Course: Foundations of Economics
Lecture 7: Inflation

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Image source: Getty Images

Inflation

- **Inflation** – a sustained general rise in prices.

- **Inflation rate** – the percentage change in average prices in an economy over a given period of time.

Understanding Inflation: terms

- Purchasing power of a given sum of money
  - Volume of goods and services that it will buy

- Real wage rate - purchasing power of wages
  - Wage rate adjusted for inflation
  - Nominal wage divided by price index
  - Volume of goods that nominal wages will buy

- Does Inflation erode real wages?
  - Suppose wages increase 2% per year due to increased labor productivity
  - Then inflation of 3% per year
  - Wage increases will accelerate to 5%
  - Workers incorrectly believe that they earned the 5%
  - But regardless of the inflation rate, their real wage rate increases by 2%

- A related misperception
  - Failure to distinguish between a rise in the general price level and a change in **relative prices**
    - An items price in terms of some other item
  - Imagine a case of pure inflation of 10%

Inflation Costs

- **Redistribution**

Inflation redistributes income away from those on fixed incomes and those in a weak bargaining position, to those who can use their economic power to gain large pay, rent or profit increases.

- **Uncertainty and Lack of Investment**

Inflation tends to cause uncertainty among the business community, especially when the rate of inflation fluctuates.

- **Balance of Payment**

Inflation is likely to worsen the balance of trade. If a country suffers from relatively high inflation, its exports will become less competitive in world markets.

Inflation Costs

- **Resources**

Extra resources are likely to be used to cope with the effects of inflation. Accountants and other financial experts may have to be employed by companies to help them cope with the uncertainties caused by inflation.

Measuring Inflation

- Two most commonly used price indices are *GDP Deflator* and *Consumer Price Index (CPI)*
- The GDP deflator is the ratio of nominal GDP to Real GDP (multiplied by 100).

$$P = GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} \times 100$$

$$P = \frac{GDP}{Y} \times 100$$

Measuring Inflation - GDP Deflator

The GDP deflator is a measure of the price level of all domestically produced final goods and services in an economy.

GDP deflator measures the current price level of domestically produced goods relative to the price level in a specific base year.

Calculating the GDP deflator follows a three-step process:

(1) calculating nominal GDP,

(2) calculating real GDP, and

(3) calculating the GDP deflator.

Step-1: Nominal GDP

Assume that an economy only produces hot dogs and chocolate. If we calculate nominal GDP as described above, we find that for the year 2020 it amounts to **USD 400,000** (100,000*2 + 200,000*1). Meanwhile for 2021 nominal GDP is **USD 740,000** (120,000*2.5 + 220,000*2) and for 2022 nominal GDP amounts to **USD 1,290,000** (150'000*4 + 230,000*3).

Year	Hot Dog		Chocolate	
	Quantity	Price (UDS)	Quantity	Price (UDS)
2020	100 000	2	200 000	1
2021	120 000	2.50	220 000	2
2022	150 000	4	230 000	3

Step-2: Real GDP

In a second step, we can now calculate real GDP. Unlike nominal GDP, real GDP shows the monetary value of all finished goods and services within an economy *valued at constant prices*. That means, we chose a base year and use the prices of that year to calculate the values of all goods and services for all the other years as well. This allows us to eliminate the effects of inflation.

Year	Real GDP
2020	*USD400,000* = (100,000*2 + 200,000*1)
2021	*USD 460,000* = (120,000*2 + 220,000*1)
2022	*USD 530,000* = (150,000*2 + 230,000*1)

Step-3: GDP Deflator

$$P = GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} \times 100$$

$$P = \frac{GDP}{Y} \times 100$$

Year	GDP Deflator
2020	([400,000/400,000]*100) The GDP deflator for the base year will always be 100, because nominal and real GDP have to be equal.
2021	([740,000/460,000]*100) **60.9%** (160.9 – 100)
2022	([1,290,000/530,000]*100) **143.4%** (243.4-100)

The Consumer Price Index (CPI) is an indicator that measures the average change in prices paid by consumers for a representative basket of goods and services over a set period of time.

Calculating Consumer Price Index (and the inflation rate) follows a four step process:

1) Fixing the market basket,

2) calculating the basket's cost

3) computing the index

4) computing the inflation rate.

$$CPI_t = \frac{Cost\ of\ Market\ Basket\ in\ year\ t}{Cost\ of\ Market\ Basket\ in\ Base\ year} \times 100$$

Example

Step-1: Consumer Basket

By conducting surveys, we find out that on average every consumer buys 4 hot dogs and 8 chocolate bars. With this information we can now fix our market basket to **4 hot dogs and 8 chocolate bars.**

Example

Step-2: Calculating Basket's Cost

Revisiting our example, we now have to find the prices of hot dogs and chocolate bars.

In 2022, an hot dog costs USD 2 and a candy bar sells at USD 1. Hence, the basket's cost adds up to USD 16 (*4 hot dogs x USD 2 + 8 chocolate bars x USD 1*).

Back in 2021, consumers only had to pay USD 1.90 for hot dog and USD 0.80 for a chocolate bar, which results in a basket cost of USD 14 (*4 hot dogs x USD 1.90 + 8 chocolate bars x USD 0.8*).

