

Chapter 29

Business fluctuations

This chapter presents stylized facts and basic concepts relating to business fluctuations. The next chapters go more into depth with specific business cycle theories.

The term *business cycles* refers to the empirical phenomenon of economy-wide fluctuations in output and employment around the trend, observed in industrialized market economies. By “trend” is meant a persistent long-term movement over time. That the fluctuations around trend are often called business “cycles” should not be taken too literally. The sequence of expansions and contractions is not periodic like sinus waves. But the sequence shows many statistical regularities. It is the job of business cycle analysts to characterize and explain these regularities.

29.1 Some business cycle facts

Compared with “white noise fluctuations”, business cycle fluctuations are characterized by composite stochastic regularities. In a short list we emphasize the following regularities displayed by time series data:

1. GDP and employment exhibit considerable *fluctuations around their trends*. (Whether the trend is best described as stochastic or deterministic is a recurrent theme in econometric time series analysis.)
2. The expansions and contractions exhibit *persistence* (duration) in that positive deviations from trend are likely to be followed by further deviations of the same sign.
3. The ups and downs tend to be *hump-shaped* rather than saw-tooth shaped (amplification).

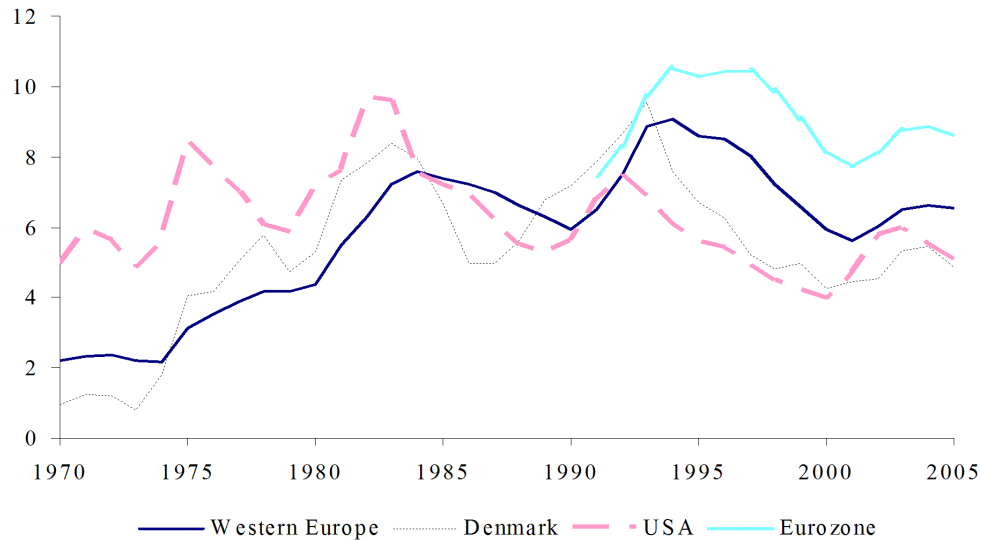


Figure 29.1: The rate of unemployment in Denmark, Western Europe, the Eurozone, and the United States, 1970-2005. Note: Unemployment is measured as the number of unemployed relative to the labor force. Western Europe comprises the EU-15 as well as Norway, Switzerland and Iceland. Germany is included after the reunification in 1991. Source: OECD, Economic Outlook.

4. The fluctuations are recurrent, but *neither periodic nor easily predictable*. The distance from peak to peak may be about 10 years.
5. The fluctuations exhibit systematic *co-movement* across production sectors, GDP components, and countries. Some facts that have played a central role for the theoretical debate are:
 - (a) Employment (aggregate labor hours) is *procyclical*, i.e., varies in the same direction as GDP, and fluctuates almost as much as GDP.
 - (b) Aggregate consumption and employment are markedly positively correlated.
 - (c) Real wages are weakly procyclical and do not fluctuate much.
 - (d) Firms' inventory holdings are procyclical, while the inventory-to-sales ratio is countercyclical.

Some of the regularities identified may only be valid for a subset of countries, depending on the structural characteristics of these. For example Fig. 28.1 shows that unemployment in Europe as well as the US fluctuates considerably. Only in the US, however, has unemployment appeared stationary since the early 1970s.

The next section gives a list of definitions of terms often used by business cycle analysts.

