Chapters 11, 12, and 13 – Theories of the Business Cycle

We have completed an initial empirical review of the business cycle, and we now turn to alternative theories of what causes the business cycle. In order to be useful at all, these theories are generally consistent with the empirical facts and the systems of equations we have developed to explain the facts. However, each theory is a different model of the business cycle, and emphasizes different economic factors and the relationships between the factors.

Demand-Side Theories:

A shared characteristic all demand-side theories is that they believe the source of most of the economic problems in private enterprise economies is a lack of consumer demand.

Long-run stagnation theories – these are not business cycle theories. These theories stress that the lack of consumer demand is a chronic feature of the economy (stagnation is long-term and is caused by high savings or the maldistribution of income). Examples are Thomas Malthus (early 19^{th} century), John Hobson (1922) and Alvin Hansen (1964).

The criticisms of these theories are:

- the U.S. economy has clearly not been in a long-term crisis or stagnation
- the lack of consumer demand is not sufficient by itself to explain a downturn in the economy as the demand for investment may make up for any consumption shortfall
- under-consumption theories do not include a theory of investment. The total demand for consumption and investment must be insufficient to purchase the supply of goods at present market prices to start a downturn
- profit expectations are limited not just by lack of demand – but also by cost considerations. For example, some under-consumption theories argue that crises or depressions can be eliminated by paying higher wages. Higher wages can create more demand, but they also will reduce profits.

Karl Marx also emphasized the importance of demand. He did, however, recognize that consumption and investment were both forms of demand. Marx argued that expansions are ended by under-consumption caused by the class structure of capitalism. Mass poverty would always limit consumption.

Effective Demand Cycle Model:

Keynes' theories are considered the core consumption theories. We have already learned the key elements of Keynesian and post-Keynesianconsumption theories:

Description:

All our models will use only private domestic economy (ignore, for now, g and x). The equilibrium condition is: national income = consumption + investment. National income also = labor income + property income. Keynes himself always analyzed aggregate income, but post-Keynesians have expanded the discussion of demand to include a functional income distribution. This model assumes the income/investment multiplier. The multiplier for an increase in income given an increase in investment is 1/marginal propensity to save.

Since this is a "demand-side" model, the consumption function is critical. Consumption is determined not only by the total amount of national income, but also by the distribution of national income between labor and property owners. The average and marginal propensity to consume from labor is higher than the average or marginal propensity to consume from property. In this model, wage earners spend all their income on consumption (lagged) and property owners spend only a small portion of their income on consumption (lagged).

Equation Description:

$y = c + i$

$y = w + \Pi$ ($\Delta y = (1/(1-c'))\ \Delta i^n$ where c' is the marginal propensity to consume.

$c = c_0 + w_{t-1} + c_2 \Pi_{t-1}$

This is actually a simplified version of the counter-cyclical labor share we have already encountered. This is important to the demand-side theories since it means the average propensity to consume declines in an expansion and rises in a contraction.

Description:

The labor share is counter-cyclical and the property share is pro-cyclical. The labor share declines during most of the expansion and rises during most of the contractions because of the wage-lag hypothesis. As national income rises, labor income rises, but more slowly, so the labor share declines in an expansion and rises in a contraction. In this simplified model, labor income = constant + *f(*national income)

The investment accelerator used in these demand-side theories is different than the one we have learned. Investment is assumed to be the accelerator times the change in consumption only, rather than the change in income (all forms of consumption y = c + i). Unlike the under-consumption models, this demand-side theory makes investment one of the key factors. Note that the net new investment depends on the change in consumption. We have already learned that the investment function is more complex than this and depends on the change in y.

Equation Description:

$1 = w/y + \Pi / y$

$w = w_0 + g_0(y)$

$i^n = \alpha(\Delta c)$

Operation of the Effective Demand Cycle Model:

In recovery, national income rises and so property income and labor income rise. These, in turn, lead to increasing consumption -- which then leads to increasing output and new investment (**via the accelerator**) -- which results in more employment and income. **The increase in investment works via the multiplier to increase income. Thus, this model uses the multiplier- accelerator to create an expansion.**

As the expansion continues, consumption grows at a slower and slower pace. This model uses the functional income hypothesis we learned. Consumption depends not only on total income, but also on how the income is divided between labor and property income. Throughout the expansion, real labor rates rise slower than real profits, labor share declines and the marginal propensity to consume declines. The slower growth of consumption gets transmitted to investment via the accelerator, and lower net investment results in less income and employment via the multiplier.

As the decline continues, the multiplier causes national income to decline, labor income falls more slowly than property income and there is a rise in labor share. The rise in labor share results in a higher marginal propensity to consume, which slows, stops and then reverses consumption. A small increase in consumption then works via the accelerator to increase net investment.

Conclusions :

1. The effective demand cycle model includes an investment function. However, the model explains investment as a function of the change in consumption only – not the change in all income (investment, government and international).

