Capital Based Macroeconomics: Boom and Bust in Japan and the U.S.

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Introduction

Some economists and the financial press believe that the U.S. in the 1990s and Japan in the 1980s experienced economic growth driven by a positive productivity shock. The economic growth was accompanied by growth of money and credit aggregates. Proponents of real business cycle considered the money growth benign, while adherents of the natural rate theory viewed it as beneficial because either the price level was stable or inflation rates were extremely low. A capital-based-macroeconomics shows how and why the accompanying growth of money and credit with or without declining interest rates was neither beneficial nor benign. Credit creation sets up the economy for a boom and eventual bust. In the case, first of Japan and then the U.S., the 'boom' was followed by a 'bust' in their respective asset markets and the real sectors of the economy.

The Economist (September 28, 2002, 9) made just such a connection in its interpretation of recent economic history of the U.S. and Japan.

> The recent business cycle in both America and Japan displayed many "Austrian" features. Hayek argued that the natural rate of interest could rise if faster productivity growth increased expectations about profits and hence investment opportunities. This is what happened in Japan in the 1980s and in America in the 1990s. If such a shift in investment occurs, *central banks need to raise interest rates* [emphasis ours]. But because inflation was low (and because Austrian economics had long gone out of fashion), the Fed and the Bank of Japan failed to do so. The cost of capital fell below its expected return, fuelling a surge in credit, equity prices and investment.

Does the actual data in both cases support such an interpretation? Table one presents data for the Japan and table two similar data for the United States.

Table 1: Japan 1981-1992[1]

Year	Growth rate: Real GDP	Growth rate: Labor Productivity	Growth rate: M2	Rate of Inflation	Long term interest rate
1981	3.1	3.05	10.7	4.9	8.38
1982	3.1	2.17	7.6	2.7	8.29
1983	2.3	1.06	6.9	1.9	7.81
1984	3.8	2.53	6.9	2.3	7.32
1985	4.2	4.26	8.9	2.0	6.49
1986	3.1	2.05	9.3	0.6	5.15
1987	4.5	3.55	11.2	0.1	5.02
1988	6.5	4.89	9.8	0.7	4.79
1989	5.3	4.44	11.8	2.2	5.13
1990	5.3	5.25	8.2	3.1	6.96
1991	3.0	2.78	2.5	3.2	6.34
1992	0.9	1.53	-0.1	1.7	5.33

[1] Data from Gordon 2003, Appendix B, A9.

Table 2: United States 1990-2001[2]

Year	Growth rate: Real GDP	Growth rate: Natural Real GDP	Growth rate: Labor Productivity	Growth rate: M2	Rate of Inflation	Long term interest rate
1990	1.8	2.6	1.16	5.5	3.8	9.3
1991	-0.5	2.7	1.15	3.7	3.7	8.8
1992	3.0	2.7	3.7	1.9	2.3	8.1
1993	2.7	2.7	1.5	1.1	2.5	7.2
1994	4.0	2.7	1.29	1.4	2.0	8.0
1995	2.7	2.7	0.98	2.0	2.2	7.6
1996	3.6	3.2	2.5	4.8	1.9	7.4
1997	4.4	3.5	1.99	4.9	2.0	7.3
1998	4.3	3.5	2.6	7.3	1.2	6.5
1999	4.1	3.5	2.35	7.6	1.5	7.0
2000	4.1	3.5	2.92	6.1	2.2	7.6
2001	1.2	3.5	1.3	7.2	2.2	7.1

The data for Japan appears compatible with an interpretation of a productivity shock to the economy around 1984 to 1985. Inflation rates were extremely low (by recent standards) and actually fell from 1984 to 1987. Monetary growth numbers and the reported long term interest rate indicate that, not only did the Bank of Japan not allow

[2] Data from Gordon 2003, Appendix A, A3.

interest rates to increase, but actually increased the rate of growth of money and credit sufficiently to put downward pressure on interest rates. The data for the U.S. is, perhaps, even more consistent with the interpretation of *The Economist*. The evidence for a productivity shock around 1995 includes increases in the rates of growth of Real GDP and labor productivity as in the Japanese case. Additional evidence for a productivity shock is provided by a revision of the rate of growth of natural GDP from 2.7% to 3.2% in 1996 and to 3.5% thereafter. Inflation rates in the relevant period (post 1995) stay between 1.2% and 2.2 % (measured by the GDP price deflator). The reported nominal interest rate remains stable or falls through 1998 and remains below the 1995 level until 2000. M2 growth rate accelerates beginning in 1996, slowing slightly after 1999.

Capital-based macroeconomics and the concepts of sustainable and unsustainable growth developed by Roger Garrison (2001) provide an explanation of business cycle phenomena that is consistent with the above data and with the stylized facts of business cycles as presented by Romer (2001, p. 170 and 1996, p. 148). These stylized facts are treated as the thing to be explained in the real business cycle literature. In this paper, we will provide the capital-based or Austrian explanation of these stylized facts. After developing the underlying theory and discussing how the theory is consistent with the general facts related to business cycles, we will use a variation of the Austrian model (Cochran, Call, and Glahe 2003) in an attempt to show in more detail how the capital-based explanation is consistent with the 1990s boom-bust in the U.S. and the 1980s boom and 1990s stagnation in Japan.

