Does Austrian Business Cycle Theory Help Explain the Dot-Com Boom and Bust?

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The American economy underwent a dramatic boom-bust cycle during the years 1995–2002. The height of the boom was characterized by enormous increases in stock prices, and especially the prices of Internet-related assets (with the necessary degree of "relatedness" declining as the boom progressed). The bust saw the rapid decline of most of the same prices. The Internet companies whose share prices were bid up came to be known as "dot-com" companies, from the common Internet domain name extension, ".com." Though the most dramatic manifestation of cyclical movement was observed in the dot-coms, the episode had clear macroeconomic significance. The cycle in stock prices was reflected by a similar cyclical movement in economy-wide unemployment, the unemployment rate falling from its 5.6–5.7 percent range during the last three quarters of 1995 to its record low of 3.9 percent in 2000 and then rising to 5.9–6.0 percent in 2002.

Does Austrian business cycle theory (ABCT) help explain what we will call the dot-com boom-and-bust cycle? And just what sort of an explanation can we expect ABCT to yield?

Because ABCT is a theory of how individual actors will choose in the face of certain forms of central bank activity, the natural mode in which to employ ABCT is that of historical explanation rather than formal modeling.[1] As Boettke (1994, p. 5) says, "Historical interpretation illustrates the power of the

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[1]Not to say that ABCT cannot be formally modeled. Indeed, Garrison (2001) is one such model, while other, simulation-based systems employing autonomous agents are possible.

theoretical framework adopted." In the Austrian tradition, empirical evidence is virtually synonymous with historical evidence.

Furthermore, ABCT is not *chiefly* a theory of high-level aggregates, such as GDP and CPI, but of what is missed in those aggregates: the division of GDP between consumable output and investment-good output is crucial to ABCT, as is the specific makeup of the investment aggregate. Movements in the CPI are not a good indication of the existence—or of the absence—of problems that manifest themselves at the subaggregate level. Accordingly, the conventional macroeconomics aggregates are not the focus of our historical interpretation. As noted by O'Driscoll and Rizzo (1996, p. 190):

> Monetary shocks produce certain types of discoordination in markets. The process of adjusting to these shocks produces effects on aggregative variables. It is not possible, however, to analyze these effects in terms of a standard macrotheory. The level of aggregation necessarily obscures the economic phenomenon being studied. If one were, for instance, to aggregate heterogeneous capital goods into "capital," the complex relationships among capital goods would be lost.

We understand the cycle as described by Mises and Hayek to be an ideal type, which *more or less* explains particular cycles.[2] Praxeologically speaking, we can say that maintaining an artificial interest rate, like all price-fixing, will have unintended consequences that the price fixer can do little to control. But the particular consequences always involve particular historical circumstances.

We believe the events comprising the dot-com boom and bust can be illuminated by tracing the Cantillon effects as new money made its way from the Federal Reserve, through the banking system, and finally to the dot-com startups. This liquidity led them to bid up the price of capital goods that were complementary to their business plans. As those prices rose, it became clear that many of their plans were not feasible. Broad-based price indices, such as the CPI and the PPI, mask such important phenomena as the steeply rising prices for web programmers, Silicon Valley real estate, and Internet domain names—precisely the effects predicted and explained by ABCT.

Consumer behavior during the period shows that, much as Mises (1998, p. 567) described, artificial booms are characterized by both malinvestment *and* over-consumption. In addition to the stock market bubble, the period in question saw increasing consumer leverage, a booming housing market, increasing debt-to-equity ratios, and lower down payments on homes.

The turn that came in 2000 triggered the liquidation of boom-inspired malinvestments. The Federal Reserve attempted to engineer a "soft landing" with a moderate tightening of credit conditions. We suggest that was a problematic solution. The large buildup in consumer debt that since has helped to

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[2]For a treatment of key differences between Mises and Hayek, see Garrison (2003).

maintain housing prices and consumer spending has cast an ominous shadow over the prospects for a smooth recovery.

Finally, we will look at an alternative explanatory framework (which we will call *mania theory*), as it applies to the recent cycle, and demonstrate that while it may complement the Austrian theory, it is not a replacement for it.

ABCT as a Tool of Historical Explanation

Aggregates and ABCT

A chief query from critics of ABCT is, "Where's the evidence?" Often, the critics hope to see a prediction of next year's GDP, or a formal model "demonstrating" that a federal funds rate cut of 0.5 percent will result in, say, a 0.4 percent rise in the CPI. But the evidence by which we judge that a theory is sound can only be the evidence called for by that theory: "Scientific evidence, too, is theory-dependent . . . evidence depends on observations, observations on measurements, and measurements not only on standards of measurement but on theory-determined concepts to be measured" (Nardin 2001, pp. 114–15). In other words, quantum physics should not be judged deficient because it does not predict the outcome of presidential elections.

ABCT is a not a theory of mathematical relationships between economic aggregates. To the best of our knowledge, no advocate of ABCT has ever claimed it could predict GDP or CPI levels. Certainly, it would be a nice bonus if ABCT could predict GDP, CPI, and pick winning stocks for us as well. But as the theory itself does not speak in terms of such macroeconomic aggregates, it is inappropriate to use them as the chief evidence by which to evaluate it. (That is not to say that ABCT has *nothing* to say about macroeconomic aggregates.)

In employing ABCT as a framework for historical explanation, "our focus is on the point of entry of the new money and the consequent changes in relative prices that govern the allocation of resources over time" (Garrison 2001, p. 67). The ideal type we explore, employing that focus, is that of the central bank credit expansion. The pieces of evidence we marshal to comprehend the subsequent economic events are the systemic effects of a lowering of the interest rate, and the changes in relative prices as new money flows through the economy.

The conformity of experience to an ideal type is always a matter of degree (Koppl 1994). A hockey puck moving over ice conforms to the ideal type "a body moving over a frictionless surface" better than does a soccer ball rolling over grass. Still, the type is not useless as an explanatory framework even in the second case. Therefore, we may find certain cycles closely conforming to the Austrian business cycle, while others do so to a lesser extent. We find criticisms of ABCT complaining that it does not explain every fluctuation in macroeconomic measures as odd as we would a contention that it could explain every fluctuation.

In our view, ABCT can be validly criticized as an ideal type on two grounds:

(1) The ideal type itself is constructed using unsound economic reasoning, so that it is on its face incoherent; or

(2) The theory is economically sound but irrelevant, as no *actual* cycles ever conform to the ideal type it describes.

We will leave it to other works (Mises 1998, 1953; Hayek 1967; Garrison 2001) to deal with the first possible criticism. This paper presents an answer to the second category of complaint, by attempting to show that the recent boom-bust cycle is just such a highly conformant cycle and that ABCT is a great aid in comprehending recent economic history.

Mises (1998, p. 543) describes the relationship between ABCT and historical data as follows:

> There prevails upon the loan market a tendency toward the equalization of gross interest rates for loans for which the factors determining the height of the entrepreneurial component and the price premium are equal. This knowledge provides a mental tool for the interpretation of the facts concerning the history of interest rates. Without the aid of this knowledge, the vast historical and statistical material available would be merely an accumulation of meaningless figures. . . . Gross interest rates as they appear in reality have nothing else in common than those characteristics which catallactic theory sees in them. They are complex phenomena and can never be used for the construction of an empirical or a posteriori theory of interest. . . . They constitute, if carefully analyzed with all the knowledge economics conveys, invaluable documentation for economic history.

And so we will attempt to employ them.

1995–1996: The Boom Begins

Our story of boom and bust begins against a backdrop of generally improving economic conditions in the U.S. in 1993 and 1994. The Plaza Accord of 1985 (Brenner 2002, pp. 59–74) had improved the profitability of U.S. manufacturing, as the G-5 powers[3] agreed to subsidize U.S. exporters by artificially lowering the exchange rate of the U.S. dollar. (Powell [2002] identifies the Plaza Accord and the accompanying monetary expansion in Japan as the beginning of that country's own Austrian-style boom and bust.) The American economy had come out of the recession of 1990–1991 in fair shape, with some of the misallocations of the 1980s boom having been corrected. It seemed investments in information technology were finally paying off, and manufacturing

[3]France, Germany, Japan, the United Kingdom, and the United States.

productivity was increasing. The stock market began to climb in 1993, and the recovery looked robust enough that the Federal Reserve began to raise rates:

Table 1

Date	*Fed Funds Rate*	*NASDAQ Composite*
1994.09	4.73	764
1994.10	4.76	777
1994.11	5.29	750
1994.12	5.45	752
1995.01	5.53	755

Source: Federal Reserve Economic Data (FRED). (We will show Fed funds rates against the NASDAQ Composite index in these tables, since the NASDAQ is the "tech stock" exchange, and most of the dot-com stocks traded on it.) [4]

But, beginning with the Mexican crisis and bailout of late 1994 and early 1995, the Federal Reserve was faced with a series of financial collapses. Over the rest of the nineties, we find the Federal Reserve oscillating between half-hearted attempts to restrain the equity boom and responding to crises that it believed called for reversing the previous restraint. In the meantime, theories of a "new economy" developed, both inside and outside the Federal Reserve, to justify soaring asset prices. We will establish the backdrop for these events by describing the important "Reverse Plaza Accord."

