

Business Cycles Theory

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Program of the lecture

- The nature of economic cycles
- A measuring of business fluctuations
- Five types of business cycles
- Business cycle theory
- Next lecture

The nature of economic cycles

Business cycle

is

a type of the fluctuation in the aggregate economic activity indicators having a sinusoidal character.

The business cycle is a complex of various cycles in many specific activities.

Generally, we can observe:

- **Output** is affected across many sectors
- **Production/consumption** of durable goods *exhibit a higher degree of volatility than* no durable goods and services
- **Price Inflation and interest rates** tend *to decline during recessions and to increase during expansions*
- **Employment** moves **in the same direction** as the **overall phase** of the business cycle

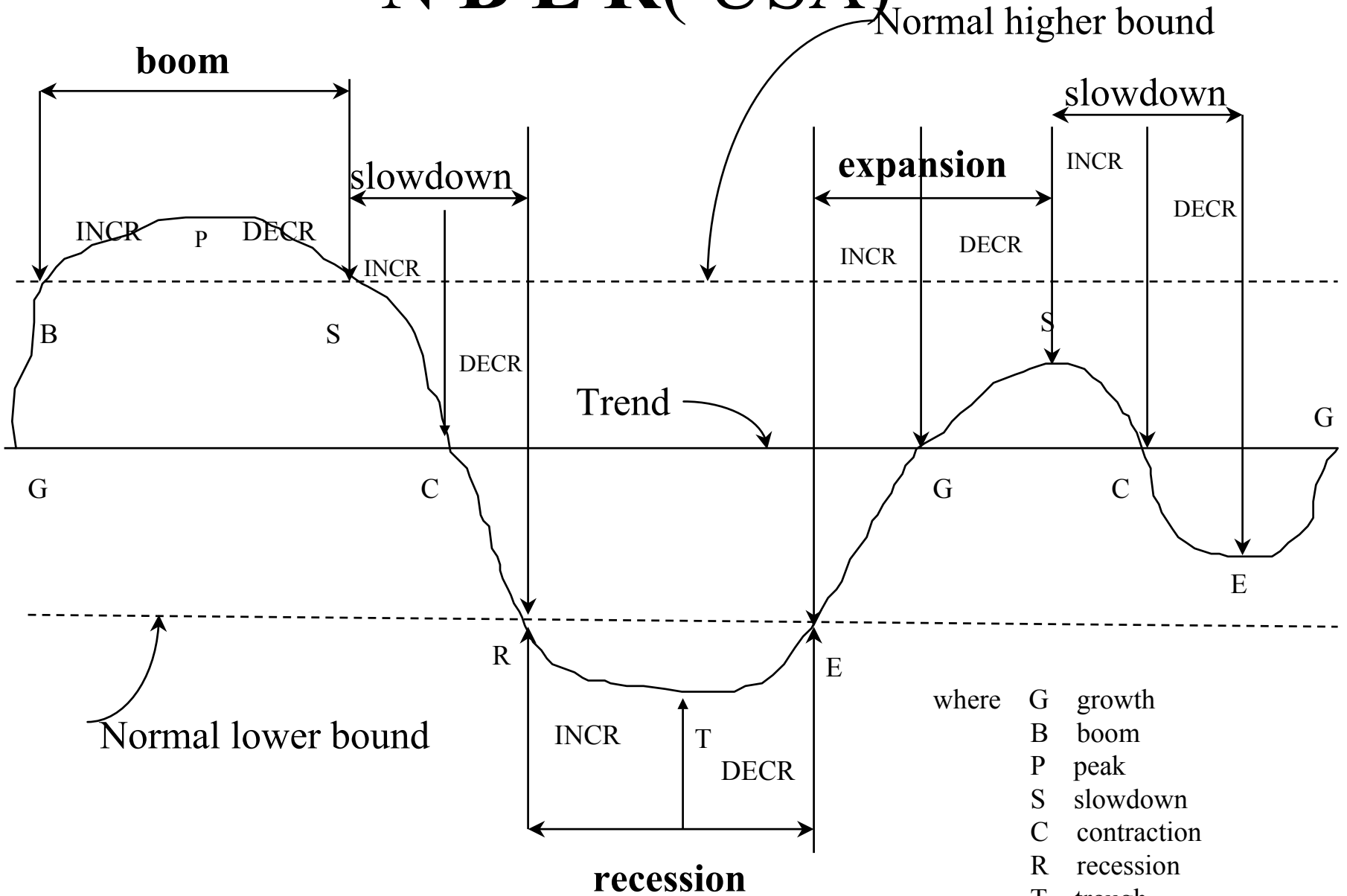
Measuring business fluctuations

The business cycle is analyzed by the following procedures:

