

## 1: Models of business cycles. A review essay – NYU Scholars

*In this elegant and relatively non-technical survey, Lucas reviews the nature and consequences of recent developments in monetary and business cycle theory. He discusses the usefulness of alternative models in determining the effects of economic policy on consumption streams and individual welfare.*

Samuelson in his seminal paper convincingly showed that it is the interaction between the multiplier and accelerator that gives rise to cyclical fluctuations in economic activity. The multiplier alone cannot adequately explain the cyclical and cumulative nature of the economic fluctuations. An autonomous increase in the level of investment raises income by a magnified amount depending upon the value of the multiplier. This increase in income further induces the increases in investment through the acceleration effect. The increase in income brings about increase in aggregate demand for goods and services. To produce more goods we require more capital goods for which extra investment is undertaken. Thus the relationship between investment and income is one of mutual interaction; investment affects income which in turn affects investment demand and in this process income and employment fluctuate in a cyclical manner. We have shown below in Fig. Fluctuations in investment are the main cause of instability in a free private enterprise economy. This instability further increases due to the interaction of the multiplier and accelerator. The changes in any component of aggregate demand produce a multiplier effect whose magnitude depends upon the marginal propensity to consume. When consumption, income and output increase under the influence of multiplier effect, they induce further changes in investment and the extent of this induced investment in capital goods industries depends on the capital-output ratio, that is, the interaction between the multiplier and accelerator without any external shocks can give rise to the business cycles whose pattern differs depending upon the magnitudes of the marginal propensity to consume and capital-output ratio. The model of interaction between multiplier and accelerator can be mathematically represented as under: From the above equations it is evident that consumption in a period  $t$  is a function of income of the previous period  $Y_{t-1}$ . That is, one period lag has been assumed for income to determine the consumption of a period. As regards induced investment in period  $t$ , it is taken to be the function of the change in income in the previous period. This means that there is two periods gap for changes in income to determine induced investment. Substituting equations ii and iii in equation i we have the following income equation which states how changes in income are dependent on the values of marginal propensity to consume  $c$  and capital-output ratio  $v$ . Thus, in a dynamic state when autonomous investment changes, the equation iv describes the path which a disequilibrium system follows to reach either a final equilibrium state or moves away from it. But whether the economy moves towards a new equilibrium or deviates away from it depends on the values of marginal propensity to consume  $c$  and capital-output ratio  $v$ . By taking different combinations of the values of marginal propensity to consume  $c$  and capital-output ratio  $v$ , Samuelson has described different paths which the economy will follow. The various combinations of the values of marginal propensity to consume and capital-output ratio which respectively determine the magnitudes of multiplier and accelerator are shown in Fig. The five paths or patterns of movements which the economic activity as measured by gross national product or income can have depending upon various combinations of the values of marginal propensity to consume  $c$  and capital-output ratio  $v$  are depicted in Fig. When the combinations of the value of marginal propensity to consume  $c$  and capital-output ratio  $v$  lie within the region marked A, with a change in autonomous investment, the gross national product or income moves upward or downward at a decreasing rate and finally reaches a new equilibrium as is shown in panel a of Fig. If the values of  $c$  and  $v$  are such that they lie within the region B, the change in autonomous investment or autonomous consumption will generate fluctuations in income which follow the pattern of a series of damped cycles whose amplitudes go on declining until the cycles disappear as is shown in panel b of Fig. The region C in Fig. The situation is depicted in panel c of Fig. The region D in Fig. This is depicted in panel d of Fig. Like the values of multiplier and accelerator of region C, their values in region D cause the system to explode and diverge from the equilibrium state by an increasing amount. In a special case when values of  $c$  and  $v$  and therefore the magnitudes of multiplier and accelerator lie in region E of Fig. It follows from above that region

A and B are alike, they after a disturbance caused by a change in autonomous investment or consumption finally bring about stable equilibrium in the system. On the other hand, the values of  $c$  and  $v$  and therefore the magnitudes of multiplier and accelerator of region C and D resemble each other but are such that they cause great instability in the system as both of these values cause successively greater divergence from the equilibrium level and the system tends to explode. The case of region E lies in between the two as the combinations of values of  $c$  and  $v$  in it are such that cause cyclical movements of income which neither move toward nor away from the equilibrium. It is worth noting that all the above five cases do not give rise to cyclical fluctuations or business cycles. It is only combinations of  $c$  and  $v$  lying in regions B, C and E that produce business cycles. The values of accelerator and multiplier in the region A are such that with a disturbance caused by a change in autonomous investment or autonomous consumption, the economic activity as measured by the level of income or Gross National Product moves smoothly from an initial equilibrium to a new equilibrium with no cyclical fluctuations or oscillations. On the other hand, the values of  $c$  and  $v$  and therefore of multiplier and accelerator of the region B produce cyclical fluctuations which are of the type of damped oscillations that tend to disappear over time, that is, the amplitude of the cycles shrinks to zero over a period of time. However, this contradicts the historical experience which reveals that there is no tendency for the cyclical movements to disappear or die out over time. However, it is worth noting that the case B explains the impact of a single disturbance on income and employment. For example, the effect of a one time increase in autonomous investment goes on diminishing over time if no other disturbance takes place. However, in reality, further disturbances such as technological advances, innovations, natural disasters and man-made disasters such as security scam in India in do take place quite frequently and at random intervals and in a way they provide shocks to the system. Thus, the values of  $c$  and  $v$  of region B can generate cyclical fluctuations over time without dying out if the above-mentioned disturbances are occurring frequently at random. This results in business cycles whose duration and amplitude are quite irregular and not uniform. As a matter of fact, the business cycles in the real world also reveal such irregular pattern. But they are not consistent with the real world situation where oscillations do not become explosive. However, the values of multiplier and accelerator falling within region C can be made consistent with the actual world situation by incorporating in the analysis the so called buffers. Buffers are the factors which impose upper limit or ceiling on the expansion of income and output on the one hand or impose a lower limit or floor on the contraction of output and income on the other. With the inclusion of these buffers the otherwise explosive upward and downward fluctuations arising out of values of multiplier or MPC and accelerator or capital-output ratio of the region C can become limited cyclical fluctuations, characteristic of the real world situation. What has been said about case C above also applies to region D where the values of multiplier and accelerator are such that give rise to directly explosive upward or downward movement which can be restrained by the factors determining the ceiling and floor. However, the adequate explanation of the business cycles in this case would require the reasons why the system starts moving in the reverse direction, say, after striking the ceiling. Hicks in his famous theory of the business cycles provides the reasons which cause movement of the system in the reverse direction after it hits the ceiling or the floor as the case may be. Hicks theory of business cycles will be explained below at length. Lastly, the case E represents a situation where the business cycles neither try to disappear, nor try to explode, they go on continually with a constant amplitude. This however contradicts the real world situation and is quite impossible. This is because in the real world situation, business cycles differ a good deal in amplitude and duration. We have explained the interaction of multiplier and accelerator in case of various values of marginal propensity to consume  $c$  and capital-output ratio  $v$ . On the basis of the interaction of the multiplier and accelerator the two categories of business cycle theories have been put forward. One category of these business cycle theories assumes the values of multiplier and accelerator which generate explosive cycles. On the other hand, Hansen has propounded a business cycle theory based on the interaction of multiplier with a weak accelerator which produces only damped oscillations. Further, as indicated above, the interaction theories have been modified either by incorporating in the analysis erratic shocks or random disturbances or by including so called buffers which check-the upward movement of income and output by imposing ceiling of expansion and checking a downward movement by imposing a floor on the contraction of output. One of

