Macroeconomics VII: Aggregate Supply

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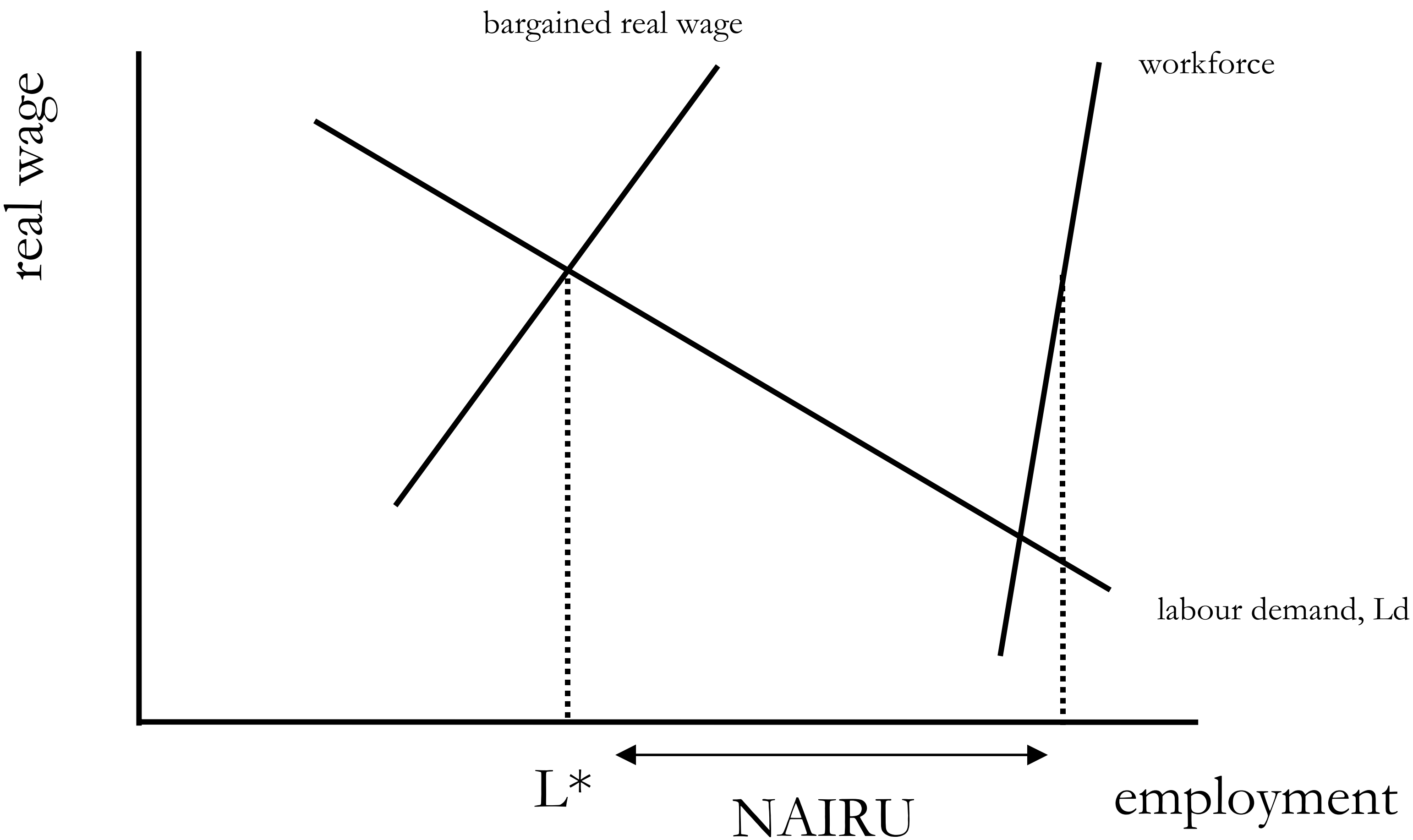
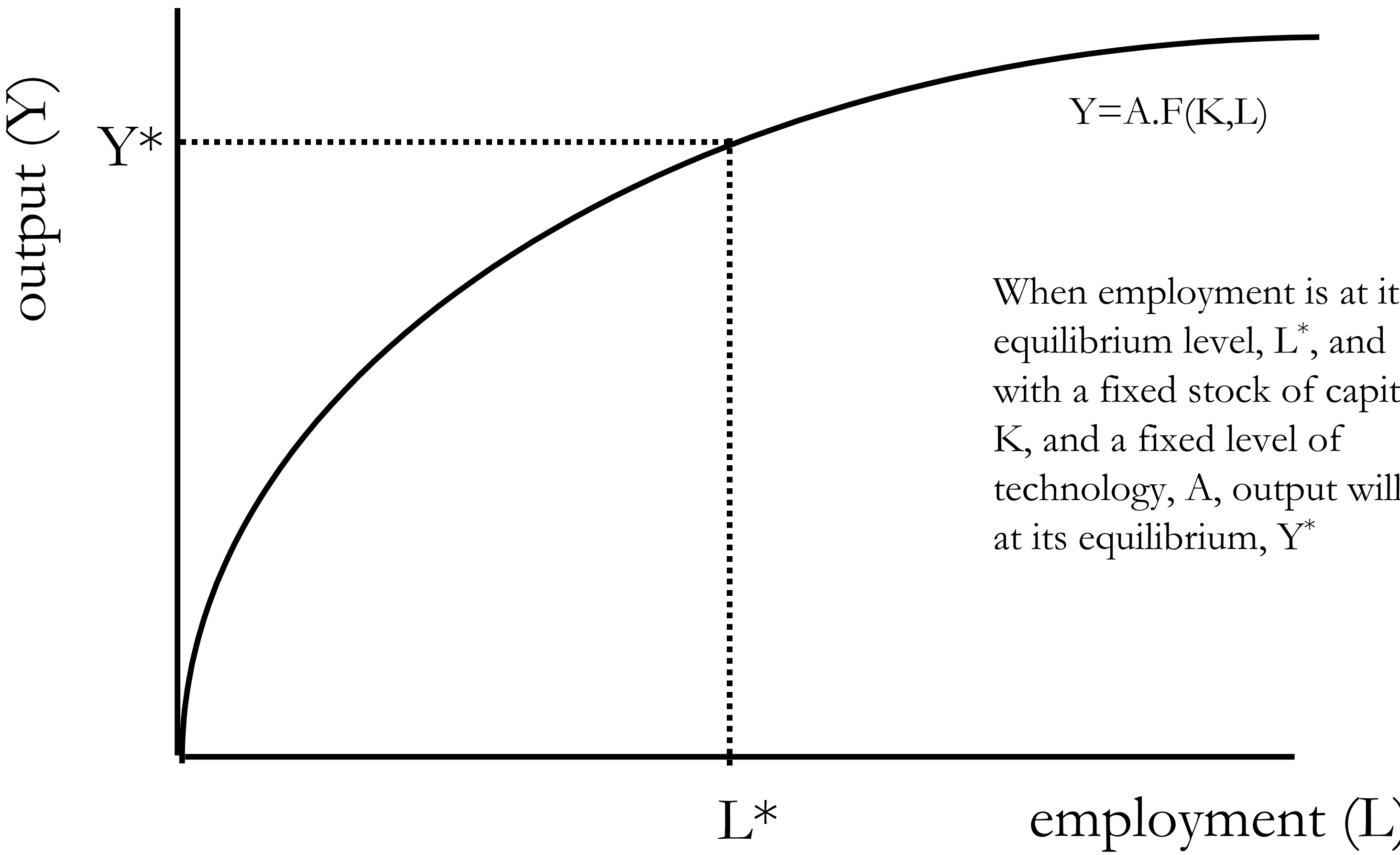
equilibrium in the labour market

