INTERMEDIATE MACROECONOMICS-II

B.A.(H) Economics, Semester-IV

Topic-4: Schools of Macroeconomic Thoughts
Lecture Notes
(Ref: Gordon, *Macroeconomics*, 12^{th} ed. Ch-17.)

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Introduction: Classical and Keynesian Economics

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- In the 1930s, the Great Depression brought a decade-long economic slump accompanied by double-digit unemployment rates.

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- The Keynesian theory based on rigid nominal wages could not provide an explanation for the causes of inflation.

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- First to emerge was, the New Classical approach originated by the late Milton Friedman, then at the University of Chicago, and Edmund S. Phelps of Columbia University. This approach was further developed by Robert E. Lucas, and Edward Prescott.
- The second strand to emerge later was, New Keynesian Approach.

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- Business cycles occur because people may be acting on incorrect information or because there may be supply shocks.

Imperfect Information and the **Fooling Model**

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- Business cycles occur only if workers inaccurately perceive the price level, hence the name "fooling model". This feature is called imperfect information.
- Friedman's model is asymmetric: Firms always know the current value of the price level but workers only learn the actual price level with a time lag.

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- The price level may rise by 10% and nominal wages by 5%, resulting in a 5% reduction in real wages, which induces firms to hire more workers.
- But the workers do not know that the price level has increased but think only that real wages have increased by 5%, and are willing to work more, Y will differ from Y^N and the business cycle happens only because the workers are *fooled*.

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- It is common to describe a model with a vertical long-run supply curve as obeying the **natural rate hypothesis**[1].

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- Firms see that the price of their product has increased and this makes them willing to hire more workers. Not realizing that all other firms in the economy are experiencing the same increase in prices.

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- Thus the unemployment rate decreases even though, without their knowledge, all other firms in the economy have raised the wage by the same amount at the same time.
- The workers are fooled into a reduction in turnover unemployment, and the macroeconomic data register a decline in the unemployment rate.

Criticisms of Friedman and Phelps versions of the Fooling Model

- Friedman and Phelps justification towards worker holding incorrect expectations for any significant length of time:
  (1) Firms have an informational advantage because they have concentrated interest in a small number of prices of particular products and monitor them continuously.
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- Three criticisms against the assumption of imperfect information under both the models:
  (1) Workers buy goods on a weekly or daily basis and discuss price changes.
  (2) News is published by the Government.
  (3) They would learn from past episodes.

Lucas Model and the Policy Ineffectiveness Proposition

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- Instead of following Friedman's rather unsatisfactory assumption that workers only gradually adapted their expectations of the price level (P^e) to the actual value of the price level, allowing themselves to be fooled for weeks or even months, Lucas introduced the **theory of rational expectations**.

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- It is important to recognize that forecasts need not have to be correct; the theory of rational expectations argues that people do not consistently make the same forecasting errors.
- For instance, the errors (or fooling) of the Friedman-Phelps model are not rational.

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- This model makes output depend positively on a **price surprise**, that is, a rise in the actual price level (P) relative to the expected price level (P^e).

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- However, if the public knows that an increase in money raises the price level, then whenever the central bank raises the money supply there will be an increase by the same amount in both the actual and expected price.
- Therefore, no surprise will occur ($P = P^e$) and output will remain at the natural level of real GDP ($Y = Y^N$).

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- The RBC model argues that fluctuations in output (Y) are caused by fluctuations in natural real GDP (Y^N) itself.
- Supply shocks can occur due to new production techniques, new products, bad weather, new source of raw materials, and price changes in raw materials.

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- In short, the RBC theory simply assumes and does not explain the persistence of business cycles that was the main criticism against the Lucas model.
- In the RBC model, the economy responds to these persistent supply shocks based on the new classical assumption of continuous equilibrium.
- Firms produce the amount they desire at prices and wages that respond flexibly to changing economic conditions, and hire the number of workers they want; workers obtain exactly the number of hours of work that they desire at the market-determined real wage.

The Labour Market in the RBC Model

Effect of an Adverse Supply Shock on Output and Employment in the Real Business Cycle Model.

