans can lead to sharp, nonlinear changes in policy priorities and hence in the rules of the financing game.

Nevertheless, political coalitions to support sensible financial reform may be more problematic following a period of rapid financialization of an economy. A clean separation between manufacturing and financial interests is not easy, for example, once stock options are used in management compensation and nonfinancial firms are more deeply engaged in zaitech like financing roles. In addition, with the fall of Glass-Steagall, it is harder to separate commercial bank and investment bank financial interests. Fresh thinking about old cleavages and political alignments will be required to craft policies that can attract the necessary political inertia. The politics involved in containing excesses that may be promoted by liberalized and globalized capital markets are likely to be complex.

**Investor Dynamics Fueling the US Equity Bubble**

Asset markets, conventional theory holds, allow investors to identify and fund those investment projects with the highest risk-adjusted return. Financial markets are efficient in this task, at least in an informational sense. Under conventional theory, they will produce distorted, suboptimal outcomes only if there is any interference with their operation. While random mispricings of financial assets may occur from time to time, such mispricings are either quickly corrected or they will tend to average out over time. Capital allocation decisions, then, are best left to the unimpeded discovery process that evolves out of the effort of investor to maximize their own wealth. Together, these precepts form what is referred to as the efficient market hypothesis (EMH).

This account of financial markets, while still the dominant view, has suffered numerous theoretical and practical challenges over the past two decades. Such contentions have bred more convoluted variations of the EMH, rather than a wholesale revision of the theory.<sup>4</sup> Still, there are enough flaws that have been exposed to leave its legitimacy as a ruling convention under serious question. When combined with the dramatic bubbles in several asset markets over the past two decades – not the least of which includes the Japanese bubble in the late 1980s and the US bubble in the late 1990s – it is clear that even highly placed policy makers have begun groping for a better understanding of how financial markets behave.

One example of this search is offered by Andrew Crockett, former General Manager of the Bank for International Settlements (and Chairman of the Financial Stability Forum) at the Fourth Hong Kong Monetary Authority Distinguished Lecture in February, 2001. Crockett's statement deserves to be read in its entirety, as it stands in marked contrast to what is loosely understood as 'the Washington consensus' view of financial markets. Crockett determined from his experience that financial markets display characteristics that distinguish them from orthodox descriptions of commodity markets.

First, the financial industry is unlike other sectors in that the feedback mechanism from supply to price is less effective or even perverse. In a traditional industry, an expansion of supply puts immediate downward pressure on price, squeezing profit margins, reducing the incentives to invest and encouraging exit from the industry. In the financial sector, the price that falls when the supply of credit increases is the interest rate. This has the effect of pushing up asset values and appearing to strengthen the balance sheet of borrowers and intermediaries alike. Rising asset values encourage leverage and credit expansion.

Second, fundamental value, the basis on which decisions to buy and sell, to lend and borrow are made, is extremely hard to assess. To an important extent, value, like beauty, is in the eye of the beholder. Its assessment is subject to powerful waves of shared optimism or pessimism. Investors are prone to see new

paradigms – individual stocks, even stock indices, can move by large amounts even in the absence of significant new information.

My third conclusion is that cyclical upswings are typically sustained by overly optimistic expectations and muted perceptions of risk. The fact is that financial intermediaries are better at assessing relative risks at a point in time, than projecting the evolution of risk over the financial cycle.<sup>5</sup>

The attributes cited above make achievement of EMH conditions highly unlikely. As Crockett openly acknowledges, bubble dynamics are a latent tendency of asset markets that can endogenously emerge under the right conditions. Chairman Crockett has in fact identified a characteristic of financial markets once isolated by Hy Minsky:

in financial and capital asset markets in which speculative and conjectural elements are powerful, the principle of substitution does not always apply. A rise in the relative price of some set of financial instrument or capital assets may very well increase the quantity demanded of such financial or capital assets. A rise in price thus breeds conditions conducive to another such rise.<sup>6</sup>

Although Crockett appears to have rediscovered Minsky, he leaves aside some of the more salient characteristics Minsky and other Post-Keynesian economists have identified in financial markets, which make them prone to bubble dynamics. Fundamentally, the conundrum may be summarized as follows: prices in asset markets are formed with a view to future economic and financial market conditions, yet these conditions cannot be known with certainty.

To construct a world more likely to hue to efficient market characteristics, several changes would be required. Financial instruments would require fixed contractual payouts rather than contingent payouts (such as capital gains). The investing class would need to be restricted to those with sufficient entrepreneurial and financial experience to make relatively sound assessments about the prospective returns of various investment projects. Finally, the liquidity of financial commitments would need to be reduced enough that investors would be forced to evaluate very long-term risk and return prospects.

But even under these ideal conditions for financial markets to behave along the lines the EMH requires, future events influencing financial asset values cannot be perfectly foreseen, nor can the range of possible future events even be captured in a probabilistic sense. As Paul Davidson has noted, barring an outbreak of clairvoyance, we have yet to figure out a way of taking samples from the future. Asset price formation is therefore tied up with how investors attempt to cope with fundamental uncertainty about the future.

Given this fundamental uncertainty, some economists and investors who have looked deeply into this question find a very different type of game is

being played in financial markets. Rather than endeavoring to build more accurate calibrations of possible payoffs under various financial market and economic outcomes, most investors will tend, as a mental short cut or rule of thumb, to assume their experience in the recent past is representative enough of the near future. They will construct portfolios on the basis of such extrapolation. Adaptive expectations, then, offer one way for investors to cope with fundamental uncertainty.

Rather than attempting to position portfolios on the basis of the most accurate forecast of a fundamentally uncertain future, other more sophisticated investors who recognize this extrapolative behavior will try to game consensus expectations about the future. Investor behavior becomes governed by ‘speculations on the speculations of others’.<sup>7</sup> Under such conditions, strategic behavior unfolds to various degrees and a proclivity toward bandwagon outcomes can emerge. To the extent financial markets or the economy behave in ways other than conventional models suggest they should – as they will especially be prone to do during asset bubbles – these conditions feed an increasing orientation toward ‘strategic’ behavior by investors. This shift further enhances bandwagon effects in financial markets.

To apply this to the late 1990s equity market bubble, changes in the behavior, practices and incentives facing three general classes of investors will be examined. These three classes include less informed trends following individual investors, rationally destabilizing speculative investors and relative performance institutional investors. The behavior of each group and more importantly, the dynamic interaction of their behavior, is crucial to understanding the strength and persistence of the equity bubble. Bubbles depend in a very essential way on such interdependent feedback loops.<sup>8</sup>

### **Individual Investors: Hopping on the Caravan to the Casino**

As the equity bull market that began in 1982 persisted with relatively brief interruptions into the mid-1990s, households adapted their portfolio preferences accordingly. 1998 saw nearly half of the households surveyed by the Federal Reserve holding stocks (directly or indirectly, as with employer-sponsored retirement accounts), quite a leap forward from the 32 percent of households recorded at the end of the 1980s’ stock market boom.<sup>9</sup> Equities as a share of total household wealth exceeded the peak last seen in 1968, another period characterized by economic good times and a robust stock market. By 1999, according to Federal Reserve data, discretionary equity holdings as a share of household financial assets had risen to 60 percent from 34 percent only a decade earlier.<sup>10</sup>

In addition, expectations of future equity returns appear to have been extrapolated from the recent past equity market performance. While the long

sweep of history available for US equity returns suggests a nominal annual return in the range of 9–10 percent has prevailed (at least prior to the late 1990s boom), by 1999 some surveys found households expecting median returns in the range of 15–19 percent for the next ten years.<sup>11</sup> Of those households with five years or less of experience, a return of 21.7 percent was expected, not far from the 22.7 percent equity mutual fund return earned between 1997 and 1999. Such results are not unique. One survey performed by Gallop for UBS Warburg on a more regular basis late in the decade shows the cresting of expected one-year returns on equities at 19 percent and the subsequent halving of expectations as the bubble popped. The very recent past apparently serves as a salient guide to the future for many individual investors, just as Keynes suggested a lifetime ago.

Perceptions of the risk involved in owning equities likewise shifted during the bubble. Households became increasingly comfortable leveraging their equity bets with margin loans or even home equity loans. Margin debt – the borrowing of money from stockbrokers to purchase more stock, where the stockholdings themselves serve as collateral – soared by \$88 billion in 1999. With the brief exception of the tail end of the go-go years in the 1960s and the run up to the sharp correction of October 1987, margin debt rarely rose above 1 percent of personal disposable income. But as the high double-digit returns began to emerge in 1995, margin debt climbed consistently year after year until it had tripled to 3 percent of disposable income. As a percentage of GDP, margin debt was last this high in the 1930s. By late 1999, household use of leverage to finance equity investment positions had become so compelling that \$24 billion in margin debt was added in November alone.<sup>12</sup> Home mortgages collateralized by equity portfolios were offered by several brokerage houses by the height of the equity bubble. In effect, users of this form of financial engineering appeared indifferent to a margin call that could literally displace them from their homes.

In explaining the dramatic decline in risk premiums being required by households as they held an increasing exposure to equities in their portfolio, Chairman Greenspan often argued that the improved availability of financial information reduced the uncertainty investors face.<sup>13</sup> With computerization and the Internet, financial information became more accessible and more plentiful than any time in history. Day-long financial news networks now run on TV like game shows. Websites update financial news minute by minute, while investors visit stock chat rooms all hours of the day and night. Analyst recommendations for stocks can be easily downloaded and even so-called whisper numbers for earnings can be reviewed at will.