The Reverse Plaza Accord

Brenner posits the "Reverse Plaza Accord" of 1995 as being an important factor in creating the late nineties boom:

> By that agreement, the big three powers [the U.S., Japan, and Germany] bailed out a Japanese manufacturing economy that was slowing to a halt under the pressure of the record-breaking ascent of the yen. They did so by engineering a striking reversal of the steep decline of the exchange rate of the dollar that had taken place over the previous decade. (Brenner 2002, p. 5)

We agree with Brenner, in that the Reverse Plaza Accord was crucial in determining which prices were influenced the most by the liquidity provided by the Federal Reserve during the boom.

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[4]Since we are not attempting to posit a fixed, mechanical relationship between Fed interest rate policy and movements of the NASDAQ Composite index, we will refrain from statistical analysis of the data presented in the tables here. What we are instead trying to establish is that, during the period in question, there was a contingent historical relationship that held between interest rate policy and the run-up in "high-technology" asset prices, due to the fact that much of the increased liquidity flowed into the asset markets —specifically the high-technology asset markets.

As Brenner describes it, Japanese manufacturing firms were faltering in 1995. "By April 1995, the yen had reached an all-time high of 79 to the dollar. . . . With the currency at such a pinnacle, Japanese producers could not even cover their variable costs" (Brenner 2002, p. 130).

Many Japanese banks were facing insolvency. The U.S. had just gone through the Mexican bailout, and authorities were not enthusiastic about having to face a similar bailout scaled up to the size of the Japanese economy.

The Reverse Plaza Accord was, in effect, an agreement that the U.S., German, and Japanese governments would subsidize American consumers' purchases of Japanese and German manufactured goods. The reversal of the exchange rate trend "was to be accomplished by lowering Japanese interest rates with respect to those in the U.S., but also by substantially enlarging Japanese purchases of dollar-denominated instruments such as Treasury bonds, as well as purchases of dollars by Germany and the U.S. government itself" (p. 131).

Driving the dollar up against foreign currencies would allow the U.S. government to maintain a stance of monetary ease without raising the CPI, since the artificially lowered price of imported goods would tend to counter the price-raising effect of the increased liquidity.

But liquidity has to go *somewhere*. One place it went was into the U.S. stock market. Another was into the asset markets of the East Asian countries whose currencies were tied to the dollar. The perverse effect of the flows was that, even as the manufacturing profitability of American and East Asian producers was undermined by the rising cost (in the yen and in various European currencies) of both their imported capital goods and their exported output, American and East Asian asset prices were given a further impetus upwards, as Japanese and European investors earned profits from both exchange rate movements *and* the rise of the American and East Asian stock markets in terms of the native currencies of those markets.

Given that some of the consequences of this policy appear obvious in retrospect, it is reasonable to ask what the thinking of the people who orchestrated the Reverse Plaza Accord was. The chief motivation seems to have been a desire to undo the previous distortions of the Plaza Accord, especially the decline of German and Japanese manufacturing, without too much pain. Brenner says:

> In a sense, the Clinton administration was favouring suppliers of non-tradable goods, lenders, and stock market speculators at the expense of manufacturers. . . . It may have believed that a slimmed-down, increasingly competitive U.S. manufacturing sector could now successfully withstand a new rise of the dollar. It may have also felt that increasing profitability and economic dynamism in the non-manufacturing sector and growing domestic consumption of manufacturing output would make up for the increasing pressure on the manufacturing sector that would result from rising relative costs in international terms and declining export growth. (Brenner 2002, p. 132)

Federal Reserve Easing

As the Reverse Plaza Accord was being formulated, the Federal Reserve was also coping with the reverberations of the Mexican debt crisis. Brenner (p. 139) says:

> In March of 1995, following the U.S. bailout of the Mexican economy (and holders of Mexican bonds), the Fed . . . [ended] its credit tightening campaign begun about a year earlier, and, starting in July 1995, it quickly lowered rates by three-quarters of a percentage point. [For the political context of the last of those cuts, see the next section.]

Meanwhile, the technology-heavy NASDAQ Composite began to rise rapidly, crossing 1,000 for the first time ever. The index rose over 27 percent in a 10-month period:

Table 2

Date	*Fed Funds Rate*	*NASDAQ Composite*
1995.06	6.00	933
1995.07	5.85	1001
1995.08	5.74	1020
1995.09	5.80	1043
1995.10	5.76	1036
1995.11	5.80	1059
1995.12	5.60	1052
1996.01	5.56	1059
1996.02	5.22	1100
1996.03	5.31	1101
1996.04	5.22	1190

Source: FRED

The Bank of Japan was easing over the same time period, cutting its discount rate from 1.75 percent to 0.5 percent. The policy of maintaining a large interest-rate differential between U.S. and Japanese central bank rates gave rise to the profitable "carry trade," whereby investors would borrow yen at low rates and reinvest at a higher yield in the U.S. (Brenner 2002, p. 139). The interest rate differential available from the carry trade, combined with the orchestrated rise of the dollar against the yen, meant that as long as the Reverse Plaza Accord held, investors were offered a nearly guaranteed profit by borrowing yen in Japan to invest in U.S. financial assets denominated in dollars. Such an arrangement could not but accelerate the rise in the price of U.S. financial assets. In addition, Asian governments became large buyers of U.S. government securities, helping to send foreign sales of U.S. government securities to several times the level of the early nineties. The already historically

high $197.2 billion of sales registered in 1995 rose to $312 billion in 1996 (Brenner 2002, p. 141).

The Birth of the IPO Boom

The legendary Netscape initial public offering (IPO) occurred in August of 1995. The IPO is significant because every bubble needs a story, which early investors can tell to later ones to justify rising asset prices. (We do not necessarily mean to impute cynical motives to those early investors. They may or may not have believed the story themselves.) The enormous potential and increasing usefulness of the Internet provided the material for such a tale, and the Netscape IPO was the dramatic lead-in that captured investors' attention.

During 1994 and early 1995, the Internet had begun to enter the broad public consciousness. One of the most prominent companies involved in the transformation of what had been a chiefly academic network into a giant commercial phenomenon was Netscape. Its browser was far and away the most popular interface to the World Wide Web, which itself was the friendliest face of the Internet. Three million copies of Netscape Navigator had been downloaded in three months after its initial release, "making it one of the most popular pieces of software ever launched" (Cassidy 2002, p. 64).

As Cassidy relates (pp. 83-86), by the summer of 1995, Netscape was getting ready to go public, even though it had never made a profit and could not project when it might do so. In July, Morgan Stanley prepared a prospectus announcing the intention to take Netscape public at between $12 and $14 a share. However, during the road show to drum up and gauge interest in Netscape's shares, the promoters found that, at such a low price, the quantity demanded far outstripped the supply of shares. Morgan Stanley raised the initial price to $28, valuing a fledgling, profitless company at more than a billion dollars. The day the stock began trading on the open market, the demand for shares was so high that the Morgan Stanley traders were unable to find a market-clearing price for two hours after the session began. When, at 11:30 that day, Netscape shares finally publicly traded, the stock was priced at $71. It closed the day at 58¼, a first day gain of 108 percent, valuing the company at $2.2 billion. As Cassidy says, "Pretty much everybody involved in the IPO had gotten seriously rich."

The Netscape IPO served as a highly visible symbol for the potential of the Internet, and the potential investor profits that might be gained by arriving at the dot-com party early.

Full Employment but Continued Monetary Ease

The events described above were taking place in a macroeconomic environment that conventionally would be considered to be one of full employment. In the view prevalent at that time, full employment was taken to mean unemployment in the range of 5 or 6 percent. That is, even in the best of times, 5 or 6 percent of the work force would be between jobs or entering the job market for the first time. Full employment simply means that the economy is not in recession. It is possible, of course, for the "full employment"

unemployment rate to drop below 5 percent, but both theory and recent history suggest that an unemployment rate that low should be considered unsustainable and a symptom of an overheated economy.