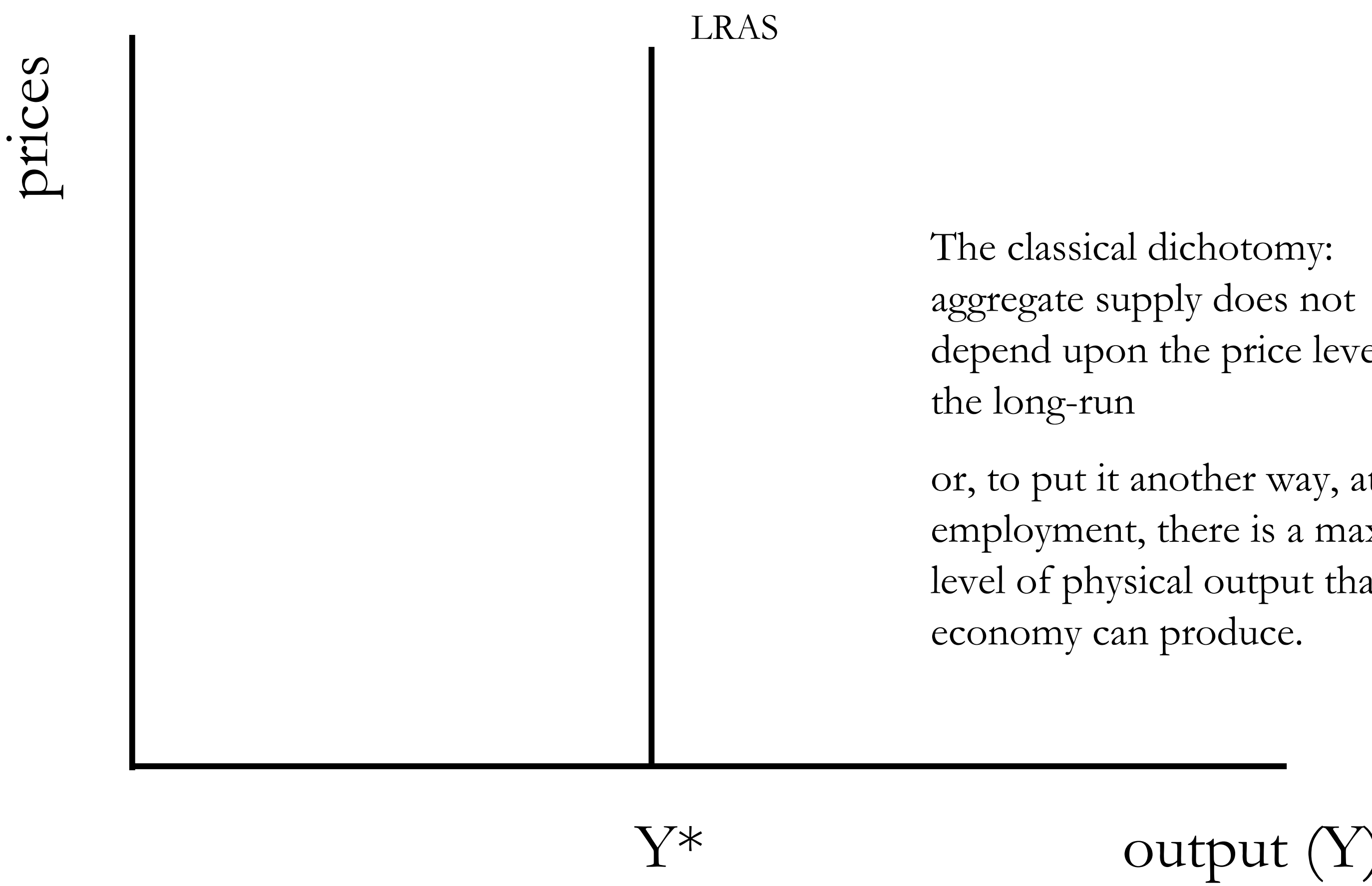


equilibrium output



When employment is at its equilibrium level, L*, and with a fixed stock of capital, K, and a fixed level of technology, A, output will be at its equilibrium, Y*

