REAL BUSINESS CYCLE SCHOOL

ECO603 - FUNDAMENTALS of MACROECONOMICS

Didem Güneş & Muhammet Aydın

9 January 2019

FATHERS OF RBC SCHOOL

- Introduced by Finn Kydland and Edward Prescott in 1982…

  …who are the Nobel Laureates in Economic Sciences in 2004.

- Their motivation:

The question of whether or not…
…an economic growth model subjected to random productivity shocks could replicate observed business cycles…
…both *qualitatively* and *quantitatively.*

- Their Challenge:

To all previous mainstream accounts of the business cycle that focused on the AD shocks…
…in particular those that emphasized monetary shocks…

CHALLENGES TO OTHER SCHOOLS OF BC

Keynesians

..attribute business cycle fluctuations to what they regard as the fundamental instability of private spending--especially investment and consumer durable goods expenditure.

New Classicals

…postulate that unanticipated changes in monetary growth are the primary cause of deviations from the "natural rate" of output and employment.

Monetarists

…argue that changes in the money supply are the most significant determinants of the rate of economic growth and the behavior of the business cycle.

RBCs

In 1982, Nelson and Plosser challenged this conventional wisdom:

"macroeconomic models that focus on monetary disturbances as a source of purely transitory fluctuations may never be successful in explaining a large fraction of output variation and that stochastic variation due to real factors is an essential element of any model of macroeconomic fluctuations."

ASSUMPTIONS OF RBC

Finn Kydland and Edward Prescott build an artificial economy consists of optimizing agents acting in a frictionless perfectly competitive environment that is subject to repeated shocks to productivity.

- A representative agent framework, where the agent/household/firm aims to maximize their utility or profits, subject to prevailing resource constraints.
- Rationally expecting and perfectly informed but not sure agents on whether a productivity shock is temporary or permanent.
- Prevailing equilibrium thanks to price flexibility.
- Fluctuations driven by large random changes in the available production technology.
- Voluntary fluctuations in employment.
- High substitutions: work & leisure
- Neutral money
- Abandonment of the distinction between the short run and the long run.

STYLIZED FACTS OF RBC

Variable	Data	Model
Consumption	Procyclical	Procyclical
Investment	Procyclical	Procyclical
Price Level	Countercyclical	Countercyclical
Money Supply	Procyclical	-
Employment	Procyclical	Procyclical
Real Wage	Procyclical	Procyclical
Average Labor Productivity	Procyclical	Procyclical