- **NBER** (National Bureau of Economic Research)- a growth cycles method
- **Schumpeter**- an equilibrium points method
- **EPA** (Economic Planning Agency) – a diffusion index
- **Australian Deviation Cycles**- high and low growth rates

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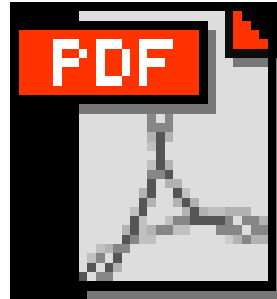
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- where
- G growth
 - B boom
 - P peak
 - S slowdown
 - C contraction
 - R recession
 - T trough
 - E expansion

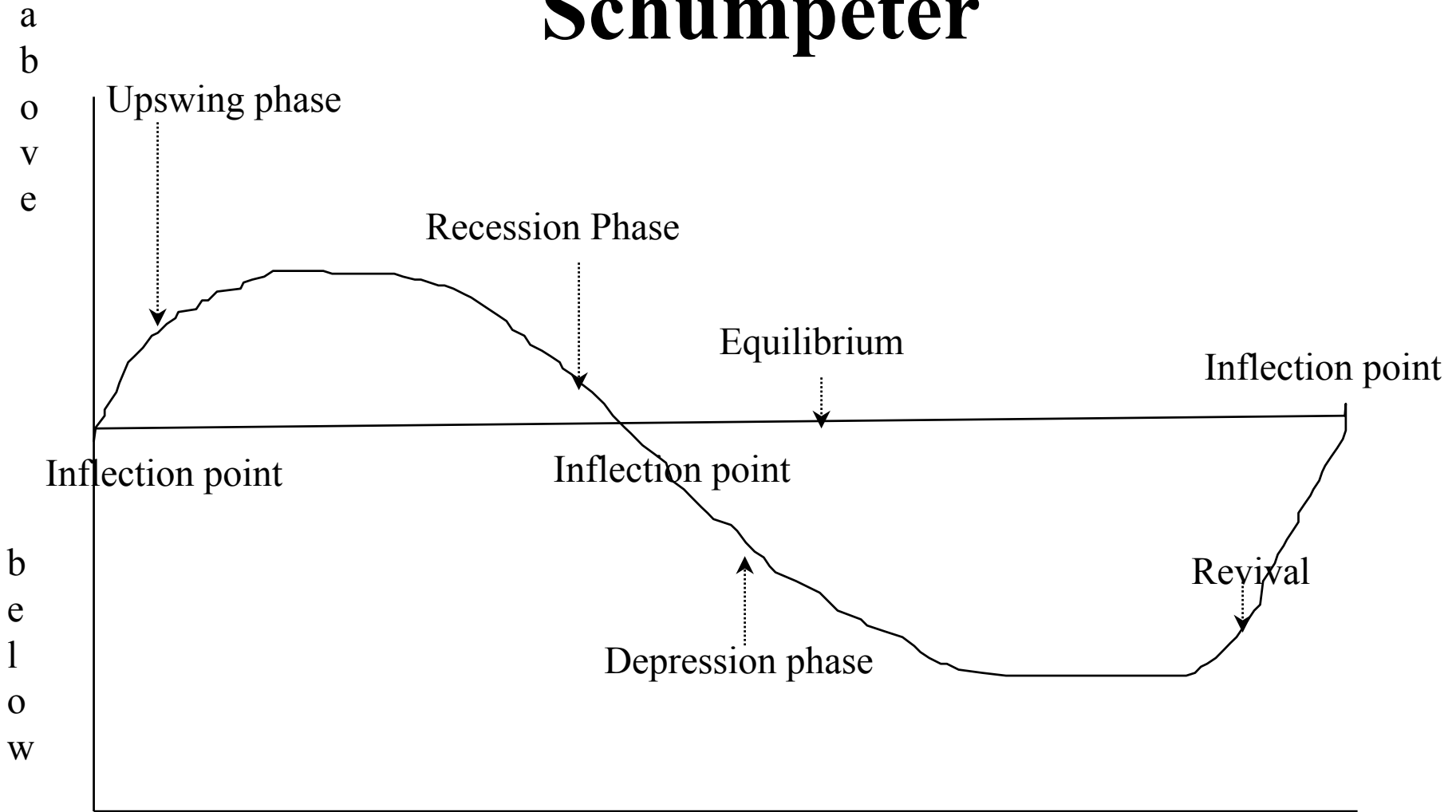
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Business cycles peaks and troughs



