National Accounts: GDP, inflation, inequality, and unemployment.

Chapter 14

Chapter Objectives

- Define concepts such as economic growth, unemployment, inflation, inequality
- Build all the different market interactions
- Establish the final framework of economics go global business

Chapter 14.1

Gross Domestic Product

GDP

Economics growth = the real rate of change in Gross Domestic Product (GDP).

GDP = market value of all final goods and services produced by the country.

GDP is flawed and it should never be used as a proxy for true development. It is, at best, a good proxy about material prosperity.

3 ways to calculate GDP:

1. Production approach (value-added)
2. Expenditure approach (supply-side)
3. Income approach (demand)

GDP is determined in the markets for goods and services through a clearing equilibrium following aggregate supply and demand interactions. It follows that the **aggregate supply quantity** is equal to **aggregate demand quantity**. Both need to be equal to the **value-added** way of calculating GDP.

GDP & GDP per capita

- Measures of economics output
- Indicate the wealth generated by countries and their population

GDP per capita = average income of a person in a country.

GDP is not a good measure of social cohesion, life satisfaction, or anything else.

14.1.1 Production (value-added)

Assume:

1. There are only three stages in the production of bread: wheat, flour, and bread.
2. The economy is closed and markets clear.
3. All wheat is used to produce flour.
4. All flour is used to produce bread.
5. All production at each stage is sold.

Bread Production

- ➜ Farmers produce wheat and sell it for 180.
- ➜ Flour manufacturers buy the wheat at 180 and after processing it into flour, sell it for 350.
- ➜ Bakers buy flour, and sell bread for **600**.

VALUE-ADDED:

1. **Wheat farmers + 180**
2. **Flour manufacturers + 170**
3. **Bakers + 250**

The sum is equal to 600.

Intermediate goods are already incorporated in the market value of final goods, and we need just to aggregated value added of all goods and services to calculate the country's GDP.

14.1.2 Expenditure (national output)

AS = AD

Each stage of production flows into three segments:

1. Intermediate goods
2. Labor
3. Capital

$$Y = f(K, AL, AN)$$

Y = f(K, AL, AN)

Y –output
A –an index of productivity
K –capital
L –labor
N –natural resources

Solow's growth model = the main driver of lung run(but not very long run) growth.

Assume production of bread is divided into:

- Wages
- Intermediate goods
- Profits

Farmers pay **70** in wages, **80** in rents, and receive **30** in profits.

Remuneration of production factors

	Wages	Rents	Profits	Value-Added
Wheat	70	80	30	180
Flour	50	70	50	170
Bread	100	100	50	250
Total	220	250	130	600

14.1.3 Income (Demand)

$$AD = C + I + G + X - IM$$

C –measures the aggregate consumption of all residents in a country;

I –represents **new** private investment in capital goods (another way to say investment in expanded capacity);

G –is the flip side of I, but for government investment

X –is total exports

IM –imports from other countries.

Consumption (C)

= the total value of goods and services consumed by households

- Families can either consume or save.

The propensity of consumption = the percentage of families' income that goes to consumption

Example: $b = 0.75$

➡ consumers spend, on average, 75% of their income on goods and services and save 25% of their income for future consumption.

Investment (I)

= the expenditure of firms on the expansion of productive capacity

Two phases:

1. Investment increases demand because companies consume resources from society (final goods and services) to execute capacity expansion
2. This, later, increases society's productive capacity because of increased K (capital) in the aggregate supply function.

While the two-stage process of investment today increasing production in the future is usually clear-cut, occasionally higher investment will not actually lead to capital accumulation.

Example: Ghost cities in China

Ghost cities in China –a phenomenon caused by the construction of new cities by local Chinese governments that occasionally flop

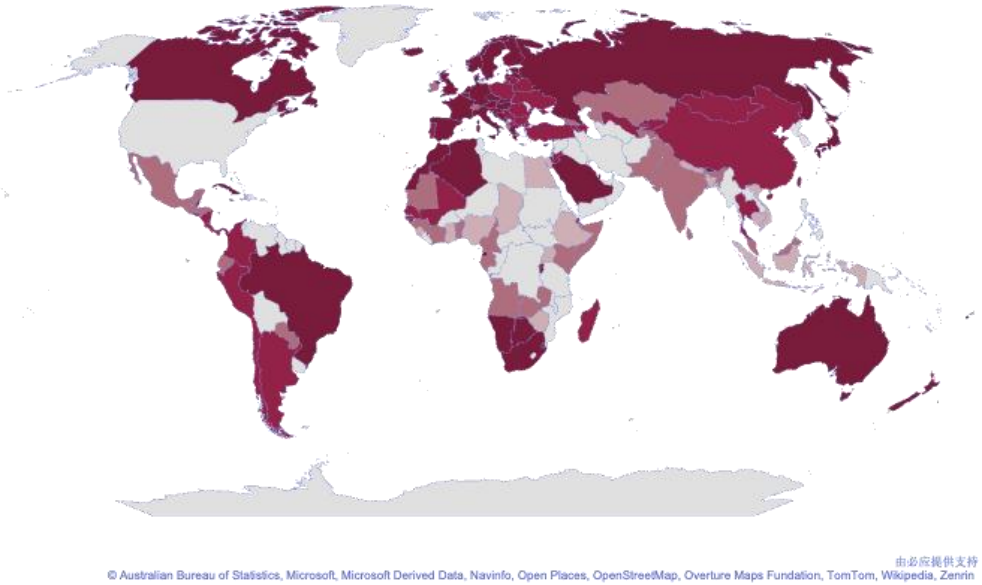
- Ordos, a ghost city in Inner Mongolia, was built for over a million people, but in 2016 the city counted only a few thousand, mostly public servants in care of the city's infrastructure, among its residents.

