Title: An Example of an Economic Model: The Circular Flow of Income

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Economic Model

An economy comprises millions of decision makers. Together their decisions generate spending, output and income. The *circular flow of income* is a model of the economy showing flows of goods and services and factors of production between *firms* (the suppliers of goods and services) and *households* (the consumers of goods and services) (Figure 1). Households provide their labour for firms who produce goods and services. In return people in work receive payments, such as wages, which are spent on the output of firms. Not all of current income is spent, some such as savings, is withdrawn from the circular flow. In addition to consumer spending, income is injected into the circular flow, for example through investment by firms. The model suggests that the economy can be managed by government fiscal (budget) policy, adjustments in spending and taxes. It tends to ignore the monetary and structural side of economies. These need to be considered too in evaluating the impact of any external (*exogenous*) or internal (*endogenous*) shock to the economy or any deliberate intervention by the government.

Aggregate demand (AD) is the total spending on goods and services in the economy. It consists of four elements: *consumer expenditure* (C), *investment* (I), *government expenditure* (G) and *expenditure on exports* (X), less any expenditure on imported goods and services (M).

$$AD = C_d + I + G + X$$

Or

$$AD = C + I + G + [X-M]$$

- *Money*: A stock concept: at any given moment there is a certain quantity of money in the economy.
- *Income*: A flow concept, measured as so much per period of time.
- The relationship between money and income depends on the *velocity of circulation* of money.

Not all money is passed on round the circular flow, some is withdrawn and some is injected.

- *Withdrawals* (or leakages) (W): Income that is not passed on round the inner flow.

- *Net savings* (S): Money put aside by households (normally in banks) less drawing on savings and borrowing.

- *Net taxes* (T): Total taxes less benefits paid to households by the government.

- *Imports* (M): Spending by domestic consumers on imported goods.

- *Injections* (J): Expenditure on the production of domestic firms coming from outside the inner flow.

- *Investment* (I): The money that firms spend on capital equipment, buildings, building up stocks etc.