But what do individual investors do with this enhanced access to financial information? Do they calculate net present values of projected future earnings' streams, as efficient marketeers would have us believe? More often than not, such analytical activities are viewed as exercises in futility by indi-

vidual investors – assuming the tools of fundamental investment analysis are even known to them in the first place. Individual investors would rather pick up the next hot rumor from the chat rooms or use charts and technical analysis to identify future market moves based on price patterns of the recent past. In Chairman Greenspan's view, the future is less opaque and more predictable given the improved information flow that technology has made available for the average investor. Yet in reality, precisely the opposite has emerged. Information flows have been employed by individual investors in a manner that primarily reinforces extrapolative behavior. Extrapolative expectations behavior seriously undermines the very basis of the asset pricing models constructed by efficient marketeers.

It is no small irony that momentum investing has never proven as lucrative as it did during 1999. Isolating the top decile of price momentum stocks for 1997–9, researchers at Sanford Bernstein found this segment of the US equity universe beat an index of the large capitalization stock market by 46 percent per year. This is more than double the prior relative performance peaks of the momentum stock surges of 1956, 1967, 1973, 1980 and 1991. While widespread adoption of computers and the Internet have surely democratized the tools for trading, such information has not led to more informed investment decision making by individuals. Rather, it has facilitated the identification of asset price trends, fostered momentum investing and for a while at least, made momentum investing a self-fulfilling prophecy.

Individuals, of course, can choose to sidestep the shortfalls of their own ignorance and defer their investment decision making to mutual fund portfolio managers with more experience and investment knowledge. But here a paradox emerges, as mutual fund managers still must attract the attention of individual investors. Since individual investors make stock selections in a trend-following manner, we have no reason to believe they would choose mutual funds in any different manner. The enormously lopsided inflows into aggressive growth and technology mutual funds in late 1999 and early 2000 certainly are testimony to this extension of trend-following behavior by individual investors choosing to hire more experienced mutual fund managers.<sup>14</sup>

Moreover, mutual fund ranking systems like Morningstar that are available to more discerning individual investors are frequently based on 1, 3 and 5-year historical performance records. Most mutual funds advertisements are built around recent performance highlights – even though in the fine print of mutual fund ads, one finds the admonition that past performance is no guarantee of future performance. Trend-following behavior by individual behavior is therefore simply displaced onto the mutual fund manager.

At the end of the day, mutual fund managers face an absolute performance derby. They must deliver the highest possible returns in their product



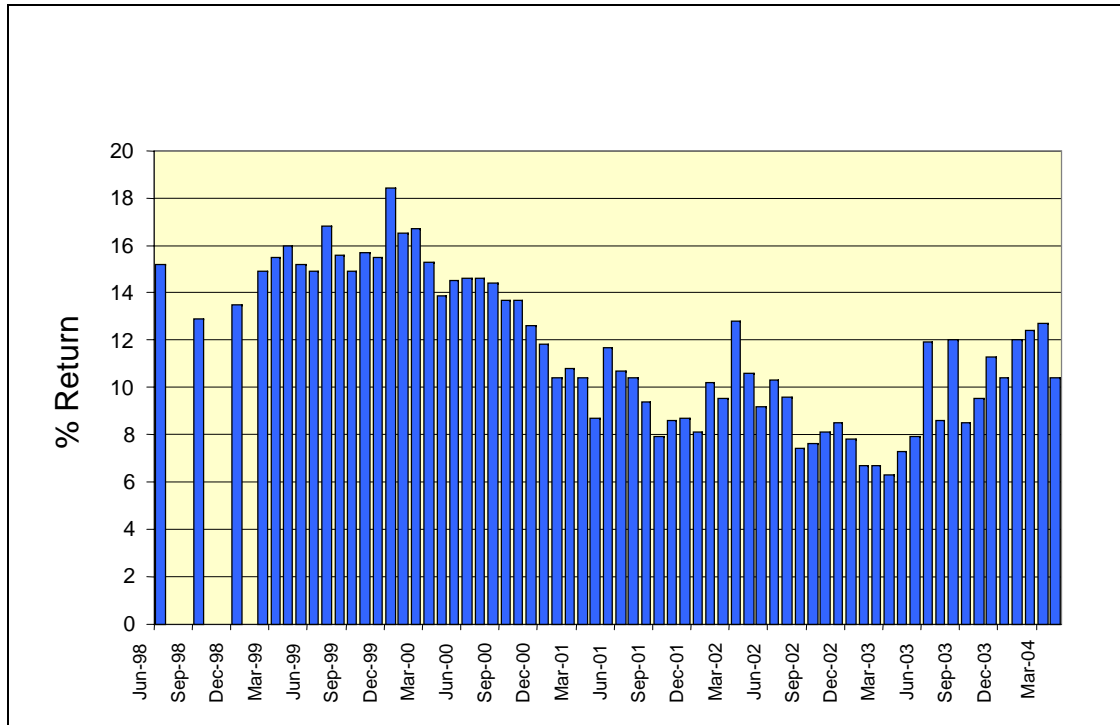


Figure 5.1 Individual investor expectations for return on own equity portfolio over next 12 months

category or face net redemptions from their funds. This places an intense pressure on mutual fund managers to chase momentum quarter after quarter. It can also lead to some rather odd redefinitions of investment styles as mutual fund managers try desperately to stay in the game.

For example, during the last innings of the late 1990s equity bubble, it was possible to find value fund managers with track records that were beating the S&P 500. How did value managers accomplish this when already richly valued stocks were soaring to unheard of price/earnings ratios? By redefining value investing, value managers managed to stay in the game. It was not unusual to hear the quip from such chameleons like value managers that if a stock rises in price, it must have previously been cheap. In this fashion, the only operative value criteria employed by these managers was the same one employed by momentum investors. From such self-serving sophistry, even those mutual fund managers whose valuation disciplines should have left them most immune to the equity bubble became active participants in the trend-following behavior.

As the bull market that began in 1982 persisted into the 1990s with relatively short-lived interruptions, households reacted in an adaptive fashion and raised the share of equities they desired to hold in their portfolios. Few individual investors make equity investments on the basis of sophisticated analytical tools like the varieties of discounted cash flow models understood by professional investors. More frequently, trend-following behavior is adopted by less informed investors or their proxies, mutual fund managers, as a way to piggy-back on the bets of what are believed to be better-informed investors. The reinforcement of adaptive expectations behavior and the increased trading activity of trend-following individual investors provided conditions to propagate the equity bubble. From such simple shifts in investor behavior, massive financial manias can be perpetrated. Financial markets, as currently structured, can be efficient in amplifying speculative dynamics.

### **Hedge Funds: the Rational Destabilizing Speculators**

One stream of conventional theory holds that asset bubbles are likely to be thwarted by a class of better-informed speculators. These better-informed speculators who will guide asset prices back to their true intrinsic or fundamental value by preying on the misperceptions of less informed investors. Investors who are not building portfolios on the basis of sound financial analysis are, according to this point of view, destined to be relieved of their wealth over time. Once false investing premises are exposed by the passage of time and the disappointment of expectations held by less informed investors, those who were willing to position their portfolios on the basis of sound, fundamental analysis will be rewarded in the marketplace. Over time,

this speculative behavior rationalizes asset prices and the less informed investor either learns a lesson or gets fleeced or both. Such speculators play a stabilizing role, according to this view.

Now professional investment managers like hedge funds, in contrast to individual investors, should be better positioned to evaluate the profitability of firms and should be capable of investigating the valuation of securities issued by firms in a more thorough and accurate fashion than most individual investors. Investment management firms can afford to hire analysts steeped in the state of the art tools for evaluating companies and they can afford more rapid access to critical business and financial information than smaller investors. In addition, because they tend to follow higher turnover and more highly leveraged investment strategies, professional investment managers get exceptional care and feeding by brokerage houses.

Yet once we introduce the presence of a large block of trend-following individual investors, as we did in the prior section, the value of the analytical skills and informational advantage hedge funds and other professional investment managers can buy depreciates fairly rapidly. George Soros (1998) calls this process reflexivity and describes it as follows:

The future that market participants seek to anticipate consists primarily of stock prices, not of fundamentals. The fundamentals matter only insofar as they affect stock prices. When stock prices find a way to affect the fundamentals, a self-reinforcing process may be set in motion that may carry both the fundamentals and stock prices quite far from what would be the conventional equilibrium. This would justify trend-following behavior.

If the equity market has departed from fundamentals, under what Keynes viewed as 'the mass psychology of a large number of ignorant individuals', then knowing the underlying value of an asset can become less important than identifying and jumping on price trends early.<sup>15</sup> Investors who recognize this change can end up driving asset prices further away from any equilibrium price based on fundamentals. Professional investment managers are unlikely to find it profitable to bet on a reversion to fundamental valuations when trend-following behavior is especially strong, as it will tend to become during a prolonged bull market. Better to cynically ride the trend while trying to stay one step ahead of the thundering herd, than to insist on a short or even intermediate term return to more theoretically justifiable asset prices.

Hedge funds, like other professional investors, face a dilemma: they can bet against the trend and risk losing money until the trend can be turned around or they can exploit the trend by jumping on board and riding the appreciation already under way until everyone is in and it exhausts itself. Soros himself identifies this as his specialty. Rather than taking their rightful place in Panglossian economics as the enforcers of rational pricing, hedge

funds will often opt to ‘ride the wave’ and thereby push prices of assets further away from their intrinsic values. In addition, hedge funds investors are notorious for copying each other’s strategies, so it is not unusual for similar momentum-based bets to race through the hedge fund community at the same time. On top of this, as hedge fund trading patterns become visible to the trading desks of Wall Street brokerage houses executing their orders, copycat trades are initiated by the proprietary trading desks of investment banks and sometimes leaked to the trading desks of institutional investment managers as well. The potential for this behavior to amplify any original bandwagon effects initiated by individual investors is quite substantial.

### **Institutional Investors: Chained to the Relative Performance Game**

Individual investors have neither the time nor the knowledge to perform the kind of serious assessments of investment prospects that efficient market theory assumes. Instead, most individual investors will prefer to take a mental short cut and extrapolate a period of economic good times and an equity bull market into the future. They tend to invest in a trend-following manner. Hedge fund managers have the time, knowledge and money to fulfill the dream of efficient market theory, but they have found a more lucrative game than fighting the tape until asset prices return to fundamentally justified values. Hedge fund managers prefer to amplify the trend-following behavior of the individual investor, taking asset prices further from equilibrium. The longer a bull market runs, the deeper ingrained these extrapolative behaviors and practices can become.