Short run: AD increases
Long run: Nation's productivity capacity is unchanged

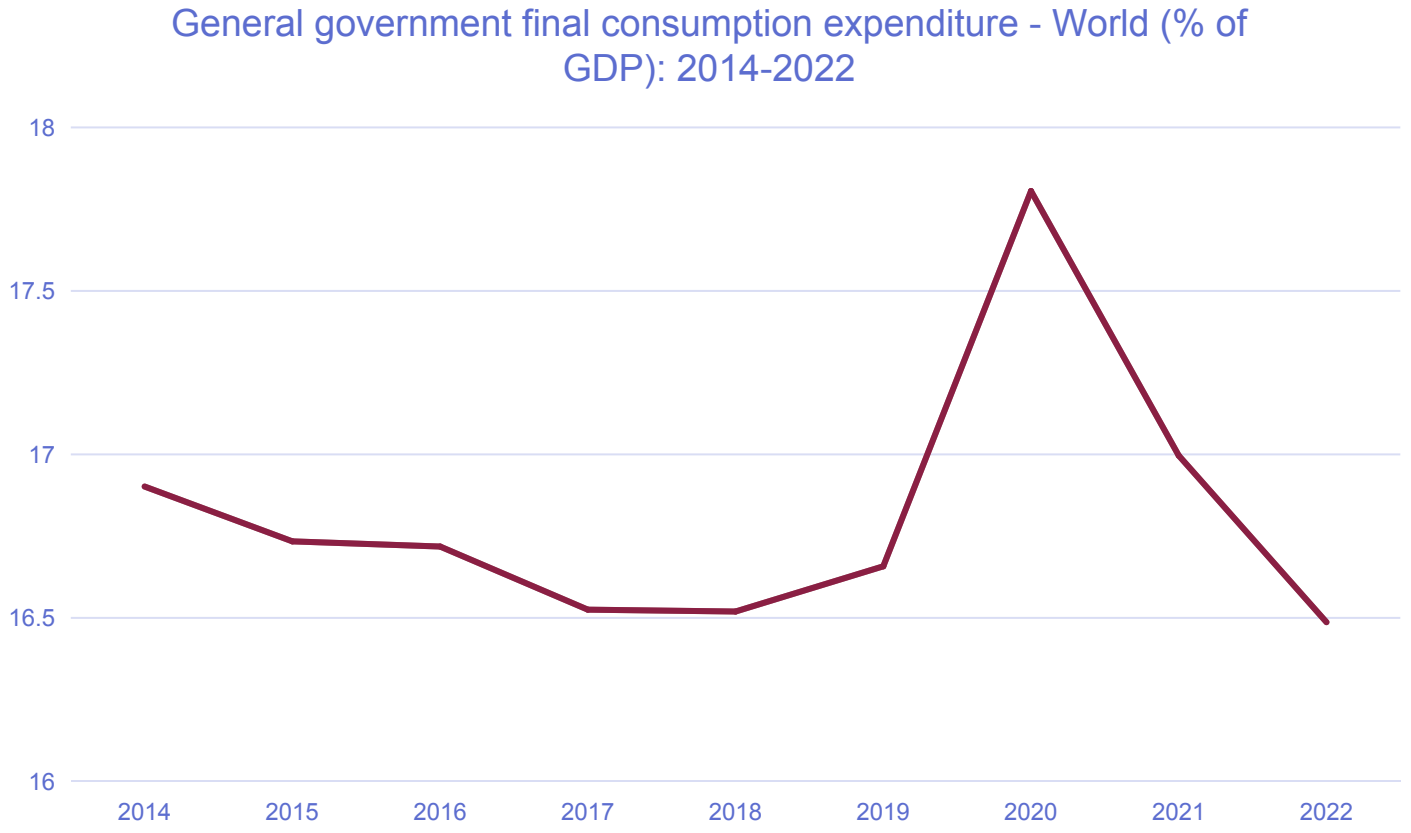
Government Investment (G) ≠Government Outlay

- **Government Investment** is related to expenditure generated by local and national governments.
- **Government Outlay** is the total amount in government budgets (includes interest on public debt, for instance).

World Bank data for general government final consumption expenditure (% of GDP)investment.



Source: WorldDataview (2024)



On average, governments around the world have been increasing their expenditure over time, from an average of 14.5% of GDP in the 1960s to 17.5% in the 2010s.

Exports (X) and Imports (IM)

Exports (X) and Imports (IM) comprise international trade:

Exports = the demand for local goods abroad

Imports = the locals' demand for foreign goods

Imports are comprised not only of final goods; international trade is also buoyant because of intermediate and capital goods.

Bread Production Example:

Earlier we found that bread contributes **600** to GDP.

Assume wheat is imported:

- Flour manufacturers still spend 180 to purchase the wheat and add 170 of value, selling all the flour to bread manufacturers, at 350.
- However, if the wheat is bought in the international market, the bread will not add 600 of value to the local economy, but only 420, which is **the value of bread sales, minus the value of imported wheat**.

People think that it is **better** for a local economy to be a **net exporter** (X–M > 0), this is **not necessarily true.**

- International trade benefits all countries by shifting internal resources to industries that are more efficient
- By engaging in trade, countries are able to produce more than they would be able to do in an autarky (in the absence of international trade)

After Second World War...

...countries followed two different paths:

1. **Import substitution**, in which the local government determines "strategic" industries that are protected from foreign competition, so that local companies can supply the local market.

   Colombia, Argentina, and Mexico all tried the import substitutions route from the 1950s until the 1990s.

2. In **export-led industrialization** path, industries that show comparative advantages are stimulated through many different types of subsidies, and local producers have incentives to become more productive in the supply of goods for foreign markets.

   Japan, South Korea, China, and other Asian countries followed the export–led path.

14.1.4. Bringing it all together

- **Regardless of how we calculate GDP, the result is the same.**
- **It is the output that is the sum of value added from all industries.**

China: GDP Composition Breakdown

O: GDP (current) US$ 9,240,270,452,050;

A: Gross national expenditure US$ 9,003,474,413,754;

A3: Final consumption expenditure, etc. US$ 4,449,395,127,883;

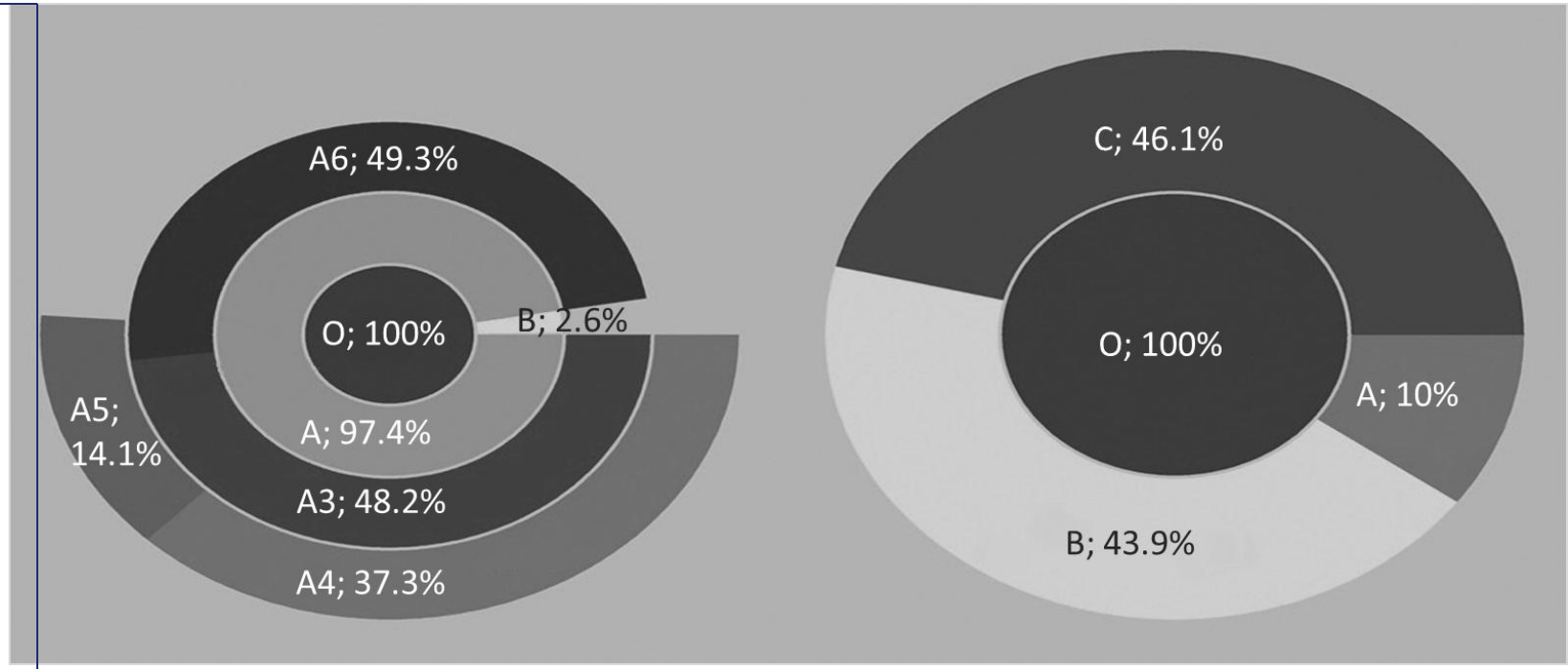
A4: Household final comsumption expenditure US$ 3,446,754,675,468;

