

# CHAPTER 19/EPILOGUE: ADVANCES IN THE THEORY OF MACROECONOMIC FLUCTUATIONS

Instructor: Dmytro Hryshko

## TWO APPROACHES

We can summarize theories of business cycles by their view of functioning of the economy's markets.

- The real business cycle theory (RBC) postulates that the economy's markets clear continuously; prices are fully flexible and do not affect the real variables (monetary neutrality).
- New Keynesian theory emphasizes the price and/or wage stickiness in the short run. Thus, fluctuations are caused by the stickiness of the prices/wages, and nominal monetary shocks can be transmitted to the changes in the real variables.

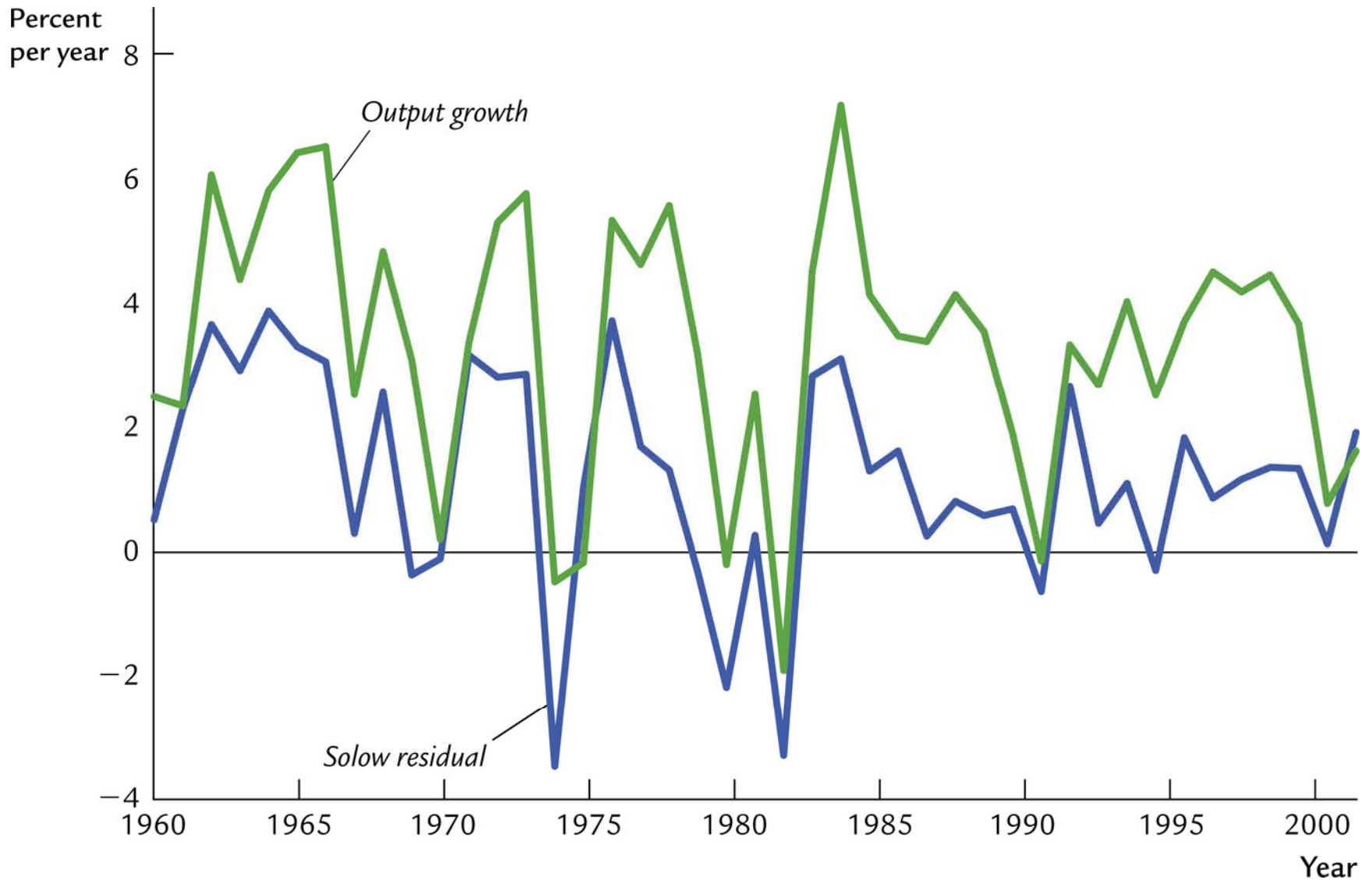
## IMPLICATIONS: RBC

- The economy's fluctuations reflect its *efficient responses* to real technological *supply shocks*. In terms of production function

$$Y_t = Z_t K_t^\alpha (E_t L_t)^{1-\alpha}$$
$$Y_t = \underbrace{Z_t E_t^{1-\alpha}}_{A_t} K_t^\alpha L_t^{1-\alpha}.$$

those shocks are realizations of the  $Z_t$  process.

- The natural rate of unemployment is fluctuating since  $A_t$  is fluctuating.
- Fiscal/monetary policies are largely ineffective.