We can see that the price level has increased from 2021 to 2022.

Step-3: Computing the Index

The index is then calculated by dividing the price of the basket of goods and services in a given year (t) by the price of the same basket in the base year (b). This ratio is then multiplied by 100, which results in the Consumer Price Index.

$$CPI_t = \frac{Cost\ of\ Market\ Basket\ in\ year\ t}{Cost\ of\ Market\ Basket\ in\ Base\ year} \times 100$$

2021	(*for instance [14/14]x100*).	100%
2022	(16/14)x100=114,3	114.3%
CPI from 2021-2022	Consumer Price Index increased from 100 in 2021 to 114.3 in 2022.	

Step-4: Computing the Inflation Rate

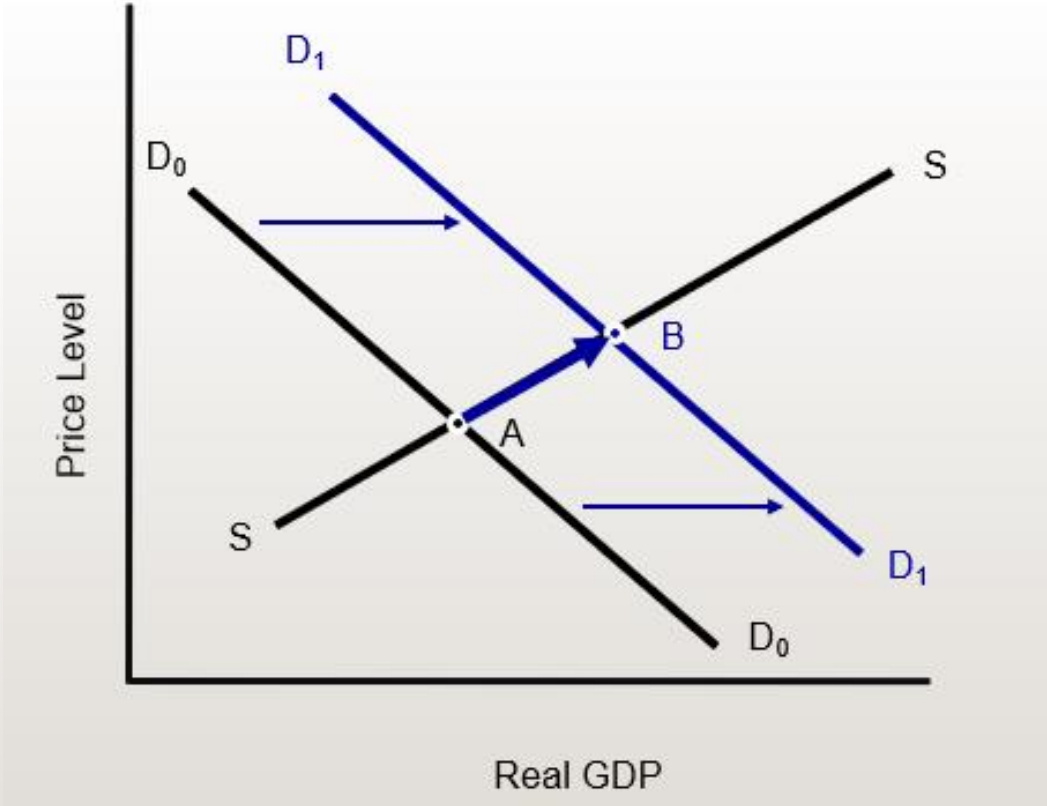
$$Inflation\ \ Rate = \frac{P_t - P_{t-1}}{P_{t-1}} x100\%$$

In our example, the inflation rate in 2021 is **14,3% (*i.e. ([114,3-100]/100)x100*).** Hence, with this formula we can calculate the inflation rate for any given year as long as the CPI of that and the preceding year is available.

- **Demand-side inflation**
  - Rise in the price level caused by rapid growth of aggregate demand

- **Supply-side inflation**
  - Rise in the price level caused by slow growth (or decline) of aggregate supply