Into this mix comes a third type of investing agent, institutional investment managers. The field of institutional investment management bloomed shortly after the Employment Retirement Income Security Act (ERISA) legislation was passed in 1974 to reduce abusive practices with respect to pension fund investing. ERISA assigned a fiduciary duty to trustees of private employment benefit plans. This fiduciary duty cannot be delegated, which has led to the breeding of what amounts to a rather large ‘protection racket’. The Chief Financial Officer (CFO) of a firm hires someone (usually an entire staff) to oversee the details of administering the company’s pension fund. If the pension fund fails to meet its return and risk objectives, the CFO can fire the delinquent staff. The corporate staff (known as plan sponsors) hire a pension fund consultant to help them find institutional investment managers that can invest the pension fund on their behalf. The consultant can be fired if their recommendations go awry. But long before the consultant is fired, the consultant will encourage the company staffers to fire an underperforming investment manager. The food chain does not cease there – but the obvious nature of the game is to lay off the risk of making bad

bad investments to other agents outside of the original corporate entity.

As this protection racket developed over the years, consultants managed to somehow maneuver their way closer to the top of this food chain. Consultants were capable of aggregating and analyzing the performance data across investment managers. They could independently and objectively assess the strengths and weakness of investment management firms. This was crucial information to corporate plan sponsors and it was information no one investment management firm had any incentive to accumulate. Especially when it came to representing investment performance, a relatively impartial third party was required if due diligence by corporate pension plan staff was to be accomplished.

Out of this role evolved several unintended consequences that may have facilitated asset bubble dynamics. While investment management firms were selected on the basis of long-term records kept by pension fund consultants, consultants naturally began to help corporate plan sponsors monitor the performance of investment managers by collecting quarterly performance results. As competitive pressures built in the very profitable investment management business, this quickly evolved into a quarterly performance derby. While no investment manager would be fired for weak performance in any one quarter, a year's worth of bad performance could get you on a watch list and if it persisted, it would get you fired. Since a year is four quarters long, the time horizon of investment managers naturally collapsed as well. Despite the long-dated nature of the liabilities in corporate pension funds, consultants managed to herd investment managers into an absurdly short investing time horizon. Since investment prospects sometimes take a long time to pay off, the incentives for investment managers to ignore or abandon fundamental analysis in favor of more short-term technical analysis-based tools became quite high.

It is worth noting a second development that encouraged this shift toward technical analysis and chart-following. Analysts at investment management firms tend to rely heavily on the work produced by brokerage house equity analysts. This includes everything from relying on accounts of conversations brokerage house analysts have with senior management of firms to cribbing spreadsheets for earnings forecasting purposes. With the deregulation of brokerage commissions back in the 1970s, the role of the brokerage house equity analyst began to shift. Rather than earning his keep by providing in-depth fundamental analysis of the competitive and financial position of a company, the sell side equity analyst function became one of facilitating investment banking business. In this fashion, brokerage house equity analysis became less disciplined and more oriented toward serving the needs of deal makers on the investment banking side. As one investment manager was quoted observing:

Equity research is a loss leader in most firms. What it does is oil the pipeline so you have a good relationship with clients, so when you do deals you have a good distribution channel. Because the money you make on IPOs is so much greater, the increased pressure from investment banking makes research dysfunctional.<sup>16</sup>

With the pressure to tout initial public offerings (IPOs) and to facilitate merger and acquisition (M&A) activity – that is, to help investment banking deals get done and so pay their way – the quality of sell-side research has deteriorated over the past two decades. Since analysts at investment management firms have come to rely on this research to guide them, there is an additional push-away from fundamental financial analysis beyond the collapsing of institutional investor time horizons.

A second by-product of the ascendancy of pension fund consultants was the proliferation of benchmarks used to gauge institutional investor performance. If the quarterly performance derby was to be run correctly, consultants needed an adequate yardstick to measure the success of investment managers. In addition, one implication of the EMH that arrived on the scene about the same time as ERISA was as follows: very few if any active investment managers should be able to beat the market on a consistent basis. To win the quarterly performance derby, active investment managers needed to beat the relevant benchmark representing what a passive investment in a stock market index could deliver. They became relative performance players. But the companies inhabiting the benchmark were not necessarily the ones an institutional investor's disciplines would have led them to own. Investment disciplines had to be skewed to eliminate large divergences between actively managed portfolio performance and benchmark performance. In effect, the introduction of relative performance investing led active institutional investors over time to look more like the benchmark. Benchmarks served an unintended purpose in coordinating the bets of active institutional investors to the point that they started looking more like passive index investors. At the end of the day, benchmarks herded professional investors into looking at the same stocks.

But with the various styles of investment management that arose as institutional investors tried to promote product differentiation to justify their fee structures, there came a proliferation of benchmarks. Each niche of the equity market had its own style of investing, from large capitalization growth down to small cap value and so each needed its own appropriately skewed benchmark. As benchmarks proliferated, consultants in the institutional investment management world facilitated a kind of division of labor. Consultants could help corporate plan sponsors find and monitor the best large cap growth stock managers, the best small cap value managers and everything in between. Investment managers would be free to pursue those investment approaches at which they excelled. But with this increasing specialization came two related unintended consequences. The overall asset

allocation decision was drawn away from the institutional investment manager and toward the pension fund consultants and cash positions in equity portfolios became highly restricted. In the absence of discretion over asset allocation or even cash positions, relative performance investment managers had only one way to win the quarterly performance derby and that was to chase the hottest stocks in the benchmark.

One last but crucial distortion was introduced to the institutional investing game by consultants. As benchmarks proliferated, as relative performance became the name of the game and as asset allocation decision-making was captured by the consultants, the measure of risk-taking consultants used to monitor institutional investors also changed. Gone was the use of standard deviation as a measure of portfolio risk. In its place, given it had become a benchmarked world, consultants introduced tracking error (or active risk) as the sole measure of risk. Should the weightings of stocks in an institutional investor's portfolio differ greatly from those of a benchmark, consultants would be quick to call the portfolio off base. Corporate plan sponsors would be notified that a portfolio manager was departing too far from the benchmark, perhaps in an attempt to change investing styles or perhaps in an attempt to bet the ranch if he was behind in the relative performance derby. Through this risk-policing function, consultants significantly enhanced the odds of herding dynamics arising among institutional investors. With tracking error risk as the critical constraint on portfolios, institutional investors were consigned to the task of grinding out returns 1–2 percent ahead of the benchmark year after year, regardless of the absolute returns delivered by the benchmark and regardless of the investment opportunities outside of the stocks in the benchmark that their fundamental disciplines might otherwise have surfaced as attractive investing opportunities.

The pattern that can be observed over time in the institutional investment business is as follows: investment time horizons collapsed, investment performance became defined relative to a benchmark or index portfolio, asset allocation and market timing skills were made obsolete by a monomaniacal focus on stock selection and risk became defined solely in relation to departures made from benchmark weightings. Each of these consultant inspired moves had the unintended consequence of enhancing herding dynamics among institutional investors. But when the changes in behavior of individual investors and hedge fund managers are joined with the changes in institutional investment practices, the likelihood of equity bubble dynamics emerging spontaneously from this mix is greatly enhanced.

To see how explosive this mix can be, consider the following scenario. A period of prolonged economic growth, punctuated by relatively mild recessions or growth recessions, lowers the risk perceptions of individual investors. A persistent bull market in equities, punctuated by relatively short episodes of falling stock prices, raises the return perceptions of individual

investors. The preferred share of the portfolio devoted to equities rises amongst households. Households, who are relatively less informed investors, bid up stocks they are told have improving earnings prospects. Stock prices begin to rise beyond the price justified by dividend discount or discounted cash flow models – models unused by most individual investors. Hedge funds cynically jump on the momentum introduced by trend-following individual investors, taking stock prices even further from equilibrium. They are rational to act as destabilizing speculators knowing the trend-following behavior of individual investors will carry prices even higher. Relative performance institutional investors who do make investment decisions using fundamental analysis suddenly face a lost quarter in their relative performance derby. Stocks in their benchmark portfolio have risen well above price levels that could be justified by the fundamentals based models employed by their security analysts. Furthermore, the weight of the sector of hot stocks in their benchmark is rising and the longer they listen to their analysts with their fundamental models, the more tracking error they end up taking on. Consultants flag this disturbing rise in tracking error for pension fund plan sponsors. Fundamental models of equity analysis are subsequently ignored or revised by institutional investors and a third set of agents feeds the self-fulfilling bandwagon effects in the equity market.

What is left is a perpetual motion machine (or at least so it seems for a time) of fairly mechanical investing that bears no relationship to the behavior expected under efficient market theory. Over time, these endogenous feedback loops are enhanced as speculative behaviors are rewarded and reinforced. Among hedge funds and institutional investing firms, a Darwinian selection process culls all but the most rabid trend followers from the thundering herd. Asset prices are taken far from fundamentals. This departure of financial markets from reality in turn encourages the build-up of macrofinancial imbalances in the real economy.