2. The effective demand cycle model leaves out the cyclical behavior of costs (raw material, labor or interest).

3. This simplified model does not include any money or credit variables, and it does not include the effects of monopoly power.

4. Simulations of the multiplier-accelerator models result in either damped or explosive business cycle. The results are often not realistic.

Supply-Side or Cost Theories of the Business Cycle:

We will not be talking about:

- Taxation theories. These are not primarily cyclical, and they are included in the text under discussions of government policy.
- Monetary or monetarism theories that include credit, money supply and interest rates.
- Marxist stagnation theories (organic composition of capital theories).

We will be talking about 2 business cycle supply-side theories: 1. **non-monetary, over-investment theories and 2. wage cost theories**.

The non-monetary, over-investment theories basically argue that excessive investment during the business cycle expansion results in the demand for plant, equipment and raw material outrunning supply. Frederick Hayek is the most important over-investment theorist.

The economy is layered. According to Hayek, in expansions, the rising demand for consumer goods generates an even greater percentage increase in the demand for plant, equipment and raw materials. The demand for raw materials rises faster than the demand for capital goods (plant equipment) because of an accelerator function, and the demand for capital goods rises faster than the demand for consumer goods also because of an accelerator.

Therefore, in expansions the price of consumer goods will rise the least, the price of plant and equipment will rise more and the price of raw materials will rise the most. In expansions, the rising prices in the early stages will eventually reduce profit rates for consumer goods, resulting in a contraction. These mechanisms also work in reverse in contractions.

Since a high proportion of raw materials used in the US are imported, if imported raw material prices rise faster than the prices of finished goods in the US, then the aggregate profit rates of US businesses will be reduced.

A Material Cost Model of the Business Cycle:

Description:

1. The equilibrium condition is again that national income = consumption + investment (ignore, for now, g and x). output supplied = consumer + investment demand, but not necessarily at the full-employment level.

2. **There is no lack of demand, consumption is a constant proportion of income.**

3. Since consumption never has a deficiency, investment becomes the key variable. **net new investment is a function of the change in profit rate**.

4. We have a new definition of profit rate that separates it into 2 ratios: the ratio of profits to output and the ratio of output to capital. **Since there is no change in the distribution of income over the cycle, the ratio of profits to output (the profit rate) remains constant.** The ratio of output to capital reflects both physical quantities and relative prices. The physical ratio of the quantity of output to the quantity of capital may be determined in the long-term by technology, or in the business cycle by an optimum for capacity utilization. **The focus of the Hayek model is that the ratio of finished output prices to capital goods prices** (which empirically include both capital goods and raw material prices since the prices of plant and equipment have tracked closely to consumer prices in recent decades) **will fall in expansions as output is rising and rise in contractions as output is declining**

Equation Description:

$$Y = C + I$$

$$C = c_0 Y$$

$$I^n = f(\Delta \Pi / K)$$

Π / K (profit rate) = Π / Y (ratio of profit to output) times Y/K (ratio of output to capital). This separates out the ratio of output to capital that depends on both the physical capital and labor and the cost of capital goods.

Π / Y = constant over the business cycle

$Y/K = a - cY$. the ratio of output to capital declines as output increases. We are most interested in the relative prices of Y and K.

Operation of the Material Cost Model:

A rising profit rate leads to a rise in investment. As investment rises, output rises and the ratio of output prices to capital goods prices declines (eventually maybe even the physical output to capital ratio may decline. The revenue from output does not rise as fast as the cost of capital goods. Therefore, the rate of profit begins to slow and decline, and this leads to a decline in investment. The decline in investment lowers output and income.

As the contraction progresses, the cost of capital goods falls faster than the prices of finished output. The physical ratio of output to capital may also rise as inefficient firms are forced out of business. Therefore, the rate of profit begins to decline more slowly, and eventually starts to rise. The rise in the rate of profit causes investment to rise and the cycle starts over.

Evaluation of Material Cost Models:

These theories have led to better understanding of relative prices in the business cycle, but the lack of labor costs limits their usefulness. Remember that raw and intermediate materials are a very small part of GDP. This is more useful as a sector model.

Wage Cost Model:

Description:

1. The equilibrium condition is again that national income = consumption + investment (ignore, for now, g and x). output supplied = consumer + investment demand, but not necessarily at the full-employment level.

2. **There is no lack of demand, consumption is a constant proportion of income.**

3. Since consumption never has a deficiency, investment becomes the key variable. **Net new investment is a function of the change in profit rate**.

4. We have a new definition of profit rate that separates it into 2 ratios: the ratio of profits to output and the ratio of output to capital. **Unlike the Material Cost Theory, the ratio of output to capital is constant. The ratio of profit to output (also known as the profit share), however, fluctuates over the business cycle. The distribution function between the labor share and the property share is once again a key element.**

5. The labor share is a negative function of unemployment (with a lag). Labor share will fall through most of the expansions and begin to rise in the last part of the expansion and in the early contraction because unemployment is declining (and vice- versa).