the famous theories of business cycles based on the interaction of multiplier and accelerator which also incorporate buffers in his analysis of fluctuations is that put forward by the noted English economist J R. We discuss below his theory of business cycles in detail. How the interaction between the multiplier and accelerator gives rise to the cyclical movements in economic activity as measured by income or output will become clear from Table Further, one period time-lag has been assumed which implies that an increase in income in a period induces the increase in consumption in the next period. Similarly, the changes in induced consumption and induced investment and hence in income brought about by the initial increase in autonomous investment of Rs. It will be seen from column 5 of Table In this way we see that the interaction between the multiplier and accelerator can give rise to the cyclical movements of the economic activity and its various phases. It is worth mentioning that we have taken particular values of marginal propensity to consume which determine the size of the multiplier and capital-output ratio which determines the size of the accelerator. The other values of multiplier and accelerator that have been explained above would give rise to the different patterns of fluctuations.

## 2: Samuelson's Model of Business Cycles: Interaction between Multiplier and Accelerator

*Real business-cycle theory (RBC theory) is a class of new classical macroeconomics models in which business-cycle fluctuations to a large extent can be accounted for by real (in contrast to nominal) shocks.*

We define the distinction between productivity and employment risk and estimate the components of risk using wage and mobility data from the Panel Study of Income Dynamics. We then calibrate a model of intertemporal consumption and labor supply and study the effect of the two sources of risk on prec We then calibrate a model of intertemporal consumption and labor supply and study the effect of the two sources of risk on precautionary saving and labor supply. Finally, we measure the relative welfare costs of employment and productivity risk and the insurance contents of simple government programs. I extend the Epstein-Zin-lognormal consumption-based asset-pricing model to allow for general i. Information about the higher momentsâ€”equivalently, cumulantsâ€”of consumption growth is encoded in the cumulant-generating function CGF. I express four observable quantities the equity premium, riskless rate, consumption-wealth ratio and mean consumption growth and the Hansen-Jagannathan bound in terms of the CGF, and present applications. Models in which consumption is subject to occasional disasters can be handled easily and flexibly within the framework. The importance of higher cumulants is a double-edged sword: It is therefore desirable to make statements which do not depend on a particular calibrated consumption process. First, I use properties of the CGF to derive restrictions on the time-preference rate and elasticity of intertemporal substitution that must hold in any Epstein-Zin-i. In this paper, we consider the problem of measuring the business cycle. Then, we investigate the extent to which a general model-based approach to estimating trend and cycle for the U. We find empirical support for a nonlinear time series model that produces a business cycle measure with an asymmetric shape across NBER expansion and recession phases. Specifically, this business cycle measure suggests that recessions are periods of relatively large and negative transitory fluctuations in output. However, several close competitors to the nonlinear model produce business cycle measures of widely differing shapes and magnitudes. Given this model-based uncertainty, we construct a model-averaged measure of the business cycle. The model-averaged measure also displays an asymmetric shape and is closely related to other measures of economic Hujfrnan, Tax analysis in a real-business-cycle model by Jeremy Greenwood, Gregory W. Huffman - International Economic Review , " A tax-distorted real-business-cycle model is parameterized, calibrated, and solved numerically in an attempt to measure the size of Harberger Triangles relative to Okun Gaps. In particular, the model constructed is used to study, quantitatively, the impact of various distortional government tax and In particular, the model constructed is used to study, quantitatively, the impact of various distortional government tax and subsidy schemes. It is shown that the government can use tax policy to stabilize cyclical fluctuations, and this is done for the economy being studied. The benefits of implementing such a stabilization policy are calculated and compared with the size of the welfare gains realized from reducing various tax distortions. Deneckere - Journal of Economic Dynamics and Control , " This paper develops a tractable multisectoral dynamic equilibrium model and provides a fairly complete analysis of the dynamics that may arise along the intertemporal competitive equilibrium path. Despite the fact that the environment displays neither random nor deterministic variability, the model Despite the fact that the environment displays neither random nor deterministic variability, the model may produce oscillations in aggregate variables such as output. We show that these oscillations can be exactly periodic, of any finite period,I. We characterize the parameter values for which each of these cases occur. A Critique of Instrumentalism: Instrumentalism is the dominant methodological position amongst orthodox economists, which holds that realism of the theories is irrelevant. This paper challenges this view, arguing that the standard instrumentalist defence of abstract theories is inapplicable when the goal of the analysis is not pr This paper challenges this view, arguing that the standard instrumentalist defence of abstract theories is inapplicable when the goal of the analysis is not prediction. Moreover, it demonstrates that the good empirical performance does not confer legitimacy on a theory to be used for other purposes- such as conducting a welfare analysis. This has wide ranging implications for the

subject, suggesting that the current emphasis on using abstract macroeconomic models to derive policy recommendations on the basis of the welfare of the representative agent is invalid. More generally, it implies that the twin goals of predictive parsimony, and unifying macroeconomics with microfoundations and welfare economics are mutually incompatible. Several papers on international business cycles have documented spurious welfare reversals, in that incomplete market economies can produce higher welfare than the complete market economy. This paper demonstrates how conventional linearization, as used in King, Plosser, and Rebelo , can genera This paper demonstrates how conventional linearization, as used in King, Plosser, and Rebelo , can generate approximation errors that are large enough to result in such reversals. Using a twocountry production economy without capital, we argue that spurious welfare reversals are not only possible but also plausible under reasonable parameter values. We show that this method can be easily implemented to accurately approximate the exact solution and therefore produce the correct welfare ordering. The accuracy of the proposed method is far better than that of the conventional linearization method and as good as that of a method involving a second-order expansion. Show Context Citation Context Cole, Maurice Obstfeld , "

### 3: CiteSeerX " Citation Query Models of Business Cycles Basil

*The traditional business cycle theorists take into consideration the monetary and credit system of an economy to analyze business cycles. Therefore, theories developed by these traditional theorists are called monetary theory of business cycle.*