### **Bubbles Distorting the Real Economy: the Obfuscation of Profits**

By way of illustration, the corporate sector was clearly not forming its profit expectations in the late 1990s on the basis of recent profit results. Cash flow and accelerator effects can be dismissed as primary drivers of the investment boom. Corporate cash flows were squeezed with profits in the latter half of the 1990s. While sales growth was solid, most of the revenue acceleration belonged to the first half of the decade. Capacity utilization fell for most of the second half of the 1990s, yet the investment share of GDP rose to a new postwar high. Nor was the low cost of equity capital (created by surging equity prices) an important element in the capital spending boom, as shares were net repurchased, not net issued, by the corporate sector. Any serious explanation of the investment boom, then, must at least in part turn to the



role of equity prices in signaling future profit conditions and the growing relevance of the arbitrage condition highlighted in the Keynes/Minsky two-price theory of investment, especially as corporate managers increasingly gained ownership shares in their firms.<sup>17</sup>

Of course, asset price bubbles can occasionally be self-contained spectacles. The froth within one particular financial market may not spill over into other asset markets or into the real economy. A bubble may be too short-lived or the asset market breeding the bubble may play too small a role in financing to matter. This, however, tends to be the exception more than the rule. Expectations and behaviors that inform real economic activity can be changed by financial manias. As a general rule, an asset price bubble encourages spending by the private sector in excess of money income – that is, deficit spending. In the recent US case, the equity bubble acted as an accelerant on the propensity of firms to invest. The bubble also depressed the propensity of households to save – especially among high-income households where equity holdings are concentrated. Finally, with both households and firms increasing their propensity to spend at a pace in excess of their income growth, the dollar appreciation associated with the US equity bubble ensured the trade deficit would deepen. The first two channels of equity market influence were US GDP growth enhancing, while the last channel was supportive of GDP growth abroad. During the 1990s, the US became the de facto global spender of last resort. These three transmission channels between the equity market bubble and the real economy played an essential role in placing the US economy on a very imbalanced growth path. But a puzzle remains as to why investors and corporate managers could have remained so blind to the decaying profit picture of the late 1990s.

Why did the equity bubble persist in the face of this profit squeeze? It is of the nature of financial manias that euphoric perceptions feed on themselves and become increasingly detached from reality. But it is not always appreciated the degree to which promoting this cognitive dissonance is in the interest of speculators and financiers. John Kenneth Galbraith (1990) captured this ‘vested interest in error that accompanies speculative euphoria’ in the following passage:

Those involved with the speculation are experiencing an increase in wealth...No one wishes to believe that this is fortuitous or undeserved; all wish to think that it is the result of their own superior insight or intuition. The very increase in the values thus captures the thoughts and minds of those being rewarded. Speculation buys up, in a very practical way, the intelligence of those involved.<sup>18</sup>

In even stronger terms, Galbraith diagnosed the following source of the cognitive dissonance which presents itself in every asset bubble: ‘To summarize: the euphoric episode is protected and sustained by the will of those who are involved in order to justify the circumstances that are making

them rich. And it is equally protected by the will to ignore, exorcise or condemn those who express doubts.<sup>19</sup>

This aspect of asset bubbles corrupts the evolving discovery process investors are supposedly engaged in (at least as depicted by mainstream theory) when they search out investment opportunities. But the corruption of the information processing ability of financial markets is taken to an even higher level when those initial providers of financial information, namely stock option laden managers of firms, face unusually large rewards for distorting financial information and very low risks of being charged and convicted for such deception. In other words, the attempt to reduce principal/agent conflict by compensating managers with stock options introduced an enormous moral hazard.

One illustration of this moral hazard behavior is apparent in the increasing obfuscation of earnings information delivered by companies (arguably the most important information desired by equity investors) during the bubble years. This growing practice of redefining earnings conventions can in part be traced back to the leverage buyout (LBO) days of the 1980s, when LBOs were the preferred tool for aligning shareholder and management interests. In the latter half of that decade, EBITDA or earnings before interest, taxes, depreciation and amortization became the preferred way of gauging the debt-carrying capacity of an as yet unleveraged firm. With the increasing shift to stock option compensation for management, the incentives to redefine and distort earnings in order to attract shareholder interest grew even stronger. The mechanism that was designed to align shareholder and management interests may instead have encouraged management to try to fool shareholders into believing in earnings growth projections that were engineered with accounting tricks.

The most glaring example of earnings obfuscation comes, ironically, with the treatment of stock options themselves. In a renowned battle between high tech executives and the Financial Accounting and Standards Board (FASB) in 1994, the issuance of options as a form of compensation was given a unique status. Options, it was decided, would be characterized as a 'non-expense expense'. This allowed a compensation expense to be omitted from a corporate income statement, thereby bolstering reported earnings. In effect, the more employees that were compensated by stock options, the more the apparent cost of labor to a firm was reduced and so the more the bottom line was boosted. This amounted to what one renowned Morgan Stanley investment strategist referred to as a practice that verged on fraud, yet it became a practice that spread well beyond the original advocates of option-based compensation in the technology sector.<sup>20</sup>

The earnings distortion introduced by stock options is large, but just how large remains a subject of some dispute. The Fed's own research found an increase in the value of options of 138 firms from 4 percent in 1994 to 10.5

percent in 1998. Independent economists at Smithers and Company found a slightly higher cost of covering options, with 12 percent of earnings of 167 companies coming from this non-expense expense.<sup>21</sup> Quantitative analysts at Sanford Bernstein, widening the analysis to the largest 2000 companies, found a larger distortion. The value of options granted amounted to an after tax value of 4.4 percent of net income in 1995, but by 2000, this value had ballooned to 19.5 per cent. By their calculations, the growth rate of earnings in the technology sector, accounting for some 60 percent of the option grants by 2000, would drop for the period 1996 to 2000 from 20 percent down to 8 percent if options were treated as a compensation expense on corporate income statements.<sup>22</sup> The use of option compensation to enhance corporate earnings was hardly trivial, especially in that segment of the economy designated as the seedbed of the New Economy.

This was not the sole manner in which stock options distorted earnings. Enormous stock repurchase operations were undertaken by the corporate sector during the 1990s to provide the shares required by this compensation program. Wall Street analysts and professional 'buy side' equity analysts are paid to guess the amount of earnings per share that companies can deliver. Since shares outstanding appear in the denominator of the earnings per share calculation, anything that involves shrinking the number of shares outstanding will tend to boost earnings per share. Not only did option-based compensation boost the numerator of the earnings per share calculation, it also reduced the denominator.

Beyond the distortions introduced by options, a more nefarious drift in the very definition of earnings per share occurred during the bubble years. Although the 1989–91 recession was relatively light by historical standards, the write-offs by banks were quite high as loan losses from the LBO and commercial office building binge of the late 1980s soared. In most cases, these write-offs were claimed to be nonrecurring expenses or noncash charges. Analysts were encouraged by management to add them back in order to arrive at an operating earnings number more reflective of true cash flows than reported earnings based on Generally Accepted Accounting Principles (GAAP). The standard of earnings measurement subsequently migrated from reported earnings to so-called operating earnings over the past decade as nonrecurring write-offs became a recurring event.

By the end of the decade, however, widespread disagreement on what constituted a valid non-recurring expense had developed, with each company driving its preferred definition down into the ranks of analysts. Citigroup, for example, got away with treating firing expenses as a one-time non-recurring charge. Intel, eager to have analysts include capital gains on sales of its holdings from its in-house venture capital operation, was quick to arm-twist analysts into ignoring subsequent capital losses after the equity bubble popped. By the second quarter of 2001, a 15 percent gulf opened up between

operating earnings as calculated by Standard and Poors (S&P) and those reflected by Wall Street analysts in tabulations by First Call. In part this is indicative of the success of management in getting First Call, the unofficial accumulator of earnings forecasts, to act as their enforcer.<sup>23</sup> Noted one recalcitrant analyst at Raymond James who did not agree that layoff charges were not a normal cost of doing business, 'Unless I'm willing to conform to their EPS number, they will refuse to show my estimate.'<sup>24</sup> First Call claims that there are more than 260 companies where the majority of analysts have been convinced to ignore GAAP when offering earnings estimates.<sup>25</sup>

This was not quite far enough into the grey zone for management however. Particularly with the arrival of the dotcoms, who often had nothing in the way of earnings to show and occasionally had nothing even in the way of revenues to show, a new, more accurate earnings standard emerged called 'pro-forma earnings'. With the advent of this new convention, any pretenses of sticking to GAAP were tossed aside. Press releases and earnings guidance from management were increasingly oriented around this 'just say anything' standard and woe to those analysts who refuse to hue to the earnings definition du jour served up by management. As Warren Buffet (1999) put it,

A significant and growing number of otherwise high-grade managers – CEOs you would be happy to have as spouses for your children or as trustees under your will – have come to the view that it's okay to manipulate earnings to satisfy what they believe are Wall Street's desires. Indeed, many CEOs think this kind of manipulation is not only okay, but actually their duty.

For example, Yahoo, one of the early adopters of pro-forma reporting, managed to report pro-forma earnings results 35 percent better than GAAP earnings in January 1999 by excluding certain costs related to the acquisition of Internet companies. Amazon was caught classifying equity holdings it has in other firms as cash under pro-forma practices. Losses were miraculously transformed into pro-forma earnings gains, as at Computer Associates.<sup>26</sup> Training seminars for CFOs like those offered by the National Center for Continuing Education promised to teach financial professionals '50 tricks and traps of managed earnings that you need to know to excel at your job and stay out of trouble'.<sup>27</sup> It is as if football teams had convinced their fans to let them reset the goal posts at the start of each quarter.

The abuse became so bold and blatant that former SEC Chief Accountant Lynn E. Turner took to renaming pro-forma earnings as 'EBS – Everything but Bad Stuff', noting that 'they seem to be used to distract investors from the actual results'.<sup>28</sup> FASB officials claim that there is nothing to be done about the ongoing redefinition of earnings. Companies are allowed to claim any earnings definition they wish in press releases, as long as they file financial statements that are in accord with GAAP accounting.

That earnings standards have eroded in a country that prides itself on transparency in its financial markets is no small irony. But this chicanery, when aggregated up to earnings expectations for the market as a whole, produced absurd results. Management, in their single-minded attempt to enhance shareholder value (now that they too are shareholders), learned how to take the management of Wall Street analyst expectations to a higher level as well. With the evolving campaign to obscure earnings, it is no surprise that analyst earnings expectations came to bear no relation to the sinking profitability visible in the national income accounts during the latter half of the 1990s. After all, cognitive dissonance is much easier to breed amidst the fog of a disinformation campaign.