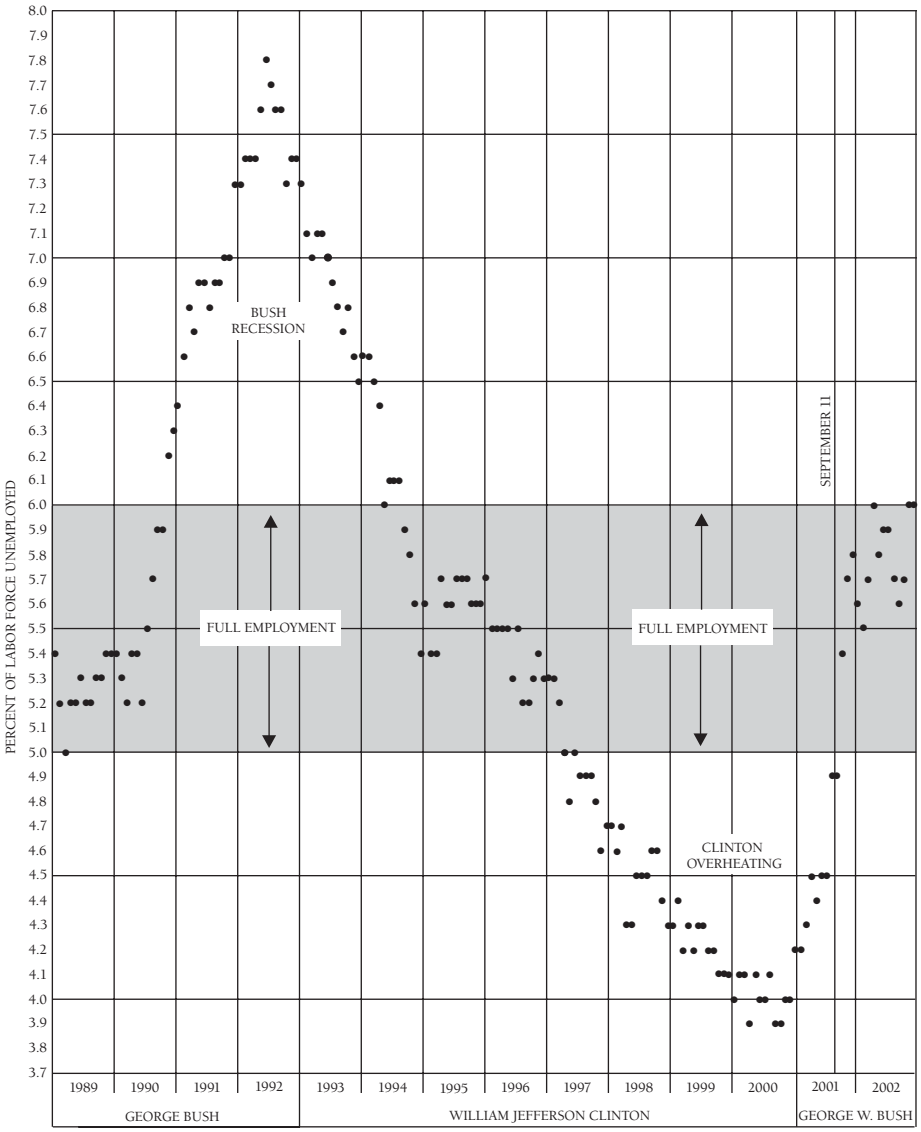
This benchmark range of 5 or 6 percent was not particularly in dispute in the mid 1990s (although, as explained in the following section, it came to be disputed later in the decade on the basis of a perceived "New Economy"). The unemployment rate had varied modestly within this benchmark range during the three years preceding the Bush recession. It then broke through the 6 percent level in late 1990, reaching a peak of 7.8 percent in mid-1992. (See Table 3 below.) From that point, the unemployment rate fell, continuing to descend through 1993 and 1994 and leveling off in 1995 just above the middle of the full-employment range. This pattern suggests the actual achievement of the much sought-after soft landing. During the 10-month period from April 1995 through January 1996, the unemployment rate stayed in the narrow range of 5.6 to 5.7 percent.

The role of the Federal Reserve in taking the economy below the full-employment range in the latter half of the 1990s was foreshadowed in early 1993, just after the inauguration of Bill Clinton. His State of the Union Address included conflicting messages. The new president identified two policy actions as essential to the future health of the economy. The first was a stimulant package, which would involve billions of dollars of new public-sector spending projects as well as tax breaks to encourage private-sector spending. The second was fiscal responsibility, which would require decreases in government expenditures and increases in tax revenues. Members of Congress and other invited guests were undoubtedly as confused as was the television audience. How could fiscal stimulation and fiscal responsibility be achieved at the same time? The new president articulated no particular role for the Federal Reserve in resolving the conflicted fiscal stance.

As usual, the audience included the chairman of the Board of Governors of the Federal Reserve System. What was highly unusual was that he was seated, quite strategically, directly between First Lady Hillary Clinton and Second Lady Tipper Gore. The next morning's newspapers contained all the predictable bar charts and pie charts to aid us in understanding just where the economy was and just where it might have been headed. But perhaps the most telling chart that the news media could have presented was the seating chart. Federal Reserve Chairman Alan Greenspan, though initially appointed by Ronald Reagan and reappointed by George Bush, had signed on as a team player in the Clinton administration.

The job of Federal Reserve chairman is inherently a politically sensitive one, but by his public showing of allegiance, Greenspan made the job explicitly and dramatically so. During the first year of the new administration, however, there was no clear conflict between economically sound policy (at least as it was conventionally understood) and politically expedient policy. The economy was still recovering from the Bush recession. Both the conventional wisdom of mainstream macroeconomists and the political interests of the

Table 3



House required the Federal Reserve to pursue a course of monetary ease while the unemployment rate was above the upper range of full employment and to exercise monetary constraint as the unemployment rate fell into the full-employment range. Monetary stimulation, followed by a "soft landing" at the 5-to-6 percent level of unemployment, required the solid technical skills that Greenspan seemed to be developing. But those technical skills could only be compromised by political considerations.

Even at full employment, the Federal Reserve can still stimulate the economy, but the effect of such stimulation is temporary. Long-run considerations—of inflation and economic discoordination—warn against monetary

ease in such circumstances. The duration of the seemingly positive but temporary effects of monetary stimulation—the "overheating"—is believed to be roughly 18 months. The most likely episodes of overheating, then, occur in the 18 months prior to a national election. This is the key implication of modern political business cycle theory and is consistent with the Austrian theory of the business cycle. The period beginning in mid-1995 and extending into 1996, which lies within the critical 18-month window with respect to the presidential election of November 1996 and during which the unemployment rate was near the middle of the full-employment range, provided an important test for the Federal Reserve.

The Fed cut the discount rate in late January of 1996 (see Table 2 above), just before the release in early February of new data on unemployment. The figure for January as initially reported was 5.8 percent—up from December's 5.6 percent. (The 0.2 percent change, like several others discussed below, did not survive the subsequent Bureau of Labor Statistics (BLS) revisions of the unemployment figures.) The mainstream financial press, both then and later, referred to this move in the direction of monetary ease as "questionable" and as "probably unwarranted." There was much justification for skepticism, because the economy was still within the range of full employment, because a single month's increase in the unemployment rate does not usually justify a response by the Federal Reserve, and because the increase in unemployment was easily accounted for by an unusually harsh winter month. (These unemployment figures are seasonally adjusted—which simply means that only a harsher-than-average winter month will affect the adjusted unemployment rate. But January 1996 was just such a harsh month.) While the increase in the unemployment rate, whatever its actual cause, may have provided some "cover" for the Federal Reserve, there was widespread belief that its monetary tools were being wielded against the Republican party and not against the winter storms. The fact that the expiration of Greenspan's second four-year term—and possible reappointment to a third term—fell in March 1996 added an extra element of politics to this particular political business cycle.

The conflict between economic soundness and political expediency was evident the very next month when the unemployment rate fell by 0.3 percent, to the very middle of the full-employment range. If the January figure had provided Greenspan a cover for monetary ease, the February figure had blown that cover. How would the Federal Reserve respond? Would it maintain its monetary ease in light of the upcoming presidential election, or would it tighten to avoid overshooting its target of full-employment. Uncertainty about the Federal Reserve's response was registered, on the day that the new unemployment rate was announced, by a drop in the Dow Jones of 171 points. Good news on Main Street (unemployment down) got translated into bad news on Wall Street (uncertainty-based demands for liquidity up). The Federal Reserve kept the discount rate down, and the episode was replayed just four months later when the unemployment figures for May were announced. Again, the unemployment rate fell by 0.3 percent, this time from 5.6 percent to 5.3 percent. On the day

of the announcement the Dow Jones fell by 115 points. As before, many investors preferred to get out of the market rather than try to guess what the Federal Reserve would do and expose themselves to the risk of big losses in the event that their guess was wrong. And, as before, the Federal Reserve did not raise the discount rate.

