

Austrian Business Cycles, Plucking Models, and Real Business Cycles

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Many media pundits, sounding like proponents of a plucking model of business cycles, compare the cause of recessions to the host (the central bank) taking away the punch bowl (raising interest rates) just as the party (boom) is getting underway. Inappropriately tight money and credit policies trigger recessions. Real business cycle theorists, on the other hand, treat money as endogenous and irrelevant with respect to economic expansions and downturns. Exogenous productivity shocks cause economic fluctuations.¹ In contrast to both, the Austrian business cycle theory traces the cause of economic recession (bust) back to the beginning of the party (the boom). The host is guilty, not of taking away the punch bowl and spoiling the party, but of spiking the punch and thus causing many of the partygoers to suffer from an unanticipated hangover. The party is wilder from the start, but tomorrow's consequences and cleanup are more severe than they need have been. The downturn is the ultimate consequence of malinvestment initiated by previously created credit resulting from central bank policy.²

This paper will argue that an Austrian capital based macroeconomics provides the more complete explanation of economic crisis. Previous work by Garrison (1996)³ explains why the recovery in the plucking model may be a combination of saving-generated sustainable growth and unstable growth spawned by credit creation. What looks like a pluck and subsequent recession is, in fact, a boom-bust cycle. This paper will extend the argument to show how the Austrian model also explains downturns, which on

¹ According to Chatterjee (2000, 1), "In contrast, 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."

² Cochran and Call (1998 and 2000) develop the essential role of created credit in the Austrian cycle process.

³ Garrison (2001, Ch. 11) further develops this argument.

the surface may appear to be caused by exogenous negative real productivity shocks, but are better interpreted as endogenous responses to a previous period of credit creation.⁴ If a positive technology shock is caused by or accompanied by money and credit creation (as the data implies), the boom or expansion is again a combination of healthy and unhealthy growth. The negative technology shock is neither mysterious nor implausible. It is the result of the malinvestment that is that part of the response to the positive technology shock financed by created credit rather than available savings.

The following sections will use and extend the graphical model developed by Garrison (2001) to illustrate how the Austrian business model provides a better understanding of the economic phenomenon underlying both the plucking model and the real business cycle model. Section 2 briefly distinguishes between sustainable and unsustainable growth. Section 3 summarizes the Austrian interpretation of the cycle imbedded in the plucking model. Section 4 uses Austrian capital theory to explain productivity shocks, the Solow residual (to use the term dear to the hearts of real business cycle theorists), and to develop an explanation that is a cycle theory and not a shock theory.

Sustainable and Unsustainable Growth

Can economic growth be maintained? If so, how? If not, why not? Such questions have been of interest to economists since the early developments of classical economics as evidenced by the title of Smith's great work *An Inquiry Into the Nature and Causes of the Wealth of Nations*. More recently the discussion has focused on the concept of sustainable growth. In a capital based macroeconomics framework sustainable growth occurs because investment exceeds depreciation and all investment is financed by

⁴ This suggestion was first made in Cochran, Call, and Glahe 1999.

available saving (Garrison 2001, Ch. 3). The growth is sustainable because it is consistent with tastes and preferences and resource availability. Regardless of its actual 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. In a simple principles level model of a growing economy, sustainable growth could be represented, as in Garrison (2001), by a continuous outward shift of the Production Possibility Frontier and a loanable funds market in equilibrium. In the equilibrium business cycle literature, such growth is often referred to as balanced growth (output, investment, and consumption all growing at the same rate) and would be represented in Figure 1 by the hypothetical growth rate ceiling and in Figure 2 by the long-term growth trend line.

Growth becomes unsustainable when it is not consistent with underlying tastes and preferences and resource availability. In terms of the simple principles level model, unsustainable growth develops when the economy attempts to produce outside its Production Possibility Frontier and the mix of output shifts towards investment without a corresponding change in time preference. The same phenomenon could occur during a recovery (a movement from inside the Production Possibility Frontier to a point on the Frontier) if, because of credit creation, the investment-consumption balance is not consistent with underlying time preferences. The Austrian macro model explains the interactions between money, credit, and investment that set up conditions for unsustainable growth and explains why conditions of unsustainable growth generate cycles in economic activity.