The Stylized Facts

A simple diagram can be used to differentiate economic growth from fluctuations or cycles (see Figure 1). Real GDP fluctuates around a steady trend of long run growth. The trend line depicts economic growth and

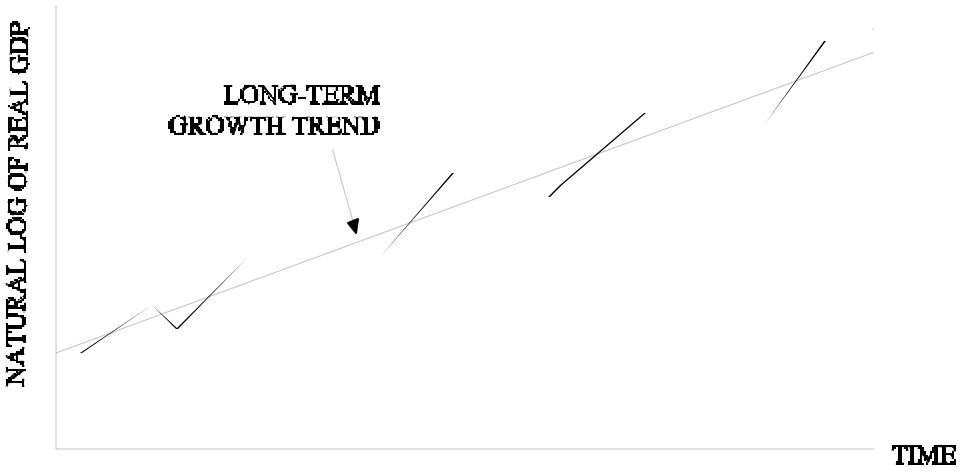

FIGURE 1: STYLIZED LONG-TERM GROWTH TREND

as Taylor (2004, 433-4) explains, "Sometimes real GDP fluctuates above the trend line, and sometimes it fluctuates below the trend line." A recession, as usually interpreted by the NBER, is a general decline in economic activity.[3]

In a shock interpretation (real business cycle) of the same data, the trend line is a statistical construct; the peaks, valleys and the associated changes in growth rates would be, in effect, optimal adjustments of the economy to a series of technology or

[3] A third alternative would be Friedman's (1993) plucking model of the business cycle which would place the trend line from peak to peak (Garrison 2001, 223). See *The Economist* (insert September 28, 2002, "The unfinished recession", p. 8) for an insightful discussion of different definitions of recession and their implications.

productivity shocks (Prescott 1986). There would thus be higher or lower levels of real GDP and associated growth rates.

What are some of the facts about economic fluctuations? Romer, (2001, 168-72) provides both discussion and a table of data that is suggestive of the pattern of economic activity for the U.S. economy- the stylized fact. First, fluctuations in real GDP do not exhibit any simple regular or cyclical pattern. The magnitude of declines of real GDP during a recession, the length of time between the end of one recession and the beginning of the next, the 'spacing', and the pattern of output decline (and recovery) all vary significantly. According to Romer (170), "The prevailing view is that the economy is perturbed by disturbances of various types and sizes at more or less random intervals… . Where the major macroeconomic schools of thought differ is in their hypothesis concerning these shocks and propagation mechanisms."[4] Second, fluctuations in sub-components are uneven and, as shown in table 1 (Reproduced from Romer 2001, p. 170), there is greater variability of the time dependent, future oriented production and consumption spending. While the table shows variability during declines, "the same components that decline disproportionately (consumer durables and all activities under investment) when aggregate output is falling also rise disproportionately when output is growing at above-normal rates" (Romer 2001, 170).

Prescott (1986, 10) makes the case that the application of the term business cycle to describe the observed movements is 'unfortunate' - economists mistakenly attempt to explain cycle phenomena independently from the growth component. The phenomena are

[4] See *The Economist* (insert September 28, 2002, 5-9) for a discussion of some of these differing views.

better understood by the use of a unified theory of growth and fluctuations. Mises and Hayek took a similar methodical approach – a single unified economic theory.

Table 1: Relative Fluctuations of Sub-Components of Output in Recessions[5]

Component of GDP	Average Share in GDP	Average Share in Fall in GDP relative to share in normal Growth
Consumption		
Durables	8.4%	15.6%
Non-durables	25.8%	11.2%
Services	29.5%	9.1%
Investment		
Residential	4.7%	20.9%
Fixed nonresidential	10.7%	11.7%
Inventories	0.7%	40.6%
Government purchases	20.6%	3.3%

But in an Austrian (Mises/Hayek) or capital-based macroeconomics the theory explains not only fluctuations, but also boom-bust phenomena. In *Monetary Theory and the Trade Cycle*, Hayek (1933, 54-60) differentiates cyclical fluctuations from shocks (fluctuations *a la* Real Business Cycle models or other exogenous shock approaches).

[5] The data presented in Romer (1996, 148) is slightly different but all components retain their same relative fluctuations.

The shock interpretation of economic fluctuations is essentially a non-economic—but not necessarily unimportant—explanation of economic change:

> The simple fact that economic development does not go on quite uniformly, but periods of relatively rapid change alternate with periods of relative stagnation, does not in itself constitute a problem. It is sufficiently explained by the adjustments of the economic system to irregular changes in the data - changes whose occurrence we always have to assume and which cannot be further explained by economic science. [6]

But the boom-bust cycle presents the theorist with a different challenge:

> The phenomena of the upward trend of the trade cycle and of the culminating boom constitute a problem only because they inevitably bring about a slump in sales - i.e., a falling-off of economic activity - which is not occasioned by any corresponding change in the original economic data.

It will be argued that a capital-based macroeconomic model helps one understand the myriad number of separate but interrelated decisions that determines a long-run growth pattern, changes in the long-run pattern, and output fluctuations. Growth is not automatic in any economy. There is no mystical long run trend. Continuing growth depends not only on countless number of decisions by numerous economic agents, but depends also critically on continuous saving by capitalists - the continuous reinvestment of a significant portion of the proceeds of business back into the business enterprise.[7] Growth rates and the level of productive activity vary and fluctuate in response to shocks as suggested by the real business cycle literature.

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[6] See especially the note on page 59 where he states, "These changes of data could serve as a complete explanation only if it could be shown that the successive phases of the Trade Cycle are conditioned by a series of such changes, following each other in a certain order."

[7] On this see the excellent discussion by Rothbard (1970 [1962], 339-364). See also Cochran and Glahe (1999, 114-117).