- *Government expenditure* (G): Government spending on goods and services

- *Export expenditure* (X): Money flows into the circular flow when overseas residents buy exports.
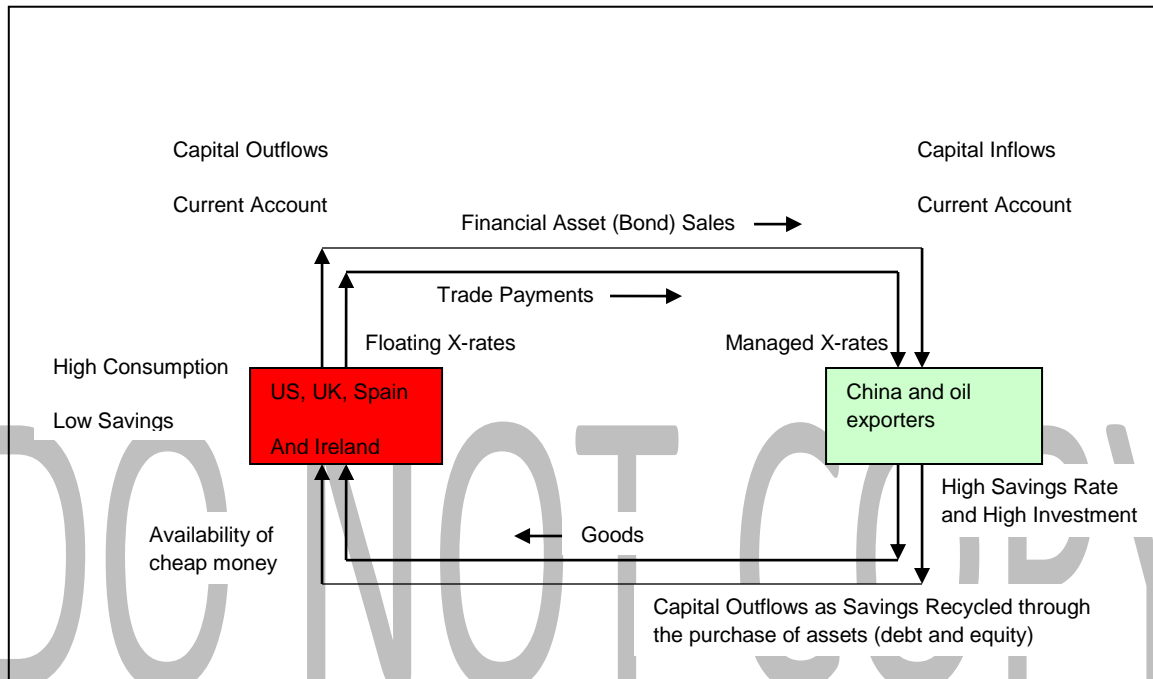
Figure 1: The Circular Flow of Income
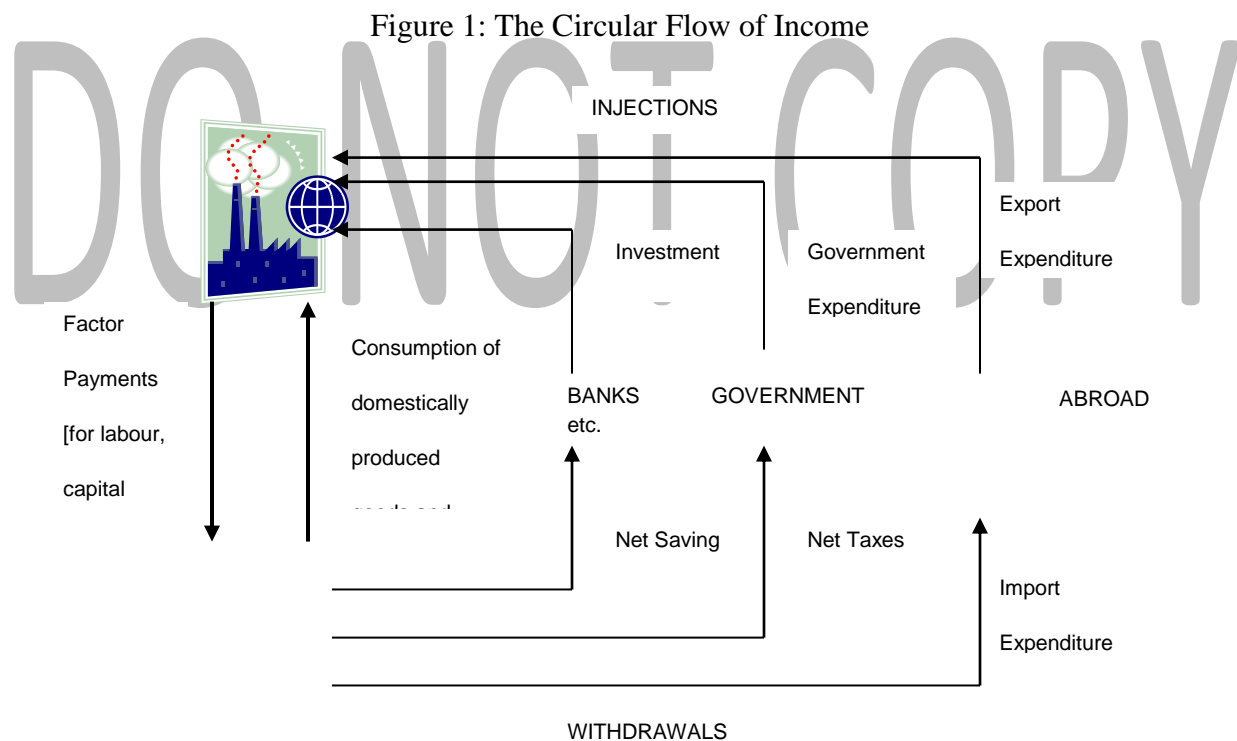
Source: Adapted from Sloman 2006, p.371

3: A suggested Model of Global Economic Imbalances

Figure 2 provides a simple model of contemporary global imbalances and how these are related to current economic problems. Imbalances exist in trade, capital flows and savings/consumption rates.

Figure 2: Global Economic Imbalances

Source: Author compilation

Is rebalancing occurring? In East Asia many economies depend on exports (have trade surpluses), they have large foreign exchange reserves and managed currencies. Among these economies only China has meaningfully pushed towards domestic demand with a large economic stimulus package in 2009, but since autumn 2008 it has reverted to a currency peg with the US dollar; foreign exchange reserves have risen to over $3,200 billion (world total around $10,400 billion at end of 2011 and nearly triple Japan's reserves, the second largest). In South Korea, Taiwan and the Philippines the governments have tried to keep their currencies low as the US$ has fallen, especially because they wish to remain competitive with China.