The market does not always react negatively to a seemingly positive development in the economy. The perversity of the Dow Jones dropping on the announcement of a lower unemployment rate is a telling symptom of the politicization of the Federal Reserve. A genuinely strong economy tends to get reflected in higher asset prices on Wall Street. But an economy being spurred on with undue monetary ease is characterized by uncertainty and by volatility in the demands for liquidity.

The particular uncertainty about Greenspan's allegiance to the Clinton administration had dissipated by September, when still a third drop of 0.3 in the unemployment rate was announced. With the presidential election only a few short weeks away and the Federal Reserve committed to monetary ease, the market did not react as it had in the earlier episodes. The Dow Jones actually rose by 53 points. (At the time, however, there was some reading of the tea leaves according to which the market had plummeted the day before the announcement in anticipation of a lower unemployment rate and then rebounded when the news was not as good as feared!)

It should be noted that a 0.3 percent change in the unemployment rate is a large change only in comparison with the typical or average month-to-month change in that statistic. A drop of 0.3 is small in comparison to the width of the full-employment range. Even the cumulative net change (from 5.8 to 5.1) took place wholly within the context of a fully employed economy. And ironically, none of the 0.3 changes survived the revisions that the unemployment statistics—like other macroeconomic statistics—routinely undergo. The currently reported time series for the unemployment rate shows no change greater than 0.2 for the entire 18 months preceding the presidential election. Nonetheless, the announced unemployment rates are the relevant ones in a discussion of the market's reaction to the monthly changes, and these reactions can be understood in terms of market participants having to second-guess the actions of the Federal Reserve in a politically charged environment.

With the interest rates held down at their pre-election levels, the unemployment rate fell to the bottom of the full-employment range before mid-1997 and continued falling for the remainder of that year and beyond. The market continued to be buffeted by growing concern that the Federal Reserve would tighten. Greenspan repeatedly voiced concerns about possible upward pressure on wage rates and worried about the rekindling of inflation. But inflation as measured by the CPI was not nearly high enough (just over 1 percent for both 1996 and 1997) to provide a politically acceptable justification for raising rates. Though temporary, the increased output corresponding to the decreased unemployment rate, aided by the downward drift of the yen and

mark against the dollar, had countered the upward pressure on prices. Students of the political business cycle might be forgiven for suspecting that Greenspan's fear of inflation was based not so much on any of the leading indicators of future movements in prices or wages but instead on his lingering worries about the ultimate consequences of the unwarranted monetary ease during the Clinton reelection campaign.

Market uncertainties associated with the political business cycle are a problem in their own right. The discussion in the financial press of "interest-rate jitters" is well founded in our understanding of the conflict between economically sound policy and political expedient policy. Traders in securities markets have to keep one eye on the Federal Reserve, trying to anticipate when policy will turn political and when it may turn back towards macroeconomic fundamentals.

The Illusion of a "New Economy"

The idea of a political business cycle can explain the aborted soft landing in 1996. The only alternative reckoning relies on a downward adjustment in the estimated level of sustainable unemployment. Did this range drop in the mid-nineties from its long-standing 5-to-6 percent level to a level that centers on some rate below 5 percent? Some argued as much, contending that the range actually had fallen—as a result, for instance, of changes in the structure of labor markets and changes in labor productivity. The wage demands of labor unions, according to one argument, had become more aligned with economic realities. According to another argument, the economy was just then feeling the effects of the computer revolution. The computer-enhanced productivity of labor had increased labor demand. The corresponding increase in the economy's output had held both wages and prices down and had allowed the achievement of a new plateau of significantly lower unemployment without inflation or an unsustainable boom. Such arguments had some plausibility. At the very least, they served as reminders that the boundaries of the full-employment range are not set in stone, but depend on institutional factors in the economy. But the plausibility of such an alternative reckoning diminished with subsequent movements in the unemployment rate. The whole of the unemployment table above suggests a cyclical rather than a secular pattern. The lows of 1998 through 2000, we contend, were unsustainable lows. To make the alternative claim that the full-employment benchmark dipped down to include 3.8 percent unemployment, achieved twice in 2000, is as fanciful as claiming that it shot up in 1992 as an alternative account of the Bush recession.

When the unemployment rate dropped further and further below the 5 percent level, Greenspan became receptive to the idea that the long-established full-employment range was no longer applicable. The apparent productivity of the labor force had ushered in a "New Economy." The similarity of that phrase to the 1920s slogan, a "New Plateau of Prosperity," seemingly did not attract the notice of the Fed chairman, despite the fact that in his youth

he had studied and lectured on the Great Depression, employing the Austrian theory of the business cycle.

To understand the so-called "New Economy," Greenspan did not take his cue from the Austrian theory and focus on policy-induced reallocations of capital. Quite to the contrary, he was inclined to assume away all complications concerning capital structure in order to draw conclusions about the productivity of labor. If he could claim that productivity had increased, he could maintain the monetary ease and could even push interest rates down further without worrying about inflation.

As reported by Bob Woodward in his *Maestro* (2000), Greenspan repeatedly indicated that he "believed but could not prove" that productivity had increased on an economy-wide basis. His thinking was organized around an accounting identity that applies, on a disaggregated basis, to particular industries. Looking for confirmation and support, Greenspan summoned some Federal Reserve researchers into his office and wrote out the equation:

$$\text{Price} = \text{labor costs} + \text{nonlabor costs} + \text{profits}.$$

Woodward (2000, p. 173) reproduces the equation and punctuates it with the response of the researchers: "They agreed." As it turns out, economists of all stripes—and, all the more, accountants—would *have* to agree. The above equation, when corrected to refer to per-unit costs and per-unit profits, is a tautology. It simply says that per-unit accounting profits are equal to the price minus the per-unit costs and that these costs can be divided into the mutually exclusive and jointly exhaustive categories of labor costs and nonlabor costs.

But Greenspan made something of it by assuming that nonlabor costs, which, we note, include the cost of borrowing, are constant. Such an assumption is unwarranted and is especially peculiar when made by a Fed chairman, whose very actions change the cost of borrowing. Granting him his assumption, though, we can easily follow his argument: *if* profits were rising, which they seemed to be in the particular industries examined, while neither prices nor wages were rising, which also seemed to be the case, then labor productivity must have been rising. It's a mathematical necessity.

The belief that productivity had increased was transformed into a declaration that we were dealing with a "New Economy," in which the old macroeconomic theories were irrelevant. Having orchestrated the longest boom in Federal Reserve history, Greenspan seemed convinced—except on rare occasions when self-doubt crept in—that such booms do not necessarily lead to busts. Increasing productivity allowed for the simultaneous achievement of low interest rates, low inflation, low unemployment, and sustainable economic growth. Greenspan's view, it turned out, was compatible with the view held by Bill Clinton, who, as Woodward (2000, p. 123) points out, was always quick to ridicule the idea that any economic problems stem from too much economic growth and too many people working.

Economists sometimes lapse into the misunderstanding that increased labor productivity means that workers have somehow become super-workers. It means no such thing. In general, workers become more productive when they work with more and better capital. At any particular time, in some industries (just which industries depends upon numerous historical contingencies), they will get more and better capital if the Fed reduces borrowing costs. We see, then, that the Fed's own easy-money policies can give rise to a measurable increase in labor productivity in particular industries and to the impression that productivity in general has dramatically risen. Undeniably, there were some productivity gains in the 1990s—just as there were in the 1920s—but concurrent productivity gains in select industries are more likely to be indicative of an unsustainable boom than of an end to booms and busts. Furthermore, many of the purported productivity gains that Greenspan was looking at later proved to be illusory. As reported in *The Economist* (2001):

> [P]art of America's previous surge has now been revised away. According to the old figures, annual productivity growth averaged 3.4% in 1999-2000. That has now been shaved to 2.6%.
>
> Most commentators found relief in the fact that average annual productivity growth in the five years to 2000 had been revised down only modestly, to 2.5%, well above the rate of 1.5% in the first half of the 1990s. On the other hand, Alan Greenspan, the chairman of the Federal Reserve, had placed huge weight on the fact that productivity growth had been accelerating—to 4.3% last year by the old figures. On this basis, he believed that structural productivity growth, after stripping out the cyclical impact of the economic boom, was around 3%. Most of the acceleration in productivity has now vanished. . . .
>
> What is more, recent productivity gains have been exaggerated not just by the cyclical impact of the boom, but also by an unsustainable surge in investment in information technology that has now gone into reverse.

