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

Real Hourly Wage

$25

$20

$15

Excess Supply of Labor

Excess Demand for Labor

150 million = Full Employment

150 million

Number of Workers

25

20

15
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 ______ 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 ___ quantity of labor demanded
  - This is why labor demand curve slopes downward
- In classical view, economy achieves full employment on its own
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
In the labor market, the demand and supply curves intersect to determine employment of 150 million workers.

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
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
## Flows in the Economy of Classica

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
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<tbody>
<tr>
<td>Total Output (GDP)</td>
<td>10 trillion</td>
</tr>
<tr>
<td>Total Income</td>
<td>10 trillion</td>
</tr>
<tr>
<td>Consumption Spending (C)</td>
<td>7 trillion</td>
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<tr>
<td>Planned Investment Spending (I^P)</td>
<td>1 trillion</td>
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<tr>
<td>Government Purchases (G)</td>
<td>2 trillion</td>
</tr>
<tr>
<td>Net Taxes (T)</td>
<td>1.25 trillion</td>
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<tr>
<td>Household Saving (S)</td>
<td>1.75 trillion</td>
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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
  - I^P
- Total spending = total output if and only if total leakages in the economy = total injections
  - S + T = I^P + G
Figure 4: Leakages and Injections

$10$ Trillion = $10$ Trillion

Total Output = Total Income

Leakages: $T$ ($1.25$ Trillion), $S$ ($1.75$ Trillion), $I_P$ ($1$ Trillion)

Injections: $G$ ($2$ Trillion), $I_P$ ($1$ Trillion)

Total Spending: $G$ ($2$ Trillion), $C$ ($7$ Trillion)

Total Income = Total Spending

$C$ ($7$ Trillion) = $G$ ($2$ Trillion) + $I_P$ ($1$ Trillion)

Total Output = Total Income

Total Spending = Total Output
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 ↑ as interest rate ↑
  - 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 . . .

. . . and the government's demand for loanable funds . . .

gives us the economy's total demand for loanable funds at each interest rate.

| Interest Rate | Business Demand for Funds ($I^P$) | Government Demand for Funds ($G - T$) | Total Demand for Funds $[I^P + (G - T)]$
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<th></th>
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<tr>
<td>5%</td>
<td>$B$</td>
<td>$B$</td>
<td>$B$</td>
</tr>
<tr>
<td>3%</td>
<td>$A$</td>
<td>$A$</td>
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<tr>
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<td>1.0</td>
<td>0.75</td>
<td>1.75</td>
</tr>
<tr>
<td>1.5</td>
<td>1.5</td>
<td></td>
<td>2.25</td>
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Trillions of Dollars per Year
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?
Figure 8: Loanable Funds Market Equilibrium

Total Supply of Funds \((S)\)

Total Demand for Funds
\([I^P + (G - T)]\)

Interest Rate

5%

1.75

Trillions of Dollars
The Loanable Funds Market and Say’s Law

**Figure 9** Loanable Funds Market: Total Spending = Total Output

\[
\text{Total Output} = \text{Total Income} = \text{Total Spending}
\]

- **Injections**:
  - $T$ ($1.25$ Trillion)
  - $G$ ($2$ Trillion)
  - $I_P$ ($1$ Trillion)

- **Leakages**:
  - $S$ ($1.75$ Trillion)
  - $T$ ($1.25$ Trillion)

\[
\text{Total Spending} = \text{Total Output} = \text{Total Income} = \$10\text{ Trillion}
\]

\[
\text{Total Spending} = \text{Total Output} = \text{Total Income} = \$10\text{ Trillion}
\]
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 ⇒ 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 $G \uparrow = \text{Amount of } I^P \downarrow + \text{Amount of } C \downarrow$

- 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

- Figure 10 Crowding out from 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