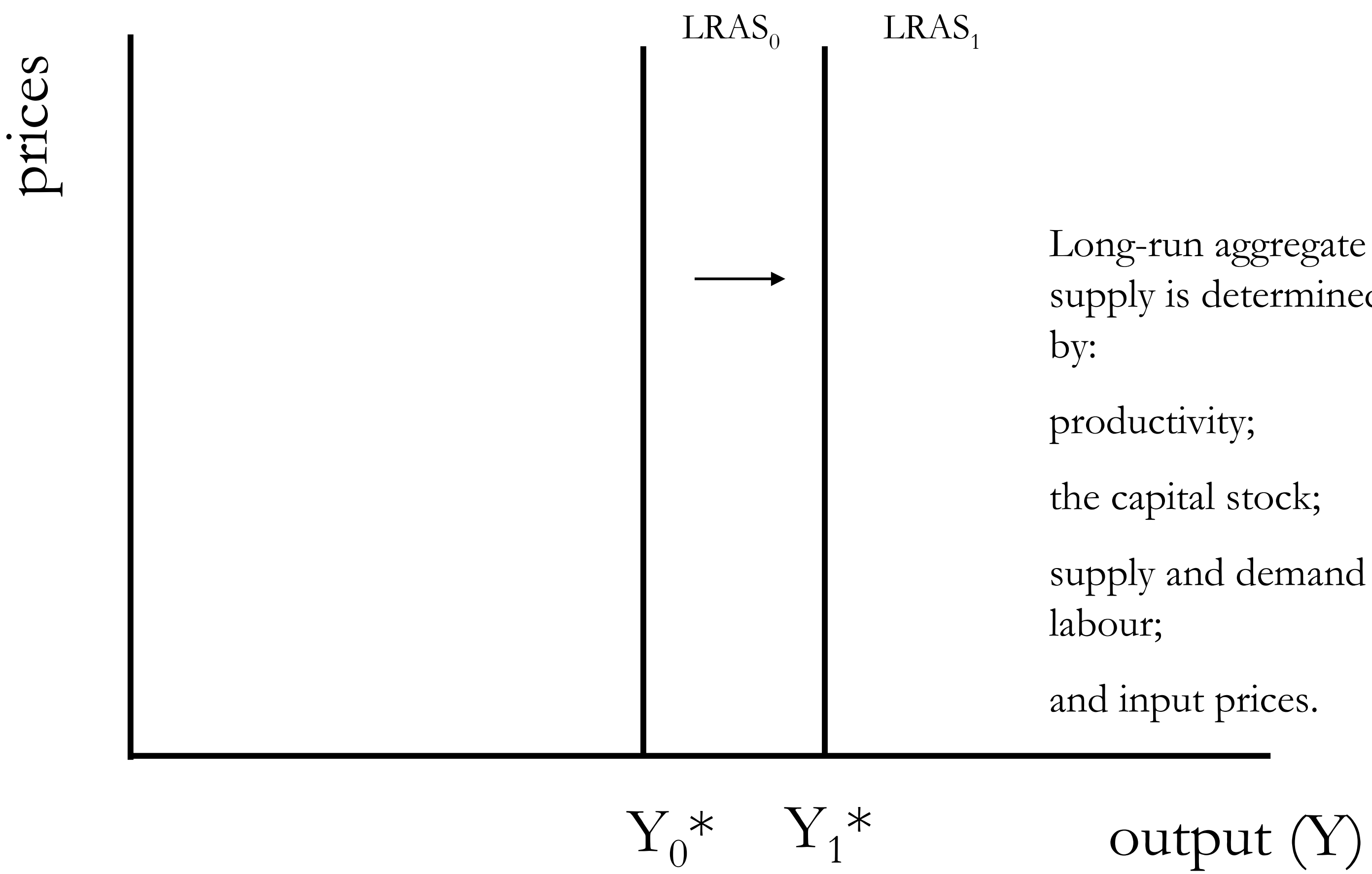
aggregate supply in the long-run



The classical dichotomy: aggregate supply does not depend upon the price level in the long-run

or, to put it another way, at full-employment, there is a maximum level of physical output that the economy can produce.

shifts in aggregate supply



Long-run aggregate supply is determined by:

productivity;

the capital stock;

supply and demand for labour;

and input prices.

is long-run aggregate supply stable?