FUNCTIONING OF RBC

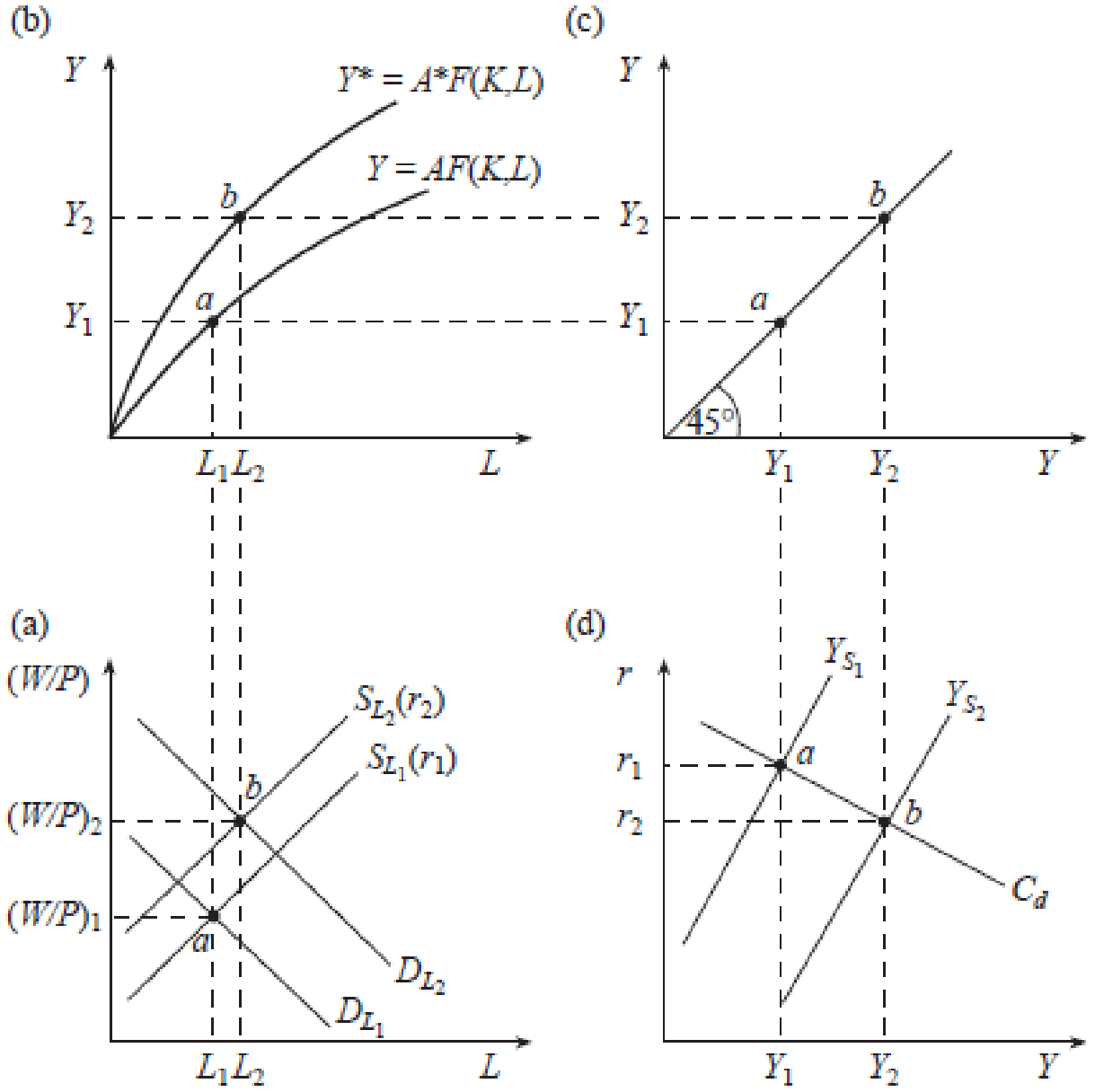
a – the initial equilibrium point

In (d), Aggregate Supply from Y_{s1} to Y_{s2}
In (b), Production from Y to Y*
In (a), Labor Demand from D_{L1} to D_{L2}
Labor Supply from S_{L1} to S_{L2}

b – the final equilibrium point

A favorable technology shock

- increases real output (from Y_1 to Y_2),
- lowers the real rate of interest (from r_1 to r_2),
- increases labor productivity and the real wage (from $(W/P)_1$ to $(W/P)_2$).



RBC AND THE NEUTRALITY OF MONEY

Tobin, Friedman and Lucas (Late 70s) - *all agreed that the rate of growth of the money supply has real effects on the economy and plays an important role in any explanation of output fluctuations.*

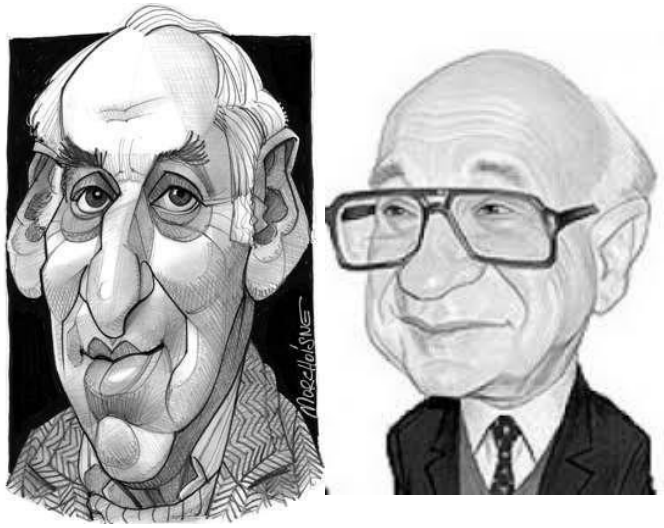
Kydland and Prescott (1982) - *after building their real model Kydland and Prescott concluded that the addition of a monetary sector may not be necessary since business cycles can be explained almost entirely by real quantities.*

King and Plosser (1984) - *the volume of inside money (bank deposits) will vary positively with output.*

Whereas in monetarist models exogenous changes in the quantity of money play an important role in causing movements in output, King and Plosser stress the endogenous response of deposits to planned movements in output. In effect the output of the financial sector moves in line with the output of other sectors.