A5: General government consumption expenditure US$ 1,299,157,066,729;

A6: Gross capital formation US$ 4,554,079,285,871;

B: External balance on goods and services US$ 236,796,038,296.

O = A + B
A = A3 + A6
A3 = A4 + A5



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O: GDP (current US%) US$ 9,240,270,452,050;

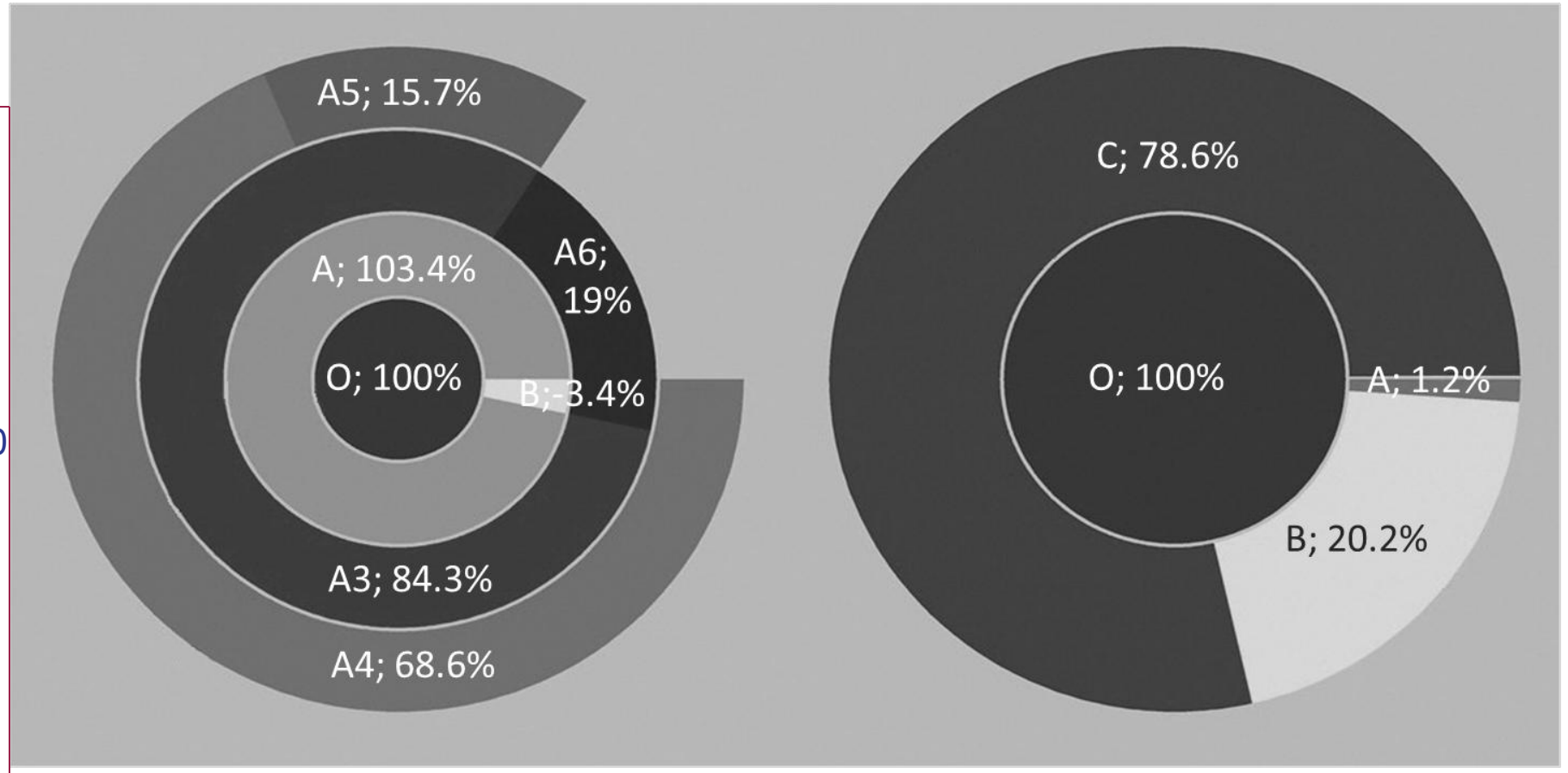
A: Agriculture, value added US$ 925,204,387,867;

B: Industry, value added US$ 4,055,851,231,952;

C: Services, etc., value added US$ 4,259,214,832,230.

O = A + B + C

United States: GDP Composition Breakdown



O: GDP (current) US$ 16,244,600,000,000;
A: Gross national expenditure US$ 16,791,800,000,000;
A3: Final consumption expenditure, etc. US$ 13,697,600,000,000;
A4: Household final comsumption expenditure US$ 11,149,600,000,000
A5: General government consumption expenditure US$ 2,548,000,000,000;
A6: Gross capital formation US$ 3,094,200,000,000;
B: External balance on goods and services US$ -547,200,000,000.
O = A + B
A = A3 + A6
A3 = A4 + A5

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Each slice of o circle is the summation of the

O: GDP (current US%) US$ 15,533,800,000,000;
A: Agriculture, value added US$ 193,461.490,065;
B: Industry, value added US$ 3,130,113,406.586;
C: Services, etc., value added US$ 12,210,225,103,367;
O = A + B + C

China vs. US

- China is indeed a manufacturing powerhouse in which industrial output accounts for more than 40% of GDP
- Agriculture is still relevant in China
- Chinese households only consume a little over 1 in 3 dollars produced in the country
- Net exports are positive
- GDP: $9.2 trillion
- GDP per capita: $7,924

- The American economy is comprised mostly of services, which correspond to almost 4 out of each 5 dollars produced in the country.
- Agriculture represents only 1.2%
- American households are responsible for more than 2 out of 3 dollars of the US economy
- Net exports are negative
- GDP: $15.5 trillion
- GDP per capita: $55,838

14.1.5. How is GDP actually measured?

- In the UK, all three approaches to estimate GDP are combined into one number.
- In the US, GDP is estimated via the income approach, by the Bureau of Economic Analysis.