There were great increases in productivity, industrial production and real per capita product throughout the period from to that included the Long Depression and two other recessions. Both the Long and Great Depressions were characterized by overcapacity and market saturation. Productivity improving technologies historical. A table of innovations and long cycles can be seen at: There were frequent crises in Europe and America in the 19th and first half of the 20th century, specifically the period " This period started from the end of the Napoleonic wars in , which was immediately followed by the Post-Napoleonic depression in the United Kingdom "30 , and culminated in the Great Depression of "39, which led into World War II. The first of these crises not associated with a war was the Panic of The first declaration was in the late s, when the Phillips curve was seen as being able to steer the economy. However, this was followed by stagflation in the s, which discredited the theory. The second declaration was in the early s, following the stability and growth in the s and s in what came to be known as The Great Moderation. Notably, in , Robert Lucas , in his presidential address to the American Economic Association , declared that the "central problem of depression-prevention [has] been solved, for all practical purposes. Various regions have experienced prolonged depressions , most dramatically the economic crisis in former Eastern Bloc countries following the end of the Soviet Union in For several of these countries the period " has been an ongoing depression, with real income still lower than in Economic activity in the US, " Deviations from the long-term US growth trend, " In , economists Arthur F. Burns and Wesley C. Mitchell provided the now standard definition of business cycles in their book *Measuring Business Cycles*: The critical feature that distinguishes them from the commercial convulsions of earlier centuries or from the seasonal and other short term variations of our own age is that the fluctuations are widely diffused over the economy " its industry, its commercial dealings, and its tangles of finance. The economy of the western world is a system of closely interrelated parts. He who would understand business cycles must master the workings of an economic system organized largely in a network of free enterprises searching for profit. The problem of how business cycles come about is therefore inseparable from the problem of how a capitalist economy functions. An expansion is the period from a trough to a peak, and a recession as the period from a peak to a trough. The NBER identifies a recession as "a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production". For example, Milton Friedman said that calling the business cycle a "cycle" is a misnomer , because of its non-cyclical nature. Friedman believed that for the most part, excluding very large supply shocks, business declines are more of a monetary phenomenon. The main framework for explaining such fluctuations is Keynesian economics. In the Keynesian view, business cycles reflect the possibility that the economy may reach short-run equilibrium at levels below or above full employment. If the economy is operating with less than full employment, i. Beside the Keynesian explanation there are a number of alternative theories of business cycles, largely associated with particular schools or theorists in heterodox economics. A common alternative within mainstream economics is real business cycle theory. Nowadays other notable theories are credit-based explanations such as debt deflation and the financial instability hypothesis. The latter two gained interest for being able to explain the subprime mortgage crisis and financial crises. These may also broadly be classed as "supply-side" and "demand-side" explanations: This debate has important policy consequences: This division is not absolute " some classicals including Say argued for government policy to mitigate the damage of economic cycles, despite believing in external causes, while Austrian School economists argue against government involvement as only worsening crises, despite believing in internal causes. Until the Keynesian revolution in mainstream economics in the wake of the Great Depression , classical and neoclassical explanations exogenous causes were the mainstream explanation of economic cycles; following the Keynesian revolution, neoclassical macroeconomics was largely rejected.

There has been some resurgence of neoclassical approaches in the form of real business cycle RBC theory. The debate between Keynesians and neo-classical advocates was reawakened following the recession of 2008. Mainstream economists working in the neoclassical tradition, as opposed to the Keynesian tradition, have usually viewed the departures of the harmonic working of the market economy as due to exogenous influences, such as the State or its regulations, labor unions, business monopolies, or shocks due to technology or natural causes. Keynesian[ edit ] According to Keynesian economics , fluctuations in aggregate demand cause the economy to come to short run equilibrium at levels that are different from the full employment rate of output. These fluctuations express themselves as the observed business cycles. Keynesian models do not necessarily imply periodic business cycles. However, simple Keynesian models involving the interaction of the Keynesian multiplier and accelerator give rise to cyclical responses to initial shocks. The amplitude of the variations in economic output depends on the level of the investment, for investment determines the level of aggregate output multiplier , and is determined by aggregate demand accelerator. The fluctuations in wages are almost the same as in the level of employment wage cycle lags one period behind the employment cycle , for when the economy is at high employment, workers are able to demand rises in wages, whereas in periods of high unemployment, wages tend to fall. According to Goodwin, when unemployment and business profits rise, the output rises. Credit cycle and Debt deflation One alternative theory is that the primary cause of economic cycles is due to the credit cycle: In particular, the bursting of speculative bubbles is seen as the proximate cause of depressions, and this theory places finance and banks at the center of the business cycle. A primary theory in this vein is the debt deflation theory of Irving Fisher , which he proposed to explain the Great Depression. A more recent complementary theory is the Financial Instability Hypothesis of Hyman Minsky , and the credit theory of economic cycles is often associated with Post-Keynesian economics such as Steve Keen. Post-Keynesian economist Hyman Minsky has proposed an explanation of cycles founded on fluctuations in credit, interest rates and financial frailty, called the Financial Instability Hypothesis. In an expansion period, interest rates are low and companies easily borrow money from banks to invest. Banks are not reluctant to grant them loans, because expanding economic activity allows business increasing cash flows and therefore they will be able to easily pay back the loans. This process leads to firms becoming excessively indebted, so that they stop investing, and the economy goes into recession. Real business cycle theory[ edit ] Main article: Real Business Cycle theory Within mainstream economics, Keynesian views have been challenged by real business cycle models in which fluctuations are due to technology shocks. This theory is most associated with Finn E. Kydland and Edward C. Prescott , and more generally the Chicago school of economics freshwater economics. They consider that economic crisis and fluctuations cannot stem from a monetary shock, only from an external shock, such as an innovation. Vernon stated that some countries specialize in the production and export of technologically new products, while others specialize in the production of already known products. The most developed countries are able to invest large amounts of money in the technological innovations and produce new products, thus obtaining a dynamic comparative advantage over developing countries. Recent research by Georgiy Revyakin proves initial Vernon theory and shows that economic cycles in developed countries overrun economic cycles in developing countries. In case of Kondratiev waves such products correlate with fundamental discoveries implemented in production inventions which form the technological paradigm: Simultaneous technological updates by all economic agents as a result, cycle formation would be determined by highly competitive market conditions: Politically based business cycle[ edit ] Another set of models tries to derive the business cycle from political decisions. The partisan business cycle suggests that cycles result from the successive elections of administrations with different policy regimes. Regime A adopts expansionary policies, resulting in growth and inflation, but is voted out of office when inflation becomes unacceptably high. The replacement, Regime B, adopts contractionary policies reducing inflation and growth, and the downwards swing of the cycle. It is voted out of office when unemployment is too high, being replaced by Party A. The political business cycle is an alternative theory stating that when an administration of any hue is elected, it initially adopts a contractionary policy to reduce inflation and gain a reputation for economic competence. It then adopts an expansionary policy in the lead up to the next election, hoping to achieve simultaneously low inflation and unemployment