But it should be kept in mind that boom-bust cycles do occur around the shifting growth paths. The boom-bust cycle is always generated by circulation credit.[8] How and when the created credit enters the system can lead to significant historical variation in the boom-bust pattern. This significant variation is reflected in the actual pattern of economic activity as interpreted by Romer (2001) as is the greater variability in all variables tied to time related decisions - investment, including variations in inventories, and consumer durable purchases relative to total output and consumption which the Mises-Hayek models predicts is a consequence of credit creation.[9] The mis-directions of production associated with credit creation and the associated boom-bust cycle alter both the structure of production and period of provision.

Sustainable Growth and Shocks in an Austrian Framework

A starting point for an Austrian interpretation of the growth/cycle interaction is Garrison's (2001) concept of sustainable versus unsustainable growth.[10] In a capital-based macroeconomics, sustainable growth occurs when investment exceeds depreciation and is financed by available saving (Garrison 2001, 63-67). Growth is sustainable because it is consistent with preferences and resource availability. Regardless of its actual

[8] See Cochran, Call, and Glahe 2003. Recognition of this fact is either obscured or ignored when in an otherwise excellent discussion of Austrian business cycle theory relative to the current slump the *Economist* (September 28, 2002, 4, 8-9 and 18-22) erroneously argues, "However, America's recent experience shows that the private sector is quite capable of destabilizing things without government help."

[9] The high variability of inventories, might, at first, seem out of whack with common sense attempts to align industries into stages of production. But it should be kept in mind that in the Hayekian example using a continuous input, point output steady state model (Garrison 2001 45-49), all fluctuations of investment are in inventories and goods in process. A lengthening of the production structure (more investment) is associated with more inventories and goods in process while a shortening is associated with lower inventories and fewer goods in process.

[10] Salerno (2001) has provided an insightful criticism of the concept of secular growth as presented in Garrison (2001, 54-56). This criticism, however, leaves the more important concepts of sustainable and unsustainable growth as developed by Garrison intact.

rate, such growth should be of no concern to monetary policy makers, particularly those concerned with accelerating inflation. Sustainable growth in a sound money environment or under a policy regime following a productivity norm should be accompanied by declining prices.[11] In broad conceptual terms, sustainable growth may be pictured as a continuous outward shift of the Production Possibility Frontier and a loanable funds market in equilibrium. The interest rate in the loanable funds market must be consistent with the broader time market represented by the margin between input prices and expected future output prices.[12] Such growth may be sustainable if the dynamics continue to favor investment in excess of depreciation while also being consistent with preferences and resource availability.

Sustainable growth does not imply a fixed long-term rate of growth. Any stylized trend picked up in the data would, as in the real business cycle case, be "defined by the computational procedure used to fit a smooth curve to the data" (Prescott 1986, 10). The actual data and associated fluctuations would be the result of and part of a historical process that results from a "dynamic coordination of entrepreneurial plans with historical development of time preferences, the size and quality of the labor force, natural resource endowments, and technological progress" (Salerno 2001, p. 60).

How does a capital-based approach differ from a real business cycle approach? The data presented in the real business cycle literature can be used as an exercise in 'interpretive economic history' (Higgs, 1995) to illustrate the relevance of Austrian

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[11] See particularly the recent article "Money, Central Banking and Monetary Policy in the Global Financial Arena" by Jerry Jordan (2001), President of the Federal Reserve Bank of Cleveland. George Selgin made a similar argument in 1997. Salerno (2003) provides a more recent defense of this type of policy.

[12] Kirzner (2001, p. 141), (referring to Mises, writes, "He relies on the reader's understanding … that the money rate of interest simply corresponds, in a smoothly running economy at a given level of production,

business cycle theory. Real business cycle theorists see the pattern of expansion and contraction present in economic data as the economy's response to exogenous productivity shocks. These "modern theories of business cycles attribute cyclical fluctuations to cumulative shocks and disturbances that continuously buffet the economy. In other words, without shocks there are no cycles" (Chatterjee 2000, 1). Money and central bank policy is viewed as largely irrelevant with respect to economic expansions and downturns. But, while policy errors do not cause downturns, counter-cyclical policies are counterproductive in that they entail costs in excess of benefits (Prescott 1986, 21 and Chatterjee 1999, 18).[13]

The real business cycle model regards fluctuations in factor productivity as the major source of fluctuations in economic activity. These fluctuations in total factor productivity, 'the effectiveness with which workers and machinery generate value-added" (Chatterjee 1999, 19), are usually identified with the 'Solow residual'. The Solow residual is developed by modeling an economy with competitive markets and constant returns to scale using an aggregate production function of the form $Q = A(t)f(K,N)$, where A, the Solow residual, is a shift parameter representing exogenous technical progress or a productivity shock, K is a measure of the capital stock, and N is a measure of labor input (Lewin 1999,76). The model can also be presented in growth terms as is done by Stadler (1994, 1752), $q = an + (1-a)k + a$ where q is the growth rate of output, n is the growth rate of the labor supply, k is the growth rate of the capital stock, and a is

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to the excess value of consumer goods at a given date, over the value— the spot prices—of the inputs invested at an earlier date in their production."

[13] This conclusion is somewhat paradoxical. How is it that fluctuations in money (or interest rates caused by changes in monetary aggregates) are benign except if attempted as counter-cyclical policies? See

"growth that cannot be accounted for by growth in labor or capital", … "multi-factor productivity growth … that has been dubbed the 'Solow residual.'" Proponents conclude that the model can account for about 70% of the post-war business cycle phenomena (Kyland and Prescott 1991). But critics contend there is "no independent corroborating evidence for the large technology shocks that are assumed to drive business cycles" (Stadler 1994, 1751). In particular, the model supplies neither a satisfactory theoretical explanation, nor an empirical/historical corroboration of the concept of a "negative technology shock".