In every country, GDP is estimated through surveys, and the numbers that statistical offices use are mere estimates of the true economic activity happening over billions of transactions in the economy.

Even though GDP is an estimate, it is usually a reliable one.

14.1.6. Nominal versus real GDP

GDP deflator = measure of inflation

= it de-inflates the nominal GDP to extract the effect of inflation on nominal GDP so we can compare the value amount of goods and services produced in different periods.

Nominal GDP is measured through a survey of goods and services and the computation of their market values.

Real GDP is the result of the disassociation between the price (GDP deflator) and quantity

$$Real\ GDP_t = \frac{Nominal\ GDP_t}{GDP\ Deflator_t} 100$$

Year	Nominal GDP	GDP deflator
2018	$20 trillion	100
2019	$21 trillion	104

Nominal GDP increases by 5%.

$$Real\ GDP_{2018} = \frac{20}{100} 100 = 20$$

$$Real\ GDP_{2019} = \frac{21}{103} 100 = 20.388$$

Real GDP grows by 1.94%.

14.1.7. Potential versus actual GDP.

Growth gap = the difference between actual and potential GDP.

- ➜ situations in which economies are performing at below their optimal level
- ➜ persistent high unemployment

Potential output is related to the non-accelerating inflation rate of unemployment (**NAIRU**), which is a representation of an ideal job market in which most people are employed at stable real wages.

Overheated economy:

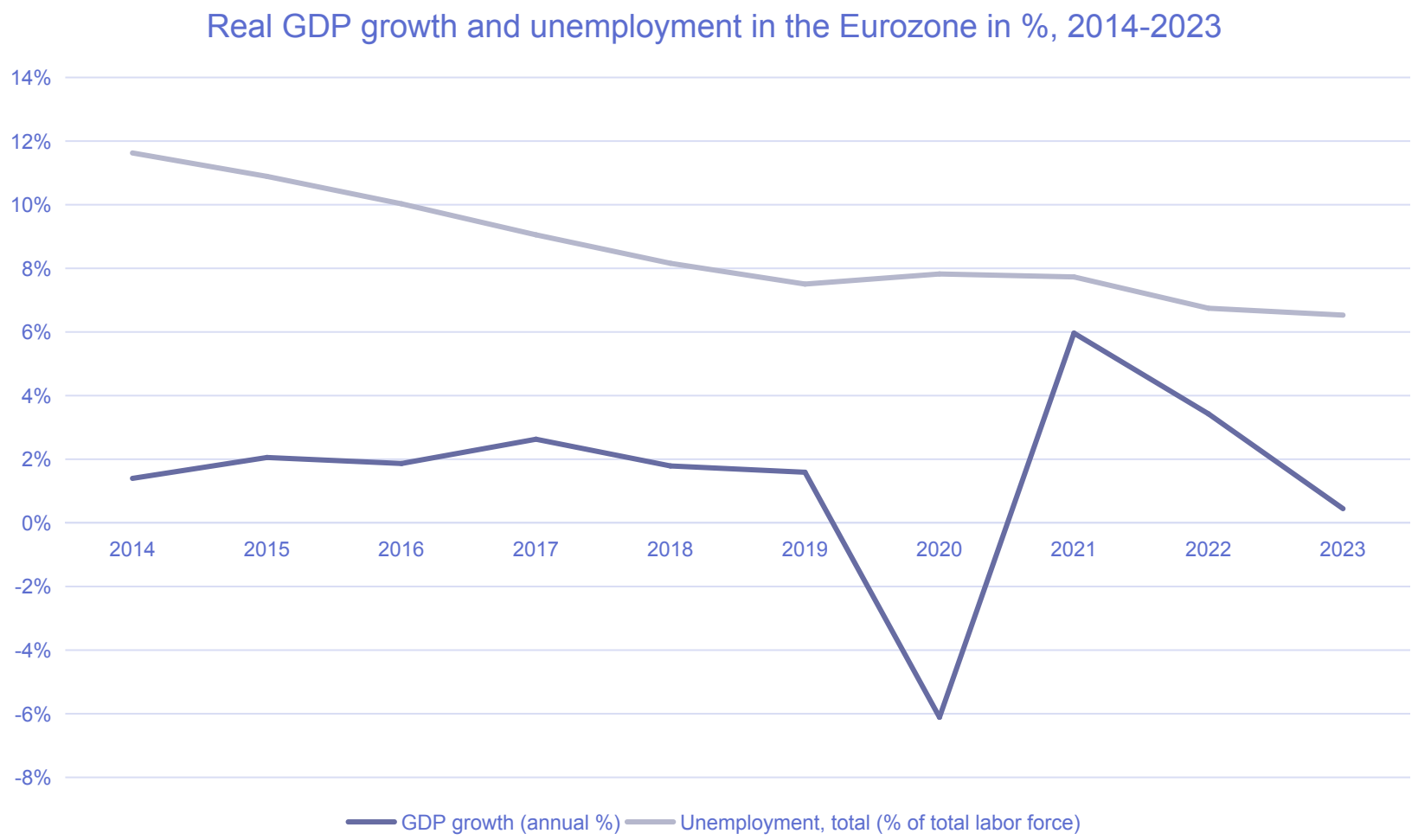
- ➔ It can happen that actual GDP > potential GDP temporarily.
- ➔ It is **much more common** to have a gap resulting from potential GDP being higher.

Unemployment:

Overheated: unemployment falls and nominal wages increase rapidly as companies compete over the limited number of people willing to work.

Depressed: unemployment rises and it is the workers who now compete for a fixed number of jobs in the private sector.

Europe’s Growth Gap



Source: World Bank (2024)

14.1.8. Limits of GDP

1. Many goods and services we consume today are not traded in the market.
2. The pace of innovation is quicker than in the past.
3. There is a non-linear relationship between income and welfare.

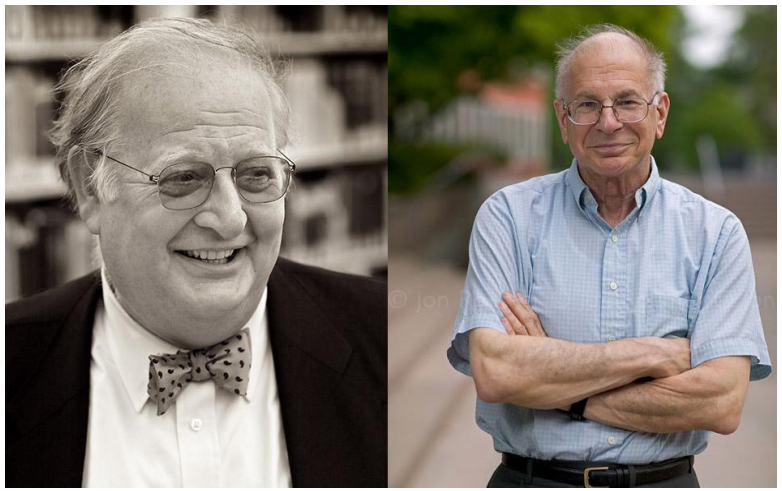
GDP captures transactions and disregards non-traded goods.