More alarming is the logical absurdity of long-term earnings expectations that began developing mid-decade. These are a crucial input to the discounted cash flow models that equity analysts are supposed to use to value stocks. For most of the history of the popular IBES survey of S&P 500 companies, long-run earnings growth forecasts aggregated up from individual company earnings forecasts by Wall Street analysts varied between 11–12 percent, as displayed in Figure 5.2. By the height of the bubble, S&P 500 earnings expectations had flown up to 18 per cent, despite the drop in the trailing 5-year annualized growth of corporate profits as measured in the national income accounts.

The quip among Wall Street strategists at the time was that the S&P 500 was not your father's index anymore. The sliver of truth to this claim had everything to do with the bubble itself. Technology stocks had some of the most extraordinary long-run earnings growth forecasts. Because the S&P 500 is a capitalization-weighted index, the share of tech earnings in the S&P rose as the tech bubble inflated. This is yet another example, as in the discussion of relative performance investment managers, of how capitalization weighting introduces a self-reinforcing dynamic to equity bubbles. Accordingly, a higher long-run earnings growth forecast for the stock market may have sounded plausible to portfolio managers and analysts. A quick back of the envelope calculation reveals the absurdity of the long-run earnings growth rate forecast by analysts in the aggregate. Even during the booming New Era of the 1990s, S&P 400 revenue growth averaged closer to 4 per cent.<sup>29</sup> Assuming this sales pace could be sustained indefinitely into the future, the 18 percent expected long-run profit growth implied not just a frictionless economy by 2022, but a thoroughly costless economy as well – profit margins would reach 100 percent in two decades under these assumptions! Management, apparently, would no longer be the only factor of production receiving stock options as compensation.

Even for those who believe earnings expectations are fashioned in some extrapolative fashion, it is something of a puzzle to understand why so many highly paid analysts and investment managers could have been so wrong.

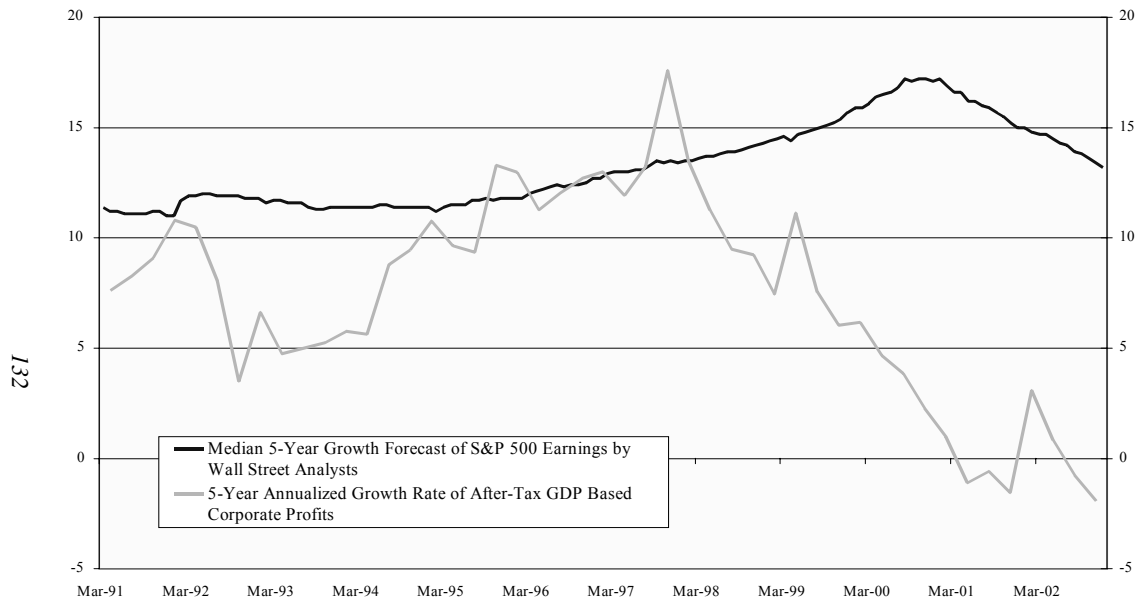


Figure 5.2 What were Wall Street analysts smoking?

This ignores the conscious campaign to obscure earnings results during the bubble years, a campaign made most urgent by the alignment of management interests with shareholder interests intended by the granting of stock options as management compensation. An enormous moral hazard was created along the way, one that produced nothing short of a 'vested interest in error', as Galbraith aptly termed it.

### **Macroeconomic Policy and the Equity Bubble**

Changes in the behavior and practices of investors prolonged the equity bubble. With the persistence of the equity bubble, the distortions the financial mania introduced to the real economy became increasingly dangerous. Flow imbalances led to private balance sheet disequilibria. Fiscal and foreign exchange policy choices exacerbated these distortions. The Rubin Doctrine – the push for a strong dollar and a fiscal surplus to pay off public debt – was precisely the opposite of what was required to avoid an unprecedented widening of private sector deficit spending during the equity bubble. But did economic policy have a more active hand in encouraging the equity bubble?

The tendency of monetary policy to react asymmetrically to equity market momentum may have introduced a serious moral hazard element to equity pricing. This bias was so evident to investors that it became known as the Greenspan Put by the late 1990s. More importantly, sometime shortly after the infamous 'irrational exuberance' speech, the Federal Reserve appears to have reversed its prior willingness to lean against asset price bubbles. The Chairman of the Federal Reserve moved, perhaps in part because of a backlash to his bold warning, from a skeptic to a true believer in the New Economy story, effectively becoming a cheerleader for the equity bubble.

### **The Asymmetric Monetary Response and Moral Hazard**

A review of the transcripts available from the Federal Reserve Open Market Committee (FOMC) deliberations suggests equity market dynamics have generally played a minor role in the policy choices of the central bank. As in mainstream macroeconomics, the equity market has historically been treated as a curious sideshow in monetary policy discussions during most of the postwar era. As a lottery unto itself, the equity market has been viewed as having little to do with the anti-inflation goals of the Federal Reserve and little to do with the transmission mechanisms of monetary policy.

In very general terms, the Federal Reserve has tended to place the interests of bankers and bondholders first. This is the constituency most frequently supported by the Fed when it weighs in on legislative matters and it is most notably the constituency that tends to rally to the defense of the Fed's autonomy whenever Congress begins questioning the wisdom of central bank

independence. For example, the draconian shift of monetary policy under Volcker beginning with the October Massacre of 1979 is understood to have in part reflected the need for creditors to end a confiscation of their wealth by high and rising inflation during that stagflationary decade.

However, with the advent of the equity bull market in 1982, when Volcker was forced to depart from his restrictive stance in the face of the Latin American debt crisis, a new constituency arose in the financial arena. Under the bullish Reagan years, the interests of commercial bankers and the so-called Bond Gods began to be increasingly confronted by the interests of investment bankers and equity investors. Investment bankers, unlike their commercial banking brethren, depend on a high volume of fee-driven transactions to drive their profitability. These transactions include arranging initial public offerings of stock, arranging corporate debt issuance and facilitating mergers and acquisitions, all of which tend to boom during periods of robust equity market performance. High and rising equity prices encourage more privately held companies to go public, increase the perceived debt-carrying capacity of firms and also provide an appreciation of the 'currency' available to execute equity-driven mergers.

While investment bankers still welcome the steep yield curves favored by commercial bankers, investment bank profitability has less to do with high net interest margins, as positions are not carried for very long on their books. Theirs is a trading culture. This more rapid turnover of asset holdings also means investment banks find their principal less damaged by periods of unanticipated inflation. There are no 30-year mortgage loans, for example, sitting on the books of investment banks, with the purchasing power of the loan principal getting eaten up by high and rising inflation during the term of the loan. Consequently, in very gross terms, the interests of investment bankers are more closely aligned with wealth-holders owning equities than with commercial bankers per se.

The strength of the bull market in equities during the eighties was in no small part fueled by the LBO boom and the merger mania. But particularly in the case of the former, this presented an unsavory outcome for the Fed. With LBOs came a surge in corporate debt that was unrelated to the expansion of the capital stock. Firms were borrowing without building much in the way of new plant and equipment. Debt obligations were being piled on to an existing capital stock that was not much more productive than prior to the LBO boom. For prudent central banks like Volcker, this presented a clear and present danger. Eventually, the weight of an accelerating pace of financial commitments against little improvement in the means to increase corporate sector incomes would ensure a state of rising financial fragility. To a central banker still smarting from the repercussions of the Latin American



debt crisis on commercial bank profitability and on Fed policy options, this bout of domestic financial engineering was hardly a welcome development.

Short of jamming the Federal funds rate higher to interrupt the equity bull market of the eighties, there appeared to be little the Fed could do to interrupt the LBO gravy-train that was filling investment banking coffers. One unexpected opportunity did present itself in 1986 and the outcome is quite telling. A target of a buyout attempt, aware of the Fed's desire to find a way to regulate leveraged acquisitions, suggested using the Fed's authority over margin requirements in an unorthodox fashion. Since the acquirer sought to use the shares of the target company as collateral for the debt to support the deal, the target firm argued the Fed could restrict the acquirer's ability to borrow by applying margin rules to the transaction. Volcker was intrigued enough by the approach that he explored several variations on the margin requirement theme. Before long, he came up against an unexpected opponent. In a subsequent interview regarding this episode, Volcker reminisced about the ambush:

Nevertheless, we played around with making a ruling to apply the margin requirement to the extent we could. Don Regan, then the Secretary of the Treasury, got practically every agency in the government to write to us saying that such a ruling would destroy America. Even the State Department wrote to us. And what the hell did the State Department have to do with it?...As a sheer political matter, I think it (the regulation of leveraged acquisitions) would have been almost impossible, even if you had more conviction than I had. The intensity of the political pressure sometimes startled me.<sup>30</sup>

Volcker at the time was probably second only to Ronald Reagan in political clout. Yet in an attempt to merely trip up some of the more excessive financial practices during the leverage boom of the 1980s, Volcker was outgunned by Wall Street, with the Treasury Secretary, a former Merrill Lynch executive, riding shotgun for investment bankers. The ascendance of a new bloc within the financial sector, one with a Wall Street axis instead of a commercial bank axis, was made very clear to the former Chairman of the Fed in this episode.