While one can not deny that fluctuations in key aggregates may be the result of agents' responses to exogenous shocks, one should expect historical studies would reveal the shocks. A capital-based macroeconomic model provides some possible answers. What is identified as a technology shock in the highly aggregated production function model may be better modeled in an Austrian capital framework as a change in the *structure of production*. This explanation relies on a lower level of aggregation (Garrison 2001, 224-29). If the above specified production function is incomplete, if it fails to identify all relevant inputs, then the shift factor A(t) picks up the effects of the unidentified or omitted inputs. "Identifying and talking about them renders them "endogenous" (Lewin 1999, 76). Clearly, from an Austrian perspective, such a production function is incomplete. If capital is viewed as a structure, there is at any point in time, not just one technology known by all and used by all, but a multiple of technologies either in use or available for use. As Rothbard ([1963] 2000, 71) clearly demonstrates, time preference and available saving limit not only the amount of

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Gallaway and Vedder (2000) for a similar conclusion relative to stabilization policy, but in an analysis

investment, but also the type of capital goods and technologies invested in.[14] The Austrian framework also makes clear the strong link between investment and technological change. New knowledge cannot affect production until there is investment in new capital goods and often new 'human capital' that makes use of the new knowledge. With high time preferences and limited saving, investments are, in general, production plans designed to meet more immediate needs. Investment projects are shorter, less labor saving, and/or less durable. The complex combination of resources that makes up the structure of production is less productive. With lower time preferences, production plans provide for greater future provision. Investment projects are on average longer, more labor saving, and/or more durable. In broad aggregate measures the results of such investment choices should show up as increased total factor productivity, the 'shock factor' in the real business cycle literature.

Unsustainable Growth and Cycles

Growth becomes unsustainable when it is not consistent with underlying preferences and resource availability. As such, it must be policy-induced, not preference-induced, growth. Garrison (2001, 76) illustrates a non-sustainable growth process by modeling the path of an economy responding to a credit expansion initiated by a central bank. The credit expansion is the familiar Mises/Hayek Austrian business cycle theory. If the economy is at full employment when a credit expansion begins, unsustainable growth occurs as the economy begins to temporarily produce outside its Production Possibility Frontier. While there is an increase in both consumption and investment, the

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more compatible with Austrian analysis.

[14] Lewin (1999), Lachmann (1956), and Cochran and Glahe (1999, 107-110) provide more in depth discussions.

mix of output shifts towards investment without a corresponding change in time preference. The capital-based macro model explains the interactions between money, credit, and investment that set up conditions for unsustainable growth as illustrated by Garrison's (2001, Figure 4.4, 69) "dueling production structures." The competing production structures makes explicit the resource misallocation and potential shortage of key resources that makes the crisis inevitable once the process of over consumption accompanied by over investment and malinvestment has begun.[15] Consumer preferences, augmented by an interest rate induced over-consumption, are pulling resources into a shorter structure of production while the credit expansion is attempting to attract resources to support a longer production structure. The resource base is ultimately not sufficient to allow completion of both structures simultaneously. The predicted pattern of economic activity including the time related subcomponents is consistent with the stylized facts reported in the real business cycle literature.

Cycle-like phenomena may be explained by random productivity shocks that may be positive (growth enhancing) or negative (growth impeding). If there is no credit creation, the fluctuations around trend, as pictured in Figure 1, are, as argued by real business cycle theorists, actually optimal or equilibrium adjustments to continuous positive and negative shocks to the economy. But if the process is initiated by creation of money and credit, the underlying capital-based theory provides an *a-priori* explanation of what is picked up in the data and interpreted as the associated productivity shocks - the positive shock is the lengthening of the structure and the negative shock is the subsequent contraction associated with the bust. Money and credit expansion rather than being

[15] See Garrison 2003.

neutral and benign is the causal factor. The data represents not just fluctuations, but a boom-bust cycle.

But this is not the only way central bank intervention can create a tendency towards unsustainable growth. To illustrate other unsustainable growth patterns, one must first develop other sustainable growth processes. Garrison (2001, 57-84) provides a step-by-step graphical presentation illustrating how a different sustainable growth process might originate. A real positive technology shock can increase the demand for loanable funds. Investment increases as does the natural rate of interest and the quantity of saving. Growth associated with the new technological possibilities can be consistent with underlying tastes and resource constraints and hence can be sustainable.

The positive productivity shocks may be exogenous. But if banks, as is likely with a fractional reserve system and a central bank targeting interest rates, respond to the higher demand for credit by expanding the supply of money and credit and thus keeping the interest rate below the new higher natural rate[16], the expansion that accompanies the economy's response to the shock leads to a mix of economic growth that is partly sustainable, the growth attributable to the productivity shock, and growth that is unsustainable, additional growth in investment and GDP that is attributable solely to the

[16] Hayek was one of the first to make a similar argument, "But it is above all for reasons of competition that the bank which first feels the effect of the increased demand for credit cannot afford to reply by putting up interest charges; for it would risk losing its best customers to other banks which had not yet experienced a similarly increased demand for credits. There can be little doubt, therefore, that the bank, or banks which are first to feel the effects of the new credit requirements will be forced to satisfy these even at the cost of reducing their liquidity" (Hayek[1933] 1966, 173). With a fiat currency and an operating federal funds market, extension of additional loans in the face of higher demand for credit at current interest rates is accomplished with limited sacrifice of liquidity. The lending bank needs to borrow not the full amount of the loan, but just sufficient additional reserves to meet its reserve requirement. If such operations puts upward pressure on the federal funds rate, the central bank committed to an interest rates target will provide the additional reserves.

credit expansion. [17]

Whenever economic growth is augmented by credit creation, a clear crisis will eventually develop in the economy, because of inconsistent production plans. Those attempting to lengthen the structure find that demand may not materialize in the necessary later stages as those attempting to shorten the structure (those responding to rising consumer demand) demand a different capital/resource mix than the mix being provided by the developing longer structure. In addition to a slack demand in some sectors, input prices are likely to increase due to the increased competition from early stages. Malinvestment becomes apparent as some businesses are caught in this squeeze between a slack demand for output and higher input prices. Plans cannot be completed as anticipated. Production may be cut back or discontinued altogether.