[Over the past 5 years (2007-11) China has pulled in an average of $160bn a quarter. It has used this to invest in everything from gold to overseas companies but ultimately has had to recycle the vast bulk of its reserves into US government bonds. The inflow has posed inflation problems. The semi-pegged currency has required that the Chinese central bank buys most of the foreign currency coming into the country, injecting fresh RMD into the economy in return. To prevent

inflation, the central bank must carry out '*sterilisation*' operations. It issues government bills to banks or forces them to set aside a portion of their deposits as required reserves to mop up the excess liquidity (thus China set banks' reserve requirements at a record high of 21.5 per cent for much of 2011).]

In general, since the beginning of the century, many emerging economies have built foreign exchange reserves and tried to keep their exchange rate low to foster exports (a form of *neo-mercantilism*) and as a cushion in bad times instead of having to turn to the International Monetary Fund (IMF).

However, some rebalancing is occurring as a result of a substantial depreciation of the US$, euro and pound sterling, which are fostering exports from these currency areas and reducing imports to them. Weak demand in developed economies and continued buoyant demand in emerging economies is also contributing to the rebalancing. Thus the trade deficit in both the US and the UK fell in 2009.

An Investment Scenario

Up to mid-2011 the impetus for global economic recovery came from emerging markets and quantitative easing in the US, the latter pushing up asset prices in the US and elsewhere and sending money to the emerging economies. This coupled with an additional investment stimulus in China led to rising commodity prices. But in 2012 commodity prices fell as world demand weakened, precipitated by problems in Europe and slowing growth China.

Higher commodity prices create social instability in developing countries. Hence, faced with inflation that attacks living standards, governments push towards subsidies and/or allowing wages to rise. In developed countries higher commodity prices are a tax on growth. Demand for Treasury bonds from emerging markets (including Middle East oil producers) has kept yields down. This has been due to emerging markets wishing to keep their currencies competitive. Emerging markets may give up this strategy and allow their currencies to rise, slowing imports and inflation. But Treasury bill yields will rise making money more expensive in the US.

Advice: Buy emerging market currencies, US farmland or gold??