Business cycles peaks
and troughs

Schumpeter



Each phase is defined as follows:

- **Recession**

A period of the decline in aggregative economic activity lasting at least one year widely diffused effects on the economy

- **Recovery**

A rebound period in aggregative economic activity characterized by relatively stable prices, expanding output, and productivity gains

- **Demand-Pull Inflation**

A period during the expansion whereby capacity constraints result in rising prices and declining productivity

- **Stagflation**

A period when an economic growth slows considerably but inflation remains relatively high

Growth rate cycle peak and trough dates



Growth Rate Cycle- Peaks and Troughs

E P A (JAPAN)

This procedure comprises 11 components:

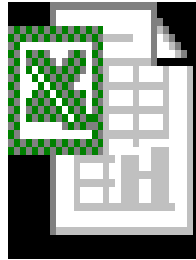
- **Index of the industrial production**
- **Index of the produce in the leading sector**
- **Index of the capacity utilization ratio**
- **Index of the consumption of raw materials**
- **Electric power consumption of large users**
- **Index of imports**
- **Construction started**
- **Ratio of job offers to applicants**
- **Sales at department stores**
- **Net profits**
- **Sales of small and medium-size enterprises**

From these **11 components** a single measure of the cycle breadth for selecting turning points in the business cycles is constructed. This measure is called

a cumulative diffusion index.

A slowdown begins when the monthly diffusion index increases by less than 50% of components, which means that less than half of the composite indicators are expanding.

Grading the major market moving numbers



Diffusion Index



Grading the major
markets

Australian Deviation Cycles

This approach is a cross between the EPA method and the NBER growth cycle method. The Australian approach measures the deviation cycle with **52 indicators** covering industrial production, money and credit, domestic activity, foreign trade, employment, and government activity.

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Five types of cycles

A specific nature of the activity determines the duration of the cycle. Five types of cycles will be explored:

- **Agricultural or Cobweb Cycles**
- **Inventory or Kitchin Cycles**
- **Fixed Investment or Juglar Cycles**
- **Building or Kuznets Cycles**
- **Kondratieff Cycles**



Agricultural or Cobweb Cycles

The best-known sector cycle in economics is the classic

agricultural commodity cycle

This type of fluctuation followed what Nicholas Kaldor called *the cobweb pattern*. The theory suggests that regular fluctuation occur in agriculture production because

- **The following period's production is determined by current or past prices**
- **The current price is determined by current production**

Homework 1

Let $S_n := a + b \cdot p_{n-1}$ be a supply function

$D_n := c + d \cdot p_n$ be a demand function

with the following initial conditions

where p is a price level.

$$\begin{pmatrix} S_0 \\ p_0 \\ D_0 \end{pmatrix} := \begin{pmatrix} 10 \\ 3 \\ 30 \end{pmatrix}$$

For what a level of the coefficients a, b, c , and d has this

economic system the stabilizing cycle character and for what a level of the coefficients a, b, c , and d has this economic system the explosive cycle character?

Inventory, or Kitchin, or Metzler Cycles

It is observed that inventory fluctuations are relatively more important than in earlier times because the other components of real output tend to be far less volatile. What causes the fluctuation in inventory cycle?

It is **a holding of inventories**

due

- **to smooth production**
- **to produce more cost-effective lot sizes**
- **to buffer stock thereby preventing lost sales because of an insufficient stock (a transaction motive)**
- **to take advantage of a lower price (a speculative motive)**

But can this behaviour be responsible for business cycle? **A. Metzler** developed a model of the inventory process with the following assumptions:

- The system is in an equilibrium
- The marginal propensity to consume is very close to the value that is equal 0.6
- Income is the sum of production for expected sales and for inventories and investment
- In the current period, desired inventories are equal to a difference between actual and expected sales in the preceding period

By Metzler derived key ideas are

- **The cycle is damped, that is, total income approaches an equilibrium and remains there**
- **Inventories lag behind income**

Homework 2

On the following data demonstrate A. Metzler's assumptions and conclusions.

