Real Business Cycle Theory

The real business cycle theory (RBC theory) regards technological change that creates random fluctuations in productivity as the source of the business cycle.

The RBC Impulse

The impulse in RBC theory is the growth rate of productivity that results from technological change.

Growth accounting is used to measure the effects of technological change.

\[ \frac{\Delta Y}{Y} = \frac{\alpha T}{T} + \frac{\alpha K}{K} + (1 - \alpha) \frac{\Delta N}{N} \]

\[ \frac{\Delta T}{T} = \frac{\Delta Y}{Y} - \frac{\alpha K}{K} - (1 - \alpha) \frac{\Delta N}{N} \]
Real Business Cycle Theory

Figure 15.5 illustrates the RBC Impulse over 1971–2001.

Note:
1. Actual RGDP = Pot. GDP
2. The economy is in constant prices of 1971.
**Pre-Keynes**

Before 1930

- $S_i$, $I$ (real investment)
- $S$, $S$ (real savings)
- $(S, I)$ determine $c$
- $[(S+c); (I+c)]$ determine $i$
- $[AS; AD]$ determine $c$

- $(N^s, N^d)$ determine $P$

**Post-Keynes**

After 1930

- $S_i$, $Y$ (nominal)
- $S_i$, $Y$ (nominal savings)
- $(S_i, Y)$ determine $c$
- $[(S_i+c_i); (Y+c_i)]$ determine $i$
- $[AS; AD]$ determine $y$

- $(M/P)^s$, $(M/P)^d$ determine the nominal rate of interest
Real Business Cycle Theory

The RBC Mechanism

Two immediate effects follow from a change in productivity

- Investment demand changes
- The demand for labor changes

* Analyze the S.D for durable goods
* Analyze the S.D for labor
Real Business Cycle Theory

Figure 15.6 illustrates the capital and labor markets in a real business cycle recession, with $R = P = 0$. Labor and wage rate regulations directly impact these markets.
Real Business Cycle Theory

A decrease in productivity lowers firms' profit expectations and decreases both investment demand and the demand for labor.
Real Business Cycle Theory

The interest rate falls.

Real Interest Rate (percent per year)

Labor [billions of hours per year]

Investment (millions of 1996 dollars)

(a) Investment, saving, and interest rate

(b) Labor and wage rate

Technology shock decreases demand for labor

Technology shock decreases investment demand
Real Business Cycle Theory

The lower real interest rate lowers the return from current work so the supply of labor decreases.

(a) Investment, saving, and interest rate

(b) Labor and wage rate
Real Business Cycle Theory

Employment falls by a large amount and the real wage rate falls by a small amount.

(a) Investment, saving, and interest rate

(b) Labor and wage rate
Real Business Cycle Theory

Real GDP and the Price Level

The decrease in productivity shifts the LAS curve leftward (= there is no SAS curve in the RBC theory).

The decrease in investment demand shifts the AD curve leftward.

The price level falls and real GDP decreases.
Real Business Cycle Theory

What Happened to Money?

Money plays no role in the RBC theory; the theory emphasizes that real things, not nominal or monetary things, cause business cycles.

Cycles and Growth

The shock that drives the cycle in RBC is the same force that generates economic growth.

RBC concentrates on its short-run consequences; growth theory concentrates on its long-term consequences.
Real Business Cycle Theory

Criticisms of Real Business Cycle Theory

Money wages are sticky—a fact ignored by RBC theory.

The intertemporal substitution effect is too weak to shift the labor supply curve by enough to decrease employment with only a small change in the real wage rate.

Technology shocks are an implausible source of business cycle fluctuations and measured technology shocks are correlated with factors that change aggregate demand, so are not good measures of pure aggregate supply shocks.
Real Business Cycle Theory

Defense of Real Business Cycle Theory

RBC theory explains both cycles and growth in a unified framework.

RBC theory is consistent with a wide range of microeconomic evidence about labor demand and supply, investment demand, and other data.

The correlation between money and the business cycles can arise from economic activity causing changes in the quantity of money and not vice versa.
Real Business Cycle Theory

RBC theory raises the possibility that business cycles are efficient so that efforts to smooth the business cycle reduce economic welfare.