Complicating the picture, for Greenspan and for us, were the repercussions in the U.S. of economic crises in other countries, as well as the fallout from some home grown crises, as explained in the following section.

1997-1998: A Time of Crisis

A series of economic crises—in East Asia, in Russia, in Brazil, and in the U.S. itself with the Long-Term Capital Management failure and the potential Y2K problem—created a situation in which the Federal Reserve felt obliged to supply repeated influxes of liquidity to the market. As a result, after increasing at a rate of less than 2.5 percent during the first three years of the Clinton administration, MZM (money zero maturity) increased over the next three years (1996-1998) at an annualized rate of over 10 percent, rising during the last half of 1998 at a binge rate of almost 15 percent (FRED 2002).

The problems inherent in the Reverse Plaza Accord first appeared in East Asia in early 1997. A significant portion of the enormous increase in liquidity worldwide, originating primarily from the American and Japanese central banks, had flowed into investments in that region. Between 1990 and 1995, 74.5 percent of capital flows to less developed countries went to East Asia (Brenner 2002, p. 158). Governments there, operating on the mercantilist Japanese model of development, subsidized a rapid industrial buildup, often channeled into certain "strategic industries" such as high tech manufacturing. Because they partially funded the subsidies by borrowing in dollars, they were reluctant to loosen their pegs, as the cost of paying back dollar loans would increase in terms of the local currency.

However, "[b]etween April 1995 and April 1997, the yen fell by 60 percent . . . with respect to the dollar" (Brenner 2002, p. 158). If East Asian governments wished to maintain their peg to the dollar, they had to let their currencies rise against the yen as well. But that led to a steady rise in the price of their exports compared to those of their Japanese competitors. The East Asian countries had committed, willy-nilly, to the U.S. policy of subsidizing German and Japanese manufacturers and their own consumers at the expense of their own manufacturers. However, with smaller economies, manufacturing bases already distorted through extensive subsidies, and without being able to print the world's reserve currency at will, East Asian governments lacked the ability to sustain such a policy as long as their American counterpart.

Corporate profits declined throughout East Asia. In South Korea, for instance, they fell 75 percent in 1996, and went negative in 1997 and 1998 (p. 161). With speculators sensing that East Asian governments could not maintain their pegs in the face of slumping exports, those governments raised interest rates in an attempt to hold the peg. Speculators made repeated runs on East Asian currencies, and capital began to flow out of the region: "Over the course of 1997, East Asia suffered a net decline in capital inflows of $105 billion (from $93 billion inflow to $12 billion outflow)" (p. 163).

When, one by one, the East Asian governments finally surrendered their pegs, the value of their countries' dollar debt rose dramatically in terms of the local currency. The crisis in East Asia "steadily worsened . . . Throughout much of 1998, stock markets continued to fall and, as money flooded out of the region, currencies swooned, placing great pressure . . . on the rest of the world economy" (p. 164).

The crisis spread to Russia in the summer of 1998, when it defaulted on its sovereign debt, much of which was held by U.S. investment banks. "The Brazilian economy started to melt down shortly thereafter" (p. 165). And Japan labored under a "hefty new value-added tax," which, along with other factors, "subtracted . . . the equivalent of 2 per cent of GDP" (p. 165).

Brenner (p. 171) says, "In late September 1998 a major crisis was unfolding in the U.S. The Russian default triggered a flight to quality in the bond market as huge differentials opened up between the interest rate paid on relatively safe U.S. Treasuries and the interest rates paid on less secure corporate bonds."

Table 4

Date	*Fed Funds Rate*	*NASDAQ Composite*
1998.06	5.56	1894
1998.07	5.54	1872
1998.08	5.55	1499
1998.09	5.51	1419*
1998.10	5.07	1845
1998.11	4.83	1771
1998.12	4.68	1949
1999.01	4.63	2193

Source: FRED

*This low for the period was hit on October 8th. In this single case, we have varied from our practice of simply taking the NASDAQ level at the end of the month, and instead looked at the low that came just 8 days later. By looking at this low we can see the tremendous effect of the October 15th rate cut. A 29 percent decline from the peak of 2014 to the low of 1419 was reversed, resulting in a 35 percent gain between October 8th and the end of the year.

Brenner continues: "The climax came on 20 September, when the huge Long-Term Capital Management hedge fund (LTCM) admitted to the authorities that it was facing massive losses." He adds, "The Fed then made its three famous successive interest rate cuts, including one dramatic reduction in between its meetings" (p. 172).

"[The Fed] also encouraged U.S. Government Sponsored Enterprises—including the FNMA, GNMA, FHLMC, and FHA—to engage in a spate of lending (and borrowing) entirely unprecedented in their history" (Brenner, pp. 172–73).

The between-meetings rate cut had a dramatic effect on stock prices all by itself. Greenspan's announcement of the cut came on Thursday afternoon, October 15th, the day before expiration Friday, when stock options for October expired. The effect of the timing was to give traders who had written call options

> every reason to buy the underlying stocks as soon as possible to limit their losses on the contract. This need for players in the option market to cover their positions immediately . . . would further strengthen the upward pressure on stock prices. . . . From three o'clock Thursday afternoon to four o'clock Friday afternoon, the stock market rose more than 7 percent. (Mayer 2001, pp. 10–11)

Brenner (2002, p. 173) notes that Fed cuts probably produced a stronger effect by signaling to investors that the Fed wanted a market recovery than they did by reducing the cost of borrowing. "Investors," Brenner says, "did not have to be reminded that [Greenspan's] intervention at this moment was hardly the first of his bailouts of financiers and corporations." After the October 1987

market crash, after the S&L crisis broke in the early nineties, and during the Mexican and East Asian crises, Greenspan had ridden to the rescue of investors, with the goal of preventing troubles on Wall Street from spilling over into the rest of the economy. The market reaction to Greenspan's intervention is typical of the effect of "big players" on markets, as described by Koppl (2002) and others.

The Federal Reserve, during a period of over a decade, had attempted to build a "firewall" protecting the "real" economy from Wall Street shocks. But firewalls work both ways: Protecting the real economy from Wall Street shocks also disconnected Wall Street from the real economy. Hedged on the downside by what could be called "Fed insurance" against falling asset prices, investing on Wall Street began to look better and better compared to investing in the messy "real" economy, where one might lose one's money!

1999–Winter 2000: The Height of Madness

By 1999, the liquidity party was in full swing. The rate on 30-year Treasuries had dropped from a high of over 7 percent to a low of 5 percent. The stock markets continued to soar. The NASDAQ Composite rose over 80 percent in 1999 alone. People who had stayed in the sidelines during the early part of the festivities began to feel left out. With abundant credit being freely served to Internet startups, hordes of corporate managers, who had seemed married to their stodgy blue-chip companies, suddenly were romancing some young and sexy dot-com:

> This week alone, General Motors Corp. Saab Cars U.S.A. chief Joel Manby left his job to become president of Greenlight.com, a new consumer auto site, and ABC-TV President Patricia Fili-Krushel resigned to become CEO of Healtheon/WebMD, a medical consumer site. (Audi 2000)

But what do we mean when we say that the economy had entered an artificial boom? Can an economy grow "too fast"? Can the participants in an economy invest "too much"? One way to answer those questions is to examine the meaning of the production possibilities frontier (PPF).

Beyond the PPF

Garrison (2001, p. 70) asks: "Is it possible for the economy to produce beyond the production possibilities frontier?" He answers, "Yes, if the PPF is defined as sustainable combinations of consumption and investment." Such combinations are sustainable only if enough consumption is forgone to fully fund the investments being planned.

However, during the dot-com boom, Brenner (2002, pp. 189–91) notes:

> [The] inflated collateral [resulting from soaring equity prices] provided . . . the basis for the greatest binge in dis-savings in U.S. history. . . . The resulting explosions of both investment and consumption shot the U.S. . . . economy forward as if shot out of a cannon. . . .

> Between 1950 and 1992, the personal savings rate had never gone above 10.9 per cent and never fallen below 7.5 per cent, except in three isolated years. But, between 1992 and 2000, it plummeted from 8.7 per cent to -0.12 per cent. . . .
>
> [B]y 2000, households' outstanding debt as a proportion of personal disposable income reached the all-time high of 97 per cent, up from an average of 80 per cent during the second half of the 1980s.

At the same time that consumers were saving less and borrowing more, businesses were increasing their capital spending. For instance, a paper by several Northern Californian organizations reports that venture capital firms invested $50.7 billion in the Bay Area during 1999–2000, which was $35 billion, or 233 percent, over the trend-line increase (Bay Area Council et al. 2002, p. 12).