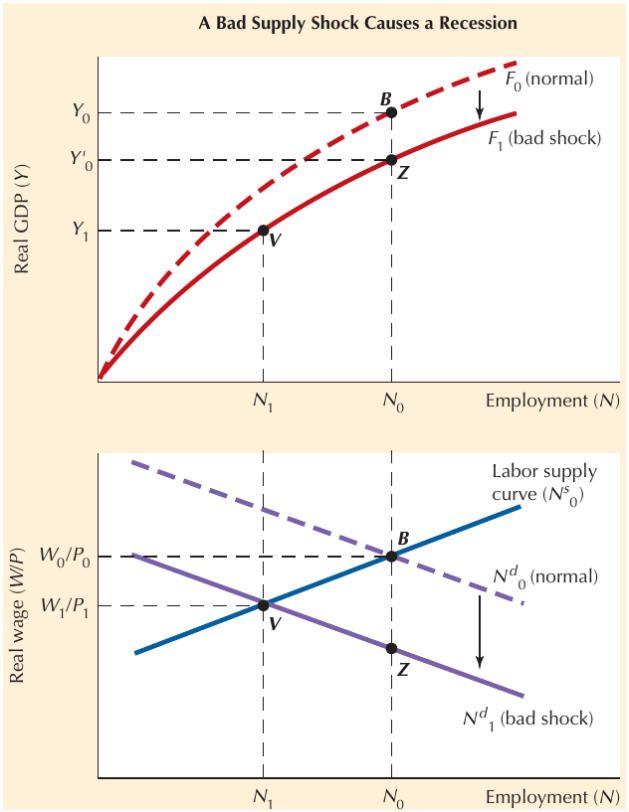

Figure: 1

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- In the lower frame of Figure 1, the labor demand curve N^d, which shows the marginal product of labor, shifts down in response to the adverse supply shock from the line labeled N_0^d to the line N_1^d.
- The effect of the adverse supply shock on both output and employment depends on the slope of the labor supply curve.

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- Employment falls from N_0 to N_1, while output falls from Y_0 to Y_1, seen in the upper frame of Figure 1.
- If the labor supply curve, is a vertical line rising above N_0 through points Z and B. Then the economy's equilibrium point would be shifted downward by the adverse supply shock from B to Z. The shock would cause no change in employment, and in the upper frame, there would be a much smaller decline in output, from Y_0 to Y_0'.

Labor Supply Behavior and Intertemporal Substitution

- Two conflicting effects of an increase in the real wage:
  (1) A higher real wage increases the reward for work as compared to leisure (the substitution effect).
  (2) But a higher real wage also raises real income and makes people want to consume more of all normal goods, including leisure, which means reducing work (the income effect).
- While drawing a positively sloped labor supply curve in Figure 1, we simply assume that the substitution effect dominates the income effect.

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- While drawing a positively sloped labor supply curve in Figure 1, we simply assume that the substitution effect dominates the income effect.
- The RBC approach not only assumes that the substitution effect is dominant, but stresses a particular dimension of substitution that takes place over time, referred to as **intertemporal substitution**[2].

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New Classical Macroeconomics: Limitations and Positive Contributions

Assessment of the RBC Model

The criticisms of the RBC model are based on its unique components:

(1) The emphasis on technological shocks as the primary cause of business cycles,

(2) The failure to include prices or money,

(3) The interpretation of what happens in labour markets during business cycles.

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- Firstly, the fact that recessions are caused by retreats (backward movement or decay) in technology seems implausible. Advocates of the RBC model suggest that bad harvests, oil price shocks and some kind of government regulation to reduce air and water pollution can constitute such backward movement.
- Second criticism is based on the distinction between the aggregate economy and the behavior of individual industries. At an industry level, one would expect technological shocks (good and bad) to occur randomly and cancel out. Any bad shock large enough to cause an economywide recession would be highly visible in industry data. But there is no data in support of this argument (except oil price shocks).

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- This suggests that business cycles are caused by both demand and supply shocks.

Positive Contributions of the New Classical Macroeconomics

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  The rational expectation approach, which has a grounding in microeconomics, requires that people do not repeat their mistakes and make use of all available information.
- **The theory of efficient financial markets**.
  The assumption of continuous market clearing is applied in financial markets, including stock market, bond market, foreign exchange market, etc. And the theory of efficient markets incorporates the assumptions of rational expectations.

- **Greater understanding of economic policy**
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- **Pervasive effect on economic research**
  New techniques of analysis introduced by these theories have had a major influence on the way economists study variables such as consumption, investment, and the foreign exchange rate. The distinction between anticipated policy changes and policy **surprises** has improved our understanding of policy changes in general.