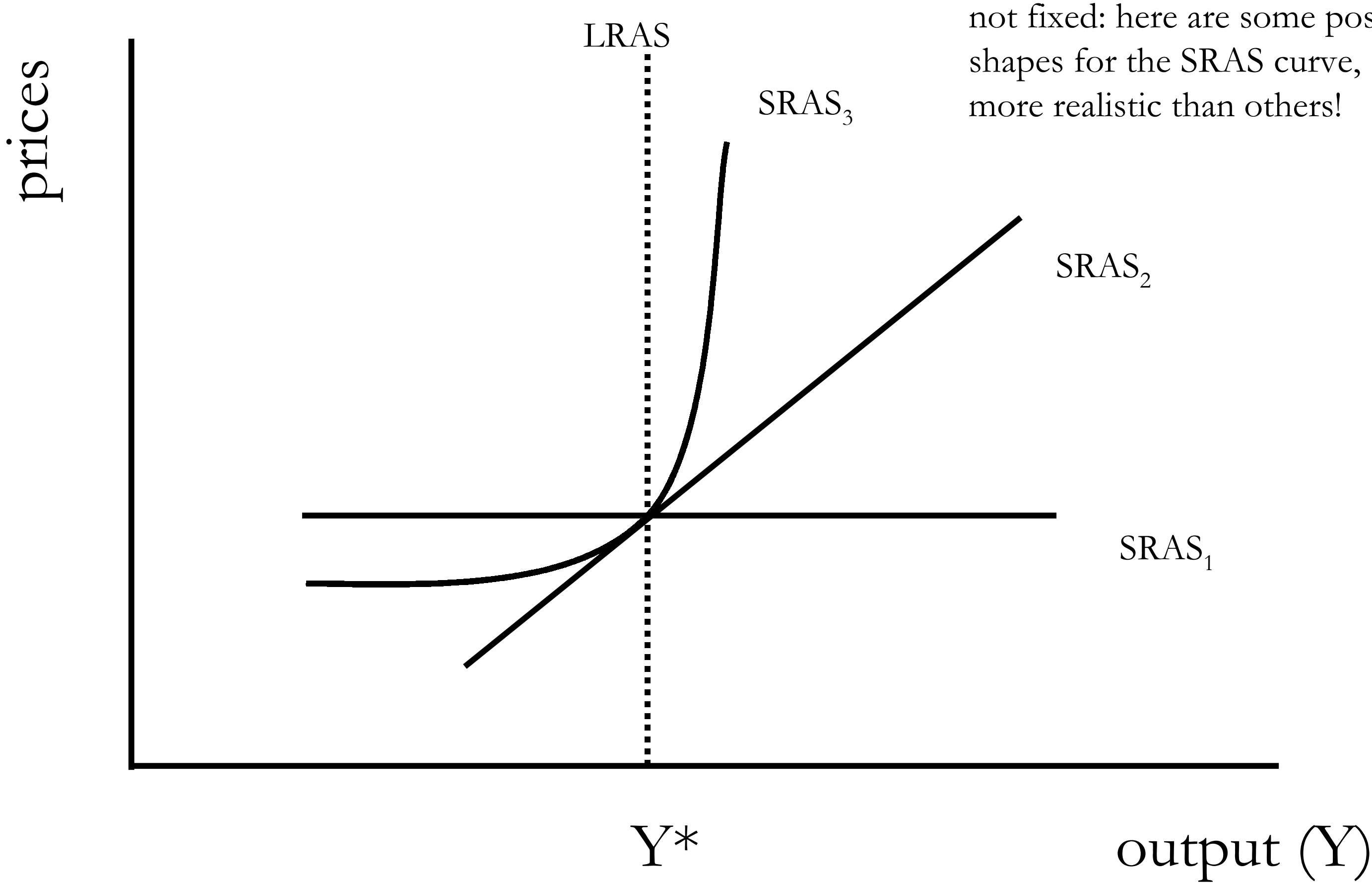
- Lots of evidence that the idea of equilibrium unemployment and equilibrium output are useful concepts.
- We can estimate the NAIRU from statistical models.
- However, three complications:
    - the NAIRU shifts over time and is hard to estimate precisely;
    - even when unemployment is above the NAIRU, very rapid rises in demand could still lead to increased inflation;
    - if unemployment is high for a very long time, the NAIRU may rise due to 'hysteresis'.

expected prices

- Phillips (1958) found relation an empirical relationship between unemployment and inflation in the UK – the Phillips curve.
- Original interpretation:
    - There is a trade-off between inflation and unemployment.
- Problem: after sustained inflation, the empirical relationship broke down.
- New interpretation:
    - There is a trade-off between unemployment and 'surprise' inflation (i.e. current inflation judged relative to expected inflation).

aggregate supply in the short-run

In the short-run, aggregate supply is not fixed: here are some possible shapes for the SRAS curve, some are more realistic than others!



four models of aggregate supply

- In the four models that follow, the short-run aggregate supply curve is not vertical because of some market imperfection. As a result, output can deviate away from its natural rate.
- Consider the following ‘surprise-supply’ function:

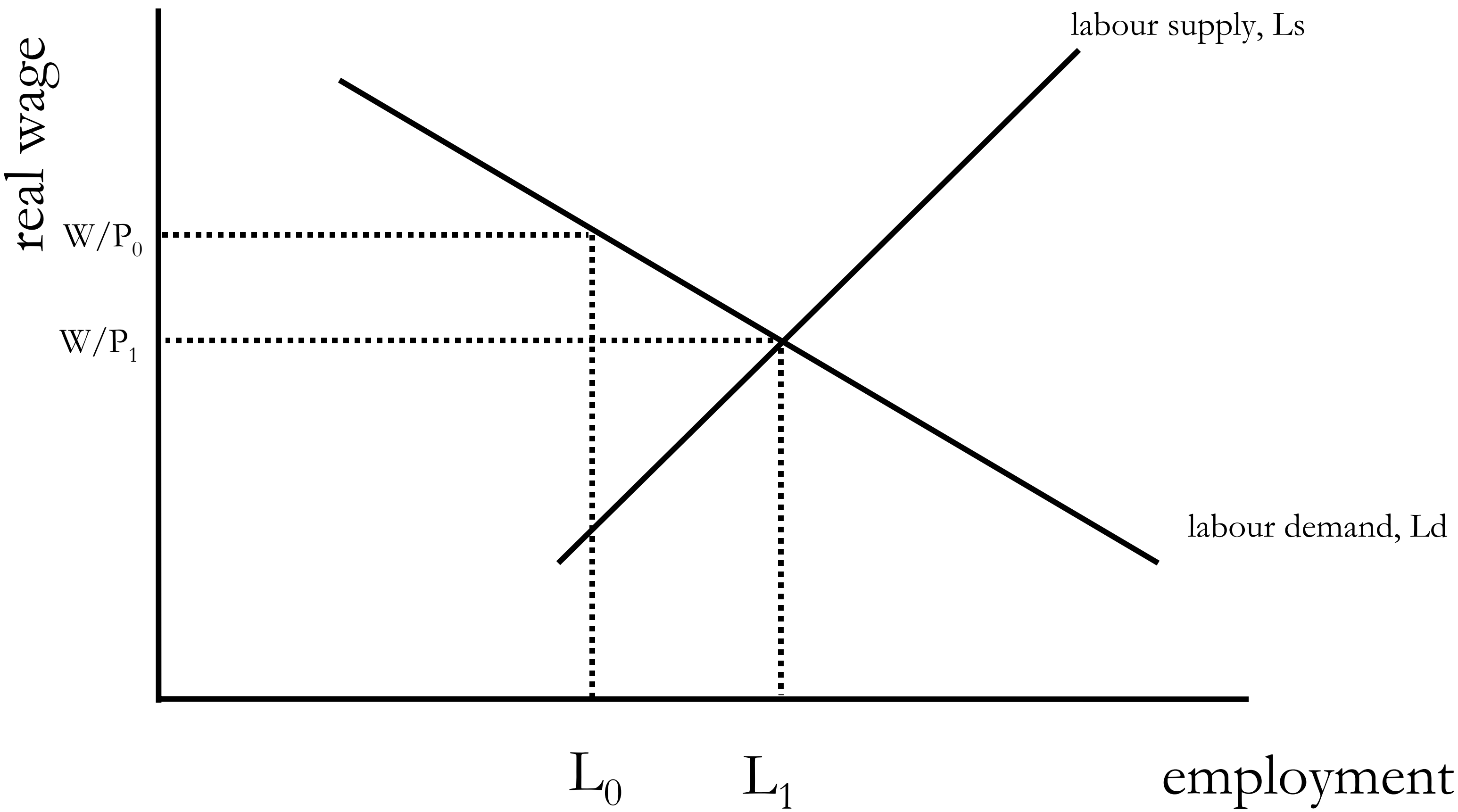
$$Y = Y^* + \alpha\ (P - P^e)$$

- where Y is output, Y^* is the natural rate of output, P is the price level and P^e is the expected price level.
- Therefore, output deviates from the natural rate by the extent to which prices deviate from their expected level, and $1/\alpha$ is the slope of the aggregate supply curve.

the sticky-wage model

- 'I hold that in modern conditions, wages in this country are, for various reasons, so rigid over short periods that it is impracticable to adjust them…' J.M.Keynes
- In many industries, especially unionized ones, nominal wages are set by long-term contracts. Social norms and implicit contracts may also be important.
- When the nominal wage is fixed, an unexpected fall in prices raises the real wage, making labour more expensive:
    - higher real wages induce firms to reduce employment;
    - reduced employment leads to reduced output;
    - when contracts are renegotiated, workers accept lower nominal wages to return their real wages to their original level, so employment rises.

