**Chapter 45: Equilibrium in the Keynesian model (2.2) (note: shifted places with Ch 46 to put the Keynesian model first)**

### Key concepts
- Equilibrium; planned expenditure equals planned output
- Deflationary (recessionary) gap
- Inflationary (expansionary) gap
- Effects of an increase in AD at low and high levels of income
- Possibility of equilibrium below full employment in the long run

<table>
<thead>
<tr>
<th>Equilibrium in the Keynesian model</th>
<th>Explain, using the Keynesian AD/AS diagram, that the economy may be in equilibrium at any level of real output where AD intersects AS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explain, using a diagram, that if the economy is in equilibrium at a level of real output below the full employment level of output, then there is a deflationary (recessionary) gap</td>
</tr>
<tr>
<td></td>
<td>Discuss why, in contrast to the monetarist/new classical model, the economy can remain stuck in a deflationary (recessionary) gap in the Keynesian model</td>
</tr>
<tr>
<td></td>
<td>Explain, using a diagram, that if AD increases in the vertical section of the AS curve, then there is an inflationary gap</td>
</tr>
<tr>
<td></td>
<td>Discuss why, in contrast to the monetarist/new classical model, increases in aggregate demand in the Keynesian AD/AS model need not be inflationary, unless the economy is operating close to, or at, the level of full employment</td>
</tr>
</tbody>
</table>

Output gaps – see “Sources” folder and “Output gaps”
Equilibrium; planned expenditure (AD) equals planned output (AS)

Aggregate demand is comprised of total planned expenditure in an economy by households, government, firms and the foreign sector. The level of income where planned expenditure equals planned output is equilibrium output.

**Figure 44.1 – macro equilibrium in the Keynesian AS-AD model**

In the Keynesian model, there is no distinction between the long run and short run so macroeconomic equilibrium is possible at all levels of income. \( Y_1 \) to \( Y_{FE} \) in Figure 44.1 show four different possibilities:

- **\( Y_0 \)** shows the economy in recession – low levels of national income, high unemployment and excess capacity in the economy. Clearly not politically desirable and most likely to lead to government intervention to stimulate aggregate demand.
- Assuming, for the sake of simplicity, that government has implemented stimulatory measures such as increased government spending, aggregate demand has increased to \( AD_1 \) and the economy has moved towards the full employment level of income – income is rising and unemployment is falling. As factors become increasingly scarce and supply-side bottle-necks set in, inflation rises also.
- At \( Y_{FE} \) all available factors are being used and any further increase in aggregate demand – to \( AD_3 \) and beyond – is purely inflationary. Output capacity simply cannot meet demand beyond \( Y_{FE} \) as no additional factors can be employed.

**Deflationary (recessionary) gap**

Assume an initial equilibrium at full employment (\( Y_{FE} \)) and that households expect property prices to fall (Figure 44.2). The perceived future loss of wealth causes households to hold back on consumption and AD falls (\( AD_0 \) to \( AD_1 \)). The gap (often referred to as a negative output gap) between \( Y_{FE} \) and \( Y_1 \) is a deflationary gap.

**Definition: “Deflationary” or “recessionary gap”**

When de facto output in terms of macro equilibrium is below potential output, there is a negative output gap – a deflationary gap.

**Figure 44.2 – Deflationary and inflationary gap**
• **Inflationary (expansionary) gap**

If, however, at \( Y_{FE} \) households expect property prices to rise and the income effect of this causes \( AD \) to increase (\( AD_0 \) to \( AD_1 \) in Figure 44.2) the effect would be inflationary. Since the economy is operating at full employment and no more available factors exist, there is no increase in real output and an inflationary gap is created.

**Definition: “Deflationary” or “recessionary gap”**

When de facto output in terms of macro equilibrium is above potential output, there is a positive output gap – an inflationary gap.

It should be noted that the YFE level of output is pretty much out there in mermaid territory – e.g. it is a guesstimate at best! The OECD collects data on a monthly basis and estimates the positive (inflationary) and negative (deflationary) output gaps:

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>-0.4</td>
<td>0.2</td>
<td>0.4</td>
<td>0.5</td>
<td>1.0</td>
<td>0.2</td>
<td>1.5</td>
<td>0.5</td>
<td>-1.2</td>
<td>-1.8</td>
<td>-2.6</td>
</tr>
<tr>
<td>Austria</td>
<td>0.6</td>
<td>-0.3</td>
<td>-1.9</td>
<td>-1.7</td>
<td>-1.1</td>
<td>0.6</td>
<td>2.4</td>
<td>1.6</td>
<td>-3.7</td>
<td>-3.0</td>
<td>-1.8</td>
</tr>
<tr>
<td>Canada</td>
<td>1.1</td>
<td>1.2</td>
<td>0.4</td>
<td>0.9</td>
<td>1.3</td>
<td>1.5</td>
<td>1.3</td>
<td>-0.1</td>
<td>-4.4</td>
<td>-2.8</td>
<td>-2.4</td>
</tr>
<tr>
<td>Germany</td>
<td>0.6</td>
<td>-0.7</td>
<td>-2.2</td>
<td>-2.5</td>
<td>-2.6</td>
<td>0.2</td>
<td>2.2</td>
<td>1.6</td>
<td>-4.5</td>
<td>-2.3</td>
<td>-0.8</td>
</tr>
<tr>
<td>Greece</td>
<td>-1.5</td>
<td>-2.0</td>
<td>0.0</td>
<td>0.6</td>
<td>-0.2</td>
<td>2.5</td>
<td>2.6</td>
<td>-0.1</td>
<td>-4.6</td>
<td>-8.9</td>
<td>****</td>
</tr>
<tr>
<td>Iceland</td>
<td>1.7</td>
<td>-1.5</td>
<td>-2.1</td>
<td>1.9</td>
<td>5.6</td>
<td>4.6</td>
<td>6.2</td>
<td>3.3</td>
<td>-3.9</td>
<td>-7.7</td>
<td>-6.2</td>
</tr>
</tbody>
</table>

(Source: OECD Economic Outlook 90 Database)
The onslaught of the recession starting in 2007/08 is clearly visible in this selection of economies, where all six saw decreases in aggregate demand during 2009. Australia seemed to weather the storm reasonably well and Germany bounced back the quickest. Which country seems to have been hardest hit?! (Rory, there are no figures for Greece in 2011!)

- Effects of an increase in AD at low and high levels of income

An increase in aggregate demand at very low levels of income (recessionary gap) might not create inflationary pressure at all since there is an abundance of factors, excess capacity and firms have unsold stocks. This is shown in Figure 44.3 where aggregate demand increases from AD₀ to AD₁ and there is an increase in real GDP but no increase in the price level. Accordingly, when the economy is at the full employment level, any increase in aggregate demand (AD₃ to AD₄) leads solely to inflation and no increase in output.

**Figure 44.3 – An increase in AD below and at full employment**

- Possibility of equilibrium below full employment in the long run

The Keynesian model assumes that high unemployment, excess capacity in firms, high levels of stocks and wage stickiness all contribute to perfectly elastic supply at low levels of income. Furthermore, markets are inherently unstable and do not necessarily clear immediately. A key element in Keynesian theory is precisely that markets are imperfect, e.g. labour and goods markets do not necessarily clear in the short run. There are built-in market imperfections such as stickiness in labour prices, unions and general unwillingness of workers to accept lower wages in recessions.

Thus, while the basic equilibrium output of AS=AD is attained at below full employment levels, other markets – notably the labour market – need not be in equilibrium. The view is therefore that equilibrium can occur and be maintained at below the full employment level even in the long run – resulting in the prescription that government intervention on the demand side is necessary for full employment to be attained. If governments do not intervene to move the economy towards full employment, it is quite possible for the economy to remain at Y₀ for an indeterminate period. This is a pivotal argument for Keynesian economists in the Keynesian – new-classical debate.
Summary and revision (need a cool pic here….maybe a pic of someone doing push-ups!)

1. Equilibrium occurs when AD equals AS – e.g. planned expenditure equals planned output.

2. Output gaps show the ‘distance’ between de fact (actual) output and potential output.
   a. When de facto output is below potential (LR) output there is a negative output gap – a deflationary gap.
   b. When de facto output is above potential (LR) output there is a positive output gap – and inflationary gap.

3. An increase in AD can have different effects on inflation and income in the Keynesian model:
   a. At low levels of income (recession) AD can increase income without creating inflationary pressure since there is factor abundance, excess capacity in firms and high levels of stocks.
   b. Approaching the full employment level of output, there is a ‘trade-off zone’ where an increase in AD increases income and also creates inflationary pressure.
   c. At full employment it is impossible to increase output – any increase in AD is purely inflationary.

4. The Keynesian model posits that markets are inherently imperfect and will not clear in the short run. It is therefore possible to have macroeconomic equilibrium at below the full employment level of output.