Resources are released for other potential uses. However, those businesses attempting to respond directly to higher consumer demand may find their plans thwarted by a lack of needed complementary resources. Labor released from the declining early stages may not be easily absorbed into the expanding later stages of production as the necessary complementary capital goods may not be readily available, if, as is likely, some of the capital goods created during the boom are not immediately useful in the expanding industries. [18]

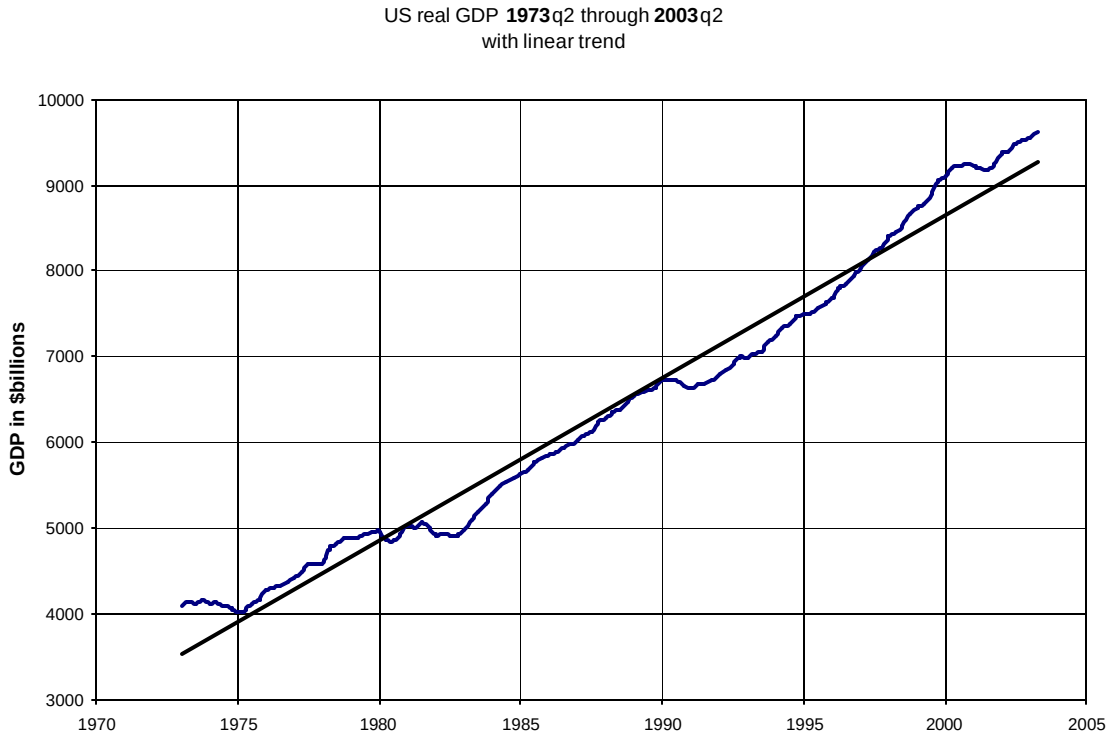
Application to US and Japan

Figures 2 and 3 show Real GDP from 1973 to 2003 for the U.S and 1960 through

[17] The idea of a combination growth path was first presented by Garrison (1996). Garrison showed how a recovery augmented by money and credit expansion contained the seeds of its own destruction because the recovery in such a case would be again a combination of sustainable and unsustainable growth.
[18] For more in depth discussions of the plan co-ordination nature of the capital structure see Lewin (1999, particularly chapters 3 and 9) and Kirzner (1996).

2001 for Japan. The data for both is consistent with the preceding analysis. Both countries experienced significantly above trend GDP numbers and higher growth rates (as shown in tables 1 and 2). In both countries, the breakout growth was followed by a recession – a bust. The data for the U.S appear especially compatible with a positive technology shock circa the mid 1990s. GDP spurts significantly above trend and, even accounting for the recession, remains significantly above trend.[19] We are, however, unaware of any historical event that explains the apparent negative productivity shock associated with the decline in Real GDP and actual growth rates. But such an effect is predicted by the capital-based macroeconomic model.

Figure 2[20]