However, as consumers were not saving enough to supply sufficient quantities of the factors of production that would complement those initial investments, many of them would, in retrospect, appear foolish. Of course, at any particular time, some investments will have been proved, *ex post*, to be unwise. The difference in a time of artificial boom is that there is a large spike in such investments. By the summer of 2002, many people no doubt felt that they had invested far too much money and labor in dot-coms and other high-technology ventures.

Numerous dot-com startup tales illustrate one means by which an unsustainable pattern of investment may be generated. With the promise of stock option riches dangling before them, many people worked a fantastic number of hours in start-up companies, investing their underpaid labor to build the company. Commenting on the work ethic at Value America, Kuo (2001, p. 28) says, "Stock was the currency of record in the Internet age, and Craig [Winn] deftly used it to create extreme loyalty, hard work, and dedication."

Such workers presumably really were producing more, for a time. But those 100-hour weeks were unsustainable in two senses. First of all, there is a physical limit as to how long people can work that much. Second, the hours that many people were working were, *ex post*, not in line with their preferences, given that for many of them the promised riches would not materialize.

IPO Mania

The height of the bubble could, to some extent, be measured by the surge in number and decline in quality of IPOs, especially during 1999. The value of IPO offerings nearly doubled from 1998 to 1999 alone (Levy 2000). Between 1986 and 1990, the San Francisco Bay area saw 90 IPOs, while between 1996 and 2000 there were 390 (Bay Area Council et al. 2002, p. 9).

Before the second half of the 1990s, it was generally considered mandatory for a business to have had at least several profitable quarters before it went public. But by 1999, companies were going public with little more than a sketchy business plan, an Internet address, and a few twenty-somethings who could speak the right lingo.

Kuo (2001, p. 65) notes that in March 1999:

> iVillage, a conglomeration of news and information Web sites for women, went public at $24 per share. It was up $56 the next day, raising its market capitalization to nearly $2 billion. . . . iVillage lost $43.7 million the previous year on a paltry $15 million in sales. . . . Across the country, Autobytel, with about $23 million in sales and $19 million in losses, saw its stock increase 75 percent on the first day of trading, while raising $100 million for operations.

Cassiday (2002, p. 214) says, "[Priceline.com,] in order to boost revenues . . . had resorted to buying tickets from the airlines at higher prices than customers had offered and making up the difference itself." Kuo (2001, p. 39) describes how Robertson Stephens, Value America's investment bank, told its founder, Craig Winn, "Profits weren't important. The *only* thing that mattered was driving substantial revenue quickly." Of course, any business can attain "substantial revenue quickly" if it is willing to lose enough money on each sale.

Y2K Liquidity and the Final Charge of the Bulls

The stock market, especially the high technology NASDAQ, seemed to levitate as Y2K liquidity hit the market in late 1999 and early 2000. The NASDAQ Composite index moved from 2746 at the end of September 1999 to 5048 on March 10, 2000, an *83 percent rise in under six months*! During this period, the Federal Reserve's target interest rates, which were rising, obscured the fact that the central bank was easing in anticipation of a possible Y2K liquidity crisis:

> During the final quarter of the year, the Fed pumped sufficient liquidity into the banking system to bring down the Federal Funds Rate from 5.5 per cent to below 4 per cent—the widest deviation from its target rate in over nine years –and thereby paved the way for the last frantic, record-shattering upward lunge in the equity markets, which took place in the first quarter of 2000. Bank loans thus raced ahead at a 19.4 per cent annual pace during the fourth quarter of 1999, the highest in at least fifteen years. . . . Simultaneously, the growth of the money supply vaulted to 14.3 per cent, even faster than in the wake of the Fed's moves to calm the crisis of the previous autumn. (Brenner 2002, pp. 180–81)

During what we will roughly designate as "the boom," from June 1995 to March 2000, MZM grew 52 percent, well ahead of real GDP growth of 22 percent (Rogers 2002) for the same period. The interest rate on 10-year Treasuries declined from 6.91 percent to 4.53 percent in October 1998, before beginning to rise again. Rates peaked in early 2000, roughly corresponding to the end of the boom. Corporate Aaa bond yields declined from 8.46 percent at the beginning of 1995 to 6.22 percent in at the end of 1998. (All data but Rogers from FRED.)

By late 1999, production of business equipment was up 74 percent and construction up 35 percent over 1992, while production of consumption goods had risen only 18 percent. Among manufacturing goods, durable good production had risen 76 percent while nondurable good production had risen just 13 percent (Federal Reserve 2000). "Annual borrowing by nonfinancial corporations as a percentage of nonfinancial corporate GDP darted from 3.4 per cent in 1994 . . . to a previously unparalleled 9.9 per cent in the first half of 2000. . . . As a result, by the first half of 2000, nonfinancial corporate borrowing on an annual basis had more than quadrupled with respect to 1994 and nonfinancial corporate debt as a proportion of nonfinancial corporate GDP had reached 85 per cent, the highest level ever" (Brenner 2002, p. 192). Low interest rates had led to an increased demand for loanable funds and a lengthening of the production process, much as in the model described by Garrison (2001).

Even as low interest rates spurred investment in certain capital goods, they led to a collapse in savings. The personal savings rate declined from an already low 2.1 percent (compared to a long-term trend of between 7 percent and 11 percent, as described above) in 1997 to -1.5 percent by 1999 (Bureau of Economic Analysis 1999). Consumers were increasingly leveraged, especially on their homes. "In 1989, about 7 percent of new mortgages had less than a 10 percent down payment, according to Graham Fisher & Co., an investment research firm. By 1999, that was more than 50 percent" (Priest 2001). The divergence of investment demand and savings supply is exactly the phenomenon described by Garrison (2001, pp. 68–71) as characterizing the "policy-induced boom," where monetary expansion drives a wedge between saving and investment.

Spring 2000: The Tide Turns

The Distortion of the Capital Structure at the Height of the Boom

As so often happens at bacchanalia, when the dot-com party entered the wee hours, it became apparent that too many guys had planned on taking the same girl home. There were too few resources available for all of the plans formulated and funded during the boom to succeed. The most crucial—and most general—unavailable factor was a continuing flow of investment funds. However, even if the Federal Reserve had not tightened, sooner or later the wedge between savings and investment would have manifested itself in an absence of other resources. There were shortages of programmers, network engineers, technical managers, office space, housing for workers, and other factors of production. The rising prices of these factors of production would have brought the boom to an end eventually, whether or not the Federal Reserve tightened credit.

Real Estate

Commercial land and its improvements are clearly important productive resources. Even residential construction is conventionally categorized as investment, with the housing services yielded by the durable dwelling constituting the corresponding consumer good. However, residential real estate in California's Silicon Valley can be considered as a factor of production in a more literal sense. A company's employees need places to live, and those places must not be unreasonably far from the company's place of business, if the employees are to work on site. When an area, such as Silicon Valley in California, is a particular focal point for a boom, we may expect to see that reflected in the price of both commercial *and* residential real estate in the area.

McCollum (1999, p. 1) tells the tale of a bellwether 1999 home sale in the Silicon Valley area:

> The house on the corner of Lowell and Bryant avenues in Palo Alto is a large 1970s contemporary—four bedrooms, 3 1/2 baths, a swimming pool and almost 3,700 square feet of living space.
>
> It went on the market in early March, and within days a bidding war among four would-be buyers pushed the final selling price to more than $3.2 million—$1 million over the asking price. . . . Driven by a potent combination of factors—low inventory, the area's allure and buyers flush with stock-option money—Palo Alto has become ground zero in Silicon Valley's housing market madness. . . .
>
> Micki Schneider, a member of the Palo Alto City Council and a 20-year resident of the city, had heard the story about the Lowell house. . . .
>
> "You can't help but be astonished by sale prices like that," she said. "And it's not like it's been gradual. Prices have just skyrocketed in recent months."

A similar "skyrocketing" occurred in the commercial real estate market: "Office rental rates have exploded, climbing from $2.10 per square foot in 1995 to $6.75 per square foot in 2000" (Huffman 2001).

Apartment rents zoomed upward as well:

> The increase [in apartment rents] from $920 per month in the fall of 1995 to $2,080 in the spring of 2000 squeezed San Franciscans. . . . The rise in rents presumably reflected an increase in demand for housing, stemming from the influx of wealthy dot-commers. (Huffman 2001)

Rising real estate costs contributed to raising the overall cost of living in the San Francisco Bay Area. Between 1996 and 2000, the cost of living premium for the region increased 12.5 percent faster than in the U.S. as a whole (Bay Area Council et al. 2002, p. 13).