on election day. In recent years, proponents of the "electoral business cycle" theory[ who? Marxian economics[ edit ] For Marx the economy based on production of commodities to be sold in the market is intrinsically prone to crisis. In the heterodox Marxian view profit is the major engine of the market economy, but business capital profitability has a tendency to fall that recurrently creates crises, in which mass unemployment occurs, businesses fail, remaining capital is centralized and concentrated and profitability is recovered. In the long run these crises tend to be more severe and the system will eventually fail. Henryk Grossman [33] reviewed the debates and the counteracting tendencies and Paul Mattick subsequently emphasized the basic differences between the Marxian and the Keynesian perspective: Goodwin formalised a Marxist model of business cycles, known as the Goodwin Model in which recession was caused by increased bargaining power of workers a result of high employment in boom periods pushing up the wage share of national income, suppressing profits and leading to a breakdown in capital accumulation. Later theorists applying variants of the Goodwin model have identified both short and long period profit-led growth and distribution cycles in the United States, and elsewhere. Austrian business cycle theory Economists of the heterodox Austrian School argue that business cycles are caused by excessive issuance of credit by banks in fractional reserve banking systems. According to Austrian economists, excessive issuance of bank credit may be exacerbated if central bank monetary policy sets interest rates too low, and the resulting expansion of the money supply causes a "boom" in which resources are misallocated or "malinvested" because of artificially low interest rates. Eventually, the boom cannot be sustained and is followed by a "bust" in which the malinvestments are liquidated sold for less than their original cost and the money supply contracts. Mainstream economists generally do not support Austrian school explanations for business cycles, on both theoretical as well as real-world empirical grounds. Yield curve[ edit ] The slope of the yield curve is one of the most powerful predictors of future economic growth, inflation, and recessions. A positively sloped yield curve is often a harbinger of inflationary growth. Work by Arturo Estrella and Tobias Adrian has established the predictive power of an inverted yield curve to signal a recession. Their models show that when the difference between short-term interest rates they use 3-month T-bills and long-term interest rates year Treasury bonds at the end of a federal reserve tightening cycle is negative or less than 93 basis points positive that a rise in unemployment usually occurs. All the recessions in the US since up through have been preceded by an inverted yield curve year vs 3-month. Over the same time frame, every occurrence of an inverted yield curve has been followed by recession as declared by the NBER business cycle dating committee.

## 4: Theories of Business Cycles (Explained With Diagram)

*The business cycle is the natural rise and fall of economic growth that occurs over time. The cycle is a useful tool for analyzing the economy. It can also help you make better financial decisions. Each business cycle has four phases. They are expansion, peak, contraction, and trough. They.*

Some of the most important theories of business cycles are as follows: Pure Monetary Theory 2. Monetary Over-Investment Theory 3. A number of theories have been developed by different economists from time to time to understand the concept of business cycles. In the first half of twentieth century, various new and important concepts related to business cycles come into existence. However, in nineteenth century, many of the classical economists, such as Adam Smith, Mill, and Ricardo, have conducted a study on business cycles. They believed that stability of an economy depends on market forces. After that, many other economists, such as Keynes and Hicks, had provided a framework to understand business cycles. The different theories of business cycle are shown in Figure The different theories of business cycles as shown in Figure-3 are explained in detail. The traditional business cycle theorists take into consideration the monetary and credit system of an economy to analyze business cycles. Therefore, theories developed by these traditional theorists are called monetary theory of business cycle. The monetary theory states that the business cycle is a result of changes in monetary and credit market conditions. Hawtrey, the main supporter of this theory, advocated that business cycles are the continuous phases of inflation and deflation. According to him, changes in an economy take place due to changes in the flow of money. For example, when there is increase in money supply, there would be increase in prices, profits, and total output. This results in the growth of an economy. On the other hand, a fall in money supply would result in decrease in prices, profit, and total output, which would lead to decline of an economy. Apart from this, Hawtrey also advocated that the main factor that influences the flow of money is credit mechanism. In economy, the banking system plays an important role in increasing money flow by providing credit. An economy shows growth when the volume of bank credit increases. This increase in the growth continues till the volume of bank credit increases. Banks offer credit facilities to individuals or organizations due to the fact that banks find it profitable to provide credit on easy terms. The easy availability of funds from banks helps organizations to perform various business activities. This leads to increase in various investment opportunities, which further results in deepening and widening of capital. Apart from this, credit provided by banks on easy terms helps organizations to expand their production. When an organization increases its production, the supply of its products also increases to a certain limit. After that, the rate of increase in demand of products in market is higher than the rate of increase in supply. Consequently, the prices of products increases. Therefore, credit expansion helps in expansion of economy. On the contrary, the economic condition is reversed when the bank starts withdrawing credit from market or stop lending money. This is because of the reason that the cash reserves of bank are washed-out due to the following reasons: Increase in loans and advance provided by banks b. Withdrawal of deposits for better investment opportunities When banks stop providing credit, it reduces investment by businessmen. This leads to the decrease in the demand for consumer and capital goods, prices, and consumption. This marks the symptoms of recession. Some of the points on which the pure monetary theory is criticized are as follows: Regards business cycle as monetary phenomenon that is not true. Apart from monetary factors, several non-monetary factors, such as new investment demands, cost structure, and expectations of businessmen, can also produce changes in economic activities. Describes only expansion and recession phases and fails to explain the intermediary phases of business cycles. Assumes that businessmen are more sensitive to the interest rates that is not true rather they are more concerned about the future opportunities. Monetary over-investment theory focuses mainly on the imbalance between actual and desired investments. According to this theory, the actual investment is much higher than the desired investment. This theory was given by Hayek. According to him, the investment and consumption patterns of an economy should match with each other to bring the economy in equilibrium. For stabilizing this equilibrium, the voluntary savings should be equal to actual investment in an economy. In an economy, generally, the total investment is distributed among industries in such a way that