**Figure 19.1** Growth in Output and the Solow Residual  
 Mankiw: Macroeconomics, Sixth Edition  
 Copyright © 2007 by Worth Publishers

## IMPLICATIONS: NEW KEYNESIAN THEORIES

- Aggregate fluctuations are caused by *demand* shocks.
- Aggregate demand is identified from the *IS-LM* model.  
Need to build micro-foundations for the aggregate supply and the sources of stickiness.

# RBC

The parable of Robinson Crusoe. Why?

Since there is no money and all of the shocks are real. E.g.:

- Population of fish in the nearby waters suddenly rises.
- Weather shocks.
- Attacks by natives.

Changes in  $C$ ,  $I$ ,  $L$  (labor and, therefore, leisure), and  $Y$  are *efficient responses* to the (real) shocks.

Ex.: storm (temporary shock).  $A_t \downarrow$ ,  $MPL$  and current wages  $\downarrow$ , cut current working hours (more leisure now),  $C \downarrow$ ,  $I \downarrow$  (since want to smooth consumption over time).

Ex.: a big school of fish in the nearby waters (temporary shock).  $A_t \uparrow$ ,  $MPL$  and current wages  $\uparrow$ , increase working time and cut leisure time,  $C \uparrow$ ,  $I \uparrow$  (since want to smooth consumption over time).

## RBC MODEL: THE INTERTEMPORAL SUBSTITUTION OF LABOR

The intertemporal substitution of labor—the willingness to reallocate work over time—should be substantial. *Not true* in micro data.

The incentive to reallocate labor between different periods is guided by the intertemporal relative wage:  $\frac{W_1 \times (1+r)}{W_2}$ .

Thus, shocks that cause  $r$  to increase or make  $W_1$  temporarily high, increase work effort in period 1, and decrease the first period amount of leisure.

## RBC MODEL: THE IMPORTANCE OF TECH. SHOCKS

Shocks to  $A_t$  are the main ingredient of *RBC* models, and the main source of the models' aggregate fluctuations.

Opponents: are recessions the periods of the technological regress? Also, technological shocks are not well measured, and in reality they are less pro-cyclical than the Solow residual.

Proponents: adverse shocks to the 'technology' (Solow residual) should be interpreted broadly. E.g., strict regulations, weather shocks, shocks to prices of raw materials (e.g., oil price shocks).

## MONEY NEUTRALITY

Is money neutral in the short run? To answer the question, need **exogenous** shocks to money supply in order to establish the causality between money and output.

Hard to find *really* exogenous shocks...

In the data: changes in money supply *correlate* with the changes in money supply.

$$\begin{aligned} (\text{Real shocks } \Rightarrow) \quad \Delta M \not\Rightarrow \Delta Y \quad (\Leftarrow \text{Real shocks}) \quad (\text{RBC}) \\ \Delta M \Rightarrow (\text{nominal frictions: sticky wages/prices}) \Rightarrow \Delta Y \\ (\text{Keynes./Monetar.}) \end{aligned}$$

To prove that  $M \Rightarrow Y$  (that is, money causes output) need to find an *exogenous* variation in  $M$ , that is, the variation *not* affected by the news of future productivity or by current real shocks.

## Measurement of the TFP

Suppose  $Y = AK^\alpha L^{1-\alpha}$ . Then,

$$\frac{\Delta A}{A} = \frac{\Delta Y}{Y} - \left( \alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta L}{L} \right).$$

Inputs are utilized with different intensity over the business cycle. Consider  $Y = AK^\alpha (uL)^{1-\alpha}$ , where  $u$  is the *utilization rate* of  $L$ . Then,

$$\frac{\Delta A}{A} = \frac{\Delta Y}{Y} - \left( \alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta L}{L} + (1 - \alpha) \frac{\Delta u}{u} \right).$$

The TFP measure will become less *procyclical* when  $\frac{\Delta u}{u} > 0$  during expansions and  $\frac{\Delta u}{u} < 0$  during recessions.

## New Keynesian Theories

Rationalize the stickiness of prices and wages.

- 1 Menu costs
- 2 Recessions as coordination failures
- 3 Staggering of wages and prices: individual wages and prices change frequently but at different points in time, and so aggregate prices and wages adjust sluggishly.

## IS THERE A CONSENSUS ON KEY MACROECONOMIC ISSUES?

- 1 In the long run, the economy's technology and availability of the factors of production determines the well-being of its citizens.
- 2 In the short run, aggregate demand determines the amount of goods and services the economy produces, and the well-being of its citizens.
- 3 In the long run, the rate of money growth determines the rate of inflation, but it does not affect the (natural) rate of unemployment.
- 4 In the short run, policymakers face a tradeoff between inflation and unemployment.

## CONSENSUS ON POLICY ISSUES?

- ➊ How to promote growth in the natural (trend) level of output?
- ➋ Stabilizing potential of discretionary fiscal policy is at best limited and the role of fiscal policy lies embedded in automatic stabilizers (problem 1, set 5; Snowdon and Vane, 2005: handout).
- ➌ Shift of focus towards monetary policy as the main tool of stabilization policy (Snowdon and Vane, 2005; Goodfriend and King, 1997).
- ➍ Stabilization policy is viewed as a game theoretic problem: policy affects expectations and therefore outcomes. Issues of policymakers' credibility are important.
- ➎ Is government budget deficit a problem?