Labor

The people needed to staff dot-com companies were also rapidly becoming more expensive. As the boom peaked, Audi (2000) reported: "So many San Francisco lawyers were leaving good jobs in big firms to work for start-up Web companies that to compete, some firms doubled the starting pay to $150,000."

Kuo (2001, p. 46) tells of how, within *weeks* of being hired in the summer of 1998, Value America executive Glenda Dorchak demanded, and received, "a lot more stock . . . a significant raise in pay," and a promotion.

Covin (2002) noted: "In the late 90s, there was a sudden increase in programmer salaries as a result of the dot-com boom. Programmers who were earning $45,000 in 1995 were making well over $100,000 by the year 2000."

Davis (2000), writing at the peak of the dot-com boom, said:

> Even though it has minted more millionaires than perhaps any company in history, Microsoft is finding that recruiting employees, particularly in Silicon Valley, is getting harder than ever.
>
> Facing a hiring crunch in California, Microsoft has boosted salaries of its Silicon Valley employees by 15 percent to stem turnover and increase staffing, the software giant confirmed. In other words, a Silicon Valley programmer receives 15 percent more in salary than one based in Redmond, Wash., for doing the same job. In the past, Microsoft has not offered regional cost-of-living raises.
>
> Like a lot of big high-tech companies, Microsoft is finding it increasingly difficult and expensive to land and retain hot employees—particularly at its high-profile WebTV operation.

Davis's tale illustrates how all companies in a boom, even industry giants like Microsoft, which did not rely on easy credit for their existence or for the bulk of their growth, are still forced to compete with companies that are relying on easy credit for access to the factors of production. Since those factors are scarce, established companies must outbid newcomers if they hope to employ them. As Mises (1998, p. 551) put it,

> Of course, in order to continue production on the enlarged scale brought about by the expansion of credit, all entrepreneurs, those who did expand their activities no less than those who produce only within the limits in which they produced previously, need additional funds as the costs of production are now higher.

Internet Domain Names

The prices for notable Internet domain names, considered vital to a dot-com venture, underwent an inflation even more dramatic than was seen in the labor or real estate markets. In 1996, tv.com sold for a mere $15,000 (Wingfield 1997). But the next year, as Wingfield describes it, a "Texas-based company . . . purchased the domain name 'business.com' for $150,000, a figure that "appears to dwarf the selling price of any previous Internet address." By

December 1999, near the peak of the boom, the very same domain name, business.com, sold for *$7.5 million* (*Online Publishing News* 1999). We doubt that the business plan of many dot-com entrepreneurs factored in that sort of price inflation.

The Dot-Com Collapse

After the Y2K scare was seen to be much ado about nothing, the Federal Reserve renewed its concern about an over-heating economy and resumed its rate increases:

Table 5

Date	*Fed Funds Rate*	*NASDAQ Composite*
2000.04	6.02	3860
2000.05	6.27	3400
2000.06	6.53	3966
2000.07	6.54	3767

Source: FRED

Finally, Greenspan seemed to succeed in puncturing the dot-com bubble, even if the resulting turbulence might have been greater than he expected. From the March peak of 5048, the NASDAQ slid to 2471 by the end of 2000. As bad as the general decline was, the drop in the dot-com stocks was even more precipitous, as illustrated in the following table:

Table 6

Stock	3/10/2000	12/29/2000	8/6/2002
QualComm	136.12	82.18	25.18
Cisco	136.37	38.25	12.07
Amazon	66.87	15.56	13.74
Yahoo!	178.06	30.06	11.50
Priceline	94.50	1.31	2.03
Sun Micro.	94.19	27.87	3.78
AOL	59.00	34.80	9.90
EBay	193.25	33.00	55.27
WorldCom	46.69	14.06	.14*

Quotes from BigChart.com
*Price from 8/5, as WorldCom did not trade on 8/6.

We did not cherry pick the worst performers from the dot-com stocks to create the above table; rather, we selected the stocks of some of the most notable "companies" in the Internet world. Many of the small companies did even worse. For instance, Perkins and Perkins (2001, pp. 289-96) list over two

hundred dot-com stocks, *every one of which declined over 80 percent* between March 2000 and March 2001.

Capital Reallocation

With the advent of the dot-com bust, the painful process of reallocating resources that were misallocated during the boom began. For some economists, the idea that capital reallocation might involve pain is a bit of a puzzle. For example, Paul Krugman (1998) pronounces the ABCT "intellectually incoherent"—largely because it cannot, per Krugman, answer the question: "[How can] bad investments in the past require the unemployment of good workers in the present?"

The puzzle is a result of viewing capital as an aggregation of homogeneous "stuff." Such a perspective overlooks important Austrian insights: capital goods form an intricate, interlocking structure, and the market process that rearranges that structure is a learning process that necessarily takes time.

The world assumed by theories that treat capital as a homogeneous "thing" is one in which information and resources flow instantly, and without cost, throughout the entire economy. No capital goods are specific to a particular business. But in such a world, why would there ever *be* misallocations, bankruptcies, and so forth? The instant that the opportunity cost of owning a resource rose infinitesimally above the marginal revenue expected from employing it, the resource would be sold, at a price equal to that opportunity cost, to another owner better able to employ it. Marginal revenue would always equal marginal cost, and no one would ever make capital gains or losses. As O'Driscoll and Rizzo (1996, pp. 54–55) point out, such a model "must neglect both the learning and the accompanying processes . . . adjustments must have an infinite velocity and resources must be infinitely mobile for a process to take place at a mere instant."

For instantaneous adjustment to occur, capital goods must consist of a uniform "capital stuff," any portion of which can be relocated anywhere in an instant. It is only under conditions of general equilibrium that such a notion makes sense. In general equilibrium, all plans are coordinated, all prices are equilibrium prices, all productive resources are deployed where they should be, and all necessary knowledge of changing conditions is instantly transmitted to everyone who needs to know it.

But consider a real world example: A few months into the recent downturn, a "For Lease" sign appeared along a busy highway in a commercially developed suburb in Connecticut. The property had been occupied by a landscaping business. A couple of years ago, at the height of the boom, the business had built an extensive series of stone walls and fences in front of their building. Our amateur eye estimated that the owners had put in somewhere between $50,000 and $100,000 worth of landscaping. No doubt, the business in question considered the effort to be an investment, as they were able to advertise the quality of their work on a busy highway.

Misled by the heightened demand for landscaping services at the height of the boom, the business had not counted on a serious fall in demand when the economy slipped into recession, and homeowners saw the value of their stock portfolios shrink and became more worried about holding their jobs than about whether their yards would make it onto Home and Garden TV.

The "homogeneous stuff" model of capital would suggest that those stone walls and fences should have smoothly "flowed" into new uses called for by the new economic conditions. Perhaps they might turn themselves into briefs for trial lawyers ready to sue Enron, or airport security screening machines. But in the real world, those goods are nearly worthless. A doctor or accountant will move into the office, and while he will surely regard his extensive stone and wood works as quite nice, he never would have built them on his own initiative.

But perhaps we're picking out a very special example, particularly unfair to the case for regarding capital as homogeneous. So instead, let's look at a cement truck. We will imagine that a construction company in Silicon Valley, at the height of the dot-com building spree, purchased the truck. When the bust came, construction work in the Valley dried up, and the company went bankrupt. Whither now the truck?

It is very unlikely that another construction company in Silicon Valley would want it. They had all over-expanded as well, and now they may be looking to sell some of their own equipment. They certainly aren't looking to purchase more. But let's assume that somewhere—say, Texas—there *is* a company that can use the truck. The first thing that has to happen is that the buyer and seller must find each other. Rather than occurring on the very day the Silicon Valley company goes bust, such a process may take weeks or months.

The courts will have their say about which creditors are entitled to what portion of the remaining assets of the bankrupt company. Then the truck is likely to move to a reseller of used construction equipment. It will advertise the truck's availability. The downturn probably will necessitate a drop in the price of cement trucks, but by how much? Unlike in mathematical models, where supply and demand curves shift and a new price simply appears, in a market process view, buyers and sellers must undertake a process of price discovery. The seller will be reluctant to lower the price too rapidly, and so he may be overly optimistic for a time, delaying a sale. As Mises (1998, pp. 576–77) says:

> The piling up of excessive inventories and the catallactic unemployment of workers are speculative. The owner of the stock refuses to sell at the market price because he hopes to obtain a higher price at a later date. The unemployed worker refuses to change his occupation or his residence or to content himself with lower pay because he hopes to obtain at a later date a job with higher pay in the place of his residence and in the branch of business he likes best. Both hesitate to adjust their claims to the present situation of the market because they wait for a change in the data which will alter conditions to their advantage.