each industry produces products to a limit, so that its demand and supply are equal. This implies that the investment at every level and for every product in the whole economy is equal. As a result, there would be no expansion and contraction and the economy would always be in equilibrium. According to this theory, changes in economic conditions would occur only when the money supply and investment-saving relations show fluctuations. The investment-saving relations are affected when there is an increase in investment opportunities and voluntary savings are constant. Investment opportunities increase due to several reasons, such as low interest rates, increased marginal efficiency of capital, and increase in expectations of businessmen. Apart from this, when banks start supporting industries for investment by lending money at lower rates, it results in an increase in investment. In such a case, investment and savings increase, but the consumption remains unaffected as there is no change in consumer goods industries. Consequently, profit increases with increase in investment opportunities, which further results in an increase in the demand for various products and services. The demand for products and services exceeds the supply of products and services. This leads to inflation in the economy, which reduces the purchasing power of individuals. Therefore, with decrease in the purchasing power of individuals, the real demand for products does not increase at the same rate at which the investment increases. The real investment is done at the cost of real consumption. The balance between the investment and consumer demand is disturbed. As a result, it is difficult to maintain the current rate of investment. The demand of consumer goods would be dependent on the income of individuals. An increase in the income level would result in the increase of consumer goods. However, the increase in consumer goods is more than the increase in capital goods. Therefore, people would invest in consumer goods rather than in capital goods. Consequently, the demand for bank credit also increases. However, the bankers are not ready to lend money because of the demand for funds from consumer and capital goods industry both. This leads to recession in the economy. As a result, economic activities, such as employment, investment, savings, consumption, and prices of goods and services, start declining. Some of the limitations of monetary over-investment theory are as follows: Assumes that when the market rate of interest is lower than the natural market rate of interest, the bank credit flows to the capital goods industry. This is applicable only in the situation of full employment. However, business cycles are the part of an economy and can take place under improper utilization of resources. Considers interest rate as the most important factor that affects investment. However, there are several factors, such as capital goods cost and businessmen expectations, which can influence investment. Focuses on balance between consumer goods and investment, which is not much required. The other theories of business cycles lay emphasis on investment and monetary expansion. Innovations are such changes of the combination of the factors of production as cannot be effected by infinitesimal steps or variations on the margin. In addition, he propounded that innovations are responsible for the occurrence of business cycles. He also designed a model having two stages, namely, first approximation and second approximation. The two stages of the model are discussed as follows: Deals with the effect of innovatory ideas on an economy in the beginning. First approximation is the startup stage of innovation in which the economy is in equilibrium. In addition, at this stage, there is no involuntary unemployment. In equilibrium, organizations lack idle funds or surplus funds to invest. In such a case, banks are the only source of funds for innovators. When the innovators get the desired fund from banks, they purchase inputs for production at a higher price to make these inputs available only for innovation purposes. Increase in prices of inputs result in the rise of prices. Over time, competitors also start copying innovation and acquire funds from bank. As a result, the output and profit of organizations start increasing. However, after a certain point of time, profit shows decline with a decrease in output prices. Simultaneously, debtors need to repay their debts to bank. This leads to decrease in the flow of money, which finally results in recession. Deals with the subsequent effects of first approximation. It is related to the speculation of future economic conditions. In first approximation, it is assumed by investors that the expansion phase would not be affected in future, especially in capital goods industries. On the basis of this belief, investors take large amounts of money from banks. In addition, in this stage, customers perceive an increase in the durable goods in future and therefore, start purchasing goods at present by borrowing funds. When the prices start falling, debtors are in the worst situation because they are not able to repay loan and meet their basic needs.

### 5: Robert Lucas, rational expectations, and the understanding of business cycles | LARS P. SYLL

Article shared by. The following points highlight the top two models of trade cycle. The models are: [www.enganchecubano.com](http://www.enganchecubano.com)'s Model of Business Cycle [www.enganchecubano.com](http://www.enganchecubano.com)'s Model of the Trade Cycle.

Interaction between Multiplier and Accelerator Article shared by: Interaction between Multiplier and Accelerator! Further, by putting forward the theory of multiplier, Keynes has shown how the effect of increase and decrease in investment on output and employment get magnified when multiplier is working during either the upswing or downswing of a business cycle. However, Keynes did not explain the cyclical and cumulative nature of the fluctuations in economic activity. This is because Keynes did not give any importance to the accelerator in his explanation of business cycles. Samuelson in his seminal paper convincingly showed that it is the interaction between the multiplier and accelerator that gives rise to cyclical fluctuations in economic activity. An autonomous increase in the level of investment raises income by a magnified amount depending upon the value of the multiplier. This increase in income further induces the increases in investment through the acceleration effect. The increase in income brings about increase in aggregate demand for goods and services. To produce more goods we require more capital goods for which extra investment is undertaken. Thus the relationship between investment and income is one of mutual interaction; investment affects income which in turn affects investment demand and in this process income and employment fluctuate in a cyclical manner. We have shown below in Fig. Fluctuations in investment are the main cause of instability in a free private-enterprise economy. When consumption, income and output increase under the influence of multiplier effect, they induce further changes in investment and the extent of this induced investment in capital goods industries depends on the capital-output ratio, that is, the interaction between the multiplier and accelerator without any external shocks can give rise to the business cycles whose pattern differs depending upon the magnitudes of the marginal propensity to consume and capital-output ratio. The model of interaction between multiplier and accelerator can be mathematically represented as under: From the above equations it is evident that consumption in a period  $t$  is a function of income of the previous period  $Y_{t-1}$ . That is, one period lag has been assumed for income to determine the consumption of a period. As regards induced investment in period  $t$ , it is taken to be the function of the change in income in the previous period. This means that there is two periods gap for changes in income to determine induced investment. Substituting equations ii and iii in equation i we have the following income equation which states how changes in income are dependent on the values of marginal propensity to consume  $c$  and capital-output ratio  $v$ . Thus, in a dynamic state when autonomous investment changes, the equation iv describes the path which a disequilibrium system follows to reach either a final equilibrium state or moves away from it. By taking different combinations of the values of marginal propensity to consume  $c$  and capital-output ratio  $v$ , Samuelson has described different paths which the economy will follow. The various combinations of the values of marginal propensity to consume and capital-output ratio which respectively determine the magnitudes of multiplier and accelerator are shown in Fig. The four paths or patterns of movements which the economic activity as measured by gross national product or income can have depending upon various combinations of the values of marginal propensity to consume  $c$  and capital-output ratio  $v$  are depicted in Fig. When the combinations of the value of marginal propensity to consume  $c$  and capital-output ratio  $v$  lie within the region marked A, with a change in autonomous investment, the gross national product or income moves upward or downward at a decreasing rate and finally reaches a new equilibrium as is shown in panel a of Fig. The region C in Fig. The situation is depicted in panel c of Fig. This is depicted in panel d of Fig. The case of region E lies in between the two as the combinations of values of  $c$  and  $v$  in it are such that cause cyclical movements of income which neither move toward nor away from the equilibrium. It is worth noting that all the above five cases do not give rise to cyclical fluctuations or business cycles. On the other hand, the values of  $c$  and  $v$  and therefore of multiplier and accelerator of the region B produce cyclical fluctuations which are of the type of damped oscillations that tend to disappear over time, that is, the amplitude of the cycles shrinks to zero over a period of time. However, this contradicts the historical experience which reveals that there is no tendency for the cyclical movements to