The diminutive role of equity market considerations in monetary policy changed with the arrival of Chairman Greenspan. In the very first FOMC meeting that Greenspan chaired, just before his first trial by fire in the October 1987 equity market crash, the Chairman made note of a curious omission in the course of the discussion. The equity market, the Chairman observed, ought not to be ignored by monetary policy makers in assessing the prospects for the US economy. Greenspan bemoaned, 'We spent all morning and no one ever mentioned the stock market, which I find quite interesting in itself. I think it's important, in the sense that as an economic force, history tells us sometimes it works and sometimes it doesn't.'<sup>31</sup>

Accounts of the period also suggest that one of the Chairman's first acts was to request contingency plans to be drawn up for a variety of destabilizing events that might require monetary policy adjustments. Included in these events was a dislocation of equity prices. For most of the 1980s, policy discussions were single-mindedly focused on money supply targeting, inflation reduction and an occasional foray into foreign exchange considerations. But with the late October equity market crash, the goal of stabilizing financial market conditions took immediate supremacy. Publicly, on the day of the crash, the Chairman was quick to announce that the Fed stood by prepared to inject all the liquidity required to keep the financial system from seizing up. On October 19, the Fed reversed their September 4 rate hike, lowering the Fed funds rate from 7.25 percent to 6.88 percent in an emerging intermeeting move. The following famous dictum was released on September 19 as well: 'The Federal Reserve, consistent with its responsibilities as the nation's central banker, affirmed today its readiness to serve as a source of liquidity to support the economic and financial system.' Thus, the short-term interest rates under the Fed's influence were immediately cut despite the fact that the economy had been reaccelerating since the 1985–6 growth recession, despite the fact that the dollar had been subject to depreciation and it was not clear that the currency stabilization goal of the Louvre Accord was going to hold, despite the fact that net corporate debt issuance was accelerating in the LBO boom and despite the fact that inflationary pressures were already building. Other monetary policy objectives were cast aside in an effort to keep the equity market open. Equity investors got the message.

Out of the public spotlight, banks and brokerage houses were encouraged to do what was necessary to serve this goal with the understanding the Fed would be forthcoming with any required injection of liquidity. The message was clear: the equity market was too big to fail and the imperative of stabilizing the equity market was to be given precedence over other monetary policy objectives. A mysterious upsurge in the OEX index futures market in the day after the crash did not fail to capture the attention of investors. Market lore holds that the Fed directly or indirectly through several large brokerage houses organized the bid that turned the equity market around.<sup>32</sup>

While this account remains mostly in the realm of rumor, two subsequent events lend more than a shade of credibility to this rendition. By March of the following year, President Reagan, an avowed free marketeer, issued the rather curious Executive Order 12631. This Executive Order set up the Working Group on Financial Markets. The Working Group was comprised of the Secretary of the Treasury, the Chairman of the Fed, the Chairman of the Commodity Futures Trading Commission and the Chairman of the Securities and Exchange Commission. With the Treasury Secretary acting as the Chairman, the Working Group's goals include, as stated in the Executive

Order, 'enhancing the integrity, efficiency orderliness and competitiveness of our Nation's financial markets and maintaining investor confidence' through 'policy coordination and contingency planning'. The Working Group was encouraged to 'consult, as appropriate, with representatives of the various exchanges, clearinghouses, self-regulatory bodies and with major market participants to determine private sector solutions wherever possible'.<sup>33</sup>

These objectives and methods were odd, to say the least, and could be written off as an overreaction by policy makers to the very alarming October crash. Under this interpretation, one might assume that the purpose of the group had been fulfilled by the time the various commission studies on the 1987 crash had been filed and that the group had subsequently been informally disbanded. However, in a February 1997 Washington Post article entitled 'Plunge Protection Team', writer Bret Fromson described how vibrant the Working Group has remained. Quoting a former government official, Fromson captured the current operations of the PPT as follows:

The government has a real role to play to make a 1987 style sudden market break less likely. That is an issue we all spent a lot of time thinking about and planning for. You go through lots of fire drills and scenarios. You make sure you have thought ahead of time of what kind of information you will need and what you have the legal authority to do.<sup>34</sup>

A 'red book' has been produced out of this effort and is held at the SEC under the official name, the 'Executive Directory for Market Contingencies', copies of which reside among the heads of each of the major US stock markets. The Working Group has also been informally expanded to include the president of the New York Federal Reserve, the head of the President's National Economic Council, the chairman of the Council of Economic Advisors and the comptroller of the currency. Clearly, the public policy goals of maintaining financial market orderliness and investor confidence have remained urgent enough since 1987 to keep the Working Group working in earnest.

All of this could be dismissed as circumstantial evidence if it were not for comments made by Dr H. Robert Heller upon his departure from the Federal Reserve. Dr Heller took exception with the Fed's stated response to the 1987 equity market meltdown. Injecting liquidity into the financial system, Dr Heller argued, was a rather blunt instrument for containing a sharp decline in the equity market. Swamping the financial system with Fed injected liquidity was bound to produce unintended consequences in conflict with other monetary policy directives. In a 1989 speech before the San Francisco Commonwealth Club and a late October *Wall Street Journal* op-ed article entitled 'Have Fed Support Stock Market, Too', Dr. Heller suggested a novel alternative. After lauding the introduction of circuit breakers following the 1987 crash and reminding readers of the Fed's ability to inject liquidity and

manage margin requirements in order to contain ‘disorderly’ financial market conditions, Dr Heller revealed his call for ‘direct action’:

The stock market is certainly not too big for the Fed to handle. The foreign-exchange and government securities markets are vastly larger. Daily trading volume in the New York foreign exchange market is \$130 billion. The daily volume for Treasury Securities is about \$110 billion. The combined value of daily trading on the New York Exchange, the American Stock Exchange and the NASDAQ over-the-counter market ranges between \$7 and \$10 billion. The \$13 billion the Fed injected into the money markets after the 1987 crash is more than enough to buy all the stocks traded on a typical day. More carefully targeted intervention might actually reduce the need for government action. And taking more direct action has the advantage of avoiding sharp increases in the money supply, such as happened in October 1987.<sup>35</sup>

More to the point, Dr Heller suggested the nature of this preferred direct action was in concert with the Fed’s legitimate and long-practiced activity in other asset markets: The Fed already buys and sells foreign exchange to prevent disorderly conditions in foreign exchange markets. ‘The Fed has assumed a similar responsibility in the market for government securities. The stock market is the only market without a market-maker of unchallenged liquidity of last resort.’<sup>36</sup> Dr Heller was even clearer about the vehicle for implementing his direct action solution:

Instead, the Fed could buy the broad market composites in the futures markets. The increased demand would normalize trading and stabilize prices. Stabilizing the derivative markets would tend to stabilize the primary market. The Fed would eliminate the cause of the potential panic rather than attempting to treat the symptom – the liquidity of the banks.<sup>37</sup>

While professional equity investors were suitably impressed by the Fed’s ‘too big to fail’ policy for the equity market after the 1987 crash, bankers and professional bond investors were subsequently impressed by the Fed’s willingness to stand the yield curve up on end during the early 1990s bail-out of the US banking system. The leverage boom, which had worried Volcker enough to pick a fight with the Treasury Secretary over the application of margin requirements to LBOs, had come home to roost. Having shoveled their way out of the Latin American debt crisis (in no small part by participating through bridge loans and other financing vehicles in the LBO boom), banks were once again hoisted on their own petard as this lending binge went bust. S&Ls deregulated in the 1980s had become so deeply involved in the junk bond game (among others games like the commercial office overbuilding) that an enormous bailout was required. With the Fed’s natural constituency once again on its deathbed, Chairman Greenspan could see only one way forward. By lowering the Fed funds rate enough to deliver a large spread between the cost of overnight borrowing among banks and the

yields available on Treasury bonds, the Fed orchestrated an enormous carry trade to revive bank profitability and rebuild tattered bank balance sheets. By keeping the Fed funds rate low for the first four years of the 1990s, ostensibly to fight the 'credit headwinds' left over from the debt boom of the 1980s, the Fed succeeded in rebuilding net interest margins at banks, thereby rescuing its core constituency.

An unintended consequence of this rescue effort by the Fed, however, was an enormous bubble in the Treasury bond market. Issuing short-term liabilities to position Treasury bond and note holdings became a very popular institutional trade in the early 1990s. By 1994, Chairman Greenspan was worried about the emergence of a different bubble, one he feared was developing in the equity market. Since Greenspan's first battle scars as Chairman of the Fed had been earned while trying to contain the potential damage of an overvalued equity market, it is not unreasonable to suspect his greatest fears lay with a replay of the October 1987 meltdown. Although a number of factors influenced the Fed's decision to begin tightening again by February 1994, it is quite clear from FOMC transcripts that containing what the Fed perceived to be an equity bubble at the time was one of its primary goals. This was not simply, as advertised at the time, a 'pre-emptive strike' against inflation.

