Introductory Macroeconomics
Semester -4, Economics (Hons) CBCS
Real Business Cycle Model
(New Classical Approach)
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Real business cycle theory is an outgrowth of the new classical theory. Real business cycle theorists believe that the supply side variables are only responsible for the fluctuations in output and employment .Factors that might cause such changes include

1. Shocks to technology
2. Variations in environmental conditions,
3. Changes in real prices of imported raw material (e.g., crude oil)and
4. Changes in tax rates

Real business cycle theorists proposed that real supply side factors are simply more important than nominal demand side influences. In this interpretation the model is just variation of the new classical model which can also incorporate supply side shocks. Real business cycle theorists differentiate their model from new classical model as they asserted a much stronger position, that is, the monetary and other nominal demand side shocks have no significant effect on output and employment. Many real business cycle models do not even include money as a variable. Business cycle model view aggregate economic variable as the outcomes of the decision made by many individual agents acting to maximize their utility subject to production possibilities and resource constraints. As such the models have an explicit and firm foundation in microeconomics. We now construct a simple model of this type. Having constructed the model we consider how optimizing economic agents respond to changes in economic condition and the implications of their responses for the behaviour of the aggregate economic variables..

Real business cycle theorists assume that:

1. All prices are flexible, even in short run.

2.money is neutral, even in short run.

3. classical dichotomy holds at all times.

4. Fluctuations in output, employment, and other variables are the optimal responses to exogenous changes in the economic environment.

5. Productivity shocks are the primary cause of economic fluctuations.

A Usual assumption in business cycle model is that the economy is populated by a group of identical individuals. The behaviour of the group can then be explained in terms of the behaviour of an individual called a representative agent. we will call the agent Robinson Crusoe Crusoe divides his time between leisure and working. He does two works. Catching fish (production)and making fishing nets (investment). Crusoe optimizes given the constraints he faces.

When a big school of fish swims by the island, GDP rises. Crusoe's fishing productivity is higher. Crusoe's employment rises.He decides to shift some time from leisure to fishing to take advantage of the high productivity.

When big storm hits the island, GDP falls. The storm reduces productivity. So Crusoe spends less time fishing for consumption. Investment falls, because it's easy to postpone making nets until storm passes. Employment falls. Since he's not spending as much time fishing or making nets, Crusoe decides to enjoy more leisure time.

In Real Business Cycle theory, fluctuations in our economy are similar to those in Crusoe's economy.

The debate over RBC theory boils down to four issues:

1. Do changes in employment reflect voluntary changes in labour supply?

2. Does the economy experience large, exogenous productivity shocks in the short run?

3. Is money really neutral in the short run?

4. Are wages and prices flexible in the short run? Do they adjust quickly to keep supply and demand in balance in all markets?

In RBC model labour market practices intertemporal substitution of labour: In RBC theory, workers are willing to reallocate labour over time in response to changes in the reward to working now versus later.

The intertemporal relative wage = $(1 + r)\, W_1 / W_2$

Where W_1 is the wage in period 1 (the present) and W_2 is the wage in period 2 (the future).

Then inlabour market in RBC theory,

1. **shocks cause fluctuations in the intertemporal relative wage**
2. **workers respond by adjusting labour supply**
3. **this causes employment and output to fluctuate**

Critics argue that labour supply is not very sensitive to the intertemporal real wage. High unemployment observed in recessions is mainly involuntary type.

Technology shocks in RBC theory

economic fluctuations are caused by productivity shocks. Effects is measured by **Solow residual**. A measure of productivity shocks shows the change in output that cannot be explained by changes in capital and labour. RBC theory implies that the Solow residual should be highly correlated with output.

Proponents of RBC theory argue that there is a strong correlation between output growth and Solow residuals. Thus productivity shocks are an important source of economic fluctuations.