This Austrian model is well suited to bridging the gap between the short-run and the long run. The model can explain seamlessly the long run growth trend (and changes in the trend), fluctuations around the trend (cycle phenomena), and the associated greater variability in investment relative to total output and consumption that is consistently picked up in economic data series. In addition, the capital-based approach of the Austrian theory avoids the empirical irregularities associated with movements in the real wage over the business cycle that haunt the labor-based approach of Friedman and can explain why demand-side policy shocks, even during periods of recession and recovery, are destabilizing (Mises 1998, 576 and 792).⁵

How is unsustainable growth generated?⁶ How can investment become inconsistent with saving and the underlying time preference? In a monetary economy with a central bank, well-developed credit markets, and a fractional reserve banking system, new money frequently enters the system through changes in the availability of credit. Monetary changes thus alter the market rate of interest relative to the equilibrium or natural rate. These money-induced changes in credit availability and the rate of interest have predictable effects on the capital structure of the economy. Monetary expansion creates “forced savings” - an “increase in capital creation at the cost of consumption, through the granting of additional credit, *without* voluntary action on the part of the individuals who forgo consumption, and without their deriving any immediate benefit” (Hayek [1933] 1966, 219).

⁵ Vedder and Gallaway (2000) provide empirical evidence that, historically, countercyclical policy has in fact been destabilizing. Hayek ([1939a] 1975) also shows theoretically why a monetary expansion that begins not at full employment but during a recession, leads to a cycle.

⁶ For a more in-depth discussion and a graphical presentation, see Garrison (2001, Ch. 4).

The change in the spending pattern should lead to a change in the pattern of resource use.⁷ Resources are switched from production for the immediate future to production for the more remote future. Both the level and type of investment change. Investment projects on the margin are both more roundabout and more productive. As a consequence, the relative flow of consumer goods will be temporarily diminished. Money income, however, increases as entrepreneurs bid resources away from alternative uses. Factor owners now have larger money incomes and no reduced demand for consumption goods. Full employment (and possibly over employment) exists, but equilibrium does not.⁸ Proportional increases in all money prices will not restore equilibrium so long as the rate of interest and intertemporal price margins are not at equilibrium levels.

The new time structure of production cannot be completed and maintained without an increase in savings (reduced time preference). Injections of additional money credit through the banking system may mask and postpone the need for adjustment. But the boom phase of the cycle is a period of dueling structures of production. Entrepreneurs are attempting to do more than the available resources will allow. In the process capital may be consumed rather than created. The previous pattern of resource use, shorter but less productive, is the one ultimately more consistent with preferences and resource availability and consistent with sustainable growth. A tendency will develop to shorten the structure of production. This tendency is the onset of the crisis.

⁷ For more discussion about the change of the pattern of expenditure within the capital structure see Garrison 2000 (pp. 64-67), Garrison 1996, Bellante and Garrison 1988, Hayek 1941, and Cochran and Glahe 1999.

⁸ See Garrison 1996.

The onset of the crisis may or may not be accompanied by a higher market rate of interest. (Hayek 1939a, 10).⁹ It is more likely that the rate of interest and credit availability will play a significant role. As the boom progresses entrepreneurs will need progressively larger increases in the supply of money credit to continue the process of building the new structure of production in the face of increasing relative demands for consumer goods. The increased demand for credit needed to maintain the new proportions, the less liquid positions of banks, and/or a tighter monetary policy by a central bank fearful of the effects of inflation, should cause the market rate of interest to increase.¹⁰ “(I)nvestment cycles typically end in a credit crunch, with a comparatively sudden and simultaneous financial ‘crisis’ for numerous firms” (O’Driscoll and Rizzo 1985, 210).¹¹

Both the form and quantity of investment will change. Investment will be made in shorter processes, in less durable goods, and in less labor saving goods. Demand for inputs in these ‘shorter’ processes will intensify, but at the same time demands for inputs in longer, more durable, or more labor saving processes will decline. The net demand for inputs in investment industries will decrease (Hayek 1941, 387, Garrison 2001, 67-77). Layoffs and idle capacity will develop in these industries. The Austrian model argues that

⁹ Hayek calls the adjustment without an increase in the rate of interest the Ricardo effect. See Hayek 1939a, 10, Hayek 1942 and 1969 and Moss and Vaughn 1986 for more in depth discussions of the Ricardo effect.