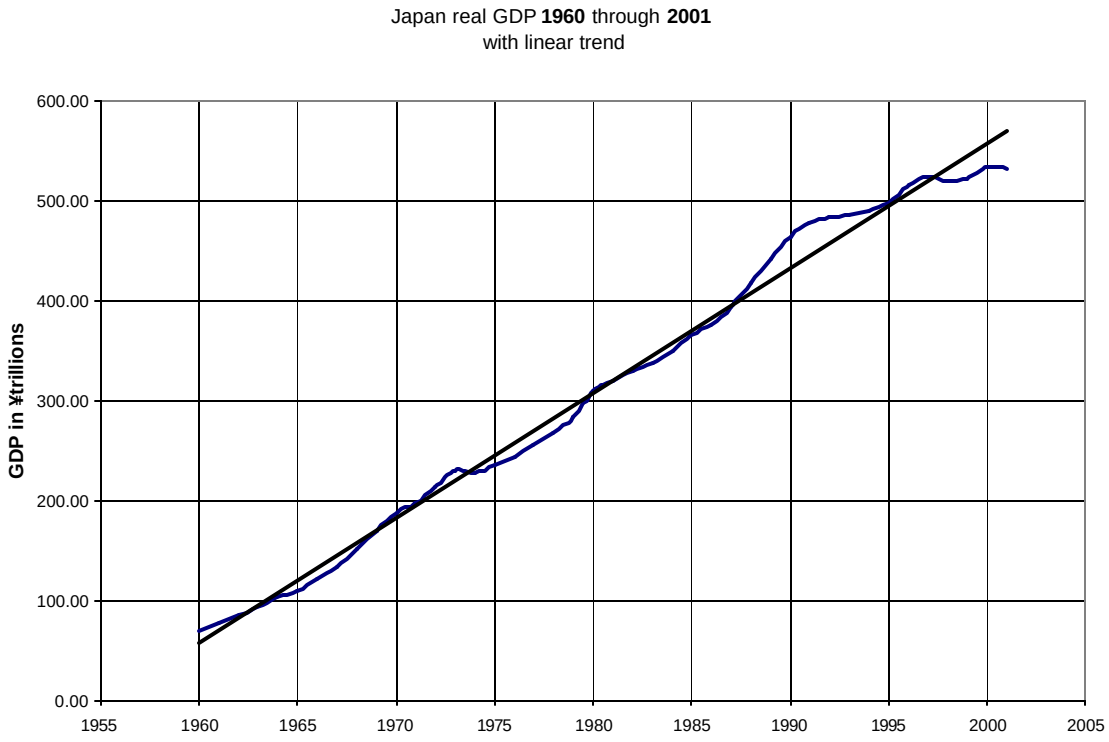
[19] See Taylor (2004, 434) for similar results re the long term trend.
[20] U.S. Real GDP data (chain weighted, seasonally adjusted) for Figures 2, 4, and 5 is from the Federal Reserve Bank of Dallas. The MZM data is from the Federal Reserve Bank of St. Louis.

While the data for Japan shows a similar pattern in the mid 1980s. It is harder to make the case for a significant external productivity shock. Japan's Real GDP spurts above trend as its growth rate increases (see Table 1), but following the observed bust, Real GDP returns to trend for several years before collapsing below trend in the late 1990s. No model besides the ABCT model predicts both the positive and the negative 'shocks' that the Japanese economy appears to have suffered.[21]

The pattern for Japan better fits the credit creation as an initiating factor of boom-bust rather than the productivity shock accompanied by credit creation hypothesized by *The Economist*. Data in Figure 4 reinforces this interpretation. A pickup in Lagged M2

Figure 3[22]

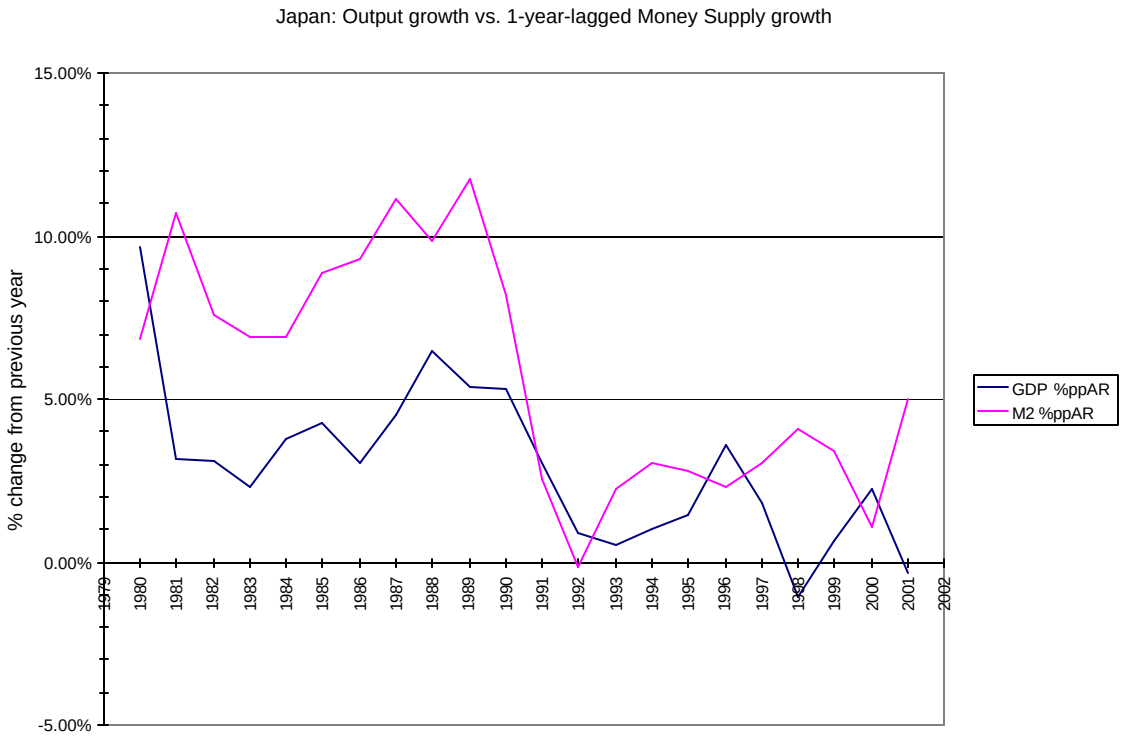
[21] For a detailed application of Austrian business cycle theory to the case of Japan with particular emphasis on the 1990s see Powell (2002a and b). Herbener (1999 a and b) provides additional detail.
[22] Data for Figures 3 and 4 from Gordon 2003, Appendix B, A9.



growth is coincident with the pickup in growth in Real GDP.

Further evidence for a boom-bust pattern for the U.S. is provided by Lansing (2003). Business fixed investment expanded at a rate during the boom (1996-to 3rd quarter 2000) that exceeded the expansion rate based on historical averages for an upturn, "an average compound rate of 10% per year- about 2.5% faster than the growth

Figure 4



rate of the U.S. economy as a whole" (Lansing 2003, 2). Reinforcing the analysis of Callahan and Garrison (2003) and consistent with our mixed shock analysis, Lansing (2) continues:

> Much of the surge in business investment during the late 1990s was to computers and information technology. During these years, measured productivity growth picked up, inflation remained low and the unemployment rate declined. Such observations were often cited as evidence of a permanent structural change- one that portended faster trend growth in the years ahead. …
>
> It is now clear that the investment boom of the late 1990s was overdone. Firms vastly overspent in acquiring new technology and in building new productive capacity- with an attendant increase in employee headcount- in an effort to satisfy a level of demand that proved to be unsustainable.