Demand Pull Inflation

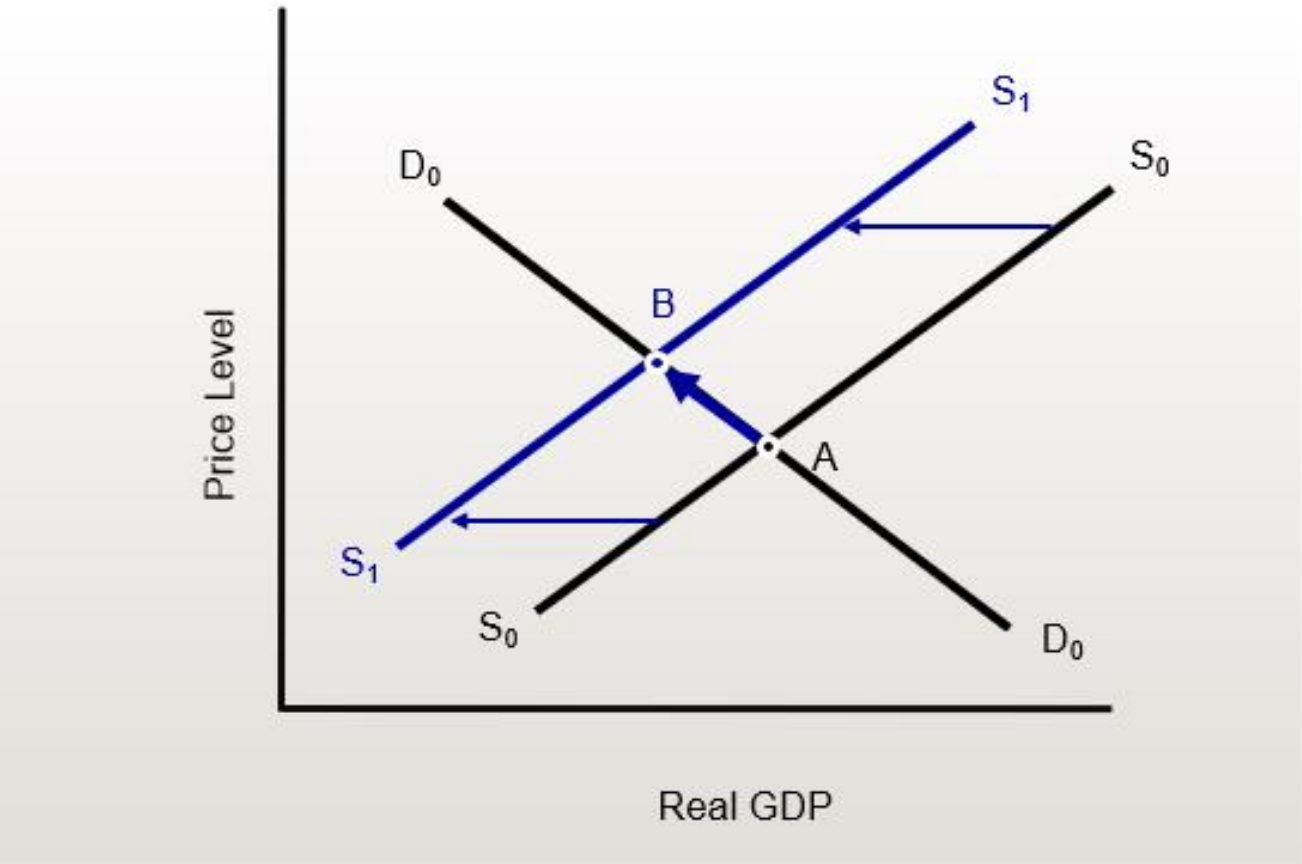


Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 319

3. Sources of Inflation

- Consumption increase (Determinants of consumption)
- Investment increase (Determinants of investment)
- Government expenditure
- Exports increase (Sharp increase in foreign income)
- Import (Determinants of imports)

Cost push Inflation



Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 296.