Eventually, when a potential buyer hears of the availability of the truck, he may want to inspect it before putting out the money to buy it. Once the transaction is complete, the truck will have to travel from California to Texas.

All of the above actions take time, and all of them have associated costs. Furthermore, we might note that *none of them involve employing any cement workers*. Eventually, a worker laid off in Santa Clara may find work in Dallas, but his change of residence will also involve time and expense.

In the wake of the dot-com bust, many workers had to make just such treks. For instance, Caldwell (2002) notes, "Santa Clara County's population dropped by 14,276 people between April 1, 2000 [roughly the height of the boom] and July 1, 2001, according to figures released by the U.S. Census Bureau. That is more than any other county in the state."

When we get a cluster of such stories occurring together, as we do when the misallocations of a boom are revealed, we find ourselves in a recession. The lack of instantaneous adjustment to the new conditions means that for a time, some useful resources will be unemployed, while they and the complementary capital goods they need to be productive are reallocated. Furthermore, as Garrison (1997) points out:

> The Austrian theory allows for the possibility that while malinvested capital is being liquidated and reabsorbed elsewhere in the economy's intertemporal capital structure, unemployment can increase dramatically as reduced incomes and reduced spending feed upon one another. The self-aggravating contraction of economic activity was designated as a "secondary deflation" by the Austrians to distinguish it from the structural maladjustment that, in their view, is the primary problem.

The costly readjustment in place of residence made itself manifest in the Silicon Valley housing market. Even as home prices continued to increase in California as a whole, "home prices in the heart of Silicon Valley—Santa Clara County—[were] down 5.3 percent on a year-to-year comparison" (Caldwell 2002).

Apartment rents in San Francisco also tumbled in the wake of the crash:

> Although apartment rents are still higher than in the spring of last year, they have been dropping since the fall of 2000. According to Metro-Rent, a rental-listing service in San Francisco, the fall in rents is unprecedented. Rents tend to rise during the summer and flatten out during the year but never fall. The fall in apartment rents, then, indicates a dramatic bust, as do the rise and fall (or fall and rise) in the other economic indicators we've discussed so far. (Huffman 2001)

By the summer of 2001, the entire Bay Area was feeling the effects of the dot-com crash:

> The number of technology pink slips handed out [in Silicon Valley] since the beginning of the year is approaching 200,000, according to various estimates, and the end is nowhere in sight. . . .

> "I don't recall ever seeing such a harsh downturn here," Dr. James Forcier, managing director of Bay Analytics, a Silicon Valley consulting firm, told NewsFactor Network. . . .
>
> Forcier said that some high-tech sectors are looking at years, rather than months, before they will fully recover from wounds suffered after the Internet bubble burst.
>
> The slowdown is taking its toll throughout northern California, from the Wine Country region, where summer visits are estimated to be off by about 20 percent, to the posh hotels of San Francisco, where room rates have been slashed by up to 50 percent in many cases. . . .
>
> Commercial real estate prices are reportedly tumbling, off by nearly a third in San Francisco, according to broker Cushman & Wakefield. And the vacancy rate is about 10 percent—mid-1970s recession levels—nearly 10 times higher than it was last summer. (DeLong 2001)

In the above story, we see the downturn affecting both higher-order producer goods (office space) and high-end consumer goods (wine country tours).

Stories of over-consumption based on unrealistically heightened expectations abound, such as this one:

> Just a year ago Kelly Scot Moore was fielding at least one job offer a week in his specialty of video production for the Web.
>
> He was so optimistic about his future as a media specialist at Folsom-based CampusEngine.com that he bought a new car and was seriously looking at ski boats.
>
> But since he was laid off just before Thanksgiving, Moore hasn't had a single job offer, despite the scores of résumés he's sent out. (Swett 2001)

Or this one:

> Bruce Hofmann signed the paperwork for construction on his Colorado dream home in April, only two days before he got laid off from his software sales job. Disappointed but not discouraged, he told his wife and three daughters he'd find new work within 48 hours.
>
> After two months of trolling online job databases for software sales jobs in Boulder and in Denver's northern suburbs, he began considering offers requiring an hour commute or longer. After three months, he contemplated sales jobs outside of software; he even received an e-mail bulletin for a used-car salesman gig. (Konrad 2001)

2000–2002: The Bust Unfolds

During 2001, the Federal Reserve demonstrated—with its 11 interest-rate cuts and a near-desperate MZM growth of over 21 percent (FRED)—that it is difficult to recreate the previous evening's euphoria in the midst of a hangover.

Maintained by waves of mortgage refinancing, zero-interest auto loans, and continued strength in the housing market, consumer spending stayed strong even as business investment faltered. However, Corrigan (2002) points out the ominous debt shadow looming over consumer finances:

> At the personal level, the ABI [American Bankruptcy Institute] showed record filings for bankruptcy in the last four quarters, with more than 1.5 million, mostly individual, filings being logged for the first time ever. Also, despite secularly low interest rates, we know debt service as a proportion of disposable income is already at a record, even without adding in the personal sector's equivalent of a "special purpose vehicle"–a consumer lease agreement whose contingent cash-flows underpin financial market debt somewhere else in the system.

The terrorist attacks of September 11, 2001, certainly delivered an unanticipated and unwelcome shock to the economy. However, the economy had already slipped into a recession by late 2000 or early 2001, and while the stock market quickly rebounded from its post-September-11th lows, most major indices sunk back below those lows a year later. By the end of September of 2002, the NASDAQ composite index had hit a 5-year low of 1173, down 77 percent from its peak in 2000. The Dow Jones Industrial Average stood at 7,598, off 35 percent from its peak. Unemployment was 2 percent above where it had been at the height of the boom, and GDP growth was an anemic 1.1 percent in the second quarter of 2002.

Table 7

Date	*Fed Funds Rate*	*NASDAQ Composite*
2000.12	6.40	2471
2001.01	5.98	2773
2001.02	5.49	2152
2001.03	5.31	1840
2001.04	4.80	2116
2001.05	4.21	2110
2001.06	3.97	2161
2001.07	3.77	2027
2001.08	3.65	1805
2001.09	3.07	1498
2001.10	2.49	1690
2001.11	2.09	1930
2001.12	1.82	1950

Source: FRED

Mania Theory: A Complementary Explanatory Framework?

An alternative class of explanations for booms and busts, which has been applied to the Internet craze by Shiller (2000), Cassidy (2002), and others,

might be categorized as *mania theories*. In a mania, investors become entranced by some particular investment—tulip bulbs, French colonial trading ventures, Florida real estate, the "nifty fifty" stocks, or Internet companies—and begin a self-perpetuating process of bidding more for the asset, seeing its price rise, bidding even more for it, and so on. Like a manic-depressive who can only maintain his manic phase for so long before crashing, eventually investors begin to have doubts about the focus of their mania, at which point the bubble bursts.

Commenting on the psychology of such theories is beyond the scope of this paper. Nevertheless, we can say that there is nothing in most mania theories that contradicts an Austrian account of boom and bust. The two theories look at the same phenomenon from the vantage point of two different disciplines: social psychology and economics. They may, in fact, prove to be complementary. The Austrian theory offers a coherent explanation of the onset of the mania—a credit expansion—and the onset of the depression—the cessation of the expansion. After all, the mere fact that people are excited about French-Colonial North America or the Internet cannot create a speculative bubble by itself. The funds to speculate with must come from somewhere, and the Austrian theory identifies where. Mises (1998, p. 583) points out that manias cannot, absent credit expansions, continue for long:

> But even if, for the sake of argument, we were ready to admit that capitalists and entrepreneurs behave in the way the disproportionality doctrines describe, it remains inexplicable how they could go on in the absence of credit expansion. The striving after such additional investments raises the prices of the complementary factors of production and the rate of interest on the loan market. These effects would curb the expansionist tendencies very soon if there were no credit expansion.

On the other hand, mania theories might help to explain the reason that booms often seem to be channeled into certain faddish investments. We believe that Austrian macroeconomics could benefit from a deeper understanding of such ideas.

Conclusion

Austrian business cycle theory, we contend, is essential to understanding the recent boom and bust cycle in the American (and, to a great extent, the global) economy. That does not mean that every recent macroeconomic event is explained by ABCT. For instance, exchange rate manipulation (e.g., the Reverse Plaza Accord) is not a part of standard ABCT, yet it played a key part in the global macroeconomic picture of recent years. However, as long as central banks continue to engage in episodic credit expansion, we believe that ABCT remains a vital component in the macroeconomist's tool chest.

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