Chapter 7

The Classical Long-Run Model

The distinction between Long-Run (L/R) and Short-Run (S/R) is important in economics. Many apparent disagreements among macroeconomists dissolve once the distinction is made. Ideally, we would want our economy to do well both in the S/R and in the L/R. Trade-off. On one hand …, on the other hand … Policies that can help us smooth out economic fluctuations may prove harmful to growth in the L/R. While policies that promise a high rate of growth might require us to put up with more severe fluctuations in S/R.

Macroeconomic Models: Classical Versus Keynesian

- Classical model
  - Developed by economists in 19th and early 20th centuries
  - Over long periods, economy performs rather well
    - Business cycle fades in significance
  - In the classical view, this behavior is no accident
    - Powerful forces are at work that drive economy towards full employment
- Classical economics
  - Economy moves to full employment in the L/R

Macroeconomic Models: Classical Versus Keynesian

- In 1936, in midst of Great Depression, British economist John Maynard Keynes offered an explanation for economy’s poor performance
  - While classical model might explain economy’s operation in L/R, L/R could be a very long time in arriving
- According to Keynesian economists
  - Production can be stuck below its full-employment level for extended periods of time
Macroeconomic Models: Classical Versus Keynesian

- Classical model is still important
  - In recent decades: active counterrevolution against Keynes's approach to understanding the macroeconomy
  - Useful in understanding economy over L/R
- Keynes’s ideas and their further development help us understand economic fluctuations—movements in output around its L/R trend
  - Classical model has proven more useful in explaining the L/R trend itself

Assumptions of the Classical Model

- Many of its assumptions are simplifying
  - Involve aggregation
- Assumption about how the world works
  - Markets clear
    - Price in every market will adjust until quantity supplied and quantity demanded are equal
  - Markets clear eventually
    - Classical model does a better job of explaining L/R growth than S/R fluctuations

Assumptions of the Classical Model

- We’ll use classical model to answer a variety of important questions about economy in L/R, such as
  - How is total employment determined?
  - How much output will we produce?
  - What role does total spending play in the economy?
  - What happens when things change?

How Much Output Will We Produce?

- Three step process
  - 1st step: Characterize the market
    - Identify buyers and sellers
    - Identify type of environment in which they trade
  - Start with market for resources
    - Labor, land and natural resources, capital and entrepreneurship
  - In the classical long-run model
    - We focus on labor resources, rather than capital or land
  - How many workers will be employed in the economy?
Figure 1: The Labor Market

- Labor supply curve slopes upward
  - as wage rate increases—more and more individuals are better off working than not working
  - a rise in wage rate increases the number of people who want to work—to supply their labor
- As wage rate increases, each firm will find that—to maximize profit—it should employ fewer workers than before
  - a rise in wage rate will decrease the quantity of labor demanded
  - This is why labor demand curve slopes downward
- In classical view, economy achieves full employment on its own

The Labor Market

Determining the Economy’s Output

- Focus only on labor
- Divide and conquer
  - Start with part of model, understand it well, and then add in other parts
- Classical analysis of economy
  - What would be the long-run equilibrium of the economy if...
  - We had constant state of technology
  - and if quantities of all resources besides labor were fixed?
  - What happens to this L/R equilibrium when technology and quantities of other resources change?

The Production Function

- Relationship between total employment and total production in the economy
  - Given by economy’s aggregate production function
  - Shows total output economy can produce with different quantities of labor
    - Given constant amounts of other resources and current state of technology
  - In classical view, economy reaches its potential output automatically
    - Output tends toward its potential, full-employment level on its own, with no need for government intervention
Figure 2: Output Determination in the Classical Model

In the labor market, the demand and supply curves intersect to determine employment of 150 million workers.

150 million

$20

LS

LD

150 million

Number of Workers

Output (Dollars)
$10 Trillion
= Full Employment Output

The production function shows that those 150 million workers can produce $10 trillion of real GDP.

The Role of Spending

- What if business firms are unable to sell all output produced by a fully employed labor force?
  - Economy will not remain at full employment for very long

- If we are asserting that potential output is an equilibrium for the economy
  - Total spending on output = total production during the year

  - Can we be sure of this?
    - In classical view answer is yes
      - Say’s Law

- Consider the simple circular flow
  - Households spend all of their income without saving it or paying tax
  - Total spending must be equal to total output (Say’s Law)

Figure 3: The Circular Flow

Goods Markets

Households

$ Total Consumption Spending

$ Total Income

Resources Supplied

Factor Markets

$ Total Revenue of Firms

$ Total Factor Payments

Firms

Goods and Services Demanded

Goods and Services Supplied

$ Total Revenue of Firms

$ Total Factor Payments

Resources Demanded

Total Spending in a Very Simple Economy

- Say’s Law

  - Each time a good or service is produced, an equal amount of income is created. For ex., each time a shirt manufacturer produces a $25 shirt, it creates $25 in factor payments to households

  - Say’s law states that by producing goods and services
    - Firms create a total demand for goods and services equal to what they have produced or more simply
    - ‘Supply creates its own demand’
Total Spending in a More Realistic Economy

- In the real world
  - Households don’t spend all their income
    - Save
    - Pay taxes
  - Households are not the only spenders in the economy
    - Businesses and government buy final goods and services
  - Trade with the rest of the world