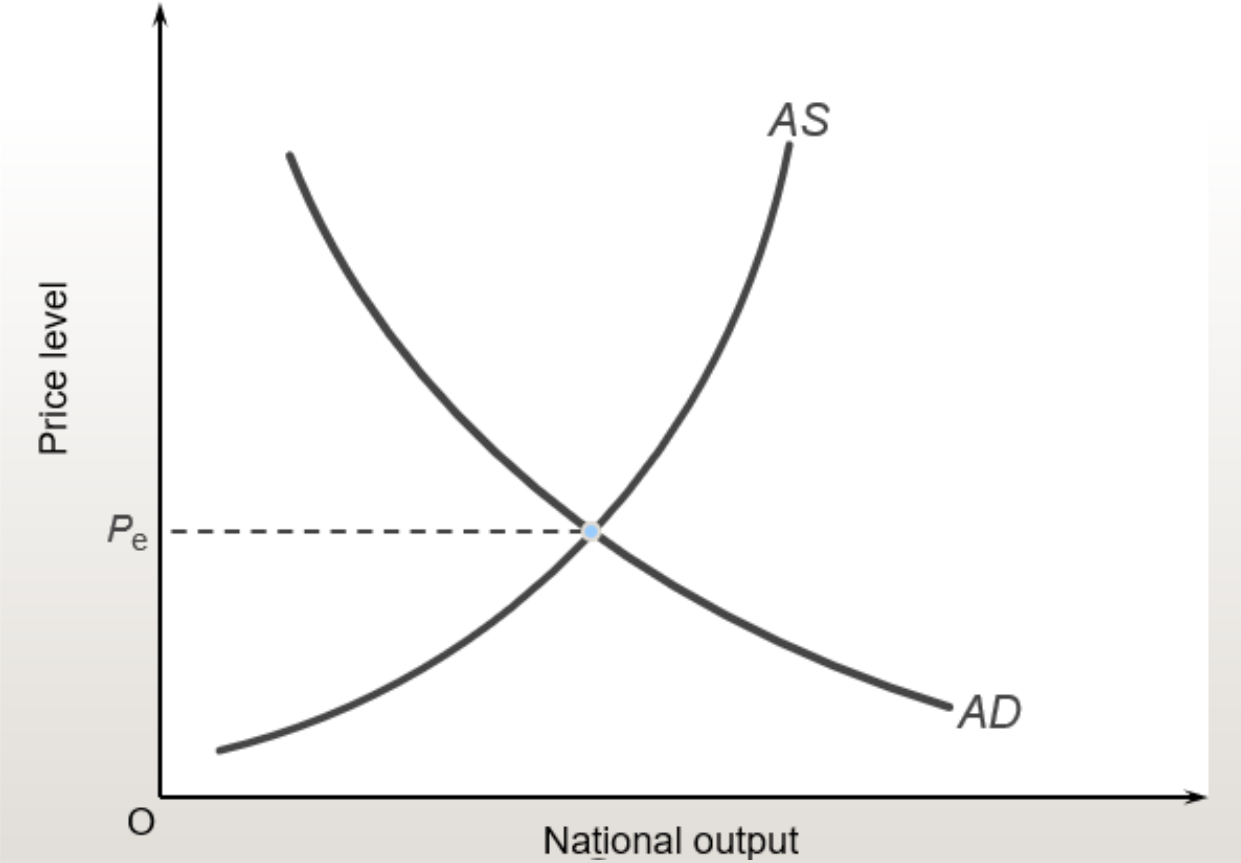
3. Sources of Inflation

- Component costs
- Rising labor costs
- Expectations of inflation
- Higher indirect taxes
- A fall in the exchange rate
- Monopoly

Inflation

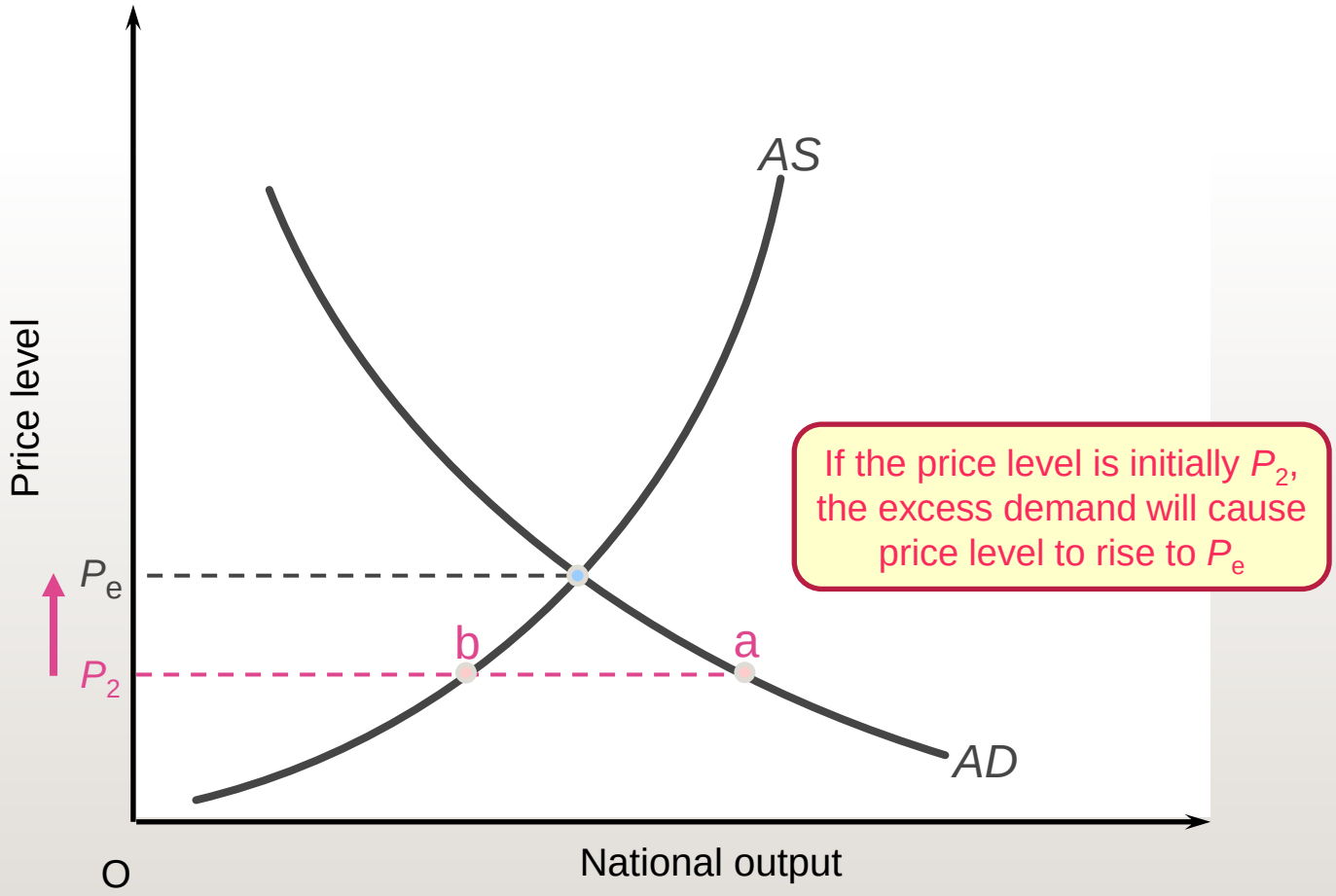
Aggregate demand, aggregate supply and the price level

GDP and the price level



Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 297.

