Chapter 45: Equilibrium in the monetarist/new classical model (2.2) *(note: shifted places with Ch 45 to put the Keynesian model first)*

Key concepts
- New classical view of macroeconomic equilibrium in the short run
- New classical view of macroeconomic equilibrium in the long run
- Business cycle revisited using the new-classical model

| Short-run equilibrium | • Explain, using a diagram, the determination of short-run equilibrium using the SRAS curve  
• Examine, using diagrams, the impacts of changes in short-run equilibrium |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equilibrium in the monetarist/new classical model | • Explain, using a diagram, the determination of long-run equilibrium, indicating that long-run equilibrium occurs at the full employment level of output  
• Explain why, in the monetarist/new classical approach, while there may be short term fluctuations in output, the economy will always return to the full employment level of output in the long run  
• Examine, using diagrams, the impacts of changes in the long-run equilibrium |

There is a degree of broad consensus on the *short run* aggregate supply curve, in that it is upward-sloping. Just as in the simple supply and demand model, equilibrium occurs when aggregate supply equals aggregate demand, i.e. when planned expenditure (quantity of real GDP demanded) equals planned output (quantity of real GDP supplied) in an economy. However, the consensus view is limited to the short run, since there is still stark disagreement between the two broad schools of thought – Keynesian and new-classical – as to the shape of the long run aggregate supply curve.

The diagrams in *Figure 46.1* illustrate the issue. The left diagram shows the broad consensus on the ‘middle range’ along a short run aggregate supply curve. When quantity demanded of real GDP equals quantity supplied then macroeconomic equilibrium is attained. This occurs when real GDP is $Y_{FE}$ and the price level is $P_0$. 
Figure 46.1 Consensus and continued disagreement

- **New-classical view of short run macroeconomic equilibrium**
  We shall look at two scenarios, the first when the short run equilibrium is above potential output levels and the full employment level of real GDP. *Figure 46.2* shows such a situation where output is at $Y_1$ – which is above the full-employment equilibrium at $Y_{FE}$. Since real GDP exceeds potential GDP, there is inflationary pressure created by this gap between de facto and potential output. The distance between $Y_{FE}$ and $Y_1$ is the *inflationary gap* in the economy.

*Figure 46.2 Short run equilibrium and inflationary gap in new-classical model*
While nothing has been built in to this scenario outlining why aggregate demand increased, the question is really what happens after this point? This is a very central issue in macroeconomics and deals once again with the theoretical rift between Keynesian and new-classical economists.

**Figure 46.3 Short run equilibrium and deflationary gap in new-classical model**

![Diagram showing short run equilibrium and deflationary gap in new-classical model](image)

Deflationary gap: arises when the short run equilibrium is below long-run equilibrium.

When output is below the long run output level there will be downward pressure on the price level, i.e. deflationary pressure. **Figure 46.3** shows how the short run equilibrium of \( Y_1 \) is below the full employment level, \( Y_{FE} \), and thus potential long run aggregate supply. This is the deflationary gap (also known as the recessionary gap) and shows that the economy is either experiencing a recession (see Business Cycle) or that the economy’s long run potential is outstripping (= exceeding) the short run increase in real GDP.

Referring to an inflationary/deflationary gap is a bit like going through simple supply and demand curves one at a time. It doesn’t really mean anything until put into context, i.e. utilised in an economic analysis as an illustration. The most important thing for now is that you understand the central issue in using the new-classical model, namely that economic forces arising during short run equilibrium will assert themselves and seek to restore long run equilibrium at \( Y_{FE} \).

- **New-classical view of long run macroeconomic equilibrium**
  The long run aggregate supply curve has thus far been explained as the level of potential output in an economy in the long run. This output level is known as general equilibrium – all factor markets and goods markets have cleared. It is also the full employment level of output since all available labourers willing and able to accept jobs are employed at the going wage rate. **Figure 46.4** illustrates the long run macroeconomic equilibrium.
When the economy is operating above potential output, there will be overfull employment. As real wages rise, labour markets adjust, and both factor and goods markets will clear, restoring the unemployment level to long run equilibrium. The economy returns to its long run equilibrium, $Y_{FE}$.

When the economy is operating below potential output, there will be additional unemployment. In the long run, factor prices will adjust, real wages will fall, and both factor and goods markets will clear. The economy will again be operating at long run (general) equilibrium, $Y_{FE}$.

The point of intersection between aggregate demand and short run aggregate supply also intersects with long run aggregate supply. At this point output equals the full employment level. **Full employment** is defined as the level of unemployment in an economy existing when supply of labour equals demand for labour, i.e. when the labour market has cleared. As the market for labour is intimately connected to output the demand for labour will be derived from planned output and planned expenditure. Those without jobs at full employment level on the labour market are ‘between jobs’, and since there will always be a portion of the total available work force seeking employment, full employment renders a ‘natural’ rate of unemployment (see Chapters 50 and 54).\(^1\)

Strong economic forces will be enacted in a situation where the economy is operating above or below the full employment level of output of $Y_{FE}$ in figure 46.4. As the new-classical AS-AD model assumes that labour markets function perfectly, any disequilibrium in the labour market will be short term so when markets clear the economy will be at full employment no matter what the price level in the economy is. Keep in mind that the new-classical view is that labour markets function perfectly so any disequilibrium (unemployment) in the labour market will be short term only.