Figure 5 and Figure 6 provide additional support for the technology shock in the mid 1990s. The trend line established with data dating back to the 1970s shows Real GDP above

Figure 5

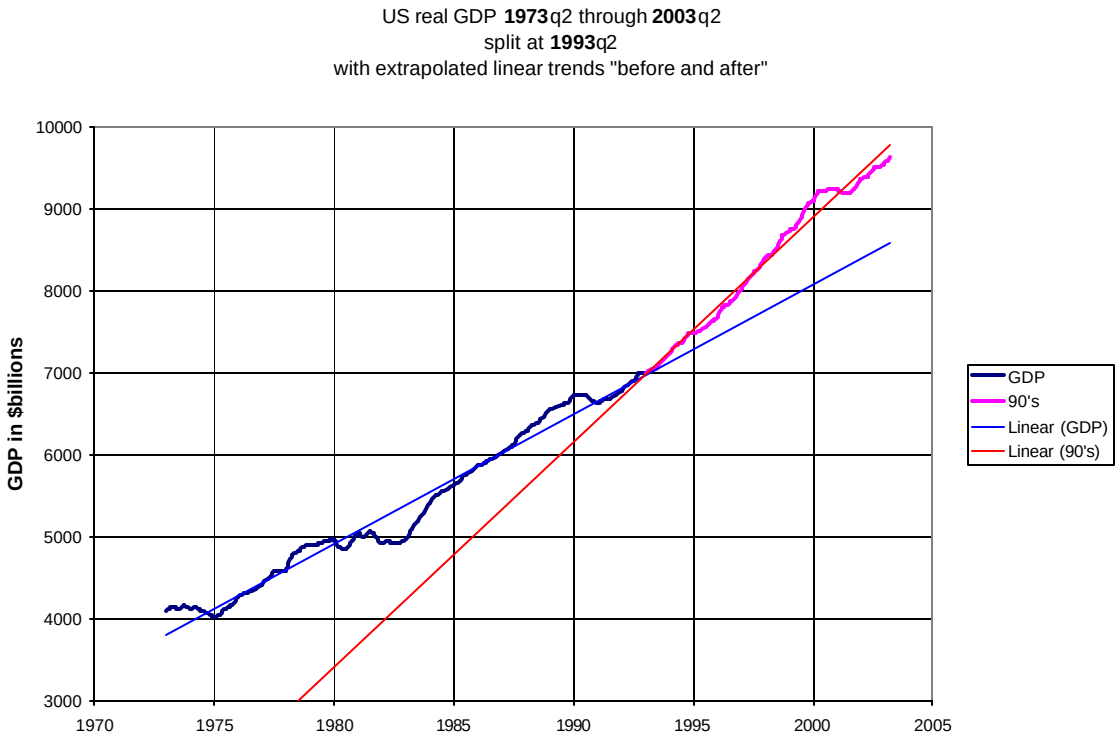
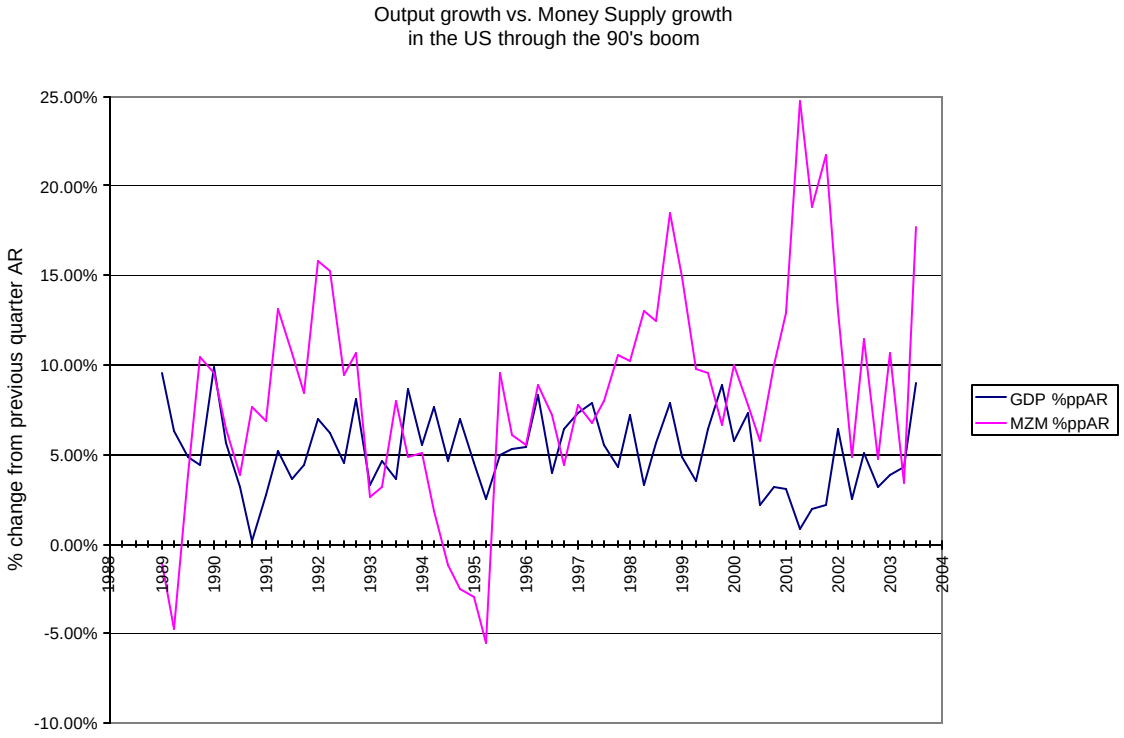


Figure 6



trend following the recession and slow recovery. A trend using post 1990 data only shows a clear break from the pre-1990 data and clearly shows a collapse below the new trend following the recession. The pickup during the recovery still has real GDP below the new trend. In Figure 5 money and credit growth as measured by MZM accelerates after the apparent growth pick beginning in late 1995.