disappear or die out over time. However, it is worth noting that the case B explains the impact of a single disturbance on income and employment. For example, the effect of a onetime increase in autonomous investment goes on diminishing over time if no other disturbance takes place. However, in reality, further disturbances such as technological advances, innovations, natural disasters and man-made disasters such as security scam in India in do take place quite frequently and at random intervals and in a way they provide shocks to the system. Thus, the values of  $c$  and  $v$  of region B can generate cyclical fluctuations over time without dying out if the above-mentioned disturbances are occurring frequently at random. This results in business cycles whose duration and amplitude are quite irregular and not uniform. As a matter of fact, the business cycles in the real world also reveal such irregular pattern. But they are not consistent with the real world situation where oscillations do not become explosive. However, the values of multiplier and accelerator falling within region C can be made consistent with the actual world situation by incorporating in the analysis the so called buffers. Buffers are the factors which impose upper limit or ceiling on the expansion of income and output on the one hand or impose a lower limit or floor on the contraction of output and income on the other. With the inclusion of these buffers the otherwise explosive upward and downward fluctuations arising out of values of multiplier or MPC and accelerator or capital-output ratio of the region C can become limited cyclical fluctuations, characteristic of the real world situation. However, the adequate explanation of the business cycles in this case would require the reasons why the system starts moving in the reverse direction, say, after striking the ceiling. Hicks in his famous theory of the business cycles provide the reasons which cause movement of the system in the reverse direction after it hits the ceiling or the floor as the case may be. Lastly, the case E represents a situation where the business cycles neither try to disappear, nor try to explode, they go on continually with constant amplitude. This however contradicts the real world situation and is quite impossible. This is because in the real world situation, business cycles differ a good deal in amplitude and duration. We have explained the interaction of multiplier and accelerator in case of various values of marginal propensity to consume  $c$  and capital-output ratio  $v$ . On the basis of the interaction of the multiplier and accelerator the two categories of business cycle theories have been put forward. One category of these business cycle theories assumes the values of multiplier and accelerator which generate explosive cycles. On the other hand, Hansen has propounded a business cycle theory based on the interaction of multiplier with a weak accelerator which produces only damped oscillations. Further, as indicated above, the interaction theories have been modified either by incorporating in the analysis erratic shocks or random disturbances or by including so called buffers which check the upward movement of income and output by imposing ceiling of expansion and checking a downward movement by imposing a floor on the contraction of output. We discuss below his theory of business cycles in detail. Further, one period time lag has been assumed which implies that an increase in income in a period induces the increase in consumption in the next period. Similarly, the changes in induced consumption and induced investment and hence in income brought about by the initial increase in autonomous investment of Rs. It will be seen from column 5 of the Table In this way we see that the interaction between the multiplier and accelerator can give rise to the cyclical movements of the economic activity and its various phases. It is worth mentioning that we have taken particular values of marginal propensity to consume which determine the size of the multiplier and capital-output ratio which determines the size of the accelerator.

## 6: Samuelson's Model of Business Cycle (With Diagrams)

*of a unified explanation of business cycles, grounded in the general laws governing market economies, rather than in political or institutional characteristics specific to particular countries or periods.*

Business cycles[ edit ] If we were to take snapshots of an economy at different points in time, no two photos would look alike. This occurs for two reasons: Many advanced economies exhibit sustained growth over time. That is, snapshots taken many years apart will most likely depict higher levels of economic activity in the later period. There exist seemingly random fluctuations around this growth trend. Thus given two snapshots in time, predicting the latter with the earlier is nearly impossible. While we see continuous growth of output, it is not a steady increase. There are times of faster growth and times of slower growth. Figure 2 transforms these levels into growth rates of real GNP and extracts a smoother growth trend. A common method to obtain this trend is the Hodrick-Prescott filter. The basic idea is to find a balance between the extent to which general growth trend follows the cyclical movement since long term growth rate is not likely to be perfectly constant and how smooth it is. The HP filter identifies the longer term fluctuations as part of the growth trend while classifying the more jumpy fluctuations as part of the cyclical component. Economists refer to these cyclical movements about the trend as business cycles. Figure 3 explicitly captures such deviations. Note the horizontal axis at 0. A point on this line indicates at that year, there is no deviation from the trend. All other points above and below the line imply deviations. By using log real GNP the distance between any point and the 0 line roughly equals the percentage deviation from the long run growth trend. Also note that the Y-axis uses very small values. This indicates that the deviations in real GNP are very small comparatively, and might be attributable to measurement errors rather than real deviations. We call relatively large negative deviations those below the 0 axis troughs. A series of positive deviations leading to peaks are booms and a series of negative deviations leading to troughs are recessions. At a glance, the deviations just look like a string of waves bunched together—nothing about it appears consistent. To explain causes of such fluctuations may appear rather difficult given these irregularities. However, if we consider other macroeconomic variables, we will observe patterns in these irregularities. For example, consider Figure 4 which depicts fluctuations in output and consumption spending, *i*. Observe how the peaks and troughs align at almost the same places and how the upturns and downturns coincide. For example, a labor, hours worked *b* productivity, how effective firms use such capital or labor, *c* investment, amount of capital saved to help future endeavors, and *d* capital stock, value of machines, buildings and other equipment that help firms produce their goods. While Figure 5 shows a similar story for investment, the relationship with capital in Figure 6 departs from the story. We need a way to pin down a better story; one way is to look at some statistics. For example, if we take any point in the series above the trend the x-axis in figure 3, the probability the next period is still above the trend is very high. However, this persistence wears out over time. That is, economic activity in the short run is quite predictable but due to the irregular long-term nature of fluctuations, forecasting in the long run is much more difficult if not impossible. Another regularity is cyclical variability. Column A of Table 1 lists a measure of this with standard deviations. The magnitude of fluctuations in output and hours worked are nearly equal. Consumption and productivity are similarly much smoother than output while investment fluctuates much more than output. The capital stock is the least volatile of the indicators. TABLE 1 Yet another regularity is the co-movement between output and the other macroeconomic variables. Figures 4 – 6 illustrated such relationship. We can measure this in more detail using correlations as listed in column B of Table 1. Procyclical variables have positive correlations since it usually increases during booms and decreases during recessions. Vice versa, a countercyclical variable associates with negative correlations. Acyclical, correlations close to zero, implies no systematic relationship to the business cycle. We find that productivity is slightly procyclical. This implies workers and capital are more productive when the economy is experiencing a boom. They are not quite as productive when the economy is experiencing a slowdown. Similar explanations follow for consumption and investment, which are strongly procyclical. Labor is also procyclical while capital stock appears acyclical. Observing these similarities yet seemingly non-deterministic fluctuations about trend, the