AD, AS, and Price

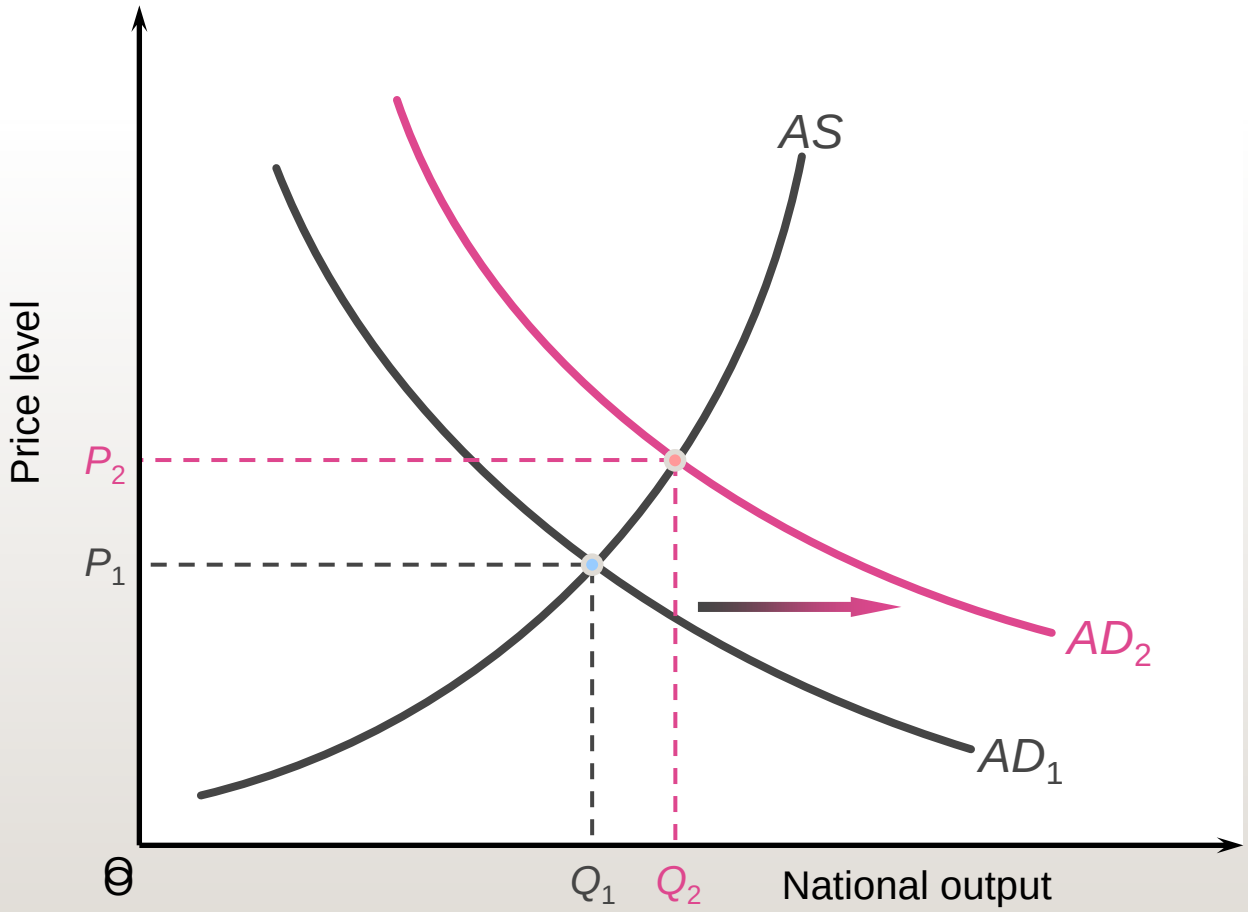


Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 297.