The Pattern of Economic Growth through Time

Growth and change in an economy (including structural and organisational change) can be understood through system's theory in terms of *systems dynamics*. The state of a system may be transient, in equilibrium (stable), or unstable (dynamic). If the system is stable, then a disturbance will result in a sequence of changes that return the system to equilibrium (*deviation reduction systems*). In contrast, if a system is unstable, then a disturbance to the system (causing a deviation) will result in the amplification of the deviation (*deviation amplifying system*). Those who believe in the *market mechanism* argue that market forces tend to work towards equilibrium. Those who believe in public intervention, suggest that intervention is often necessary to prevent damaging disruption to economies by market forces. "One of the main lessons of the 2008 crisis is in fact that the stability properties of globalised finance are similar to those of many other complex systems [Leijonhufvud, 2009]. As long as the shocks to which such systems are subjected do not exceed a given amplitude, they rapidly return to equilibrium. If the amplitude is excessive, however, such a return becomes impossible and only a prompt external intervention can help avoid a complete collapse of the system." (Brender and Pisani 2010: 162).
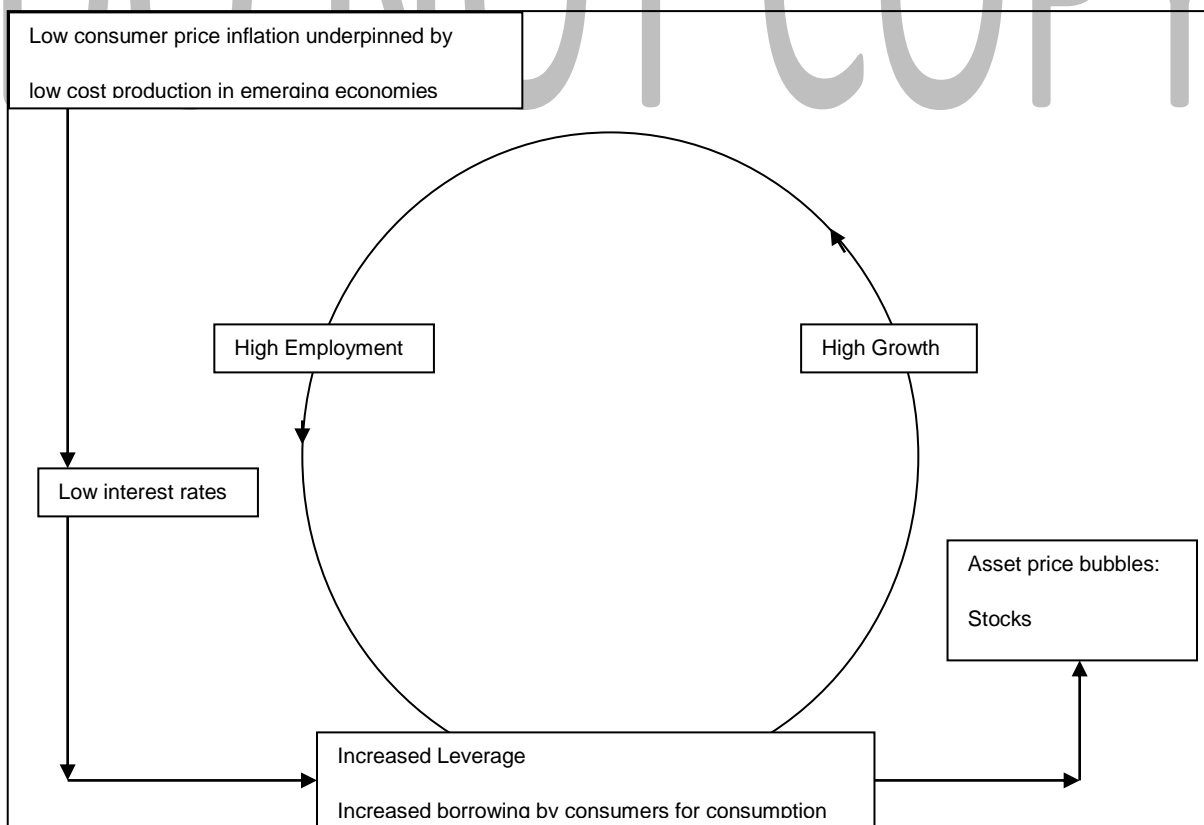The development of systems (the process of growth) can be depicted through *vicious* and *virtuous circles* (or *spirals*) of growth or decline (Figures 3 and 4). A well known growth spiral is that depicted in Myrdal's model of *cumulative causation* (Figure 5). Finally, growth is constrained by the existing attributes (resources) within a region. In this sense, the trajectory of growth may be *path dependent*. For example, a region that has developed around heavy manufacturing industry may find it difficult to attract tourism development. A region that has developed around tourism will not have the skills base or supplier infrastructure to attract high technology industrial development. If this is accepted, *how will economies that have developed unbalanced industrial structures rebalance themselves?*

Figure 3: Vicious Circles of Decline (Negative Feedback Loops)

Leveraged Asset Holders   **The Economy**

Falling Asset

Contraction

Fewer

Contraction
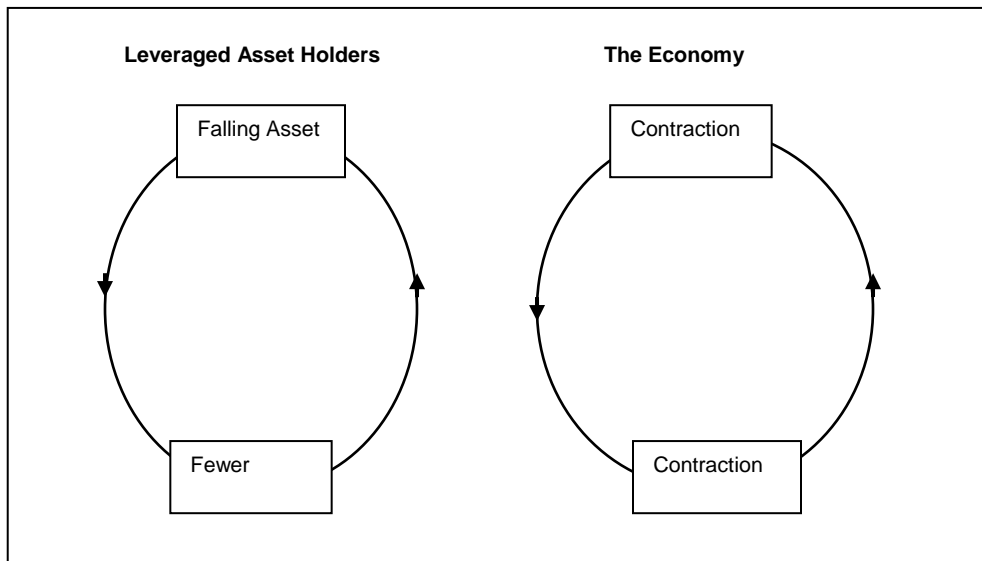
Source: Author Compilation

Figure 4: The 'NICE' Economy of Non-Inflationary Constant Expansion in Advanced Economies 2000-2007

