Business cycles

Definition of business cycles (Abel + Bernanke, p. 290)

1. Fluctuations of aggregate economic activity

2. Cyclical pattern: Expansions and contractions
Turning points of the business cycle (peak and trough)

Temporary vs permanent effects

3. Co-movements

4. Recurrent but not periodic.

5. Persistence

Business cycle facts
Business cycles look alike (Lucas). Possibility of a general, unifying theory

Qualitative
1. Direction of movement relative to aggregate economic activity (pro-, counter- , a-cyclical)
2. Timing of turning point (leading, coincident, lagging)

Qualitative and **quantitative**
Characterizing the entire empirical joint probability distribution of a set of macroeconomic variables
1. Volatility
2. Cross-correlations at various leads and lags
3. Auto-correlation
4. Dynamic path (IRF)

Main findings:
A critical and unsettled issue: Detrending time series

Real GDP is persistent
All components of spending are procyclical
Consumption is less volatile than GDP. GDP is much less volatile than investment
Inventories are the most volatile component of investment
Imports and exports fluctuate less than investment but more than consumption
Net exports are countercyclical
Prices are countercyclical and leading
Employment is procyclical, lagging and considerably less variable than output
Hours worked are procyclical, slightly leading and less variable than employment
Inflation is procyclical
Nominal interest rates are procyclical
Correlation between hours worked and productivity (real wage) is almost zero
Real and nominal exchange rates are equally volatile
Output across countries is more highly correlated than consumption

Effects of a contractionary monetary shock
The aggregate price level initially responds very little
Aggregate output falls
Interest rates initially rise
Real wages decline by a modest amount
Profits fall

Key criterion in the evaluation of any theoretical model: Does it replicate the facts it wants to explain? Does it replicate other facts?
Qualification: Are the facts indisputable?

Review of macroeconomic theories
Determine aggregate economic activity, Y, and the general price level, P (inflation):

AD(p) = AS(p)

Aggregate demand = C + I + G + NX
Slope: P↑ ⇒ M/P↓
Position: G, T, M, V, π-exp, i, Wealth….

Static: C(Y) I(r) NX(q, Y, Y*)
vs
Intertemporal approach: C(Y-perm, Y-temp, r) NX(r, Y-temp, Y*-temp)
Aggregate supply:
1. Classical model: wage and price flexibility ⇒ vertical AS
Unemployment = natural rate
Business cycles are the result of supply shocks (changes in productivity, taxation, regulations…) that shift the AS curve. Shifts in AD only matter for nominal prices

Monetary neutrality
Recessions as creative destruction (Schumpeter)

2. Keynesian model: fixed prices (market failures) ⇒ positively sloped AS

AD shocks are emphasized as the main source of macroeconomic fluctuations

Preoccupation with macroeconomic stabilization: Rules vs discretion, part I
The effectiveness of policy (fiscal and monetary):
a) Debate concerning slopes, multipliers etc.
View of the government: Enlightened, well informed server of the public interest
b) Debate with monetarists (Friedman)
Keynesians advocated the use of activist, discretionary monetary policy to fine tune the economy.
Monetarists opposed the exercise of macroeconomic stabilization policy because of the following reasons:
I. Lack of effectiveness due to lack of appropriate information

a) Information lags regarding the state of the economy
b) Long and variable lags between monetary policy actions and their results.
Leading indicators

II. Scope for policy manipulation to satisfy political goals (the political business cycle). Incompetence

According to M. Friedman monetary policy has been the main source of macroeconomic instability.
Monetarists advocate the adoption of a rule (such as constant growth of the money supply). Keynesians believe that the CB has either superior information or greater flexibility than the private sector

3. Neoclassical synthesis
Accounting for inflation
Fixed prices in the short run, flexible in the long run

Prices increase with excess nominal aggregate demand

$\pi(t) = p(t) - p(t-1) = k[yd(t) - ys(d)] = h\,u(t)$

⇒ AS positively sloped in both the short and the long run!

The Phillips curve
An inverse relationship between growth in nominal wages and the rate of unemployment (or inflation and measures of economic activity)
It suggests that a government faces an exploitable trade off between inflation and unemployment. That is, that it

can achieve lower unemployment if she is willing to accept higher inflation

Key weaknesses:
Theoretical: Confusion between nominal and relative price adjustment (Friedman, Phelps)
Empirical: Instability of the estimated relationship between inflation and unemployment. Estimation over successive time periods showed an upward shift and eventually a disappearance

Outcome of these shortcoming: Major policy failure in the 70s. Systematic expansionary monetary policy that aimed at combating higher unemployment resulted in excessive inflation in the seventies (oil shocks also contributed).

4. Imperfect information rational expectations theory

Key question faced in the seventies
Is there a **permanent** trade off between inflation and unemployment?
Is there **any** trade off between inflation and unemployment?

The key role of **expectation**s in the determination of the slope of the AS and Phillips curves (Friedman, Phelps)

Adaptive expectations: An average of past inflation rates. Changes in expectations occur slowly over time as a result of past inflation rate changes. People gradually correct their past mistakes

$\Rightarrow$ for the slope of the Phillips curve: There is a trade off in the short but not in the long run. The trade off requires accelerating inflation. In the long run:

The natural rate of inflation: The rate that is invariant to monetary policy

Rational expectations (Lucas, Sargent)
1. Key insight: Expectations are forward looking.
2. They should correspond to the prediction of the relevant model.. For example,
E(P): E(AD) = E (AS)
3. They should be the best guess of the future given available information

Important point: Rational expectation does not mean perfectly accurate but simply correct on average

Example: My wife's trips to the shops Average: 100
If we have quarreled the night before: 150
If we have quarreled and my sister has recently bought some nice clothes: 200
Conditional on the information available: different predictions about spending
$\Rightarrow$ for the slope of the AS curve and the Phillips curve in the short and the long run.
The expectations augmented AS (Phillips) curve

Main point of RE model: Inflation expectations errors lead to changes in real wages and to output fluctuations. The business cycle is due to mistakes

I. The Keynesian model
Labor contracts fix nominal wages
Anticipated vs unanticipated changes in inflation

To generate *persistent* effects we need staggered contracts (Taylor)

Shortcoming: a) Accounting for the existence of labor contracts
b) Accounting for output fluctuations in countries with no union participation

II. The flexible price, imperfect information model
Perceived vs unperceived changes in the supply of money.

Shortcomings: a) Requires long informational lags on monetary aggregates
b) Cannot easily generate persistence in economic fluctuations

Summary:
Anticipated changes in AD do not affect output and lead to acyclical inflation
Unanticipated changes in AD affect output and lead to procycyclical inflation
Changes in AS or in expectations (that are not validated by actual behavior) affect output and lead to countercyclical inflation

P**roject**
Select an issue of importance (such as: what are the implications of monetary union in Europe for macroeconomic stability in France) or simply an interesting paper from the literature.

Set up a suitable model
Preferences, production opportunities, technology, information, shocks, institutional features (market structure etc).

Solve the model (derive the FOCs)

Calibration: Assume particular values for the parameters of the model (or estimate them). Calculate the steady state
Remark: These two tasks are typically carried out simultaneously as some parameter values are selected in order to match SS relationships

Linearize the FOCs and constraints

Impose equilibrium
This results in a system of linear, stochastic difference equations

Solve this system

Simulate the model based on the solutions
Calculate empirical pdf: moments IRF variance decomposition