¹⁰ Hayek (1935, Lecture III) describes the process where the rate of interest increases.

¹¹ Market adjustments and/or a credit crisis will eventually reverse the initial effects of the artificial expansion of credit and money. As explained by von Mises ([1940] 1998, 40), “But the boom cannot continue indefinitely. There are two alternatives. Either the banks continue the credit expansion without restriction and thus cause constantly mounting price increases and an ever growing orgy of speculation, which, as in all other cases of unlimited inflation, ends in a ‘crack-up boom’ and in a collapse of the money and credit system. Or the banks stop before this point is reached, voluntarily renounce further credit expansion and thus bring about the crisis.” The downturn follows in either instance.

downturn is the result of unhealthy or unsustainable growth. Unsustainable growth is the consequence of money and credit growth in excess of voluntary savings.

The time to prevent a crisis is during the boom. Extensive malinvestment needs to be prevented if persistently high unemployment is to be prevented. The way to avoid extensive malinvestment is to avoid money and credit creation. The recession is the corrective phase of the cycle; market forces have begun to reassert themselves. Once a crisis has begun, policy makers must walk a fine line. If market processes are not interfered with by price rigidities, the recession that follows the crisis should be a procedure that eliminates and corrects the past errors and malinvestments.¹² Expansionary policies in this phase of the cycle may be counterproductive in the long run. Sustainable growth is restored only when the structure of production adjusts to the plans of consumers. These conclusions and their policy implications remain highly controversial.¹³

Plucks

The contrast between two approaches – recession as the result of removing the punch bowl (the pluck) and recession as the result of a spiked punch bowl – can be illustrated by using a stylized form of the Friedman (1993) plucking model (see Figure

¹² See Vedder and Gallaway (1993 or 1997) and Benjamin M. Anderson (1949) for a comparison of the 1920-21 crisis that fits the recovery without interference model and the Great Depression which is interpreted as a crisis followed by significant interference in the pricing system. See also Rothbard 1975. More recently Cole and Ohanian (1999) and Prescott (1999, 29) have looked at the Great Depression from the perspective of neoclassical growth theory and come to similar conclusions; employment remained low because “labor market institutions and industrial policies changed in a way that lowered normal employment.”

¹³ The real business cycle literature makes similar claims about policy and these claims “strike many economists as so outrageous that they simply dismiss real-business-cycle theory as false”(Chatterjee 1999, 18). As an example, Solow (2000,152) refers to the conclusions of these models that cycles are optimal adjustments to unexpected shocks to technology as “most spectacularly implausible”. Many critics of Hayek and Austrian business cycle theory rejected the approach in favor of Keynesian for similar reasons.

1). The usual interpretation of U.S. growth data in a plucking model is that “U.S. data on real output show an important ‘ceiling’ effect; growth rates are on average below the ceiling rate, but tend back to the ceiling rate” (Goodwin and Sweeney 1993, 178). Why does such a pattern in the data appear? While a monetarist/monetary disequilibrium model can be used to explain the observed business cycle phenomena, the Austrian model can also provide a plausible explanation of the observed pattern as developed by Garrison (1996 and 2001).¹⁴

In the monetarist model, ‘natural’ full-employment growth is interrupted by monetary disequilibrium, the “money string is plucked downward” (Friedman 1993, 173). These plucks are interpreted as random policy errors that decrease the supply of money or fail to increase it in response to an increased demand for money. The resulting excess demand for money coupled with price rigidity triggers a recession followed by a subsequent recovery that may or may not be aided by an expansionary policy.