Conclusions

While the most developed part of a capital-based macroeconomics, the Mises-Hayek business cycle theory predicts the frequently observed boom-bust pattern in economic activity,[23] the capital-based model is relatively underdeveloped relative to the aftermath of a boom. Can economic policy replace and or supplement market adjustments

[23] While some argue the Austrian's never rigorously established this point (Laidler 1999, 43-46), the Mises-Hayek business cycle model does argue that accelerating credit creation can extend the boom, but a crisis

to make the recessions less serve and recovery stronger? Garrison (1996 and 2001, 224-31) provides an answer for stimulus during recovery. Such a policy creates a 'mixed' economy similar to our technology shock plus credit creation model. Growth includes both a sustainable and an unsustainable. The recovery is stronger, but the seeds are sown for the next bust.

Work needs to be done on the implications of credit creation that begins during the recession, but before recovery has began. For the first time in U.S economic history the economy went into a recession despite a massive reflation attempt. This has created according to Puplava, an economy "still plagued by a plethora of excesses of imbalances leftover from the 1990s, which have yet to work themselves off. Furthermore, the Fed has been fueling these excesses by its policy of flooding the markets with liquidity. All that has managed to do is create additional bubbles in real estate, mortgages, the bond market, and consumer consumption. Instead of creating healthy balanced growth in the economy it has created more imbalances and bubbles in the financial markets. This will not only prolong the recovery process, but also makes it more severe when it inevitably corrects."[24]

Hayek (1979, 13) argues, "The chief conclusion I want to demonstrate is that the longer the inflation [the increase in the effective quantity of money] lasts, the larger will be the number of workers whose jobs depend on a continuation of the inflation, often even on a continuing acceleration of the rate of inflation–not because they would not have found employment without the inflation, but because they were drawn by the

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will eventually come because either the central bank will flinch and slow the pace of credit creation, the Ricardo effect will kick in, or hyper inflation and crack up boom will occur.

inflation into temporarily attractive jobs, which after a slowing down or cessation of the inflation will again disappear." Rothbard (2000, xxvii) comes to a similar conclusion, "The longer the inflationary distortions continue, the more severe the recession-adjustment must become." Notice these are statements about the severity of the maladjustments, not statements about the length of the recession/depression. It is an inappropriate jump in logic to go from the conclusion that the greater the length of the period of artificial credit expansion the greater the degree of malinvestment and thus the greater the necessary reallocation of resources to a prediction about the length of the adjustment period including recovery.

The restructuring of the economy requires a realignment of relative prices and wages and a movement capital resources and labor from the areas where demand had been artificially created by credit expansion to sectors of the economy where demand is consistent with underlying preferences. The crisis - the recession - is the "necessary corrective process by which the market liquidates the unsound investments of the boom and redirects resources from capital goods to consumer goods industries"(Rothbard, 2000, xxvii). How long this adjustment takes is more of an historical rather than a theoretical problem. As Rothbard (2000, 14) explains, "Since factors must shift from the higher to the lower orders of production, there is inevitable 'frictional' unemployment in a depression, *but it need not be greater than unemployment attending any other large shift in production"* [emphasis ours]. The adjustment can be quick and the unemployment temporary if markets are allowed to work during the necessary period of liquidation and restructuring.

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[24] Jim Puplava, "The 'OK' [unbalanced and at risk] Economy" at www.financialsense.com, September 12

What then causes or leads to a prolonged depression? Here again Rothbard (2000, 14) provides a clear answer, "Unemployment will progress beyond the 'frictional' stage and become really severe and lasting only if wage rates are kept artificially high and are prevented from falling. If wages are kept above the free-market level that clears the demand for and supply of labor, laborers will remain permanently unemployed."[25] Evidence provided in Vedder and Gallaway (1997) support this response for the U.S. in the 1930s and Herbener (1999a and b) shows how the analysis applies to Japan in the 1990s.

The question has come up whether business cycles are more or less severe, and the economy more or less volitile, today than in the past. The most recent National Economic Trends from the St. Louis Fed provides evidence for a decline in volatility post 1962. A study by Stock and Watson (2002) examines three different hypotheses relative to the perceived decline. They indicate that 20-30 percent of reduced volatility in the U.S. economy could be explained by 'improved monetary policy' with most of the rest attributed to smaller shocks.

It may be true that post Volker monetary policy with a greater emphasis on control of inflation and price stability is an improvement on the monetary policy pre natural rate theory where the focus was more on employment, but as the recent boom-bust illustrates there is much room for improvement.

Hayek (1979, 17) was premature in abandoning his earlier arguments about the

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and October 3, 2003.

[25] Recently Cole and Ohanian (2002, 32), using neoclassical growth theory model, came to a similar conclusion regarding the experience of both the U.S. and U.K. during the 1930s, "This analysis supports our earlier work that cartelization and labor bargaining account for much of the long-run U.S Great Depression. This analysis also supports our earlier work arguing that unemployment subsidies are a key

harmful effects of money and credit growth in a growing economy for his more pragmatic approach in the 70s that "Though monetary policy must prevent wide fluctuations in the quantity of money or in the volume of the income stream, the effect on employment must not be its dominating consideration. The primary aim must again become the stability of the value of money."

ABCT clearly explains why instability will still be a significant problem in such a monetary policy environment and provides the foundations for monetary reform that would make the economy even less volatile.

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factor in understanding the long-run U.K. Great Depression."

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