29.2 Key terms from the business cycle vocabulary

Impulse versus *response*. The “impulse” is a disturbance to the economic system coming “from the outside”. Is synonymous with a “shock” to an exogenous variable (an unanticipated sudden shift in its value). The “response” refers to the reaction of the economic system, i.e., the effect on endogenous variables.

Propagation and *propagation mechanism*. “Propagation” refers to the spreading of effects of the impulse through the economic system (synonymous with “dissemination”, “transmission” or “proliferation”). And “propagation mechanism” is the economic mechanism involved in this spreading.

The propagation mechanism can lead to *amplification*, *persistence* and *co-movement*:

Amplification is present when an α per cent deviation (from normal) of an exogenous variable results in a more than α per cent deviation (from normal) of an endogenous variable. Is more or less synonymous with “magnification”, “multiplier effect” or “blow up effect”.

Table 1 Glossary concerning shocks and their effects

Effect on dependent variable	Shock type		
	Temporary	Persistent	Permanent
Temporary			
Persistent			
Permanent			

Persistence refers to effects on endogenous variables along another dimension, namely the time dimension. A shock has “persistent” effects to the extent that the effects last long. Is synonymous with *durability* of the effect. Is often measured by the auto correlation coefficient calculated from the time series of the endogenous variable. Sometimes the shock itself is said to be persistent, usually meaning that there is a relatively durable change in an exogenous variable. One should be aware that the distinction between “temporary” and “persistent” may refer to either the effect of the shock or the shock itself. Table 1 gives a reminder, where also the possibility of permanence is included.

Co-movement refers to the presence of significant correlation between two or more de-trended variables (usually in logs).

Finally, *volatility* usually refers to the standard deviation (sometimes variance) of the deviations of a variable from its trend value. Fixed capital investment is much more volatile than GDP whereas consumption is considerable less volatile.

29.3 A quick glance at the Great Recession and its aftermath

Some data on labor market flows in the USA published by the Bureau of Labor Statistics is shown in the figures 28.2 - 28.4. The terminology used is the following: *total separations* equal the sum of *quits* and *layoffs and discharges*, *quits* being separations on the initiative of the worker and *layoffs and discharges* being separations initiated by the firm. Large fluctuations in employment are envisaged. The shaded areas in the figures indicate periods of *recession* as diagnosed by the NBER (National Bureau of Economic Research). The NBER defines an economic recession as: “a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales”.¹ It is noteworthy that after the 2008-2009 outbreak of the “Great Recession” the trough level of employment is lower than it was after the dot.com-bubble 2001 recession.

At least two different stories could in principle explain this sharp fall in employment.² One is a “Schumpeterian story” about reallocation of labor from old to new industries due to technological change (new industries blossom and old suffer). During such structural changes “above-normal” frictional unemployment due to “mismatch” arises.

The other story is a “Keynesian story” about an overall fall in aggregate demand triggered by a financial crisis. A believer of the Schumpeterian story would expect *total separations*, *hiring*, and *quits* to rise during the recession, as workers move from obsolete industries to blossoming industries. The figures 28.2 and 28.3 indicate the opposite: *total separations*, *hiring*, and *quits* behave procyclically not countercyclically.

A believer of the Keynesian story would expect *layoffs and discharges* to rise and *hiring* to fall during the recession, as firms generally need fewer workers to satisfy the slack demand. In addition, this story predicts that *quits* should fall,

¹A simpler definition, popular in the press, is that a recession is present if in two consecutive quarters real GDP falls.

²Krugman, New York Times, Dec. 11, 2010.