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- Therefore, both old and new Keynesian are **non-market clearing models** i.e. prices fail to adjust rapidly enough to clear markets within a relatively short interval after a demand and supply shock.
- Also workers and firms do not act as if they were making a voluntary choice to cut production and hours worked.
- The history of business cycles is punctuated by recessions and depressions lasting several years, during which workers and firms could not sell all the labor and output desired at the going wages and prices.

The New Keynesian Model

- The New Keynesian economics explains rigidity in prices and wages as consistent with the self-interest of firms and workers, all of which are assumed to have rational expectations.

[3] Nominal rigidity constitute barriers to the adjustment of nominal prices.

[4] Real rigidity refers to what makes firms reluctant to change the real wage, the relative wage or the relative price.

The New Keynesian Model

- The New Keynesian economics explains rigidity in prices and wages as consistent with the self-interest of firms and workers, all of which are assumed to have rational expectations.
- Unlike the original model, which assumes a fixed nominal wage, the new Keynesian approach attempts to explain the slow adjustment of both wages and prices.

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The New Keynesian Model

- The New Keynesian economics explains rigidity in prices and wages as consistent with the self-interest of firms and workers, all of which are assumed to have rational expectations.
- Unlike the original model, which assumes a fixed nominal wage, the new Keynesian approach attempts to explain the slow adjustment of both wages and prices.
- Two distinctions are essential to the new Keynesian model.
  (1) The distinction between wage setting in labour markets and price setting in product markets.
  (2) The distinction between **nominal rigidity**[3] and **real rigidity**[4].

[3] Nominal rigidity constitute barriers to the adjustment of nominal prices.

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- **Staggered contracts** are wage contracts that have different expiration dates for different groups of firms or workers.
- New Keynesian theories also explain real rigidities, the stickiness of a wage relative to another wage, of a wage relative to a price, or of a price relative to another price. Theories that explain real rigidities in labor markets include the efficiency wage model.

Why Small Nominal Rigidities have Large Macroeconomic Effects

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- In contrast to the neoclassical model, which assumes perfectly competitive **price takers**, the new Keynesian approach assumes that small menu costs will stop imperfectly competitive firms from constantly changing their prices.
- And these menu costs do not have to be large to explain this price stickiness.

Price setting by a Monopolistic Firm

The red slanted line is the initial demand curve and the orange MR_0 line is the marginal revenue curve. The horizontal blue line is the initial marginal cost schedule MC_0. Output is chosen where MR equals MC. Price (P_0) is shown at point E_0. The purple area shows the consumer surplus. Profit is represented by the green rectangle.