RBC AND THE NEUTRALITY OF MONEY

Kydland and Prescott (1990) - *have questioned the whole basis of this debate and argue that 'there is no evidence that either the monetary base or M_1 leads the cycle although some economists still believe this monetary myth'.*



This 'blasphemy' has been rejected by Keynesian and Monetarist economists alike who, as a result of real business cycle analysis, have been thrown into an alliance which would have seemed unthinkable during the intense debates that took place between Tobin and Friedman during the 1960s and early 1970s.

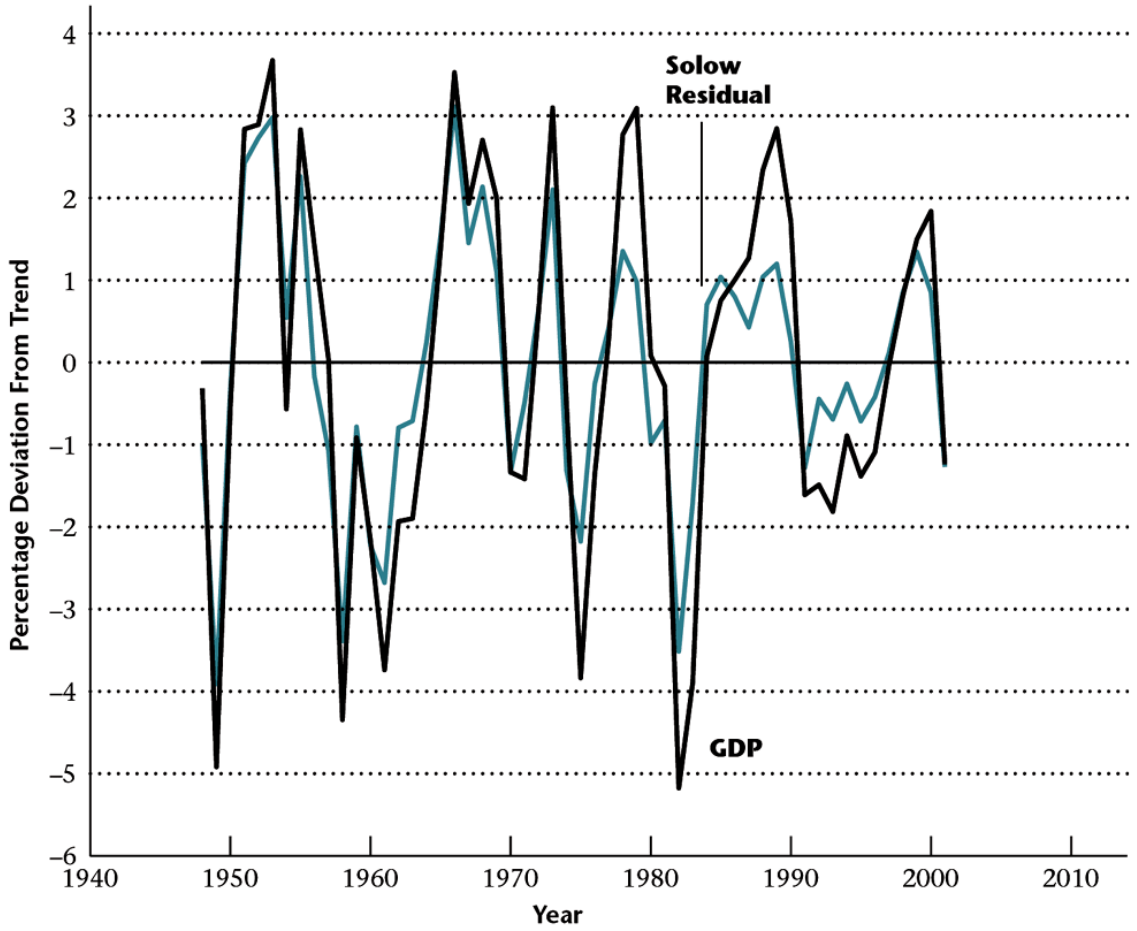
MEASURING TECHNOLOGY SHOCKS: SOLOW RESIDUALS

Prescott (1986) suggests that Solow's method of measuring this variance is an acceptable and reasonable approach.
Assume a Cobb-Douglas Production function we have:

$$Y = AK^{\delta}L^{1-\delta}, \quad \text{where } 0 < \delta < 1$$

Then the Solow residual will be

$$A = \frac{Y}{K^{\delta}L^{1-\delta}}$$



POLICY IMPLICATION OF RBC

Before 1980, although there was considerable intellectual warfare between macroeconomic theorists, there was an underlying consensus relating to three important issues.