Low consumer price inflation underpinned by low cost production in emerging economies

High Employment

High Growth

Low interest rates

Asset price bubbles:

Stocks

Increased Leverage

Increased borrowing by consumers for consumption

Source: Author compilation

Figure 5: Model of Cumulative Causation or Virtuous Circle of Growth
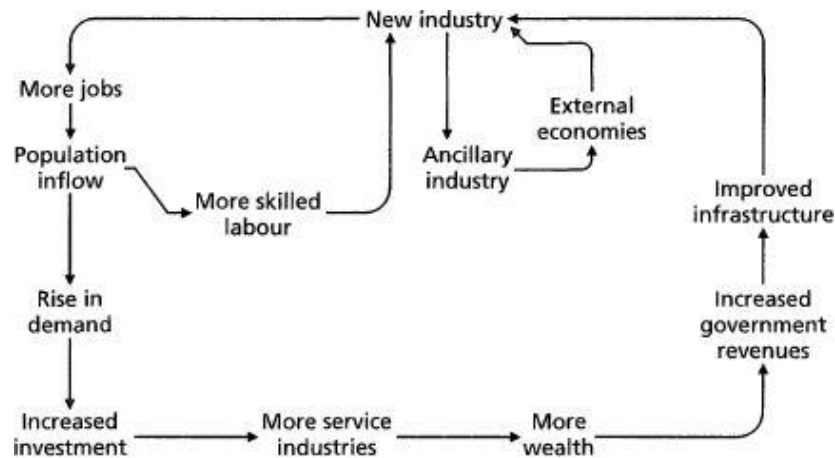
After Myrdal 1957

4.1 Business Cycles

The pattern of economic growth through time is not linear, but involves periods of growth and decline. Most economists accept that short waves (around ten years) are an inherent feature of economic growth in all market economies. In addition, some authors claim to have identified long waves (*Kondratieff cycles* of 50 years or more) associated with fundamental new technologies, but these are much less widely accepted (see Dicken 2007). [Note: A crucial consideration when interpreting time series data is not to confuse an element of a cycle with a trend.]

The *business cycle* refers to the periodic fluctuations of national output around its long-term trend (Figure 6). The cycle can be divided into four phases: i) slowdown, ii) trough (slump/recession), iii) expansion (growth acceleration), and iv) peak (boom). In purely technical terms a recession is defined as two successive quarters of falling output (as measured by the percentage contraction from one quarter to the next).

In periods of expansion and boom businesses tend to over extend themselves (as Chuck Prince, former chief executive of Citigroup, said about Citi's leanding at the top of the boom in 2007: "as long as the music is playing, you've got to get up and dance"), consequently when a period of contraction arrives many businesses fail. Understanding the business cycle, is thus of crucial importance. Unfortunately, the length, magnitude and exact path of the cycle (V, U, or W

shaped) varies from one cycle to another making the timing impossible to predict with any degree of precision (within five years). Hence, businesses need to adopt strategies that can accommodate cyclical changes in demand, for example *geographical* and *product diversification*. However, as integration increases in the world economy, national economic cycles may have become more synchronised (Figure 7). If this is so, then the magnitude of national cycles could be magnified and geographic diversification strategies less strategically useful.