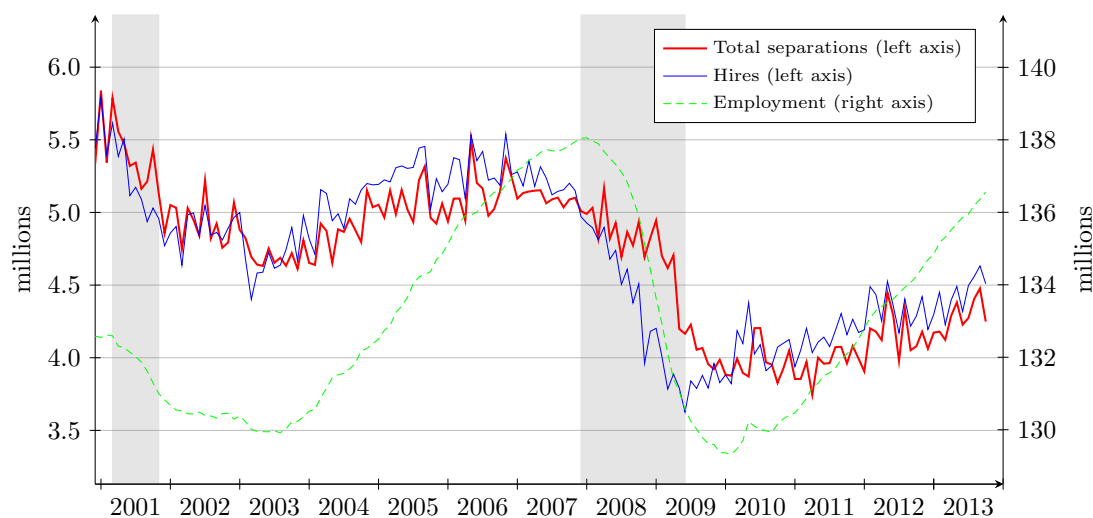


Figure 29.2: Total separations, hires, and employment (seasonally adjusted). USA December 2000 - October 2013. Recessions according to NBER in gray. Source: Bureau of Labor Statistics.

as there is a perception that vacant jobs are scarce. These three predictions are confirmed by the figures. The combination of a rise in *layoffs and discharges* and a fall in *quits* implies that the direction in which *total separations* move is ambiguous according to the Keynesian story. Fig. 28.2 indicates that *total separations* fell during both the dot.com-bubble recession in 2001 and the Great recession 2008-2009; so we can conclude that the fall in *quits* dominated. Moreover, for the whole decade Fig. 28.3 suggests a negative correlation between *quits* and *layoffs and discharges*.

In Fig. 28.4 we see a *Beveridge curve* for the U.S. based on observations over a decade. The variable drawn along the horizontal axis in Fig. 28.4 is the *unemployment rate* in different months since year 2000 (number of unemployed people as a percentage of the labor force). The variable drawn along the vertical axis in the figure is the “job openings rate” in the same months; an alternative name for this variable is the *vacancy rate* (number of vacant jobs as a percentage of the labor force). As expected, the Beveridge curve (so named after the British economist William Henry Beveridge, 1879-1963) is negatively sloped. In a boom, unemployment is low and vacancies plenty because recruitment is difficult, as few workers are searching for a job. In a slump unemployment is high and the vacancy rate low because recruitment is easy, as many workers are searching for a job. In this way, the economy’s position on the downward sloping Beveridge curve can be interpreted as reflecting the state of the business cycle. Indeed, Fig. 28.4 shows that from the start of the recent recession in December 2007 until