1. Economists viewed fluctuations in aggregate output as temporary deviations from some underlying trend rate of growth.

   An important determinant of this trend was seen to be an exogenously determined smooth rate of technological progress.

2. Aggregate instability in the form of business cycles was assumed to be socially undesirable since they reduced economic welfare.

   Instability could and therefore should be reduced by appropriate policies

3. Monetary forces are an important factor when it comes to explaining the business cycle.

Orthodox Keynesian, monetarist and new classical economists accepted all three of these pillars of conventional wisdom.

POLICY IMPLICATION OF RBC

During the 1980s everything changed…

Nelson and Plosser (1982) and Kydland and Prescott (1982) caused some changes in the rules of the game…

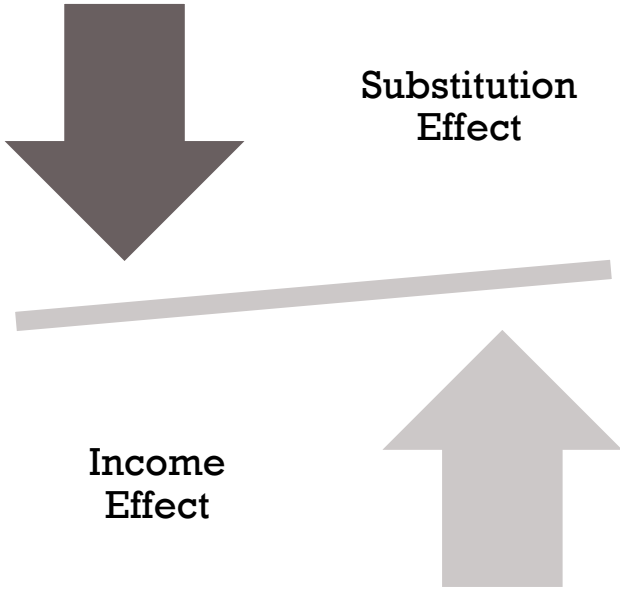
1. Economic fluctuations are optimal and permament responses to uncertainty in the rate of technological progress.

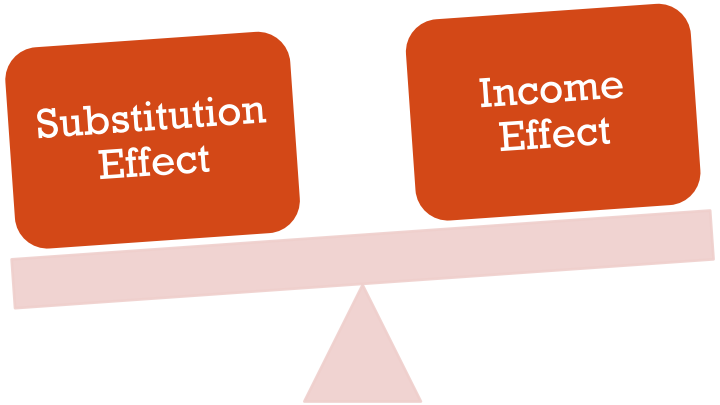
2. Since instability is the outcome of rational economic agents responding optimally to changes in the economic environment, observed fluctuations should not be viewed as welfare-reducing deviations from some ideal trend path of output.

3. Monetary factors are no longer relevant in order to explain such instability; nor can monetary policy have any real effects. Money is neutral.

CRITICISMS OF RBC

1- Intertemporal Substitution of Labor:





The conventional neoclassical analysis of labour supply highlights two opposing effects of an increase in the real wage.

In real business cycle models the substitution effect must be very powerful compared to the income effect.

CRITICISMS OF RBC

2 -The reliance on mainly unobservable technology shocks.

Muellbauer (1997) argues that the kind of technological volatility implied by RBC is 'quite implausible' for three reasons:

- technological diffusion tends to be slow
- aggregation of diffusion processes tends to produce a smooth outcome in aggregate
- the technical regress required to produce recessions cannot be given plausible microfoundations.

3 -The idea of recessions being periods of technological regress

4 -The issue of unemployment:
Tobin - *Recessions are not periods where we observe an increase in rate of voluntary quits!*

5- The neutrality of money and the irrelevance of monetary policy for real outcomes

6- The pervasive use of the representative agent construct in real business cycle theory

7- The lack of robust empirical testing

THANK YOU FOR YOUR PATIENCE