One of the ‘strong economic forces’ referred to above is of course inflationary pressure. Inflation is rather carefully defined in economics, and means a sustained rise in the general price level. Since the macroeconomic environment is most dynamic over time, price levels will be continually adjusting to economic activity. In fact, ‘long run’ in our AS-AD model doesn’t really mean ‘the point where the economy will wind up ultimately’ but rather ‘the level around which economic activity will hover over the longer term’. In other words, it is highly unlikely that the economy will be at general equilibrium for any length of time since there is always an ongoing process of adjustment towards the

\(^1\) One question begging to be addressed is how we arrive at the point we call potential output in the first place. Good question. I don’t have an answer. Unfortunately, nobody else does either. In fact, it is impossible to precisely set down potential output in an economy and the LRAS curve must be viewed as a theoretical assumption put in place to aid us in our analysis. So while there is theoretical merit in assuming that potential output is unrelated to the price level and thus vertical, the actual position of long run aggregate supply must be estimated.
long run output level – not at the long run output level.

Coming up next; a Most Important Diagram, as my upcoming bestseller Economics According to Winnie the Pooh will read. Central to the new-classical view is that demand management is relatively ineffective in the long run. Figure 46.5 shows the long run effect of expansionary demand management – increasing government spending and/or lowering interest rates – with the economy initially at full employment level of output, point A.

Figure 46.5 – New-classical view of an increase in aggregate demand beyond full employment

**A to B:** The increase in aggregate demand due to fiscal/monetary stimulation increases aggregate demand from AD₀ to AD₁; real income increases from Y_FE to Y₁ and the price level rises from P₀ to P₁. Since wage levels and factor prices are assumed to remain constant during the short run, the short run supply curve does not shift. Instead firms experience higher costs due to bottlenecks and scarcer factors.

**B to C:** The short run effect is an inflationary gap at point B. In line with derived demand effects on factors, this will result in ever scarcer factors of production – e.g. capital, raw material and labour – and the increase in the price level from P₀ to P₁ will lead to a hollowing-out of wages for workers. Factor prices will ultimately be forced upwards as firms bid on available factors and workers will demand higher wages to make up for lost real purchasing power; short run aggregate supply will decrease in the long run, shown by the shift from SRAS₀ to SRAS₁. The economy has returned to the full employment level of output, Y_FE, but at a higher price level, P₂. This is point C in the diagram.

The A-B-C series in figure 46.5 once again shows the importance of the long run aggregate supply in the new-classical AS-AD model. Any point of short run equilibrium below or above the long run potential – shown by the LRAS curve in the model – will ultimately be corrected as factor markets clear.

**A fall in AD – point C to D to A:** I briefly illustrate the new-classical view of the long run by assuming that the economy is initially in equilibrium at point C, and that aggregate demand instead has decreased, shifting aggregate demand from AD₁ to AD₀ moving the economy to point D and a resulting deflationary gap. As firms lower prices in accordance with falling demand, the gap between (falling) final output prices and wage prices narrows, this in fact means higher relative labour prices for firms. Firms respond by demanding less labour and as the labour market

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**Diagram Notes:**

- B to C: As factor prices are bid up by both firms and workers, in the long run the short run aggregate supply will shift to the left, back to the original LRAS curve but at a higher price level. The economy will thus move from point A to C via point B. Again, any increase in AD which is not matched by the long run potential of the economy will be inflationary – shown by the increase of the price level from P₀ to P₂.

- A to B: An increase in AD will increase output in the short run, but also make factors scarce and decrease real wages for workers.
responds, labour prices fall – which enables firms to increase output and increase short run aggregate supply. This increases the short run aggregate supply from $\text{SRAS}_1$ to $\text{SRAS}_0$, bringing the economy back to general long run equilibrium at point A.

- **Business cycle revisited using the new-classical model**

“Economists have forecast 9 out of the last 5 recessions.” Unknown.

The observation that economic activity varies over time is not a new discovery. I always find it fitting irony that in many Germanic languages the word for cyclical variations in the business cycle is *Konjunktur*, derived from the Roman word *conjugare* – ‘to bend, bring together, align’ – which was used in Roman times to explain planetary alignments in astrology. Rulers and the ruled have for centuries known that general prosperity fluctuated between ‘good times’ and ‘bad times’ and there have always been attempts to explain and predict the economic future. Perhaps the most interesting of these, mentioned earlier, was a proposal by William Jevons (one of the original neo-classical economists from the late 1800’s) that the fluctuations in the economy were caused by sunspots.  