In the Austrian model, the problem develops as an investment boom. As previously argued, investment generated by savings is sustainable, while investment generated by credit creation is not. “The boom for the Austrians refers to something going on largely *within* the output aggregate. It is represented in Friedman’s plucking model not by a conspicuous recovery to trend but rather by some period preceding a pluck which Friedman, operating at a higher level of aggregation, presumes to be healthy growth” (Garrison 1996, 800). The credit-induced part of the boom or recovery however, is malinvestment and not sustainable growth.

¹⁴ While the Austrian model can be adapted to this interpretation of the data, fluctuations below a growth ceiling (Figure 1), the Austrian cycle also is consistent with fluctuations above and below a sustainable trend line (Figure 2).

The self-reversing effects of a money/credit injection exist even if the monetary increase occurs when unemployed resources already exist. The final outcome of the process may be delayed but does not change. An increased supply of money credit granted to entrepreneurs will initially stimulate investment relative to consumption (and in excess of investment levels consistent with underlying time preference). If there are available stocks of all resources including consumer goods, as often may be the case when an economy is inside its Production Possibility Frontier, the idle resources may be absorbed temporally and the process may continue unimpeded for some time. Costs need not rise since newly employed resources do not have to be bid away from alternative uses. The increased money incomes of input owners need not cause the price of consumer goods to increase if the additional consumer goods can be supplied from stocks. The Keynesian multiplier process may reasonably describe the initial phases of such a recovery. This process, however, essentially describes a process where no real scarcities exist, an “economics of abundance” (Hayek 1941, 369-74). But when scarcities reassert themselves, bottlenecks develop.¹⁵ The increased incomes generated from increased investment due to credit expansion eventually lead to a relative scarcity of consumer goods and the crisis will again be upon the economy. While the downturn may appear to be the result of a pluck (a central bank or banking sector induced restriction in credit availability), more careful analysis makes it clear that a “policy-induced boom contains the seeds of its own undoing” (Garrison 1996, 800).

¹⁵ “Bottlenecks” are really nothing but the adjustment to the presence of goods with varying degrees of scarcity (Hayek, 1941, 374).

Shocks

Real business cycle theorists see the pattern of expansion and contraction present in economic data as the economy's response to exogenous productivity shocks.¹⁶ 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 largely irrelevant with respect to economic expansions and downturns. But, while policy errors do not cause downturns, counter-cyclical policies are counterproductive, they entail costs in excess of benefits (Prescott 1986, 21 and Chatterjee 1999, 18).

Austrian business cycle theory and real business cycle theory may be somewhat complementary. 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’.¹⁷ 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 $Q = Af(K,N)$, 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).¹⁸ Proponents conclude that the model can account for about 70% of the post-war business cycle phenomenon (Kyland and Prescott 1991). But critics contend

¹⁶ A critic of real business cycle theory, Solow (2000,152) refers to the conclusions of these models that cycles are optimal adjustments to unexpected shocks to technology as “most spectacularly implausible”.

¹⁷ See Stadler 1994 (p. 1752).

¹⁸ The model can also be presented in growth terms as is done by Stadler (1994, 1752), $q = \dot{a}n = (1-\dot{a})k + a$ where q is the growth rate of output, n is the growth rate of the labor supply and k is the growth rate of the capital stock and z is “growth that cannot be accounted for by growth in labor or capital”, ... “multi-factor productivity growth ... that has been dubbed the ‘Solow residual.’”

there is “no independent corroborating evidence for the large technology shocks that are assumed to drive business cycles” (Stadler 1994, 1751).

While one should not deny that fluctuations in key aggregates may be the result of agents’ responses to exogenous shocks¹⁹, one should expect historical studies would be able to identify 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. The explanation relies on the Austrian use of 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 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. As explained by Hayek (1941, 6)

The problems that are raised by any attempt to analyse the dynamics of production are mainly problems connected with the interrelationships between different parts of the elaborate structure of productive equipment which man has built to serve his needs. But all the essential differences between the parts are obscured by the general endeavor to subsume them under one comprehensive definition of the stock of capital. The fact that this stock of capital is not an amorphous mass but possesses a definite structure, that it is organised in a definite way, and that its composition of essentially different items is much more important than its aggregate “quantity” ...