Period	Expected Sales	Inventories	Other Investment	Stock of Inventories	Total Income	Sales(actual)	I/S ratio
1	600	0	500	1500			
2	600	0	500	1275			
3	825	225	500	1163			
4	1163	338	500	1163			
5	1500	338	500	1247			
6	1753	253	500	1373			
7	1880	127	500	1500			
8	1880	0	500	1595			
9	175	-95	500	1642			
10	1642	-142	500	1642			
11	1500	-142	500	1607			
12	1393	-107	500	1553			
13	1340	-53	500	1500			
14	1340	0	500	1460			
15	1380	40	500	1440			
16	1440	60	500	1440			
17	1500	60	500	1455			
18	1545	45	500	1477			
19	1568	23	500	1500			
20	1568	0	500	1517			

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Fixed Investment Cycles or Juglar Cycles

Clement Juglar analyzed a behavior of
fixed investment

(i.e., business expenditure on equipments and structures). He demonstrated that the fixed investment has a longer life than inventories. The fixed investment cycle is varied from 7 to 11 years.

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The Building Cycle or Kuznets Cycle

This cycle is both a long-term and short-term.

The shortterm fluctuations are tied to *the credit markets*.

The longterm waves are primarily *functions of demographics*.

The basic logic for the Kuznets cycle is as follows:

During prosperous economic times the demand for labor increases which puts upward pressure on wages. In turn, the improved economic environment causes an increase in new family formations, sparking the demand for new housing units. This then boosts the economic output more, and the process begins again.

But, the dating of the Kuznets cycle seems more controversial than the logic for the building cycle.

The Building Cycle

was constructed for understanding of the phases of

the real estate cycle

which is very important for investment.

The building cycle is divided into four phases

- **development**
- **overbuilding**
- **adjustment**
- **acquisition**

The Building Cycle Phases

For distinguishing, particular phases of a supply and demand cycle are monitored, a supply and demand cycle are represented by home sales(demand side of the market) and housing starts(supply side of the market).

•Development

demand picks up and an increasing in housing starts follows. This phase is characterized by low vacancy rates and rising rents. This one reaches maturity after about 3 to 5 years. A signal of this turning point is the aggressive bidding up of land prices.

- **Overbuilding**
is such phase when housing starts consistently to pace home sales out
- **Adjustment**
is such phase when builders react to the declining demand and curtail housing starts.
- **Acquisition**
is such phase of the cycle when housing starts continue to decline while home sales are firm. The building activity is further reduced although vacancy rates have peaked and rent concessions have ceased.

Kondratieff Cycles

N.D. Kondratyev analyzed the long wave cycles with a duration of between 45 and 60 years. Kondratyev never set any theory for long wave. He only cited several empirical characteristics of his long wave. But his observations led to a theoretical explanation of the long wave by J. Schumpeter, W.W.Rostow, G.Ray, and J.van Duijn. All have developed

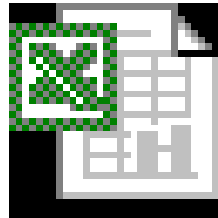
The innovation theory of the long wave

The innovation theory

Most empirical evidence does not support the long wave lasting about 50 years and resulting from a clustering of innovation. As Kondratieff suggested, a 9-year centered moving average of the data is calculated from GNP USA data, but it is difficult to see a pronounced long wave in this data over this period. It is necessary also discriminated the influence periodicity of moving average estimators from the periodicity which really exists as recommended Slutsky and Yule (Slutsky-Yule effect).

Homework 3

On the following time series data use three-, five-, seven-, nine-, eleven-, fifteen-year moving average estimator and discuss obtained results by you.



Real GDP

Long waves in economic development

There are four schools of economic thought on the existence of long-waves in economic activity. These approaches are as follows

- **Schumpeter's Three-Cycles Schema**
is consisted of a short inventory(Kitchin) cycle superimposed on an investment(Juglar) cycle which in turn forms the Kondratieff wave.

Schumpeter's set of cycles were developed on the following premise that a innovation must take much longer time than others to have a full effect. He claimed that is possible to count off six Juglar's to a Kondratieff and three Kitchins to a Juglar - not as an average but in every individual case. This assertion has had to be rejected as a rigid relationship.

- **Forrester's System Dynamics**

This approach is constructed on the sum of three *independent* types of cycles: the business, Kuznets, and Kondratieff cycles.