When we moved on February 4th, I think our expectation was that we would prick the bubble in the equity markets...evidence of the dramatic shift in the economic outlook began to emerge after we moved and long-term rates began to move up...While the stock market went down after our actions on February 4th, it has gone down really quite marginally on net over this period. So what has occurred is that while this capital gains bubble in all financial assets had to come down, instead of the decline being concentrated in the stock area, it shifted over into the bond area. But the effects are the same. These are major capital losses, which have required very dramatic changes in actions and activities on the part of individuals and institutions.<sup>38</sup>

Chairman Greenspan was not willing to allow another equity bubble to emerge. But he was not entirely confident about the Fed's ability to control an asset bubble popping operation. It was not obvious to him that the Fed could finesse the other side of the operation – the necessary stabilization of the equity market after the bubble had been popped – like it had finessed his first trial by fire, the October 1987 equity plunge.

So the question is, having very consciously and purposely tried to break the bubble and upset the markets in order to sort of break the cocoon of capital gains speculation, we are now in a position – having done that and in a sense succeeded perhaps more than we had intended – to try to restore some degree of confidence in the System. And that means we have to find a way, if at all possible, to move toward a policy stance from which we will not be perceived as about to move again in any short period of time...I'm worried that we could break the back of this

financial system and find out in retrospect not only that this situation has the negative characteristics of some of the data of the 1920s, but we could also find out that the experience of the 1987 stock market crash, which was benevolent, is not something that is likely to be replicated.<sup>39</sup>

At the end of the day, the Fed was forced to realize that by doubling short rates between the end of 1993 and February 1995, the Fed was disrupting a number of highly leveraged trades in the bond market. The bubble that needed to be popped was in the bond market, not the equity market. Yet by flattening the slope of the yield curve with its tightening, the Fed blew up a number of leveraged positions in the fixed income markets. This included the demise of Orange County's colorful Treasurer who had claimed to have been led astray by his Merrill Lynch bond salesman and untold damage to other leveraged investors in the hedge fund community and on the proprietary trading desks of Wall Street firms. Goldman Sachs, for example, experienced one of its deeper losses in 1994 – one that was large enough to require a capital infusion from the Bishop Estate for a 15 percent interest in the then still closely held firm – mostly related to the carry trade that had been placed on US Treasuries.

This case of the mistaken identity of the true asset bubble would be less remarkable if it were not for a political ploy adopted in 1993 by one of the head bond traders at Goldman Sachs. In a famous exchange in 1993, Bob Rubin lobbied the recently elected President Clinton on his fiscal policy orientation. Clinton had campaigned on the informal challenge to President Bush, 'it's the economy, stupid'. Clinton was predisposed to break out of the jobless recovery imposed by the credit headwinds of the early 1990s by implementing a program of public investment spending. Rubin, instead, introduced Clinton to the notion that he best not offend the Bond Gods by taking the fiscal balance any further into deficit territory, which such an infrastructure spending led program would surely do. Clinton's response reportedly was to ask who were these Bond Gods and how could he possibly get reincarnated as one. Rubin was apparently forthcoming and downright persuasive. The financial education of President Clinton had begun. The public investment-led fiscal program was scotched as the Bond Gods were offered their pound of flesh.

When Chairman Greenspan went after what he perceived to be an equity bubble in 1994 and inadvertently ended up popping a bond bubble he had not been able (or perhaps willing) to detect, the Chairman made at least two political enemies. Rubin's ploy was imperiled if the Fed tightening was going to produce a rise in bond yields even though President Clinton had betrayed his election platform and pledged himself to the path of fiscal rectitude. In addition, a *Business Week* article reported 'White House aides say Clinton threw purple fits when Greenspan raised rates seven times between 1994 and 1995'. What is worse, the profits of the Wall Street firm

in which Rubin was a partner were equally imperiled by the Chairman's move. This disruption of Rubin's ploy by Chairman Greenspan may have earned him enough enmity on Wall Street that many knives were sharpened for the next time the Chairman stepped out of line. That Greenspan persisted in the face of such opposition may also tell us something about his resolve at the time to combat asset bubbles.

Regardless, in 1994, the Greenspan Fed did consider asset bubbles a worthy object of monetary policy and the Fed was willing to try to pop such bubbles. The damage done in the bond market, as exemplified by the Orange County snafu and by the Mexican crisis at the end of 1994, was sufficient to send the Fed back into easing mode. Yet during the 1995 easing, passages from the FOMC transcripts indicate the Chairman remained ever vigilant against the re-emergence of an equity bubble. This worry would culminate in his famous December 1996 irrational exuberance speech and it is at this juncture that Wall Street may have pulled out its well-sharpened knives.<sup>40</sup> The controversy set off on Wall Street by this remark was enormous and it is not hard to imagine the rancor translated into a political uproar that dwarfed the storm Volcker faced during his bid to apply margin requirements to LBOs.

The Chairman's third performance on the moral hazard stage occurred with late 1998 LTCM/Russian bond crisis. On this occasion, the Fed funds rate was cut from its 5.5 percent level (one that had prevailed since March 1997) to 5.25 percent at a regular FOMC meeting at the end of September, a little over one week from SOMA manager Peter Fisher's first look at the LTCM books. Fisher found the positions 'a lot bigger than anybody thought and far more intricately interwoven with major markets and major players'. The financial market shock waves rippling out from the Russian bond default and the LTCM unwind were enough to make Fisher sense a growing fear of 'this layer cake becoming unglued'. In the more antiseptic language of the FOMC minutes:

The size and nature of the positions of this fund were such that their sudden liquidation in already unsettled financial markets could well have induced further financial dislocations around the world that could have impaired the economies of many nations, including that of the United States.<sup>41</sup>

The initial Fed funds ease was followed by an intermeeting cut on October 15 to 5 percent and another regular FOMC meeting cut to 4.75 percent in mid-November. As the minutes from the October 15 teleconference call reveal, the Fed felt the pressing need to contain what were becoming increasingly disorderly financial market conditions:

Risk aversion in financial markets had increased further since the Committee's meeting in September, raising volatility and risk spreads even more, eroding

market liquidity and constraining borrowing and lending in a number of sectors of the financial markets...The members generally concluded...that the easing actions under consideration were more likely to help settle volatile financial markets and cushion the effects of more restrictive financial conditions on the ongoing expansion.<sup>42</sup>

At the time, economic growth was accelerating, private debt growth was rampant and the unemployment rate was breaking through what at the time was believed to be the NAIRU constraint. Both the FOMC minutes and the transcripts during this episode reveal no deterioration in the real economic data being released. In fact, the September 29 minutes suggest the FOMC 'recognized that there were at present few statistical indications that the economy was on a significantly slower growth track. Indeed...consumer expenditures and business investment retained considerable strength'.<sup>43</sup> The Fed was quick to place financial market stabilization and reversal efforts to the fore in their evolving policy reaction function. The message, once again, was not lost on investors.

As the second half of the 1990s progressed, few references were made to the irrational exuberance Greenspan boldly warned of in late 1996. Instead, no doubt as part of his penance for introducing doubt about the legitimacy of the equity bull market so soon after his flawed 1994 attempt to pop a bubble, Greenspan's speeches increasingly began sounding like they were penned by Wall Street investment strategists. Odes to a productivity revolution built on the back of high-tech innovation can be read in increasing volume and stridency across his speeches and testimony of the late 1990s. By the time a July 14, 1997 *Business Week* cover story entitled 'Alan Greenspan's Brave New World' (Foust 1997) hit the street, the Chairman's rethink was officially complete. Subtitled 'He's not scared by faster growth. Why? Because productivity gains are keeping inflation in check', the article describes how the Chairman required that his staffers create a new productivity series by 'zeroing out' any industry showing falling productivity. 'Reason? In this cost cutting era, he can't fathom any sector becoming less efficient.' Judy Shelton, described as 'a conservative scholar who meets with the Fed chief several times a year' provided the quote to frame the remainder of the decade: 'He is very open to the possibility that we have entered a new economic age.'

That the Chairman's sudden conversion to New Economy thinking within little more than half a year from his 'irrational exuberance' *faux pas* was accomplished under political duress from Wall Street remains sheer speculation. What cannot be dismissed as speculation is an increasing acknowledgment by the Fed of the role financial markets were coming to play in the economy during the 1990s. The Fed's growing sense that to be effective, it must try to manage investor expectations emerges from various speeches of the time.



The Chairman's conversion, then, involved a new orientation toward financial markets. Rather than fighting the judgments of a hundred million investors head on, the new operating procedure would involve influencing investor expectations in order to enhance the odds of achieving the Fed's goals. This orientation revealed a deeper respect for the whims of the market and perhaps the need for the Fed to take cover behind financial markets for its moves after having strayed into the political crossfire one too many times.

The New Economy talking points embraced by the Chairman were widely held justifications for increasingly absurd equity valuations. The Fed was seen as essentially validating the euphoric expectations being built into equity prices. The willingness of the Fed to let the economy run right through what were previously believed to be natural speed limits was taken by equity investors as a clear sign that the Fed was now well on board the New Economy bandwagon.

This embrace of the investing myths of the euphoric equity market, along with the Fed's willingness to backstop any equity declines, eventually came to be known as the Greenspan Put. After the early January 2000 dip in the equity market, Paul Kasriel, the chief domestic economist at Northern Trust in Chicago, was openly writing in his column what every investor already knew: 'If you own stock, you should view this as a blessing because we know Greenspan always comes to the defense of the stock market when it sells off. So this would be a buy signal.'<sup>44</sup> Around the same time, near the peak of the equity bubble, Merrill Lynch quantitative analyst Steve Kim issued a short piece in which the nature of the Greenspan Put was fully analyzed in the language of options trading. Kim determined that investors had correctly identified a free put on their assets, one that had been implicitly written by the Fed:

Alan Greenspan's Fed, through its actions, has made a clear statement: under situations of systemic financial distress, the Fed is willing to step up to provide liquidity...Greenspan's Fed has been successful in implementing the policy and as a result, investors' confidence in the Fed has grown exponentially...the Fed's consistent pattern of providing liquidity during financial crises seems to be conditioning investors to believe that the Fed is writing them free out of the money put protection on the market (and on other asset classes)...We believe that such a perception would change investor behavior and thereby influence market return-risk and valuation characteristics.<sup>45</sup>

Kim noted a particular characteristic of the Greenspan Put: there was a clear asymmetry to the resetting of the strike price of the put. He described this unique property as follows:

The strike of the put resets as the market moves up. For instance, if the market moves up 20 percent over a year, then the market declines 20 per cent, the Fed is likely to react to the 20 percent decline and not the 20 percent increase leading up

to the decline. Such resetting target level results in relatively constant distance between the put strike and the underlying.<sup>46</sup>

In plain English, Kim determined the Fed was in effect offering insurance against the downside risk to equity investors without collaring any of the upside. The payoff is asymmetric, as is true of all simple option strategies by design. But the Greenspan Put includes a novel feature, in that it is conveniently reset over time as the equity market appreciates. There is no time value wasting away at the value of the Greenspan Put – quite the contrary – but since investors receive the Greenspan Put protection gratis, courtesy of the Fed, this aspect is not terribly important.