Ex: Cooking or reading to kids at home are not considered economic activities. In modern life, in which opportunity costs are high, such activities are valuable and improve social welfare, both in the short and long runs.

Money buys happiness only up to a point

...however, it does buy life satisfaction without limit

Angus Deaton, Bettina Aten and Daniel Kahneman found:



- In 2015 dollars the relationship between money and short-term well-being tops up at approximately $75,000
- After some quantity of money that satisfies the basic needs, more money does not necessarily lead to better quality of life.

14.2. Unemployment

If unemployment is rising then social welfare is declining.

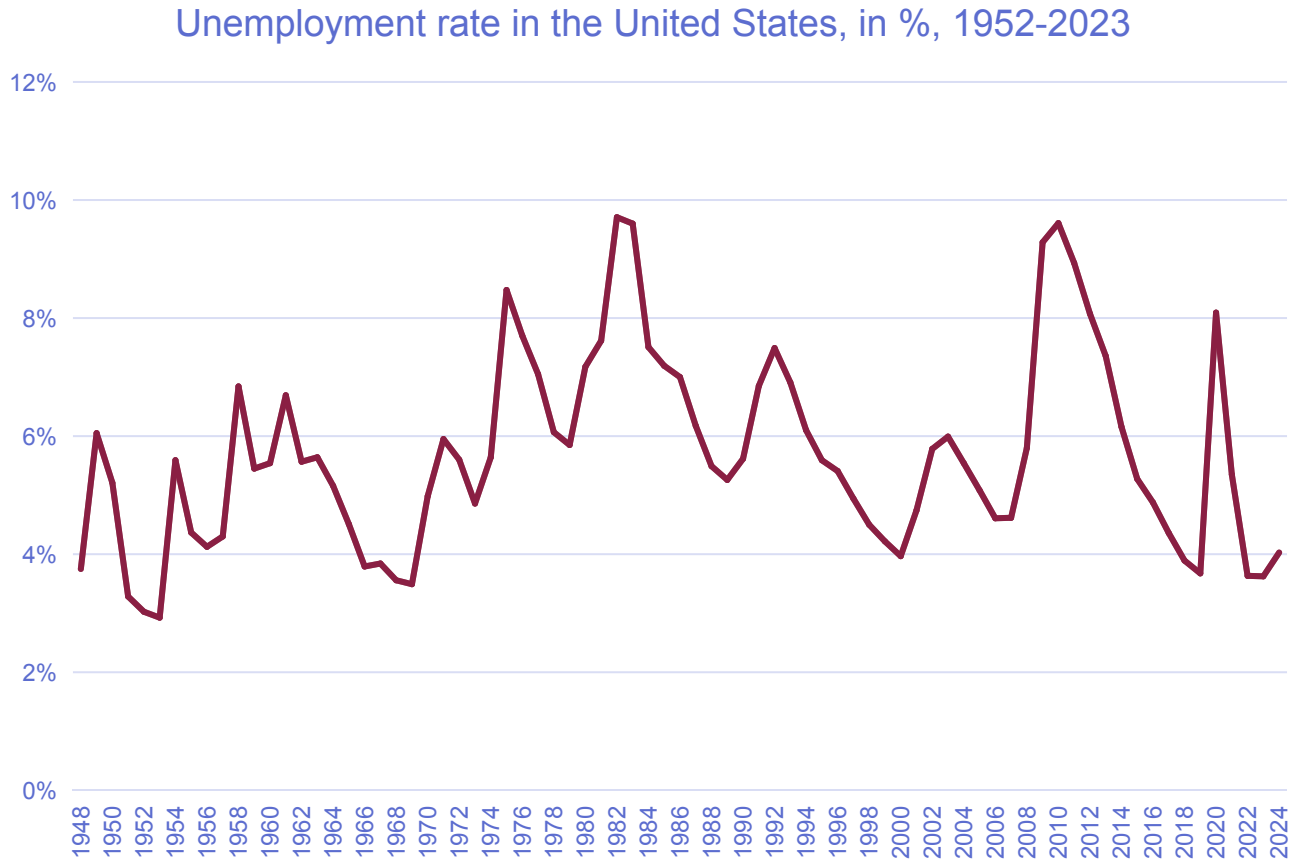
Unemployed person = a person who is in the labor force and cannot find a job, even though he or she is actively looking for one.

Not in the labor force: under 16 years of age, students, retired, in the military, taking care of children or other family members, incarcerated, or who are neither working nor seeking work.

Unemployment in the **US** at the end of 2016 was 4.6%, which meant that 6.9 million individuals in America could not find a job.

In **Hong Kong**, unemployment in 2016 stood at 3.4%, with 136,000 people without a job in the same period.

Both economies were in full employment.