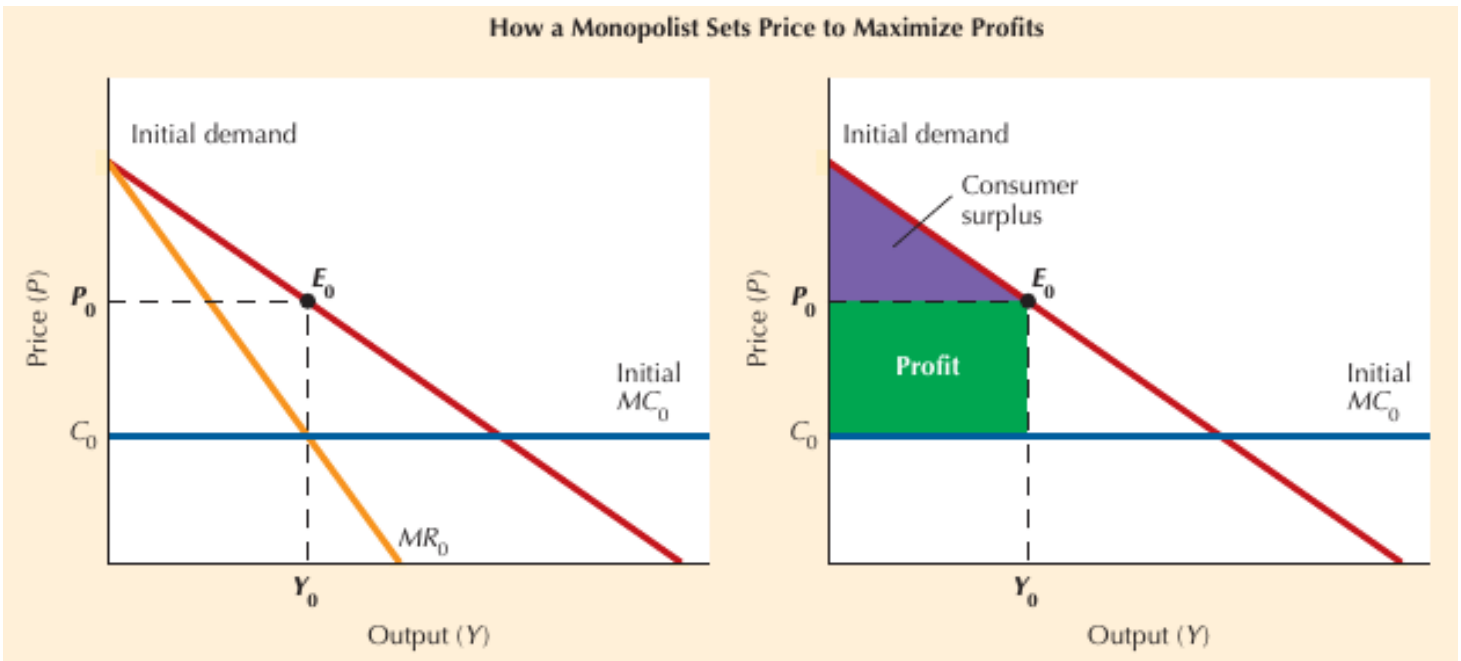

Figure: 2

The firm's response to a decline in demand

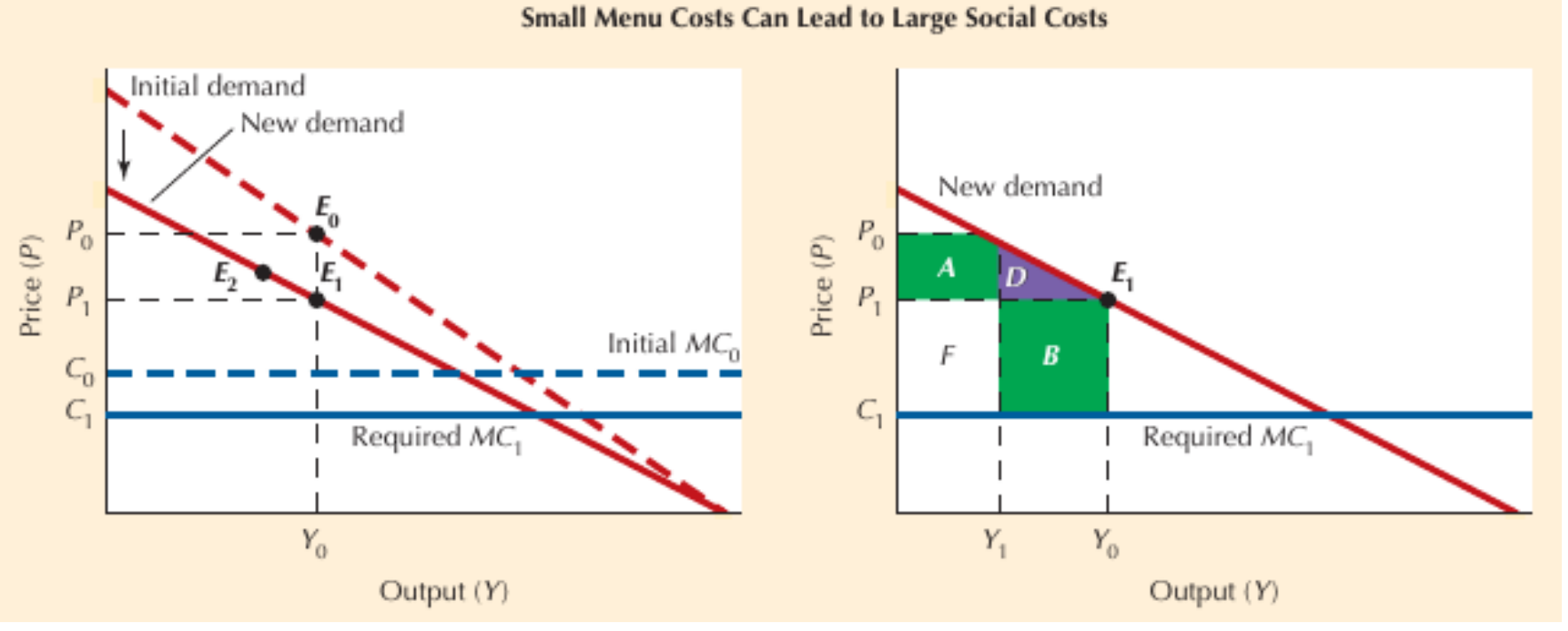

Figure: 3

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- The lower blue line is called **required MC** because a decline in MC is needed to avoid a recession.