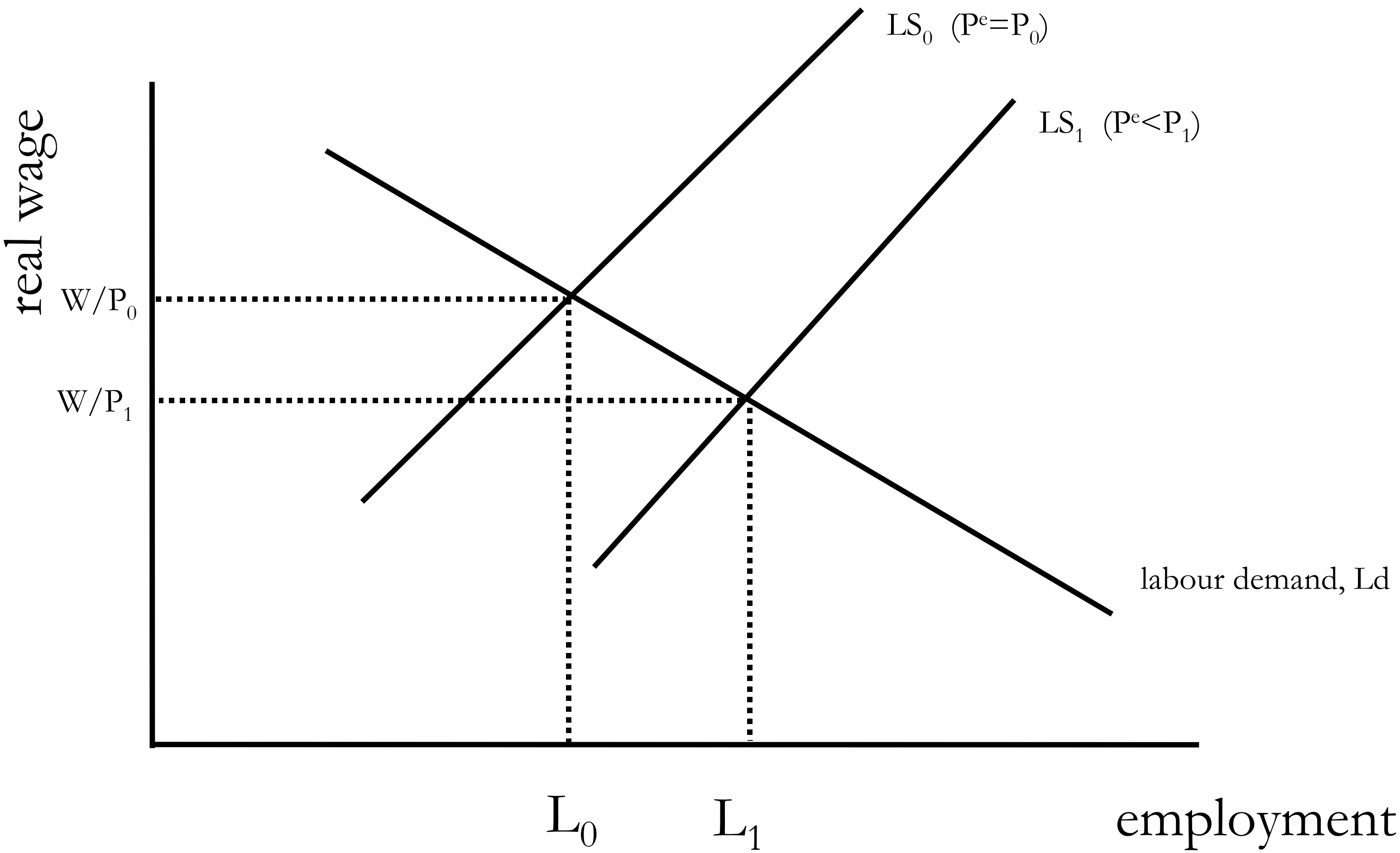
a fall in prices, with sticky-wages



the worker-misperception model

- In the sticky-wage model, long-term contracts meant that the labour market was slow to reach equilibrium.
- In the worker-misperception model, the labour market can reach equilibrium, however, workers suffer from ‘money illusion’.
- This means that while firms know the price level with certainty, workers temporarily mistake nominal changes in wages for real changes.
- If prices rise unexpectedly, firms offer higher nominal wages but workers mistake these higher nominal offers for higher real wages, and so offer more labour.
- At every real wage, workers supply more labour because they think the real wage is higher than it actually is.
- Eventually workers realise that real wages haven’t risen, so their expectations correct themselves and labour supply returns to its previous level.

a rise in prices, with money-illusion



the imperfect information model

- Consider an economy consisting of many self-employed people, each producing a single good, but consuming many goods.
- In this economy, a yeoman farmer can monitor the price of wheat and so knows of any price change immediately. But she cannot monitor other prices as easily, so she only notices price-changes after one time-period has passed.
- How does the farmer react if wheat prices rise unexpectedly?
- One possibility is that all prices have risen, and so she shouldn't work any harder.
- Another possibility is that only the price of wheat has risen (and so its relative price has risen), so she should work harder.
- In practice, any change could be a combination of an aggregate price change and a relative price change. Therefore, the farmer has a 'signal-extraction' problem and will tend to raise output when all prices rise, mistaking this for a relative price rise.