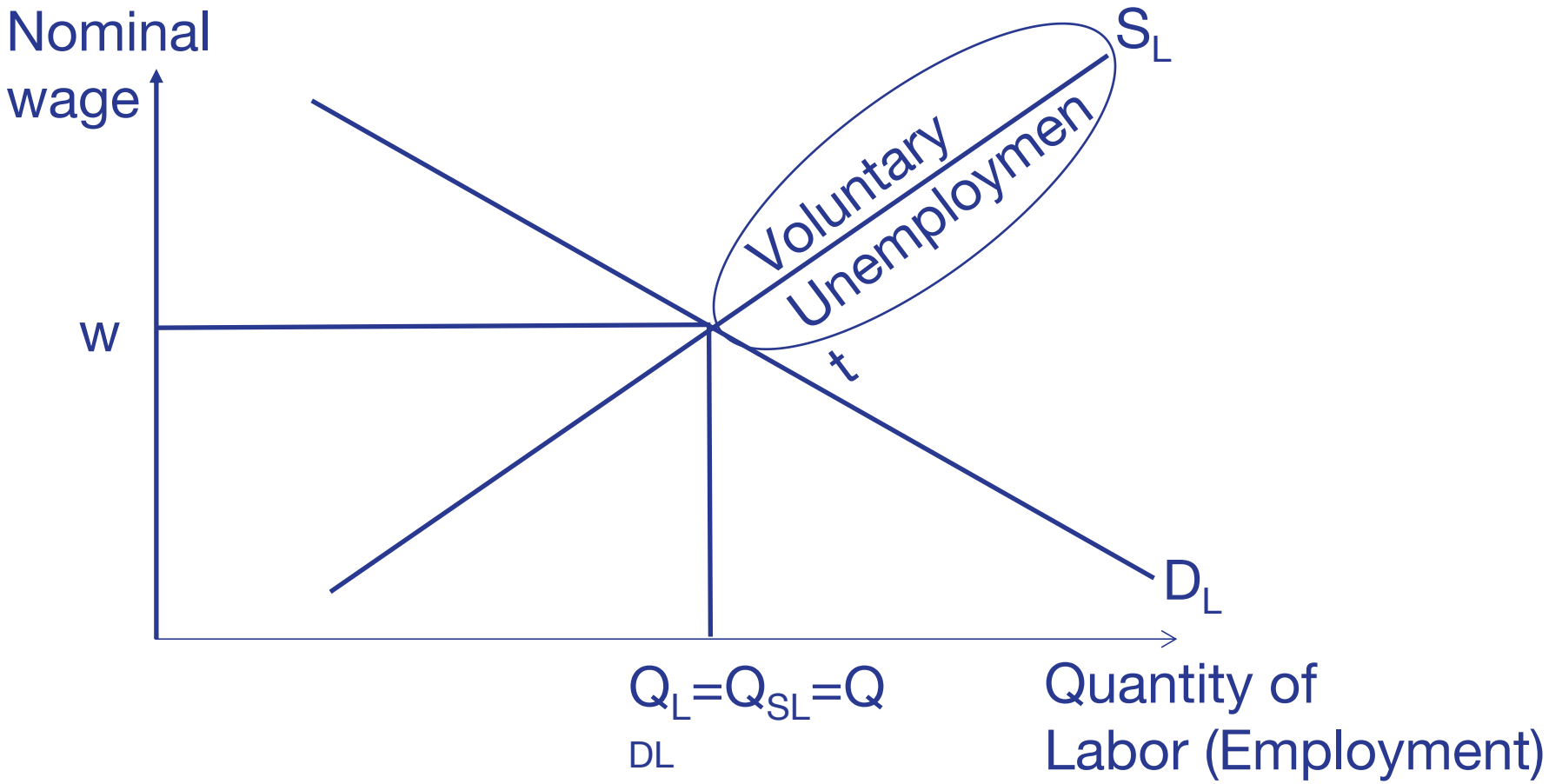


- The unemployment rate follows the business cycle, rising in a recession and decreasing as the output increases.

Full employment = unemployment rate 4–5%

Frictional unemployment = people switching jobs

14.2.1 Unemployment dynamics



Given a perfectly competitive market, the quantity demanded of labor (QDL) would be equal to the quantity supplied (QSL), at the prevailing nominal wage (w).

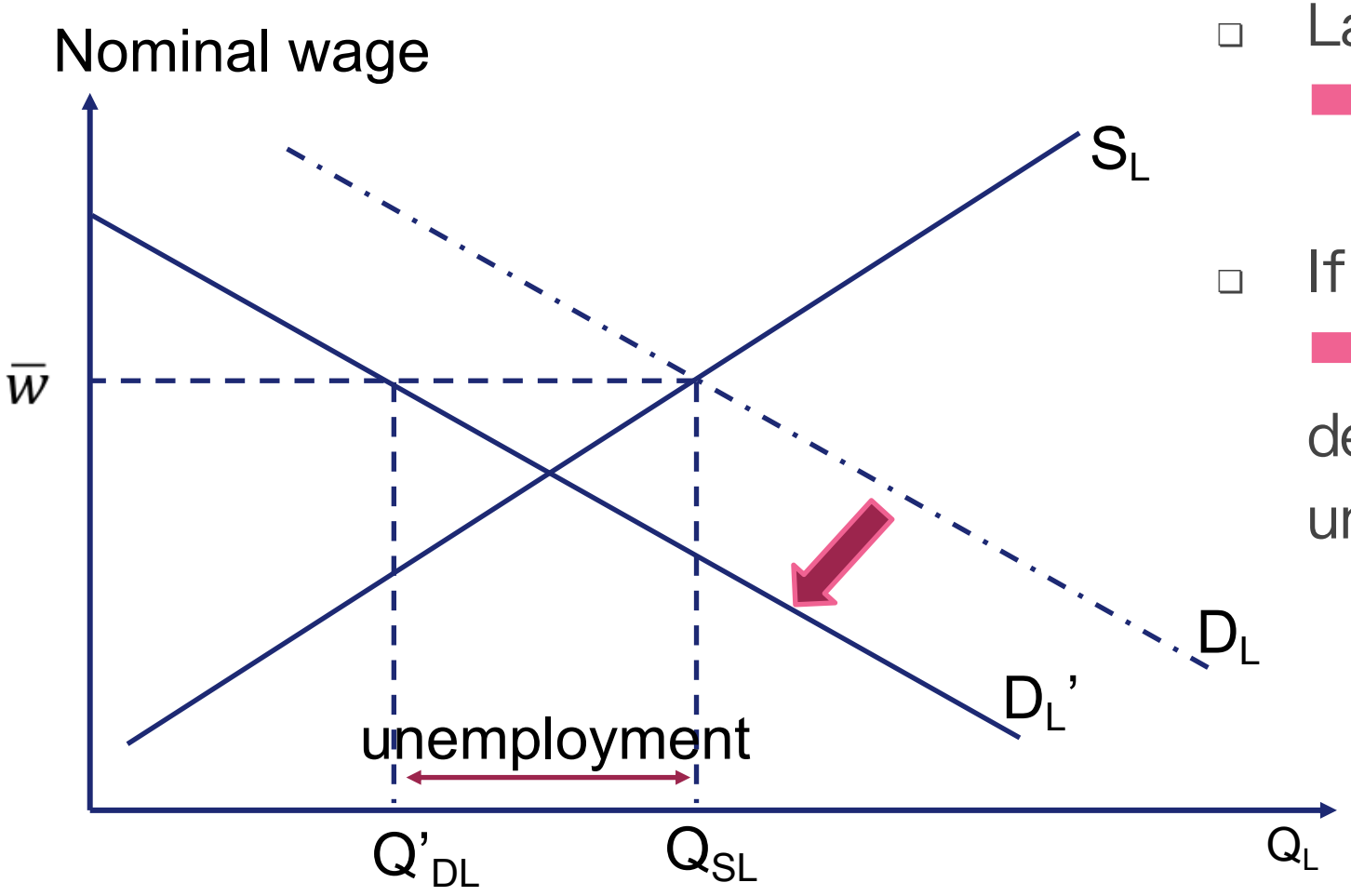
- Some people would choose not to work at the current wage, but that would not decrease social welfare
- There are occupations with an excess supply of candidates, while others involve little competition
- Acquiring skills is expensive, and access to education is heterogeneous across the world.
- Language barriers act as deterrents in an increasingly globalized world.

The full employment rate = NAIRU (non-accelerating inflation rate of employment)

➔ Structural unemployment happens when the actual rate of unemployment is persistently higher than the NAIRU.

- Regulations, shocks and institutions that work poorly contribute to persistent unemployment.

Labor Market



- Labor market in complete equilibrium → no unemployment
- If there is nominal rigidity → shock that shrinks labor demand causes structural unemployment

Hysteresis

- Successive recessions or persistent stagnations should be counterbalanced by periods of economic buoyancy.
- Economies do not grow linearly, but over time, the unemployment rate should be close to full employment.
- **BUT**, if the economy does not recover quickly, many workers lose skills that are not easily recouped.
  Hysteresis is one possible reason why structural unemployment can become persistent over time, and it is one of the reasons why European countries face high and persistent rates of unemployment.

Microeconomic view

When governments try to control prices by fiat there are two possible outcomes:

1. Rationing;
2. The emergence of black markets.

A minimum wage is just another price cap set by policymakers to influence markets, in this case the labor market.

Minimum wage < Market wage → no effect.