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- From the right frame of Figure 3, the profit box is a rectangle lying above the MC line with its upper right corner at the equilibrium point E_0 or E_1. Comparing the two profit boxes, by lowering the price from P_0 to P_1 the firm gains the profit area marked B and loses the profit area marked A.

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- Despite the gain in profit from cutting price, the firm may choose not to cut price if the menu cost, which we can call z, is large enough. The firm cuts price if the gain in profit $(B - A)$ exceeds z, but not if z exceeds $(B - A)$.

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- Despite the gain in profit from cutting price, the firm may choose not to cut price if the menu cost, which we can call z, is large enough. The firm cuts price if the gain in profit $(B - A)$ exceeds z, but not if z exceeds $(B - A)$.
- But if the firm decides not to cut price. Output drops from Y_0 to Y_1, and society loses the consumer surplus area D and the profit area B. The amount society loses could be many times that the firm would have lost if the price was reduced.

Macroeconomic externality and the effects of sticky Marginal Cost

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- This is treated as an externality because the firm does not bear this cost.
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- Since they fail to do so, it is referred to as a **coordination failure**.

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- As an implication, Menu costs are not needed at all to explain how recessions occur.

Coordination Failures and Indexation

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- Following a negative demand shock, output must fall if MC declines less than MR.
- There are two reasons why firms may rationally expect MC to move differently than MR
  (1) MR may move with aggregate nominal demand but MC may not. This would occur if a firm believes that its costs depend on many specific factors other than the perceived level of AD (like, price changes for imported materials, etc.)
  (2) With fixed nominal AD, MC would also remain fixed, while a local shift in demand could reduce MR.

The Input-Output Approach and the Absence of Full Indexation to Nominal Demand

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- With only two firms, each supplying the other, firms could easily disentangle the local-versus-aggregate components of their costs.
- But with thousands of components, containing ingredients from many other firms, the typical firm has no idea of the identity of its full set of suppliers.

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- *MC* will drop if all workers and firms cut wages and prices together by the same percentage as nominal demand.
- For instance, to avoid coordination failure the daylight saving time rule comes in play.

Long-Term Labor Contracts as a Source of the Business Cycle

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- Just as monopolistic firms impose costs on society while maximizing profits, so do firms and workers that enter into long-term contracts.
- However, the New Keynesian model emphasizes, there are good reasons why workers and firms desire such contracts.

Characteristics of Labour Contracts

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- This sector sets the pattern for the rest 90% non-union workers.
- This is because the nonunionized firms do not want their employees to quit and join rival unionized firms.

Scheduled wage changes and COLAs

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- Wage changes during the lifetime of the contract are allowed, but they are set in advance at the time of the negotiation.
- There are two types of prenegotiated changes.
  (1) A scheduled change that takes place each year in a multi-year contract,
  (2) There is sometimes a **cost-of-living agreement (COLA)** that sets in advance the change in nominal wage that will be allowed for each percentage change in inflation. This helps workers maintain their real wages.

Analysis of the New Keynesian Models

- The advantage of the New Keynesian Models over other approaches is that the latter fails to provide an adequate theory of the business cycle, partly because they do not distinguish between the private interest (for instance, signing contracts) and the collective interest in avoiding business cycles.

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- However, the new Keynesian model has been criticized for suggesting too many reasons why wages and prices are sticky.
- Business cycles were common even before the rise of labour unions in the US in the 1930s and 1940s.

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- Stochastic means any model that contains random variables.
- General Equilibrium describes any model that provides an explanation of the behavior of the entire economy instead of just a part of the economy.

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The simplest of these models include three equations:

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- The third equation is a version of the Taylor Rule which allows the short-term interest rate to respond to deviations of the actual inflation rate from the Fed's inflation target and also to the output gap.