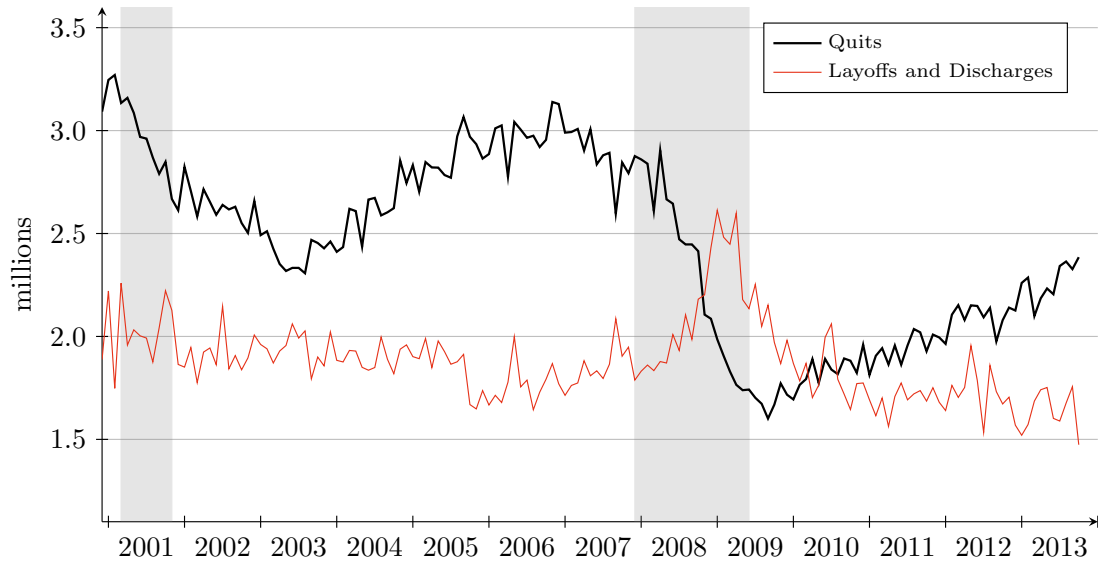


Figure 29.3: Quits and layoffs and discharges (seasonally adjusted). USA December 2000 - October 2013. Recessions according to NBER in gray. Source: Bureau of Labor Statistics.

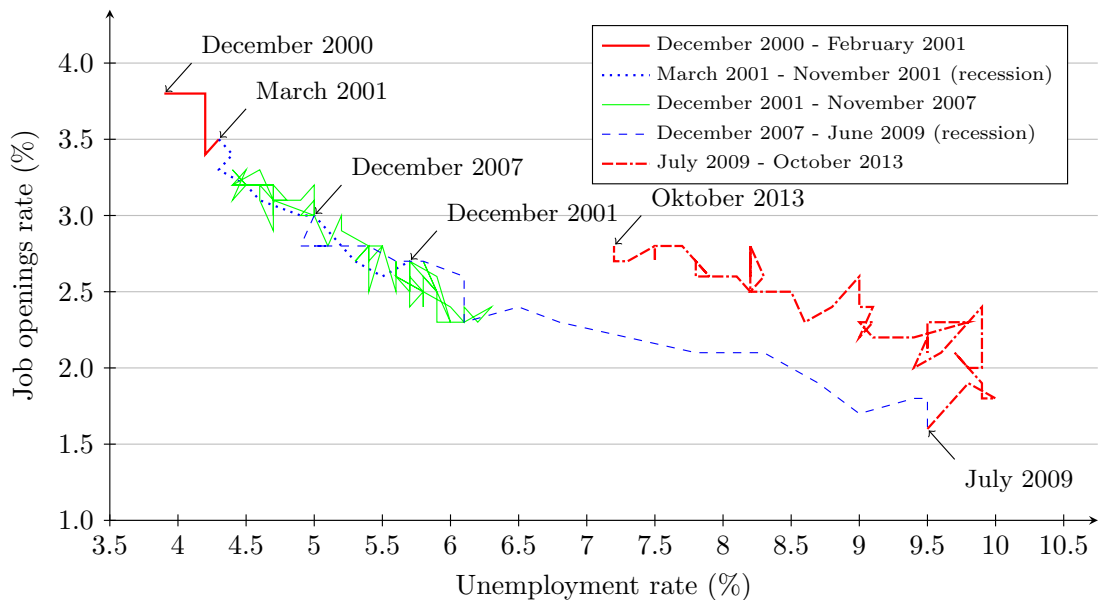


Figure 29.4: The Beveridge curve (seasonally adjusted). USA December 2000 - October 2013. By “job openings rate” is meant vacancy rate. Source: Bureau of Labor Statistics.

October 2009, the economy moved down the curve as the vacancy rate fell and “layoffs and discharges” rose.

An outward shift of the Beveridge curve is a sign of reduced matching efficiency in the labor market. Such a *mismatch* phenomenon can be due to fast technological and structural change. Firms in the new industries have vacant jobs but it is hard to find appropriate workers. Since October 2009, the economy has moved somewhat up and to the left. This is a sign of increased mismatch. On the other hand, as Barlevy (2011) concludes and the figure suggests, increased mismatch can account for only 2 of the 5 percentage point increase in the unemployment rate since December 2007. So in his Nobel laureate lecture, Dale Mortensen (2011) concluded: “The real problem is that demand for goods and services has not recovered because real interest rates have remained too high”.

29.4 Conclusion

In the next chapters we consider different theoretical approaches to the explanation of business cycle regularities.

29.5 Literature notes

Articles in Handbook of Macroeconomics (1999) and for example the macroeconomics textbook by Abel and Bernanke (2001) describe in more detail the empirical regularities that characterize business cycle fluctuations, including both the direction and the timing of the cyclical behavior of economic variables.

29.6 Exercises