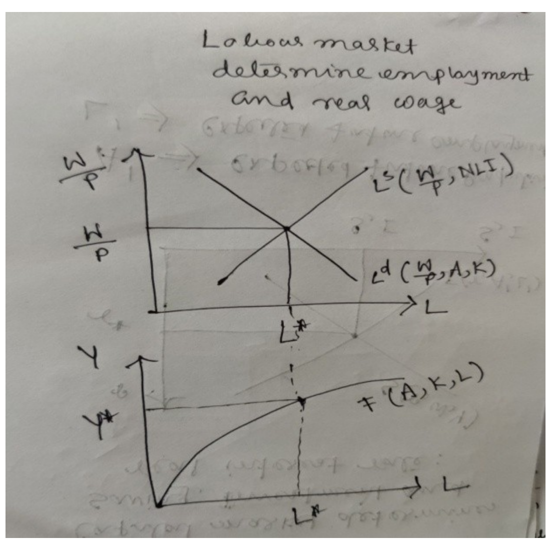
Critics note that the measured Solow residual is biased to appear more cyclical than the true, underlying technology.

The neutrality of money RBC critics note that reductions in money growth and inflation are almost always associated with periods of high unemployment and low output. RBC proponents respond by claiming that the money supply is endogenous: Suppose output is expected to fall.Central bank reduces money supply in response to an expected fall in money demand.

RBC theory assumes that wages and prices are completely flexible, so markets always clear. RBC proponents argue that the degree of price stickiness occurring in the real world is not important for understanding economic fluctuations. RBC proponents also assume flexible prices to be consistent with microeconomic theory. Critics believe that wage and price stickiness explains involuntary unemployment and the non-neutrality of money.

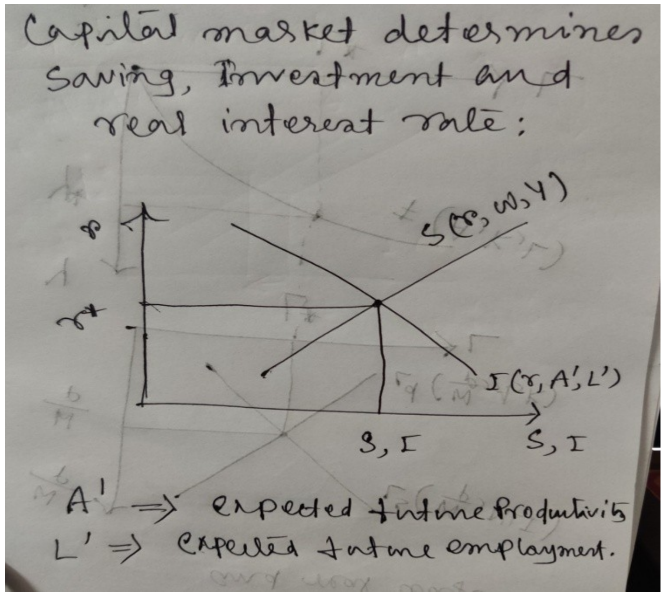
We have a simple economic model consisting of two markets:

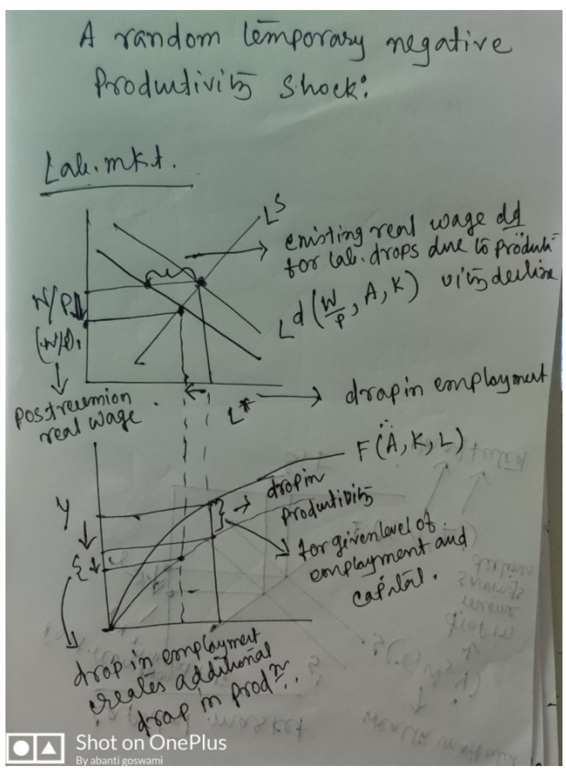
Labour markets determine employment and real wage. Real business cycle theory suggests that the business cycle is caused by random fluctuations in productivity.