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. Time preference and available saving limit not only the amount of investment, but

also the type of capital goods and technologies invested in.²⁰ With high time preferences and limited saving, investments are, in general, production plans 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 and less limited saving, 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.

At a lower level of aggregation, what looks like an economy’s response to a ‘positive technology’ shock may be in fact an economy’s response to credit creation. The productivity increase is in reality endogenous. Or it could be a combined response; the economy is subjected to a truly exogenous productivity shock in new knowledge or improved production techniques. The greater potential productivity of new investments projects of all types increases the demand for credit, but the higher demand for credit is partially accommodated by credit creation. In either case, the economy-wide response will be a combination of sustainable and unsustainable growth. Part of the expansion of investment during the response period will be malinvestment. As the malinvestments are discovered and corrected, productivity will decline and show up in aggregate data as a negative productivity shock. The money and credit creation during the expansion, rather

¹⁹ Hayek (1933) recognized this point.

²⁰ Lewin (1999), Lachmann (1956), and Cochran and Glahe (1999, 107-110) provide more in depth discussions. 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 that make use of the new knowledge.

than being harmless (or helpful) endogenous response of banks to changing market conditions, set the stage for the boom-bust pattern of the cycle.

Conclusion

Chatterjee (2000, 10) recognizes that real business cycle theory does not address the issue of the ‘ultimate source of cyclical volatility because the random shocks in the RBC model result from variations in unspecified factors ...’ A capital-based macroeconomics can help fill in the blanks and provide a better understanding of the underlying market processes. In fact, the empirical results reported in the real business cycle literature can be reinterpreted in a way that provides historical support for Austrian business cycle theory and a capital based macroeconomics.

Capital based macroeconomics developed from the insights of Mises and Hayek requires a blending of monetary and capital theory.²¹ The effects of monetary changes on the distribution of spending and the structure of production are important. Changes in money that increase credit availability can cause unsustainable growth. Analysis that ignores this feature of the economy can and does present a misleading picture of the medium run, the series of short run adjustments that eventually result in the fabled long run.

Monetary shocks are important because they can and do cause real maladjustments. The path of the economy following a monetary disturbance is a

²¹ Proponents of Austrian (Hayek-von Mises) cycle theory who emphasize the relative price changes and downplay the capital theory aspects of the Hayek-von Mises model leave the theory open to criticisms similar to Haberler (1938, 67). Why doesn't the original change in relative prices cause disruption of production and unemployment or why if resources flow smoothly into the expanding industries as relative prices changes don't the resources flow smoothly back to the original industries when the relative price change reverses itself? Paul Krugman has recently raised the issue again. See Garrison (1999) for another response based on Hayek's arguments. Cochran and Call (1998) provide a summary of the important ways in which Austrian monetary theory differs from traditional analysis.

disequilibrium path, not an equilibrium path.²² The distribution of the money expenditure flow is altered by the monetary disturbance from the equilibrium distribution determined by the underlying real factors. This is true whether the disturbance is the result of a deliberate policy change (exogenous money) or whether the monetary change is a passive response of the banking system to some real shock (endogenous money).²³ This initial alteration of the spending pattern in the economy will affect relative prices and will redirect the employment of resources into directions consistent with a new unsustainable pattern of spending. The relative price changes brought about by the monetary factors are not consistent with the underlying real factors. As economic agents discover that plans are not consistent with economic realities, the real forces – tastes and preferences and resource availability – will reassert themselves. The cluster of entrepreneurial errors are discovered and corrected.²⁴

Garrison (2001) argues that a key feature of capital-based macroeconomics is that it provides the macroeconomics of the medium run.²⁵ The Austrian theories of capital and credit creation theoretically separate sustainable from unsustainable growth. The long run is the series of short run adjustments. The Austrian model thus provides a single model of the short run, the medium run, and the long run. While business cycle phenomena may be caused by exogenous shocks or inappropriately tight monetary policy, much of the actual cyclical activity is best interpreted as the consequence of and caused by credit created unsustainable growth. This type of cyclical activity is preventable with an appropriate monetary framework, but may be difficult to correct with short-run macroeconomic

²² See Cochran and Glahe 1992.