Inflation

(a) demand-pull inflation

Demand – Pull Inflation

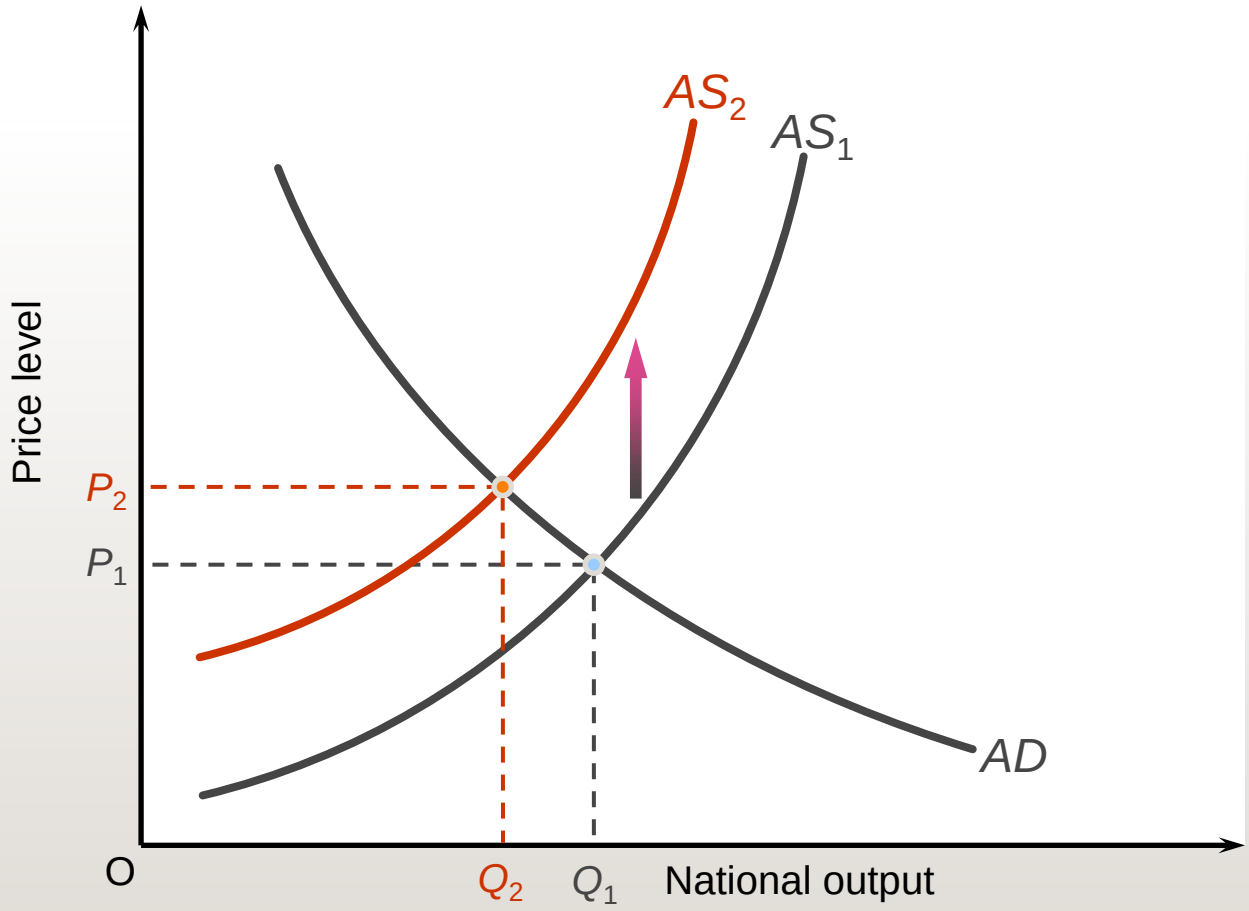


Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 297.