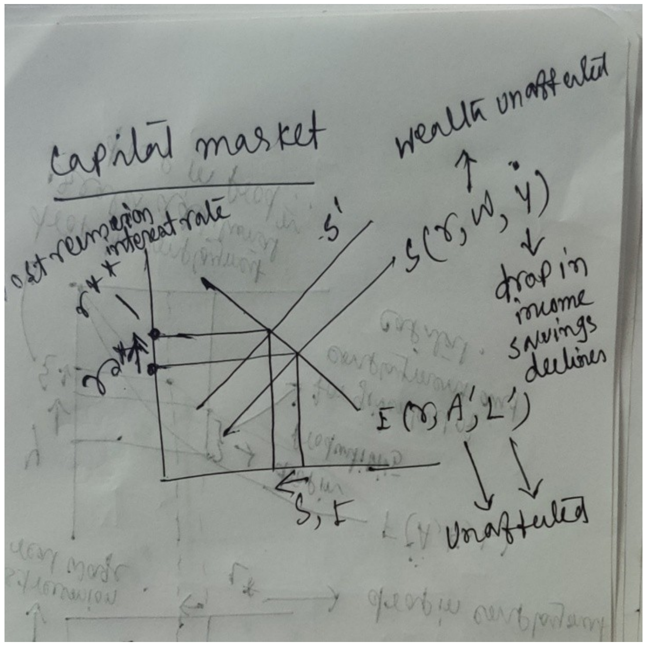


NLI= Non-labour income

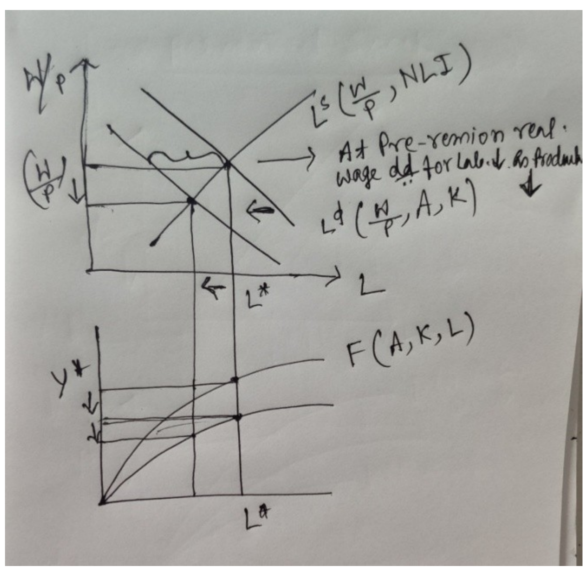
Capital markets determine Savings, Investment, and the real interest rate :



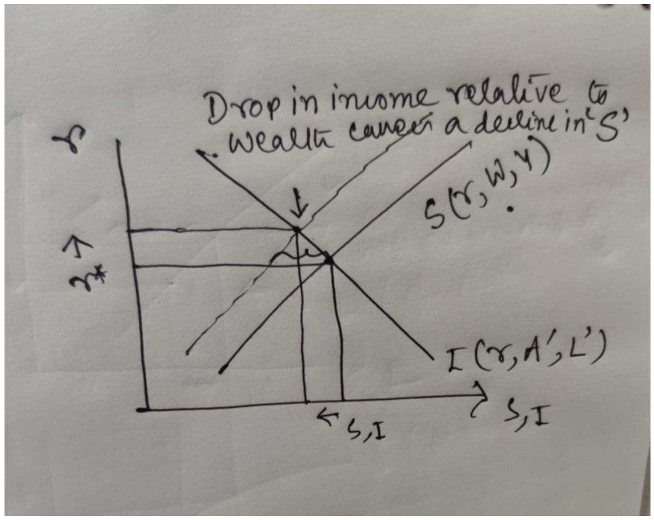




But when total productivity decreases there is a fall in marginal productivity of labour. So labour demand curve shifts downward. The drop in labour demand creates excess supply of labour – real wages fall and employment decreases. The drop in employment creates an additional drop in production.



Let us now see what happens to capial market. The capital market reacts next.



There is a drop in Income .Wealth is relatively unaffected. The drop in income relative to wealth causes a decline in savings. Expected Future productivity is unaffected. Expected Future employment is unaffected. The interest rate will need to adjust to equate the new level of savings.