²³ See Cochran and Glahe (1999, 95-101) and Hayek ([1933] 1966).

²⁴ See Hülsman 1998.

policy.²⁶ A monetary policy based on the principle of sound money would accommodate sustainable growth without generating endogenous instabilities and unsustainable growth.

²⁵ See Solow (2000) for a discussion of the lack of a medium run in main-stream macroeconomics.

²⁶ Vedder and Gallaway (2000) provide both empirical evidence and a strong theoretical argument supporting the ineffectiveness or ‘fraud’ of macroeconomic stabilization policies.

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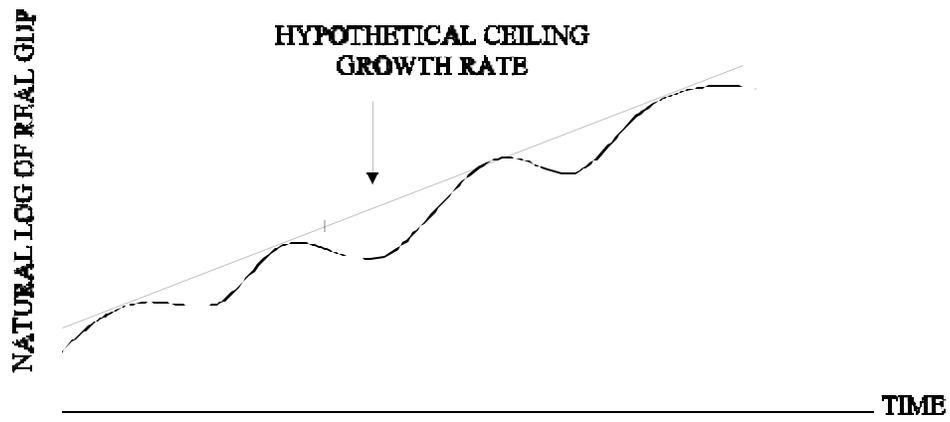


FIGURE 1: STYLIZED "PLUCKING MODEL" OF THE ECONOMY

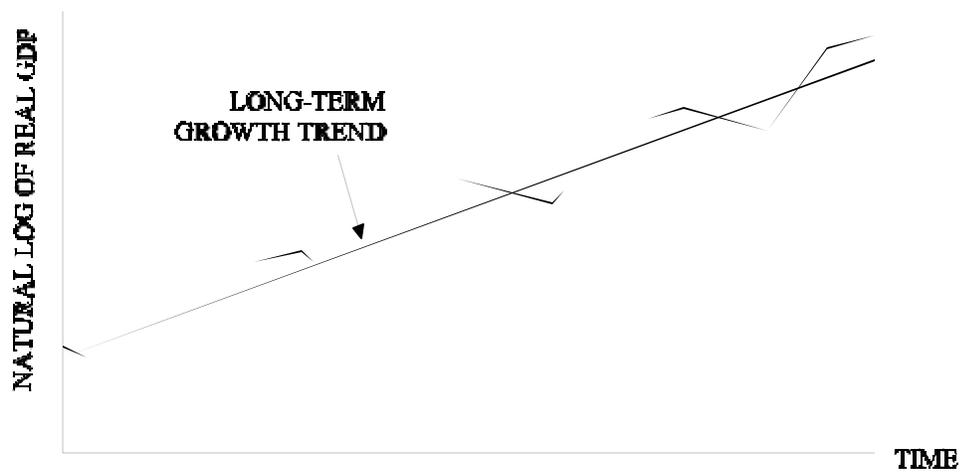


FIGURE 2: STYLIZED LONG-TERM GROWTH TREND