Inflation

(b) cost-push inflation

Inflation

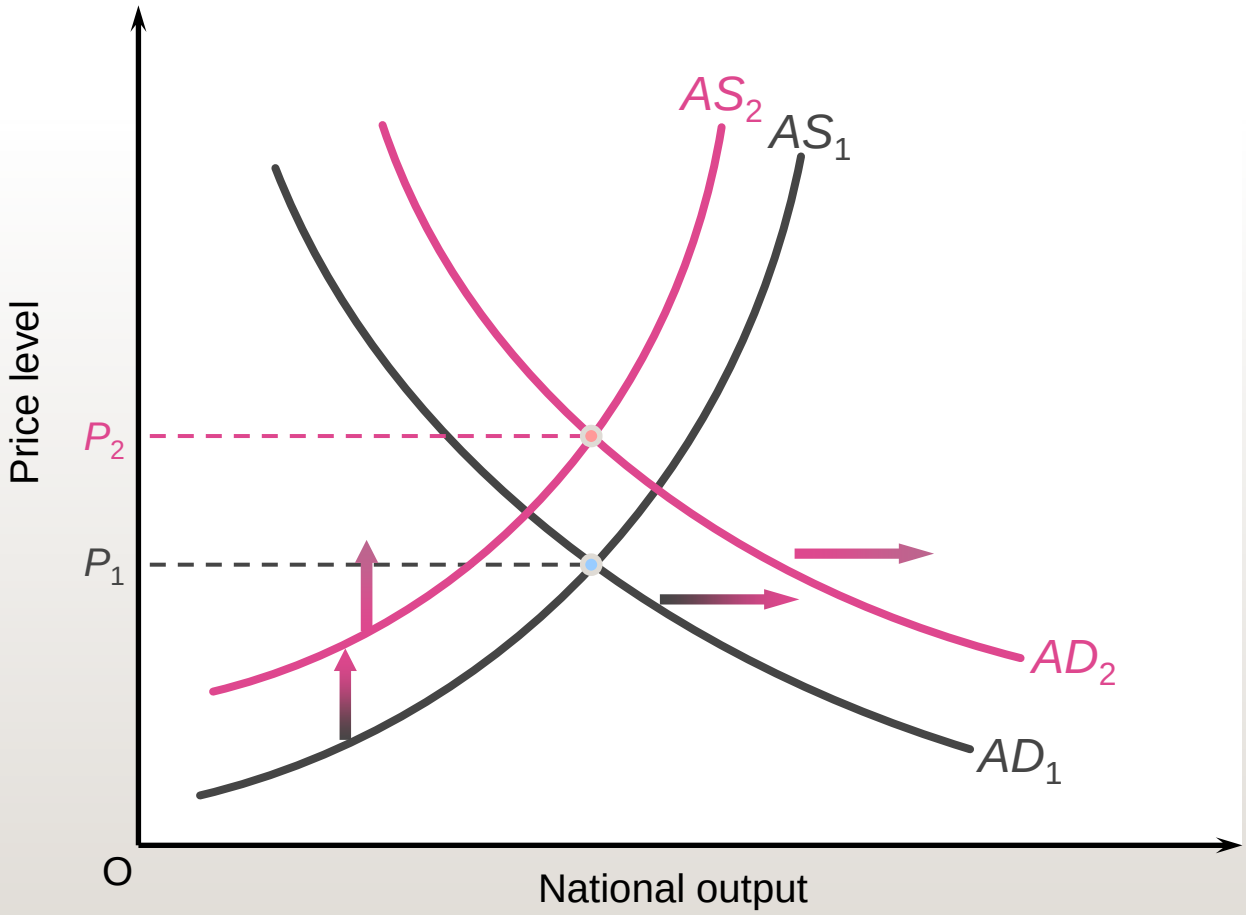


Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 297.

Inflation

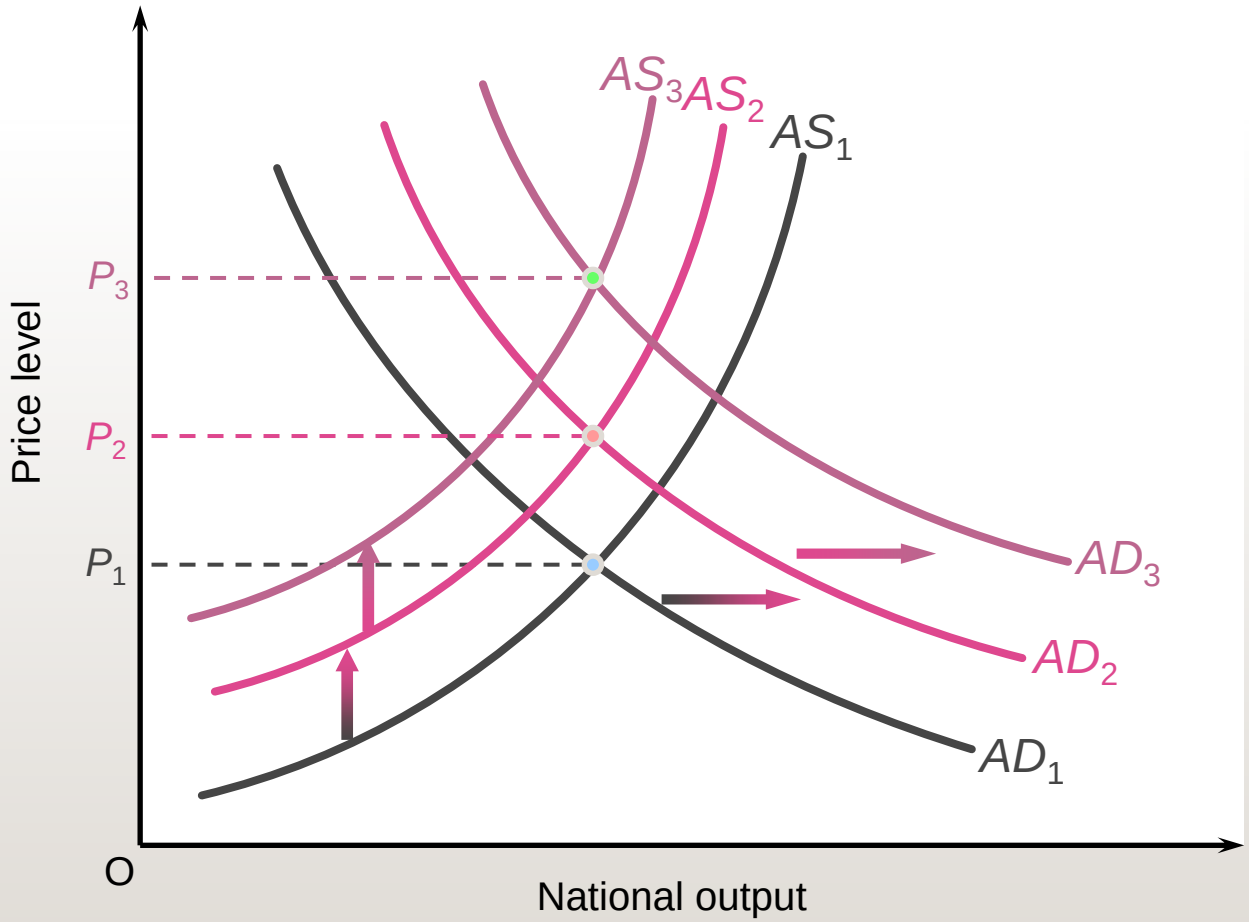
The interaction of demand-pull and cost-push inflation

Demand-Pull & Cost-Push Inflation



Source: Sloman (2016), Essentials of Economics, 7th ed, Prentice Hall, page 297.