Cyclical sectors: Within an economy, some sectors tend to be more prone to cycles of growth than others. For example, the property market, construction industry and shipbuilding tend to be very cyclical, while food manufacturing and food retailing tend to be more stable.
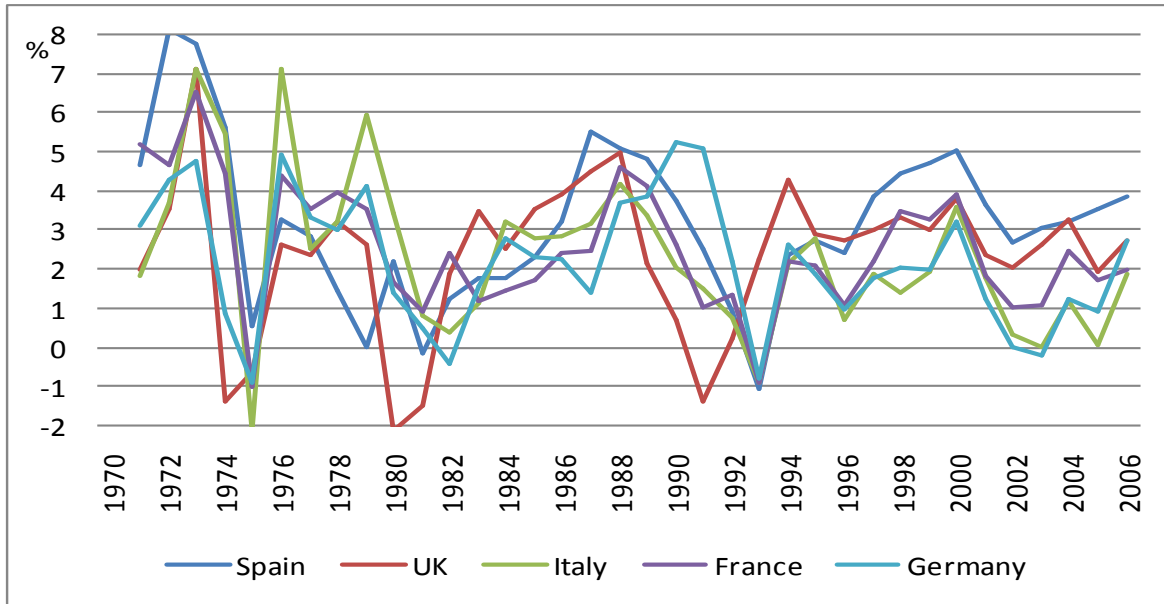
Periods of boom and bust tend to create uncertainty in the economy and can be very damaging. Hence government policy is often designed to smooth out the cycles through *counter-cyclica*l measures as opposed to *pro-cyclical* ones.

Figure 6: Phases of the Business Cycle
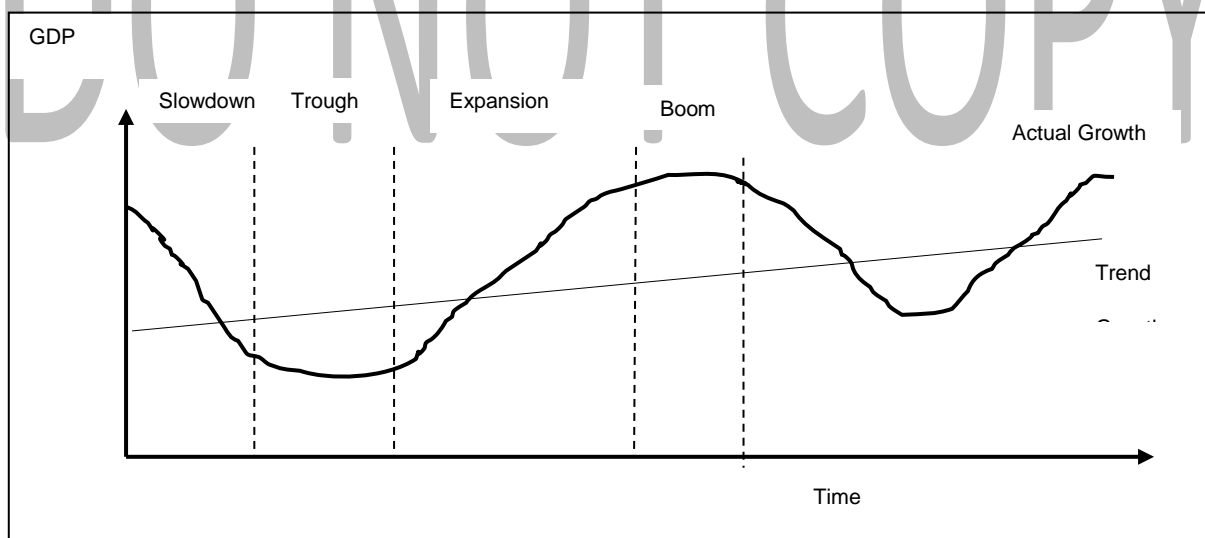
Source: Author compilation

Business Cycles in European Economies

Source: Author Compilation

4.1.1 Economic growth concepts

•   *Actual growth*: The percentage annual increase in national output.