The business cycle can result from interactions among inventories, production, employment, and an utilizing of capital equipment. *The Kuznets cycle* is consistent with policies governing production and the acquisition of capital equipment. *The Kondratieff cycle* is mainly caused by a fluctuation in the capital stock market as a result of the structural setting of the capital equipment sector and a result of overinvestment.

•Burns and Mitchell's "Cycle of Cycles"

Their the long wave is consisted of a sequence of cycles. This sequence has two phases - *the industrial phase* and *the speculative phase*.

Their view is as follows: After a severe depression industrial activity rebounds sharply but speculation does not. The following contraction in business is mild which leads people to be less cautious. So, while the cyclical advances become progressively smaller in industrial activity, they become progressively larger in speculative activity. Finally, the speculative boom collapses and a drastic liquidation follows which ends this cycle of cycles and brings us back to the starting point.

As examples are introduced:

The period 1961-1965 is the industrial phase marked by productivity increases, an unemployment rate drop, and price stability.

The period 1965-1974 is the speculative phase marked by a wave of corporate mergers, a wave of speculation in real estate, greater stock market speculation, and a buildup in inventories.

This idea of the long wave does not require a fixed length for this cycle of cycles.

Rostow's Stages of Long –Term Economic Growth

His hypothesis is based on the interaction of several processes. The major interactions are the impact of leading sectors of economic activity, the relative profitability of producing foodstuffs and raw materials versus industrial goods, and waves of migration that are linked to investment in housing and infrastructure. These factors tend to be catalysts for economic growth

- **Traditional Society**

- A period in the economic activity limited by technology

- **Preconditions for take off**

- The occurrence of agricultural improvement and development of commerce

– **Take off**

- Activity marked by rapid growth in limited areas

– **Drive to Maturity**

- A diffusion of modern technology to many sectors of the economy

– **Age of High Mass Consumption**

- A shift to consumer goods and services by the leading sectors of the economy

– **Search for Quality**

- An emphasis in the economy on quality over quantity

Business Cycle Theory

The mainstream of economic theory was

Classical economic theory

developed by making at least two simplifying assumptions that precluded worrying very much about instability. These assumptions are

- **Say's law of market** was correct, i.e., the process of producing output created the income necessary to purchase it.
- **full employment of all resources** was the economy's natural condition

Nevertheless both assumptions have fallen in because no automatic regulator guarantees that people in the economy would necessarily choose to buy what had been produced. Uncertainty about future sales is considered part of the justification of profits. Entrepreneurs take chances.

It is necessary to stress that business cycle theories have not any a winner. Some of the theories are new, but some are quite old. All these theories can be potentially instructive in understanding the current causes of instability.

Classification of Business Cycle Theories

Modern business cycle theory is classified into four basic blocks:

- *Simple unicausal theories*
- *Business economy theories*
- *The savings-investment process theories*
- *New classical theories*

Simple unicausal theories

- **Agricultural**(W.S.Jevons,H.S.Jevons,H.L.Moore)
- **Psychological**(Mills,Pigou)
- **Purely monetary**(Hawtrey)

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Business economy theories

- **Price/cost relations, profit margins**
(Mitchell, Lescure)
- **Inventory cycles**
(Abramowitz, Stanback)

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The savings-investment process theories

• **Pre-Keynesian**

- Over investment
 - Monetary (Wicksell, Hayek, Mises)
 - Non monetary
 - Shortage of capital
(Tugan-Baranovsky, Cassel)
 - Innovation (Schumpeter)
- Under consumption (Malthus, Sismondi)
- Marxian

- **Keynesian**
- **Post- Keynesian**
 - **Dynamics models**
 - Multiplier-accelerator interaction
(Samuelson, Fellner)
 - Growth-Cycle
(Harrod, Domar, Kalecki, Kaldor)
 - Neo-Marxian (Sherman, Evans)
 - Chaos (Baumol, Quandt, Brock, Sayers)

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New classical theories

- **Monetarist**
(Friedman, Meltzer, Brunner, Schwartz, Cagan)
- **Real Business Cycle**
(King, Ploesser, Walsh)
- **Supply side**
(Laffer, Craig)
- **Political business cycle**
(Kalecki, Nordhaus)
- **Rational expectations**
(Muth, Lucas, Sargent, Wallace, Barro)

Next lecture

- **Simple unicausal theories**
- **Business economy theories**
- **The savings-investment process theories**