Equation Description:

$y = c + i$

$c = c_{0y}$

$I^n = f(\Delta\Pi / K)$

Π / K (profit rate) = Π / Y (ratio of profit to output) times Y/K (ratio of output to capital). This separates out the ratio of output to capital that depends on both the physical capital and labor and the cost of capital goods.

Π / Y **= fluctuates over the business cycle**

Y/K **= a constant .**

$1 = w/y + \Pi / y$

$w/y = a - bu_{t-1}$

Operation of the Wage Cost Model:

When the expansion begins, unemployment is high, so the labor share is low and falling. Lower labor share means higher profit share -- which means more investment. Higher investment means more jobs, more income and less unemployment.

Once unemployment has declined to a point, however, labor gains more bargaining power and the labor share rises. The rising labor share means lower profit share and lower rate of profit. A lower rate of profit results in lower profit expectations which results in lower investment.

During the contraction, unemployment rises and the bargaining power of labor declines. The labor share declines, productivity increases and the profit share and profits turn around and begin to rise. This starts the expansion process again.

Evaluation of the Wage Cost Model:

Wage costs are the largest part of total costs, so it is important that a business cycle theory include wage costs.

This theory specifically states that the decline in unemployment precedes the increase in labor share which, in turn, precedes the decline in the profit rate. However, the empirical data shows that the profit rate often peaks and turns down before the labor share begins to rise.

Clearly, profits are determined by more than the cost of labor -- revenues and raw materials costs, for example. Profit behavior cannot be understood without considering demand and cost.

Profit Squeeze Model:

Profits are determined by both revenue and costs. Therefore, a profit squeeze may be caused by 1 constant revenues while costs rise, 2. revenues may rise but costs rise even faster, or 3. revenue may fall and costs rise, remain constant or fall slower than revenue. Michal Kalecki (*Theory of Market Dynamics*, 1968) developed an endogenous profit squeeze model.

Description:

Output (GDP) is still defined as consumption + investment. (we ignore government and international). However, we now add that GDP also = labor income + raw material cost + profits (we ignore taxes, rent and interest).

The consumption function is the same one used in the Effective Demand Theory. Consumption is determined not only by the total amount of national income, but also by the distribution of national income between labor and property owners. The average and marginal propensity to consume from labor is higher than the average or marginal propensity to consume from property. In this model, wage earners spend all their income on consumption (lagged) and property owners spend only a small portion of their income on consumption (lagged).

New investment is a function of the change in profits. We use the change in profits, not profit rates, although investment is probably a function of both.

Profit is related to both demand and supply variables. Profits = (consumption + investment) – (labor costs + raw material costs). In expansions, for example, real wages rise, but profits rise even more because the demand effect dominates the cost effect in those periods. The ratio of the prices of raw materials to consumer goods (which includes the prices of plant and equipment) rises in expansions and falls in contractions.

The labor share is a negative function of capacity utilization (because of wage lags) and a negative function of unemployment (with a long lag time). This is the Synthetic Hypothesis we studied in Chap. 6.

Unemployment is counter-cyclical and capacity utilization is pro-cyclical.

Equation Description:

$y = c + I$
$y = (w + m + \Pi)$

$c = c_0 + w_{t-1} + c_2 \Pi_{t-1}$
$1 = w/y + \Pi/y$

$i^n = f(\Delta\Pi)$ There are time lags on these profit changes, of course.

$\Pi = y - (w+m)$ or $y = (c + i) - (w + m)$
where m = raw material costs

$w/y_t = w_0 - a(y/z_t) - b(u_{t-1})$ to show a longer lag time on unemployment than capacity utilization.
y/z = capacity utilization
u = the unemployment rate
y/z and m are positive functions of y and u is a negative function of y.

Operation of the Profit Squeeze Model:

In a recovery, aggregate demand rises rapidly. Costs are also rising (wages increase but less than productivity and raw material costs also rise but slowly at first), but more slowly than demand because productivity is very high. Therefore, total profits are rising (as are profit expectations and available cash for investment) which results in rising investment. Rising investment leads to more income and consumption via the multiplier.

Real consumer demand rises ever more slowly in prosperity because the marginal propensity to consume declines (caused by a declining labor share). Near the cyclical peak, consumer demand is growing very slowly. Now, however, raw material costs (and interest costs) are rising rapidly (labor costs are also rising), putting a squeeze on profits. The decline in profits causes a decline in investment, which results in a decline in employment and income.

During a crisis and depression, real consumer demand falls, but consumption falls more slowly than income. The average and marginal propensity to consume turns and begins to rise as the labor share rises (labor share rises in contractions because productivity falls faster than real hourly wages). Aggregate profits fall rapidly in early contraction because productivity is falling, and investment declines rapidly as a result. The decline in investment works via the multiplier to lower employment and income.

Late in a contraction, however, consumption falls more slowly than income, the labor share is rising, and the propensity to consume begins to rise. Demand is falling slower while costs are declining rapidly. Total profits turn and begin to rise and profit expectations also rise. Investment begins to rise as a result of the improved profits or profit expectations.