•   *Trend output*: The smooth path of long-run output once its short-run fluctuations are removed.

•   *Potential growth*: The percentage annual increase in the economy's capacity to produce. Two of the major factors contributing to potential economic growth are: an increase in resources; an increase in the efficiency with which resources are used.

•   *Potential output*: The output that could be produced if there were full employment of resources.

•   If actual growth < than potential growth then there will be an increase in spare capacity (factories and offices working below their capacity): there will be a growing gap between actual and potential output. In policy terms actual output needs to be kept as close as possible to potential output.

•   *Sustainable output*: The level of national output corresponding to no excess or deficiency of aggregate demand. It corresponds to stable inflation. If output is below this level there will be

a deficiency of demand and a fall in inflation; if above, then there will be excess demand and a rise in inflation. Output gaps tend to follow the business cycle.

4.1.2 Explanations of the Business Cycle

- *Fluctuations in aggregate demand* (Keynesian, demand side, explanation). This explanation leads Keynesians (followers of the ideas of John Maynard Keynes) to recommend policy initiatives that are counter cyclical: increased public investment and fiscal policies to stimulate demand in downturns and increased taxes and reduced public spending in upturns (see the circular flow of income). A more stable pattern of growth, they argue, provides a better climate for investment, which in turn results in higher trend economic growth.

- *Instability of investment*. The *accelerator theory* links the level of investment to the rate of change of national income. Investment is held to rise quickly in the expansionary phase and contract quickly in the slowdown. Changes in investment (an injection into the circular flow of income) cause multiple changes in income – thus the process is called the accelerator. Increased incomes themselves stimulate further rises in income through the multiplier process (the ratio of the change in output to the change in spending that causes the change in output). As a result the multiplier/accelerator process creates a virtual upward spiral of growth in the phase of expansion and a vicious downward spiral of decline in the slowdown.

- *The stocks cycle*: Firms hold stocks (inventories). These fluctuate with the course of the business cycle and themselves contribute to fluctuations in output. As the first tentative signs of recovery appear, firms may be reluctant to invest and prefer to run down stocks in case the recovery does not last. But as the economy grows stronger businesses will invest and will also need to rebuild stocks. Once stocks have been re-established, this element of investment is no longer necessary, slowing total investment.

- *The political cycle*: Elected governments (and non-elected ones) have political motives for their decisions as well as purely economic ones. As election time nears they will want to ensure a growing economy and 'feel good' factor. Thus, they may inject money into the economy through public spending and lower taxes. In contrast, in the early years of a new government they may make decisions that are less popular. Government's that prioritise their own popularity over prudent economics are described as '*popularist*' governments.

- *Technological developments*. Joseph Schumpeter argued that innovations may induce changes in the business cycle.

4.1.3 Determinants of the path of business cycles

- *Time lags*: It takes time for injections (tax cuts/increases, public spending increases, etc) and withdrawals (tax increases, lower public spending) to be fully reflected in national income, output and employment. There are leads and lags in the stimulus response system. For example, the response to small changes in interest rates is never immediate. The multiplier process takes time to operate.
- *Psychological effects*: Once the economy is growing expectations about the future become more optimistic and people spend and invest more. In a slowdown people become more pessimistic, spending and investing less (saving more). There are two powerful drivers behind people's actions, greed and fear. These help to explain the behaviour (note: there is a specific area of economics devoted to trying to explain economic phenomena through peoples' behaviour, known as *behavioural economics*).

4.1.4 Questions and concepts in the business cycle

- *Turning points:* The crucial factor in business cycles is what determines turning points and when these occur.
- *Ceilings and floors:* Actual output can go on growing more rapidly than potential output only as long as there is spare capacity in the economy; until the ceiling is reached. Equally, there is a minimum level of consumption that people tend to retain in an economic trough (continuing to buy essential goods and services), which provides a floor. Firms have to replace worn out equipment and thus there is also a floor to investment.
- *Echo effects:* The replacement of goods and capital purchased in a previous expansionary/boom phase may help to bring a slowdown/trough to an end.
- *The accelerator:* For investment to continue rising, consumer demand must rise at a faster and faster rate. If this does not happen, investment will fall back and the boom will end.
- *The multiplier:* The ratio of the change in equilibrium output to the change in autonomous spending that caused the change.