While economists today seldom use planetary alignments (or the entrails of geese and dogs) to predict business activity, I am not entirely certain that we are much better at predictions than the Roman fortune-tellers and astrologers – as economists were then called. Economists today have as yet to construct a method for accurately predicting the sequences of economic expansion and contraction, but not for want of trying. What we refer to as the business cycles (or trade cycle) is the aggregate of economic activity over a longish period of time, and economists use a number of variables in trying to map out the changes. The most common variable used and correlated to time is real GDP. Business cycle theory then looks for the causes of business cycles and of possible responses by policymakers. We will look at several possibilities herein, but first let’s examine the basic cyclical variation through the lens of the AS-AD model more closely.

**Aggregate supply/demand and the business cycle**

The diagram series in *figure 46.6* is a continuation of *figures 46.2* and *46.3* (inflationary and deflationary gap, respectively) covered earlier.

- **Deflationary gap**: Point A in diagram I shows that real GDP, $Y_b$, is below the long run potential, $Y_{FE}$. This is illustrated as a deflationary gap in **diagram II**. A deflationary gap is often characterised by falling inflation rates (or falling prices) and increased unemployment (called *cyclical* unemployment).

- **General equilibrium**: Over the next time period (note that $t_0$ is a point in time and $t_0$ to $t_1$ is a period of time) aggregate demand increases, bringing short run AD and AS in line with long run potential at $Y_{FE}$ at point B in diagram I. As aggregate demand rises between $t_0$ and $t_1$, unemployment decreases and settles at the full employment level and real GDP increases from $Y_b$ to $Y_1/Y_{FE}$. General equilibrium is achieved (AD = SRAS = LRAS) as seen in **diagram III**.

- **Inflationary gap**: Aggregate demand continues to increase during the next period, ($t_1$ to $t_2$), resulting in real GDP of $Y_2$ at point C and an inflationary gap shown in **diagram IV**. Unemployment decreases below the full employment level. Inflationary gaps are associated with, well, inflationary pressure.

- **Points D and E** are real output levels when the AD trend is reversed, in other words when aggregate demand is falling over the time period $t_2$ to $t_4$.

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2 This is actually not as zany as it may sound. Jevons saw distinct correlation between the periodicity of sunspots and the duration of the business cycle. He hypothesized that sunspot activity caused changes in the earth’s weather cycle, and that this then affected crops and thus the entire agrarian economy. Unfortunately it was discovered that the calculations of sunspot activity were in error and their length did not actually match the business cycle. Back to the drawing board.
In moving from point A to point E in figure 46.6 a complete cycle is completed. Please note that the series is only an *illustration* and a rather simplistic one at that. I am trying to explain the basic business cycle – not reality! I have in this respect made two highly simplifying assumptions; 1) real potential GDP has not changed over the cycle; and 2) only aggregate demand changes during the cyclical phases which is rather unrealistic. If you can answer Pop Quiz 3.3.4 question number one below correctly then you are well on your way to understanding this.

**Figure 46.6 – AD and the business cycle**
Based on twenty years of real GDP values for Sweden, where the trend line has been adapted in order to remove cyclical variations, basically, the sum of the positive and negative output gaps should be zero. Over the 20 year period, real GDP in Sweden increased from SEK1,350 billion to SEK1,900 billion. This shows that long runt potential output during the time period has grown by some 40%, and, solving the equation \((X = \text{average growth rate})\); \(1,350 \times X^{20} = 1,900\) gives a yearly average increase of real GDP of 1.723%. This is significantly lower than the average growth rate of 2.75% for other developed countries during the same time period.³

**Figure 46.6 Cyclical variations and long run growth in Sweden 1980 – 2000**

The average yearly growth rate is 1.723%. (Shown by the starting value times 1.01723 over 20 years; SEK1,350 billion \(\times 1.01723^{20} = \text{SEK1,900 billion.}\)

Source; *Makroekonomi* Fregert & Jonung pages 252 – 255

(Rory, could we make the trend line blue please and not dotted.)

The trend method used above comes with a most noticeable weakness attached, namely that the trend for any given economy will differ depending on **which time period** is used to calculate it. The trend in Sweden based on the period 1980 to 2000 was 1.7%, but other figures show that in the 50 year period prior to 2000 the average yearly increase was closer to 2.8%. The trend over a five, ten or even one hundred year period will be different than the trend based on the past twenty years. Therefore the long run trend can be most subjective depending on the time period and will not be constant over time – thus we have a problem in setting a correct trend line since it will vary over the longer and shorter time series used in the calculation of the trend. In conclusion to the above, while I have not addressed any additional methods in assessing long run potential output, the fact remains that since we cannot agree on what time period the long run trend should be based on – ‘how long the long run is’ – there will be no conclusive way to set the waterline and agree on how high the waves and how deep the swells are.

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³ UNCTAD handbook of statistics 2002, p 347
Summary and revision (need a cool pic here….maybe a pic of someone doing push-ups!)

1. There is broad consensus amongst economists that the SRAS curve is upward sloping. The main disagreement is LRAS.

2. The new-classical view is that the LRAS curve is not correlated to the price level. It is possible for AD to create short-run equilibrium beyond income at full employment (LRAS) but rising factor costs and demands for higher wages will push up production costs for firms and decrease SRAS back to general equilibrium.

3. The LRAS curve shows potential long run output and is an estimate based on long run growth trends.