question arises as to why any of this occurs. Since people prefer economic booms over recessions, it follows that if all people in the economy make optimal decisions, these fluctuations are caused by something outside the decision-making process. So the key question really is: Economists have come up with many ideas to answer the above question. The one which currently dominates the academic literature on real business cycle theory [ citation needed ] was introduced by Finn E. Kydland and Edward C. They envisioned this factor to be technological shocks<sup>1</sup>. Examples of such shocks include innovations, bad weather, imported oil price increase, stricter environmental and safety regulations, etc. This in turn affects the decisions of workers and firms, who in turn change what they buy and produce and thus eventually affect output. RBC models predict time sequences of allocation for consumption, investment, etc. But exactly how do these productivity shocks cause ups and downs in economic activity? This momentarily increases the effectiveness of workers and capital, allowing a given level of capital and labor to produce more output. Individuals face two types of tradeoffs. One is the consumption-investment decision. Since productivity is higher, people have more output to consume. An individual might choose to consume all of it today. But if he values future consumption, all that extra output might not be worth consuming in its entirety today. Instead, he may consume some but invest the rest in capital to enhance production in subsequent periods and thus increase future consumption. This explains why investment spending is more volatile than consumption. The life cycle hypothesis argues that households base their consumption decisions on expected lifetime income and so they prefer to "smooth" consumption over time. They will thus save and invest in periods of high income and defer consumption of this to periods of low income. The other decision is the labor-leisure tradeoff. Higher productivity encourages substitution of current work for future work since workers will earn more per hour today compared to tomorrow. More labor and less leisure results in higher output today. On the other hand, there is an opposing effect: However, given the pro-cyclical nature of labor, it seems that the above substitution effect dominates this income effect. Overall, the basic RBC model predicts that given a temporary shock, output, consumption, investment and labor all rise above their long-term trends and hence formulate into a positive deviation. Furthermore, since more investment means more capital is available for the future, a short-lived shock may have an impact in the future. That is, above-trend behavior may persist for some time even after the shock disappears. This capital accumulation is often referred to as an internal "propagation mechanism", since it may increase the persistence of shocks to output. A string of such productivity shocks will likely result in a boom. Similarly, recessions follow a string of bad shocks to the economy. If there were no shocks, the economy would just continue following the growth trend with no business cycles. To quantitatively match the stylized facts in Table 1, Kydland and Prescott introduced calibration techniques. Using this methodology, the model closely mimics many business cycle properties. Yet current RBC models have not fully explained all behavior and neoclassical economists are still searching for better variations. The main assumption in RBC theory is that individuals and firms respond optimally all the time. It follows that business cycles exhibited in an economy are chosen in preference to no business cycles at all. This is not to say that people like to be in a recession. Slumps are preceded by an undesirable productivity shock which constrains the situation. But given these new constraints, people will still achieve the best outcomes possible and markets will react efficiently. So when there is a slump, people are choosing to be in that slump because given the situation, it is the best solution. This suggests laissez-faire non-intervention is the best policy of government towards the economy but given the abstract nature of the model, this has been debated. This meant they worked and consumed more or less than otherwise. In a world of perfect information, there would be no booms or recessions. Calibration [ edit ] Unlike estimation, which is usually used for the construction of economic models, calibration only returns to the drawing board to change the model in the face of overwhelming evidence against the model being correct; this inverts the burden of proof away from the builder of the model. In fact, simply stated, it is the process of changing the model to fit the data. Since RBC models explain data ex post, it is very difficult to falsify any one model that could be hypothesised to explain the data. RBC models are highly sample specific, leading some [ who? Structural variables [ edit ] Crucial to RBC models, "plausible values" for structural variables such as the discount rate, and the rate of capital depreciation are used in the creation of simulated variable paths.

**7: Real business-cycle theory - Wikipedia**

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Hicks put forward a complete theory of business cycles based on the interaction between the multiplier and accelerator by choosing certain values of marginal propensity to consume  $c$  and capital-output ratio  $v$  which he thinks are representative of the real world situation. In case values of these parameters lie in the region C, they produce cyclical movements  $i$ . To explain business cycles of the real world which do not tend to explode, Hicks has incorporated in his analysis the role of buffers. In other words, cyclical fluctuations in real output of goods and services take place above and below this rising line of trend or growth of income and output. Thus in his theory he explains business cycles along with an equilibrium rate of growth. Hicks assume that autonomous investment, depending as it is on technological progress, innovations and population growth, grows at a constant rate. With further assumptions of stable multiplier and accelerator, equilibrium income will grow at the same rate as autonomous investment. It follows therefore that the failure of actual output to increase along the equilibrium growth path, sometimes to move above it and sometimes to move below it determines the business cycles. In this figure, AA line represents autonomous investment. Given the marginal propensity to consume, the simple multiplier is determined. Then the magnitude of multiplier and autonomous investment together determine the equilibrium path of income shown by the line LL. Hicks calls this the floor line as this sets the lower limits below which income output cannot fall because of a given rate of growth of autonomous investment and the given size of the multiplier. But induced investment has not yet been taken into account. If national income grows from one year to the next, as it would move along the line LL, there is some amount of induced investment via accelerator. The line EE shows the equilibrium growth path of national income determined by autonomous investment and the combined effect of the multiplier and accelerator. FF is the full employment ceiling. It is a line that shows the maximum national output at any period of time when all the available resources of the economy are fully employed. Thus starting from point E, the economy will be in equilibrium moving along the path EE determined by the combined effect of multiplier and accelerator and the growing level of the autonomous investment. When the economy experiences such an outburst of autonomous investment it pushes the economy above the equilibrium growth path EE after point P0. The rise in autonomous investment due to external shock causes national income to increase at a greater rate than that shown by the slope of EE. This greater increase in national income will cause further increase in induced investment through acceleration effect. This increase in induced investment causes national income to increase by a magnified amount through multiplier. So under the combined effect of multiplier and accelerator, national income or output will rapidly expand along the path from P0 to P1. Movement from P0 to P1 represents the upswing or expansion phase of the business cycle. But this expansion must stop at P1 because this is the full employment output ceiling. The limited human and material resources of the economy do not permit a greater expansion of national income than shown by the ceiling line CC. Therefore, when point P1 is reached the rapid growth of national income must come to an end. Hicks assumes that the full employment ceiling grows at the same rate as autonomous investment. Therefore, CC slopes gently unlike the very steep slope of the line from P0 to P1. For a short time the economy may crawl along the full employment ceiling CC. But because national income has ceased to increase at the rapid rate, the induced investment via accelerator falls off to the level consistent with the modest rate of growth determined by the constant rate of growth of autonomous investment. But the economy cannot crawl along its full employment ceiling for a long time. The sharp decline in growth of income and consumption when the economy strikes the ceiling causes a sharp decline in induced investment. Thus with the sharp decline in induced investment when national income and hence consumption ceases to increase rapidly, the contraction in the level of the income and business actually must begin. Once the downswing starts, the accelerator works in the reverse direction. That is, since the change in income is now negative the inducement to invest must begin to decrease. Thus there is slackening off at point P2 and national income starts moving toward equilibrium growth path EE. This movement from P2 downward therefore represents the downswing or contraction phase of the business cycle.