the sticky-price model

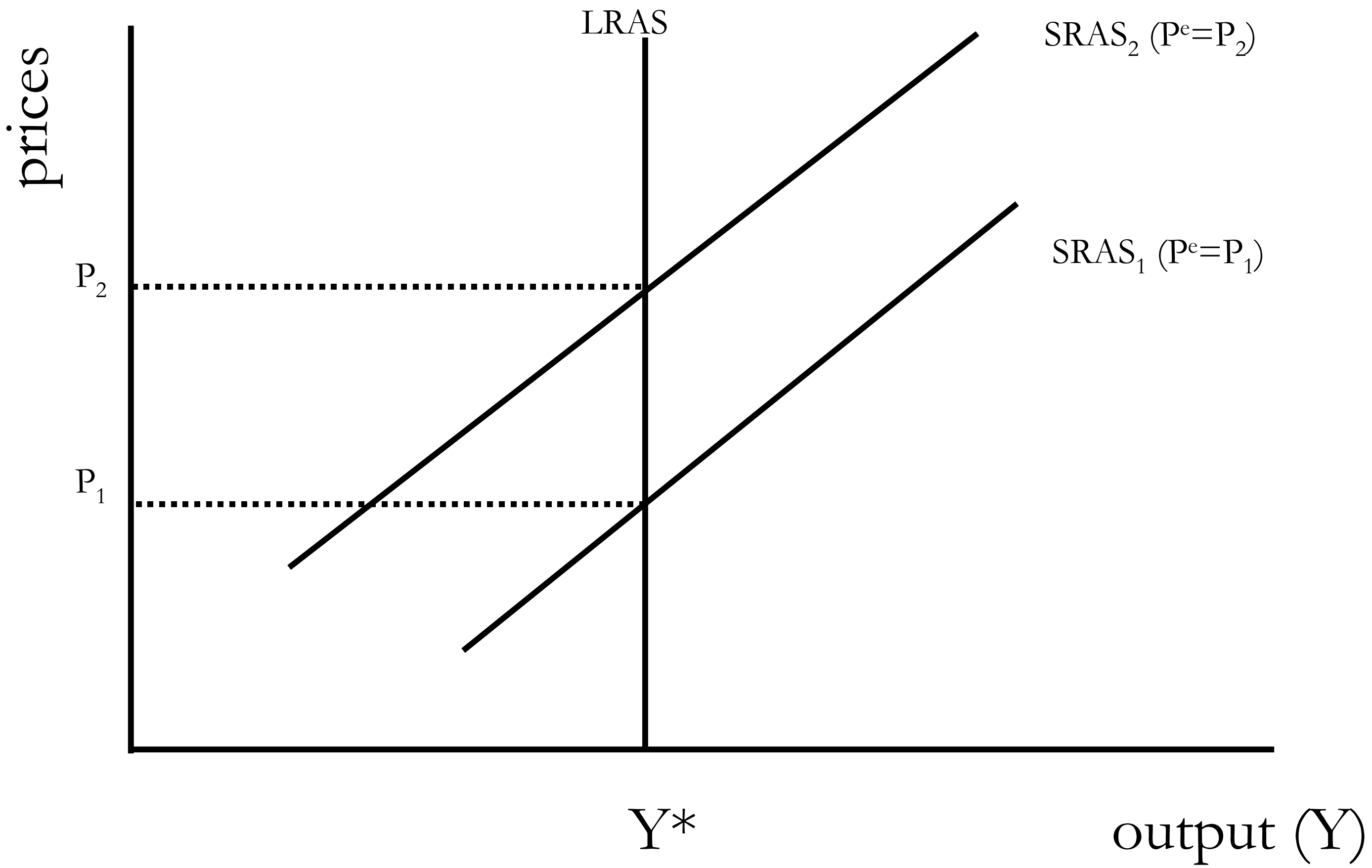
- It may also be the case that firms cannot adjust their prices immediately either, since they may have long-term contracts or there may be costs to changing prices ('menu costs').
- If aggregate demand falls and a firm's price is 'stuck', it will reduce its output, its demand for labour will shift inwards, and output will fall.
- Notice that sticky-prices have an external effect since if some firms do not adjust their prices in response to a shock, there is less incentive for other firms to do so.

taxonomy of aggregate supply models

Market with imperfection

Markets clear?	Labour	Goods
Yes	Worker-Misperception model: workers confuse nominal wage changes with real changes	Imperfect-Information model: suppliers confuse changes in the price level with relative price changes
No	Sticky-Wage model: nominal wages adjust slowly	Sticky-Price model: The prices of goods and services adjust slowly

short and long-run aggregate supply



summary

- In the long-run, aggregate supply is determined by real factors, such as the level of employment and the productivity of the workforce.
- In the short-run, there may be a trade-off between reduced unemployment and rising inflation.
- Equally, rising unemployment will lead to downward pressure on inflation.
- This trade-off may arise for a number of reasons, such as sticky-wages, worker misperceptions, sticky-prices, and imperfect information.