To bolster his case, Kim cited the curious reversal of the normal inverse relationship between the S&P 500 price/earnings multiple and the one year trailing volatility of the S&P 500 price index. This anomalous relationship between valuation and volatility began to appear in the early 1990s. Kim interpreted this as consistent with option theory: higher volatility should raise the value of a put, with the multiple of the S&P 500 index on earnings representing the value in this instance. Kim placed into an option theoretic context what equity investors had informally begun thinking early in the 1990s with the memory of the 1987 response fresh in their minds and with the Fed's ongoing ease at the time aimed at reviving the banking system.<sup>47</sup> No fault investing had arrived.

## CONCLUSION

The influence of financial markets on the US economy and the ascendancy of financial interests in US policy making over the past decade, has been nothing short of striking. The relevant question is whether allowing the supremacy of financial interests has strengthened or weakened the US economy. While the generation and concentration of financial wealth in the US economy has captured the attention of the rest of the world, it has become increasingly clear that the late 1990s' prosperity was built on a house of cards. The complicity of macroeconomic policy makers in allowing the US economy to enter into a state of unprecedented financial fragility cannot be ignored. Ironically, while orthodoxy leaned on the need to get public finances in order, private financial balances were debauched. The ruling ideology of fiscal prudence at all costs was, at best, myopic and, at worst, part of a cynical attempt to make the world safe for Wall Street. In addition, the increasingly asymmetric monetary policy response to financial markets introduced significant moral hazard dynamics which amplified and extended bubble dynamics.

Although the private sector behavior that fed equity bubble dynamics and the attendant financial imbalances reversed as the bubble unwound, these adjustments made the policy challenge on the other side of the bubble even greater. The enormous swing in fiscal policy did prove sufficient to reverse private sector deficit spending by 2003, but curiously, all of the improvement was on the business sector side, with the household sector remaining mired in deficit spending. Even a return to a smaller than normal private financial surplus is just an initial step. For private balance sheets to truly be repaired, households and firms must run persistent surpluses by spending less than they are earning.

Given the profound collapse in profit margins, the return on capital and capacity utilization that accompanied the reversal of private deficit spending in the post-bubble period, the path of private investment spending may well remain weaker than normal for some time to come. The enormous overhang of capital stock financed during the bubble years must first depreciate away before the profit expectations of entrepreneurs can revive. Fortunately, high-tech equipment tends to have a short economic life. But by way of the macro profit equation, it is evident that a dampened or slowly rising investment share of GDP leaves any rebuilding of US profit shares at the mercy of 1) a stabilization in household savings rates, 2) an active, intentional rise in the fiscal deficit as a share of GDP and 3) a reorientation of foreign economies away from export-led strategies sufficient to reduce and reverse the US trade deficit as a share of GDP. These are not impossible tasks, but they are not likely to emerge spontaneously either.

The concerted effort to liberalize and globalize financial relations has proved more problematic than its original architects imagined. The fantasy of efficient financial markets and their ability to intelligently allocate capital is confronted by the reality of what Sir John Templeton, one of the great investors of our time, has referred to as 'the greatest financial insanity any nation has ever known'.<sup>48</sup> Fortunately, such challenging times open up room for creative initiatives that can speed the repair of the economy, as well as prevent future severe disequilibria from developing in the first place. In the wake of the disillusionment brought on by the bursting of asset bubbles comes the momentary opportunity to refoot financial relations on a more sound and sustainable basis.

## NOTES

1. Minsky (1986, chapters 8-9), offers a good description of the dynamics involved in generating financial fragility. While Minsky's model did not require asset bubbles to generate financial fragility, asset bubbles are likely to accelerate financial fragility tendencies, making Minsky's insights especially relevant.
2. For elaboration on the profit equation, see Kalecki (1971, chapter 7) and Keynes (1953, chapter 10, section ii). On the importance Keynes' placed on this equation to macroeconomic analysis, see Rymes (1989, p. 32). Minsky (1986, chapter 7) also explores the profit equation and how it relates to aggregate price formation.
3. Estimates of the scale of the required policy response have been simulated by Wynne Godley and others at the Levy Economics Institute for much of the past half decade. See, for example, Shaikh et al. (2003).
4. See Lo and MacKinlay (2001), for a detailed, technical description of the various challenges to the EMH and the subsequent permutations made to the EMH. For a comprehensive and very accessible description of the main contender to the EMH, known as behavioral finance, see Montier (2002).
5. Crockett (2001, pp. 4-5). A web link is available to the full speech at [www.bis.org/review/rev01a.htm](http://www.bis.org/review/rev01a.htm).
6. Minsky (1986: 106).
7. Keynes (1964, chapter 12) is the classic description by an economic theorist and investment practitioner of this strategic behavior in financial markets.
8. Much of this analytical framework is taken from an unpublished manuscript on the tech bubble co-authored with Frank Veneroso in the fall of 1999.
9. See the triennial Federal Reserve Board Survey of Consumer Finances. A weblink to the 2001 survey may be found at [www.federalreserve.gov/pubs/oss/oss2/2001/scf2001home](http://www.federalreserve.gov/pubs/oss/oss2/2001/scf2001home).
10. See Federal Reserve Statistical Release Z.1, Flow of Funds Accounts of the United States, Table L. 100.
11. See Shiller (2000, chapter 3) for a larger discussion of the unusually strong US investor expectations about equity market performance that emerged in the bubble years.
12. Margin debt data is made available by the New York Stock Exchange at [www.nyse.com/pdfs/margin0304.pdf](http://www.nyse.com/pdfs/margin0304.pdf). Personal income and GDP data is made available by the Bureau of Economic Analysis of the US Department of Commerce at [www.bea.doc.gov/bea/dn/home/gdp.htm](http://www.bea.doc.gov/bea/dn/home/gdp.htm).
13. See, for example, the October 14, 1999 remarks by Chairman Alan Greenspan before a conference sponsored by the Office of the Comptroller of the Currency entitled 'Measuring Financial Risk in the Twenty-first Century' available from [www.federalreserve.gov/boarddocs/speeches/1999/19991014.htm](http://www.federalreserve.gov/boarddocs/speeches/1999/19991014.htm).
14. Equity mutual fund flows by fund type are available from AMG Data Services at [www.amgdata.com](http://www.amgdata.com).
15. Keynes (1964: 154).
16. Morgenson, NYT, November 19, 2001.
17. See Fazzari and Papadimitriou (1992, chapter 6) for a lucid description by Jan Kregel of the two-price theory.
18. Galbraith (1990: 5).
19. Ibid, p. 9.
20. Byron Wein of Morgan Stanley made this accusation at the 9th Annual Hyman P. Minsky Conference sponsored by the Levy Economics Institute, April 21-3, 1999.
21. Cadette et al. (2001), offer a useful summary of estimates of the magnitude of earnings distortions provided by option accounting. See especially pp. 14-16.
22. Bernstein Research, July 9, 2001.
23. See Johannes (2000), for an example of this enforcer role.
24. Lahart (2001).
25. D. Henry and C. Schmitt, *Business Week* cover story, 'The Numbers Game', May 14, 2001.
26. *Business Week*, May 14, 2001.
27. See [www.nccetraining.com](http://www.nccetraining.com).

28. *Business Week*, May 14, 2001.
29. See the monthly S&P Analysts Handbook for S&P Industrials (old S&P 400) revenue per share data.
30. McCauley et al. (1999, p. 88.31).
31. Federal Open Market Committee transcript, August 18, 1987, p. 23.
32. See pp. 36–45 in Woodward (2000), for a more detailed description of the unusual policy responses considered during the October 1987 crash.
33. For a complete copy of the Executive Order, see the National Archives and Records Administration at [www.archives.gov/federal\\_register/codification/executive\\_order](http://www.archives.gov/federal_register/codification/executive_order).
34. Fromsom (1997: H01).
35. Heller (1989), Op-Ed.
36. Ibid.
37. Ibid.
38. FOMC Transcript, March 22, 1994, p. 41.
39. Ibid: 44–5.
40. Remarks by Chairman Alan Greenspan at the Annual Dinner and Francis Boyer Lecture of the American Enterprise Institute for Public Policy Research, Washington, DC, December 5th, 1996.
41. FOMC Minutes, September 29, 1988, p. 10, in the section entitled 'Financial Problems of a Large Hedge Fund'.
42. Ibid: 10 also contains this brief description of the subsequent October 15, 1998 conference call, at which a second 25 basis point fed funds rate cut was decided upon.
43. Ibid: 5.
44. Archives of Kasriel's work at Northern Trust can be found at [www.ntcs.com/library](http://www.ntcs.com/library).
45. Kim (2000: 1).
46. Ibid: 2.
47. Further, more academic investigation of the Greenspan Put can be found in a later November 2001 paper, CEPR Discussion Paper No. 3041, downloadable from [ssrn.com/abstract=290467](http://ssrn.com/abstract=290467).
48. CNBC interview, October 2, 2001.

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