Minimum wage > Market wage → unemployment.

Macroeconomic view

The impact of minimum wage on employment depends on:

- the level of development;
- the conditions of the local labor markets;
- the size of informal markets;
- other variables.

It is difficult to model all possible and secondary effects of wage gains. We would need to know at least :

- short and long run estimates on the elasticity of unemployment;
- the rate of substitution between capital and labor;
- potential increases in productivity from higher living standards.

There are no unequivocally good policies.

14.2.2. Labor markets and social welfare

Labor market outcomes that are relevant to economic well being:

1. Underemployment and discouraged workers
2. Formal versus informal employment
3. Temporary versus permanent employment
4. Regional patterns

Underemployment and discouraged workers

- Employment of an individual is incomplete in terms of hours worked or his/her skills not being fully matched
  - ex: immigrants, engineers driving cabs
  - discouraged workers

Formal versus informal employment

- Informal workers earn less, enjoy reduced access to public services, and suffer from instability in their employment and careers.

Ex: In Chile there is a positive and statistically significant association between informal employment and mental health in both women and men.

Informal working arrangements are not entirely bad for society

- Many workers in high paid positions in emerging countries prefer flexible contracts, especially if there are grey areas in terms of tax implications for informal workers.

Regional patterns

- The unemployment rate is a national aggregate that does not reveal much about regional patterns.

Detroit in the mid-2010s

- ➜ A dysfunctional labor market that does not clear in the same way as in the rest of the US
- ➜ In 2010 it had an unemployment rate of 24.8%

Temporary vs. Permanent Employment

- Social welfare is maximized when people can choose and move freely between part-time and full-time employment.

- Among people in the labor force for 27 weeks or more, only 4.1 percent of those usually employed full time were classified as working poor, compared with 13.5 percent of part-time workers.

Uber drivers, unemployment and informal contracting.

Are Uber drivers employees? How are they counted in the Bureau of Labor Statistics surveys?

The company contends that all Uber drivers are independent contractors who own their cars:

- ➜ In late 2015 Uber drivers in California pursued a class action suit in which they claimed they should be considered regular employees, instead of independent contractors.
- ➜ In April 2016 the company and the drivers reached a settlement, in which Uber agreed to pay USD 100 million but did not recognize its drivers as regular employees.

Every single Uber driver is employed, statistically. Nevertheless, the question of their underemployment remains open.

Informal workers in India

Informal Worker in India

In India almost 90% of workers were employed in the informal sector until mid–2010s

- Labor in the informal sector is casual, insecure, and unprotected
- Regulations that try to augment the number of formal workers may have the opposite effect if they increase the relative cost of formal versus informal occupations.

Informality that destroys social welfare in developed countries may, for a time, increase wellbeing in developing countries.

14.2.3. Sclerotic labor markets

In sclerotic labor markets:

- ➜ flows decrease;
- ➜ individual unemployment duration increases;
- ➜ the proportion of long-term unemployed increases.

Olivier Blanchard's model of sclerotic labor markets that helps explain persistent unemployment in Europe:

- Jobs are constantly created and destroyed.
- Workers who lose their jobs become unemployed, and look for new jobs.
- Companies that create new jobs look for workers by posting vacancies.

In equilibrium → positive unemployment, positive vacancies, flows of workers in and out of employment.

If the shock is bad enough, companies terminate the job.

Higher protection leads to sclerosis first and hysteresis later.

Unemployment in South Africa

Unemployment in South Africa.

In South Africa, between 2009 and 2015 employment increased from 14.2mln to 15.7mln.

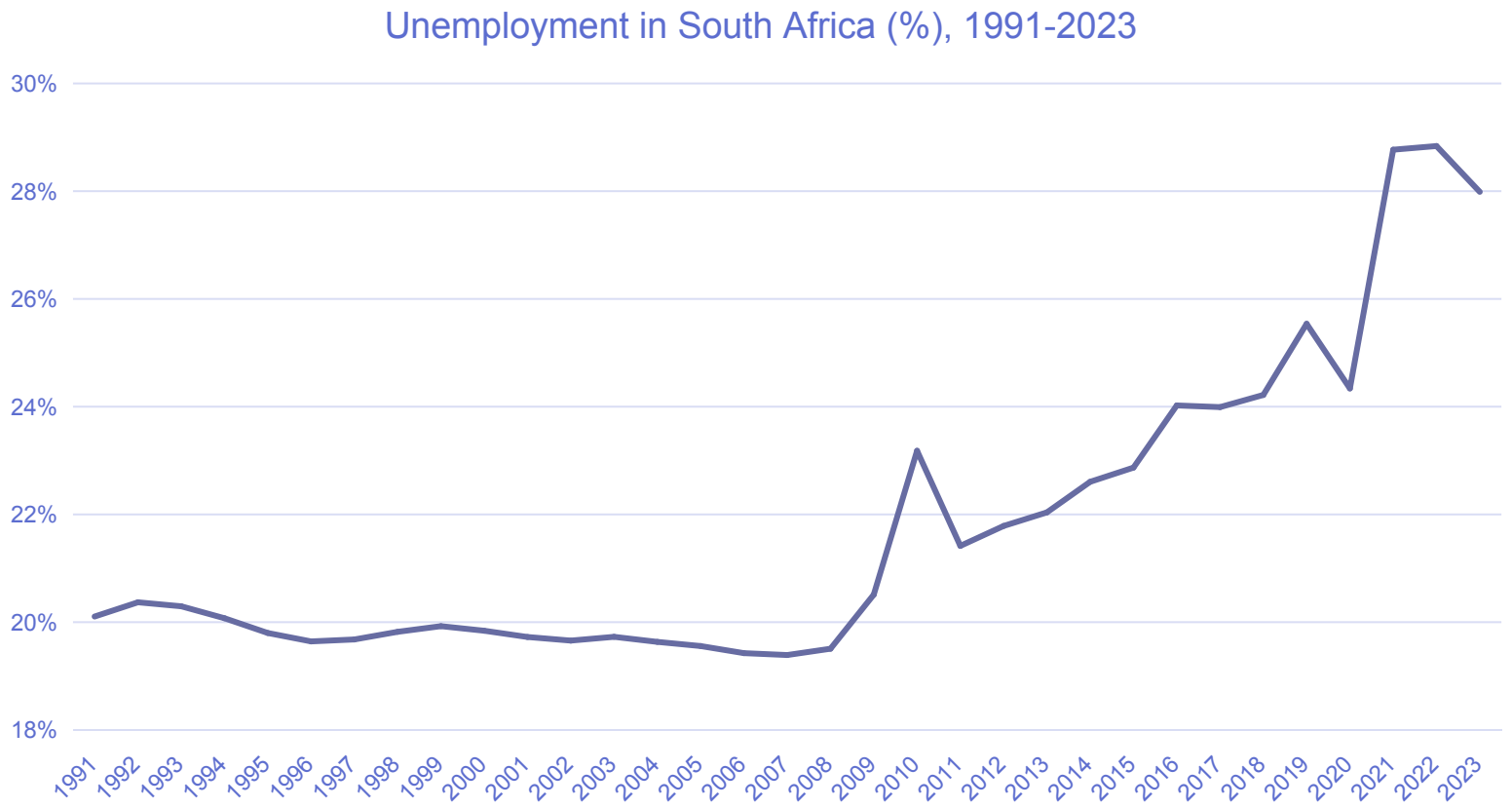
In 2015:

- 35,955 million people aged between 15 and 64 years in South Africa
  - 20,887 million were economically active
    - 15,657 million were employed
    - 5,230 million were unemployed

If we take into account discouraged workers:

Unemployment rate is 34.9% instead of 25%

Unemployment rate for people under 25 is 63.1%



Source: World Bank (2024).