Demand-Pull & Cost-Push Inflation



HYPERINFLATION

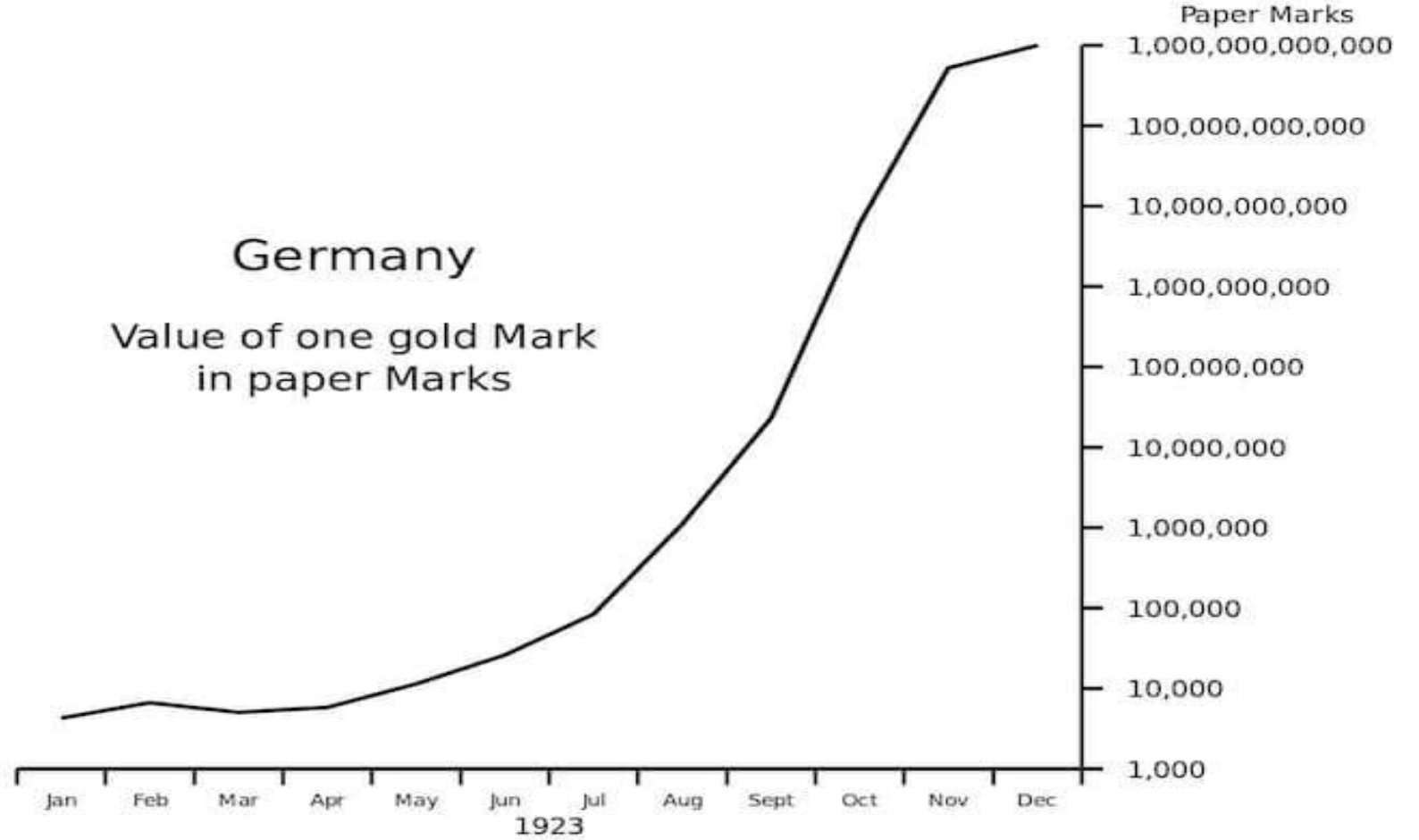


Image source: Wikipedia https://en.wikipedia.org/wiki/Hyperinflation_in_the_Weimar_Republic#/media/File:Germany_Hyperinflation.svg

WEIMER GERMANY IN 1923

Image source: https://www.luxuo.com/business/finance/inflation-the-lessons-from-weimar.html

REFERENCES

- Baumol & Blinder, (2009), MACROECONOMICS, 11th ed, Cengage Learning.
- John Sloman, (2016), Essentials of Economics, 7th ed, Prentice Hall.
- Irvin B. Tucker, (2018), Survey of Economics, 10th ed, Cengage learning.
- Karl Case, Ray Fair, (2004), Principles of Economics, 7/e, Prentice Hall Business Publishing.
- N. Gregory Mankiw, (2018), Principles of Economics, 8th ed, Cengage learning