Some New Macroeconomic Variables

- Saving and net taxes are called leakages out of spending
  - Income that households receive, but do not spend
- There are also injections—spending from sources other than households
  - G
  - IP
- Total spending = total output if and only if total leakages in the economy = total injections
  - S + T = IP + G

Flows in the Economy of Classica

<table>
<thead>
<tr>
<th>Total Output (GDP)</th>
<th>10 trillion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Income</td>
<td>10 trillion</td>
</tr>
<tr>
<td>Consumption Spending (C)</td>
<td>7 trillion</td>
</tr>
<tr>
<td>Planned Investment Spending (IP)</td>
<td>1 trillion</td>
</tr>
<tr>
<td>Government Purchases (G)</td>
<td>2 trillion</td>
</tr>
<tr>
<td>Net Taxes (T)</td>
<td>1.25 trillion</td>
</tr>
<tr>
<td>Household Saving (S)</td>
<td>1.75 trillion</td>
</tr>
</tbody>
</table>

Figure 4: Leakages and Injections

Total Output = $10 Trillion
Total Income = $10 Trillion
C ($7 Trillion)
S + T = IP + G
G ($2 Trillion)
I ($1 Trillion)
Total Spending
The Loanable Funds Market

- Where households make their saving available to those who need additional funds
- Total supply of loanable funds = Household saving
  - Funds supplied are loaned out, and households receive interest payments.
- Businesses’ demand for loanable funds = Planned investment spending
  - Funds obtained are borrowed, and firms pay interest on their loans.
- Budget deficit
  - Excess of government purchases over net taxes
  - \( G - T \)
- Budget surplus
  - Excess of net taxes over government purchases
  - \( T - G \)

The Loanable Funds Market

- When the government runs a budget deficit, its demand for loanable funds is equal to its deficit. The funds are borrowed, and government pays interest on its loans.
- View of the loanable funds market:
  - The supply of funds is household saving
  - The demand for funds is the sum of the business sector’s planned investment spending and the government sector’s budget deficit, if any.

The Supply of Funds Curve

- Since interest is reward for saving and supplying funds to financial market
  - Rise in interest rate increases quantity of funds supplied (household saving), while a drop in interest rate decreases it
- Supply of funds curve
  - Indicates level of household saving at various interest rates
  - Quantity of funds supplied to the financial market \( \uparrow \) as interest rate \( \uparrow \)
  - Saving, or supply of funds, curve slopes upward
- Other things that affect savings besides the interest rate
  - Tax rates
  - Expectations about the future
  - General willingness of households to postpone consumption

Figure 5: Supply of Household Loanable Funds

As the interest rate rises, saving or the quantity of loanable funds supplied increases.
The Demand for Funds Curve

- As interest rate ↑ investment cost ↑
- When interest rate falls investment spending and the business borrowing needed to finance it rise
  - Business demand for funds curve slopes downward
- What about government's demand for funds?
  - Government sector's deficit and its demand for funds are independent of interest rate
- As interest rate decreases quantity of funds demanded by business firms increases
  - Quantity demanded by government remains unchanged
  - Total quantity of funds demanded ↑

Figure 6: Business Demand for Loanable Funds

As the interest rate falls, business firms demand more loanable funds for investment projects.

Figure 7: The Demand for Funds

Summing business demand for loanable funds at each interest rate . . .

Equilibrium in the Loanable Funds Market

- In classical view loanable funds market is assumed to clear
  - Interest rate will rise or fall until quantities of funds supplied and demanded are equal
- Can we be sure that all output produced at full employment will be purchased?
**The Loanable Funds Market and Say’s Law**

- As long as loanable funds market clears, Say’s law holds
  - Total spending = Total output
- Here’s another way to see the same result,
  - Loanable funds market clears: \( S = I^p + (G - T) \)
  - Loanable funds market clears: \( S + T = I^p + G \)
  - Leakages = Injections \( \Rightarrow \) Total Spending = Total Output
- Say’s law shows that total value of spending in economy will equal total value of output
  - Rules out a general overproduction or underproduction of goods in the economy
  - Market clearing assumption …

**Fiscal Policy in the Classical Model**

- Could government increase economy’s total employment and total output by raising total spending?
  - Two ideas for increasing spending come to mind
    - Government could simply purchase more output itself
    - Government could cut net taxes, letting households keep more of their income
- Fiscal policy is a change in government purchases or in net taxes
  - Designed to change total output
- Demand-side effects
  - Arise from fiscal policy’s impact on total spending
  - In the classical model fiscal policy has no demand-side effects at all
Fiscal Policy in the Classical Model

- What would happen if the government of Classical attempted to increase employment and output by increasing government purchases?
- Crowding out is a decline in one sector’s spending caused by an increase in some other sector’s spending.
- In classical model a rise in government purchases completely crowds out private sector spending so total spending remains unchanged.
- The amount of $G\uparrow = \text{Amount of } lP\downarrow + \text{Amount of } C\downarrow$
- In classical model, an increase in government purchases has no impact on total spending and no impact on total output or total employment.
  - Because there is no demand-side effects

An Increase in Government Purchases

The Classical Model: A Summary

- Began with a critical assumption
  - All markets clear
- In classical model, government needn’t worry about employment.
  - Economy will achieve full employment on its own
- In classical model, government needn’t worry about total spending.
  - Economy will generate just enough spending on its own to buy output that a fully employed labor force produces.