In this downswing investment falls off rapidly and therefore multiplier works in the reverse direction. The fall in national income and output resulting from the sharp fall in induced investment will not stop on touching the level EE but will go further down. The economy must consequently move all the way down from point P2 to point Q1. But at point Q1 the floor has been reached. Whereas the upswing was limited by the output ceiling set by the full employment of available resources, in the downswing the national income cannot fall below the level of output represented by the floor. This is because the floor level is determined by simple multiplier and autonomous investment growing at constant rate, while during the downswing after a point accelerator ceases to operate. It may be noted that during downswing the limit to negative investment disinvestment and therefore the limit to the contraction of output is set by the depreciation of capital stock. There is no way for the businessmen to make disinvestment at a desired rate higher than the depreciation. After hitting the floor the economy may for some time crawl along the floor through the path Q1 to Q2. In doing so, there is some growth in the level of national income. This rate of growth as before induces investment and both the multiplier and accelerator come into operation and the economy will move towards Q3 and the full employment ceiling CC. This is how the upswing of cyclical movement again starts. If the rigid form of acceleration principle is not valid, then the interaction of the multiplier and accelerator which is the crucial concept of the Hicksian theory of trade cycles is not valid. It may be noted that Kaldor puts forward a theory of business cycles which does not make use of the rigid or strict form of the acceleration principle. In his trade cycle theory Kaldor provides for investment being directly related to the level of income and inversely related to the stock of capital. A look at the above investment function used by Kaldor will reveal that investment is directly related to the income and inversely related to the stock of capital. Thus in Kaldor- Goodwin investment function, the increase in income, the capital stock remaining constant, will cause an increase in investment which will enlarge the stock of capital. On the other hand, according to this new investment function, if capital stock increases, output or income remaining constant, investment will fall due to its being negatively related to capital stock. Thus Kaldor- Goodwin approach to investment while gives up the rigid acceleration principle but still retains the basic idea of investment related to income because in this approach investment will cause the capital stock to expand towards the stock of capital as desired for the production of output of the preceding year. Even its critics such as Kaldor though indicating some of its weaknesses acknowledge its merit.

### 8: [www.enganchecubano.com](http://www.enganchecubano.com): Customer reviews: Models of Business Cycles

*What is the 'Business Cycle' The business cycle describes the rise and fall in production output of goods and services in an economy. Business cycles are generally measured using rise and fall in.*

In fact in this essay it will be argued that modern orthodox neoclassical economic theory in general does not pass the smell test at all. The recent economic crisis and the fact that orthodox economic theory has had next to nothing to contribute in understanding it, shows that neoclassical economics "in Lakatosian terms" is a degenerative research program in dire need of replacement. To that end I will below present "with emphasis on the chosen model-building strategy" a paradigmatic example, Robert Lucas business cycles theory, to exemplify and diagnose neoclassical economic theory as practiced nowadays. This modeling activity is considered useful and essential. Since fully-fledged experiments on a societal scale as a rule are prohibitively expensive, ethically indefensible or unmanageable, economic theorists have to substitute experimenting with something else. We are storytellers, operating much of the time in worlds of make believe. We do not find that the realm of imagination and ideas is an alternative to, or retreat from, practical reality. On the contrary, it is the only way we have found to think seriously about reality. To Lucas business cycles is an inherently systemic phenomenon basically characterized by conditional co-variations of different time series. As noted by Hoover [ It is rather that, in order to obtain an invariant relation, one must derive the functional form to be estimated from the underlying choices of individual agents. Lucas supposes that this means that one must derive aggregate relations from individual optimization problems taking only tastes and technology as given. Why should involuntary unemployment, for example, be considered an unintelligible disequilibrium concept? Given the lack of success of these models when empirically applied, what is unintelligible, is rather to pursue in this reinterpretation of the ups and downs in business cycles and labour markets as equilibria. To Keynes involuntary unemployment is not equatable to actors on the labour market becoming irrational non-optimizers. It is basically a reduction in the range of working-options open to workers, regardless of any volitional optimality choices made on their part. Involuntary unemployment is excess supply of labour. That unemployed in Lucas business cycles models only can be conceived of as having chosen leisure over work is not a substantive argument about real world unemployment. This is his preference given his options. For the new classicals, the unemployed have placed and lost a bet. It is sad perhaps, but optimal [Hoover Sometimes workers are not employed. All economic theories have to somehow deal with the daunting question of uncertainty and risk. This hypothesis [Lucas To me this seems much like putting the cart before the horse. Instead of adapting the model to the object "which from both ontological and epistemological considerations seem the natural thing to do" Lucas proceeds in the opposite way and chooses to define his object and construct a model solely to suit own methodological and theoretical preferences. All those "interesting and important" features of business cycles that have anything to do with model-theoretical openness, and a fortiori not possible to squeeze into the closure of the model, are excluded. One might rightly ask what is left of that we in a common sense meaning refer to as business cycles. Lucas "and neoclassical economics at large" does not heed the implied apt warning. The model should enable us to posit contrafactual questions about what would happen if some variable was to change in a specific way. Hence the assumption of structural invariance, that purportedly enables the theoretical economist to do just that. There are simply too many competing illustrations and stories that could be exhibited or told. To my knowledge no in any way decisive empirical evidence have been presented. They too are part and parcel of an ever-changing and open economy. No matter how clear, precise, rigorous or certain the inferences delivered inside these models are, they do not per se say anything about external validity. But in the realm of science it ought to be considered of little or no value to simply make claims about the model and lose sight of the other part of the model-target dyad. Neoclassical economics has since long given up on the real world and contents itself with proving things about thought up worlds. Empirical evidence only plays a minor role in economic theory, where models largely function as a substitute for empirical evidence. Hopefully humbled by the manifest failure of its theoretical pretences, the one-sided, almost religious, insistence on mathematical-deductivist

modeling as the only scientific activity worthy of pursuing in economics will give way to methodological pluralism based on ontological considerations rather than formalistic tractability. If not, we will have to keep on wondering "with Robert Solow" what planet the economic theoretician is on. In Dalla Chiara et al eds. *Revue Internationale De Philosophie* The Microfoundations of Macroeconomics. Manuscript, 27 May The University of Chicago Press.

### 9: Business cycle - Wikipedia

*Samuelson's Model of Business Cycles: Interaction between Multiplier and Accelerator! Keynes made an important contribution to the understanding of the cyclical fluctuations by pointing out that it is the ups and downs in investment demand, depending as it is on the profit expectations of the.*

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