- *Random shocks* (events): National or international shocks (such as the recent financial crisis).
- *Changes in government policy:* Keynesians argue that governments should deliberately attempt to manage the economy, mostly through demand side policies (notably fiscal policy). Others argue that the government should free up (liberalise) the economy and allow the market mechanism to work through so-called automatic stabilisers. They believe that solutions are to be found on the supply side rather than the demand side.

4.1.5 Observations on the business cycle: Different markets in the economy may have their own specific cycles, for example in the property market or in the financial market. In a study of 18 banking crises in the industrial countries since the Second War, Carmen Reinhart and Ken Rogoff (2008) found that:

- Ahead of each crisis house prices rose rapidly, as did equity prices
- Current account deficits ballooned, with capital inflows accelerating on the eve of the crisis.
- Rising public debt also a near universal precursor of a crisis.
- Financial shocks have often been preceded by periods of financial deregulation.
- Asset price bubbles also often follow periods of price stability. Low inflation leads to low interest rates and people taking on more risk to gain a higher return (in the late 1970s when investors lent to developing countries and then in the sub-prime crisis when they lent to another 'developing country' inside the US). Risk is misunderstood and miss-priced.
- Optimism, greed, euphoria and despair do not recognise national boundaries; they spread rapidly around the world. **[Continued...]**

References

- Begg, D. (2006) Foundations of Economics, 3rd edn, Chapters 8-3 and 9-1. London: McGraw Hill

- Begg, D. Fischer, S. and Dornbusch, R. (2008) *Economics*. London: McGraw-Hill, 9th edn, Chapter 31, 598-612

- Brender, A. And Pisani, F. (2010) Global imbalances and the collapse of globalised finance. Brussels: Centre for European Policy Studies

- Dicken, P. (5th edn, 2006) *Global shift*. London: Sage, pp. 75-77

- Kindleberger, C. (revised edn, 1986) *The world in depression, 1929-1939*. University of California Press

- Kindleberger, C. (5th edn, 2005) *Manias, panics and crashes: a history of financial crises*. Wiley

- Leijonhufvud, A. (2009), "Stabilities and instabilities in the macroeconomy", Voxeu.org

- Myrdal, G. (1957) *Economic theory and underdeveloped regions*. London: Methuen

- Reinhart, C. and Rogoff, K. (2008) This Time is Different: A Panoramic View of Eight Centuries of Financial Crises. *NBER Working Papers and Harvard University Working Paper*

- Sloman, J. and Wride, A. (2009) *Economics*, 7th edn. Harlow, England: FT Prentice Hall. Chapters14 and 17

- Country time series data on GDP can be found at the IMF 'World Economic Outlook' website

- http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/index.aspx

- Choose country level data < select country < select GDP at constant prices percent change < select start and end year

Appendix: Data from World Economic Outlook Database, April 2011.

World Population 7 billion, World GDP $69,000 billion (PPP $78,300 billion)

USA

22% (19%) world GDP, 4.5% world pop

Fragile growth

Stimulus Package: i) Increased Money Supply (Quantitative Easing); ii) tax reductions, iii) public works

Cheap money

EUROPEAN UNION

25% (20%) world GDP, 7% world pop

Low growth

Austerity measures to reduce debt. Rescue packages for Greece, Ireland and Portugal.

JAPAN (

8% (6%) world GDP, 1.8% world pop

Low growth

Deflation from 1990s property crash

Shock of earthquake, tsunami and nuclear incident in 2011

RMB

NET CAPITAL OUTLOW

Purchase of government debt (US Treasury bonds)

NET CAPITAL INFLOW

Purchase of Goods

Foreign Direct

International Monetary System

$ US

CHINA

9% (14%) of World GDP, 19% world pop

Strong growth

Stimulus package on infrastructure

Intervention to keep currency weak

EMERGING ECONOMIES

Brazil, India, Indonesia, Malaysia, Philippines, South Africa, Thailand, Russia,

High commodity prices stimulating growth but capital inflows pushing up inflation

LOW INCOME COUNTRIES

Notably in Africa

Inflation from higher commodity and fuel prices

Social discontent