Living conditions are far worse for the unemployed than for the informally employed –in terms of living space, access to drinking water, and the availability of sanitation, electricity, etc.

Barriers to informal employment

- The apartheid system repressed the informal activities of black South Africans through such restrictive legislation as the Group Areas Act, harsh licensing, strict zoning regulations, and effective detection and prosecution of offenders.

- Enforcement of minimum wages and other labor contract stipulations.

14.3. Inflation

Inflation is bad.

Inflation= increase in prices of goods and services

= weighted average price of a basket of goods and services representative for the typical consumer.

4 steps to estimate the inflation rate:

1. Define the goods and services that comprise the typical basket of goods;
2. Establish the weight of each product;
3. Investigate the price changes in the marketplace;
4. Calculate the index.

Two main indexes: CPI and PPI

CPI = a proxy for rising costs of living for the average household

PPI = describes the average increase in costs for the producers of goods and services

Calculating Inflation

Assume a country where people only work, eat and come home to do it again the

Good	Weight	Year 1	Year 2
Housing	40%	5000	5500
Transportation	20%	200	240
Foodstuff	40%	2000	1900

$$CPI = \sum w_i p_i$$

$$CPI = 0.4 * 0.1 + 0.2 * 0.2 + 0.4 * (-0.05) = 0.06 = 6\%$$

CPI of 6% a year is high for developed countries, but average for emerging markets.

14.3.1. Core versus non-core goods and services

Most economists use core instead of general inflation indexes to estimate the strength of an economy or forecast future inflation.

Difference between core vs. non-core goods and services comes from **volatility.**

The core CPI excludes some food and energy categories.

14.3.2. Technology, quality and cost of living

The methodology of CPI and PPI changes over time to take into account some quality changes, but **the updates are minimal**.

Given the rise in the quality for goods and services, the **CPI overstates the true inflation**.

Costs of living decrease in real terms, over time, as the quality and the technology improve.

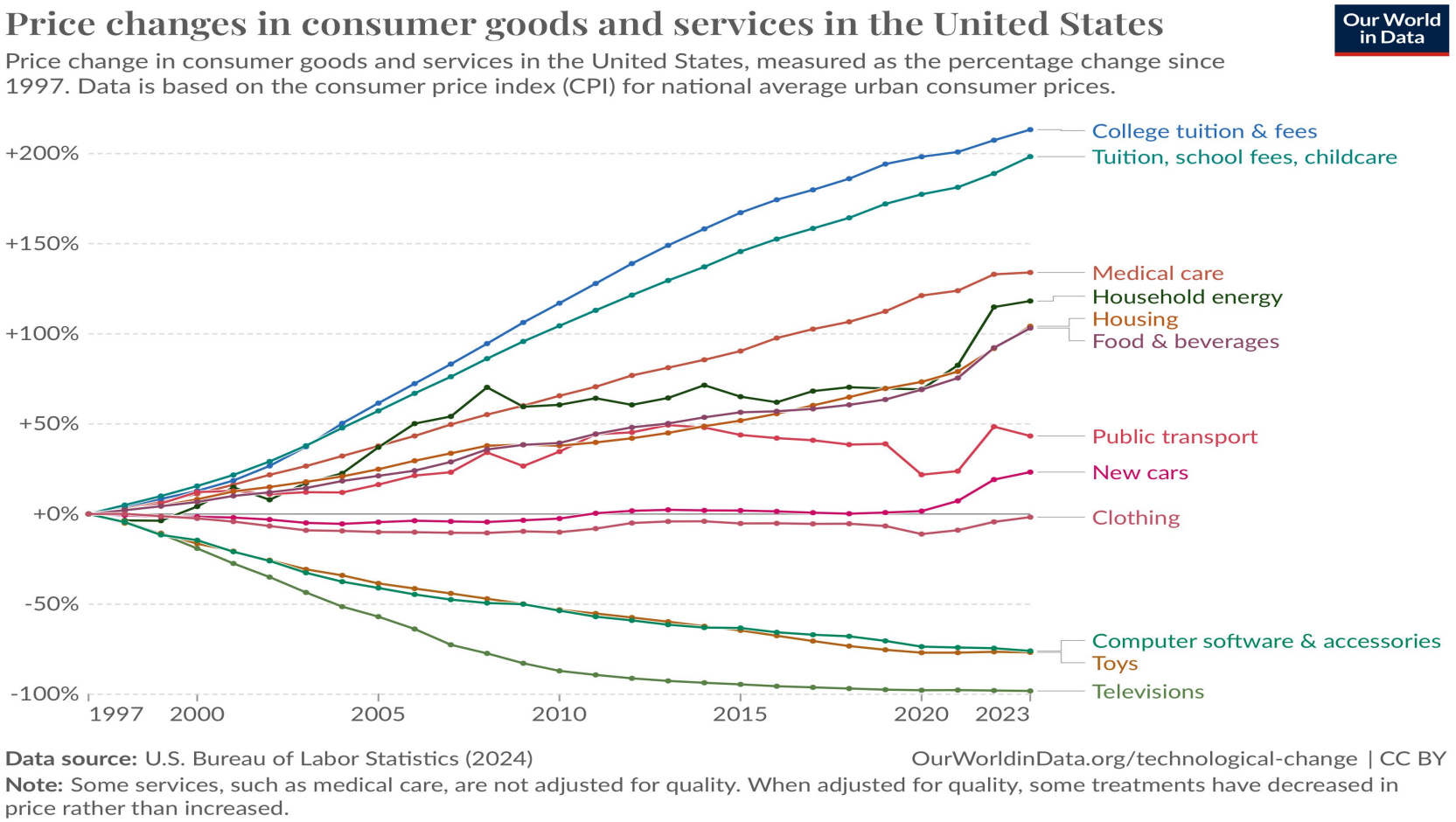
Ex: A computer's price may be the same as 20 years ago, but its processing power is thousands of times those of old computers.

14.3.3. Perceived versus real inflation

People perceive inflation to be higher because of two factors:

1. The individual basket of goods is **different** than the one used in the CPI's calculation;

2. There is a **psychological bias**: we concentrate more on the goods that became expensive, ignoring most of the goods with constant or declining prices.



Source: BLS and Ourworldindata (2024)

- We tend to automatically create a **mental model** of the CPI in which we ascribe a larger weight to goods and services that are (1) more relevant and (2) that have the highest price bumps.
- Whenever (1) and (2) **coincide**, we tend to complain that our costs of living are getting out of control, even if that is far from the truth.

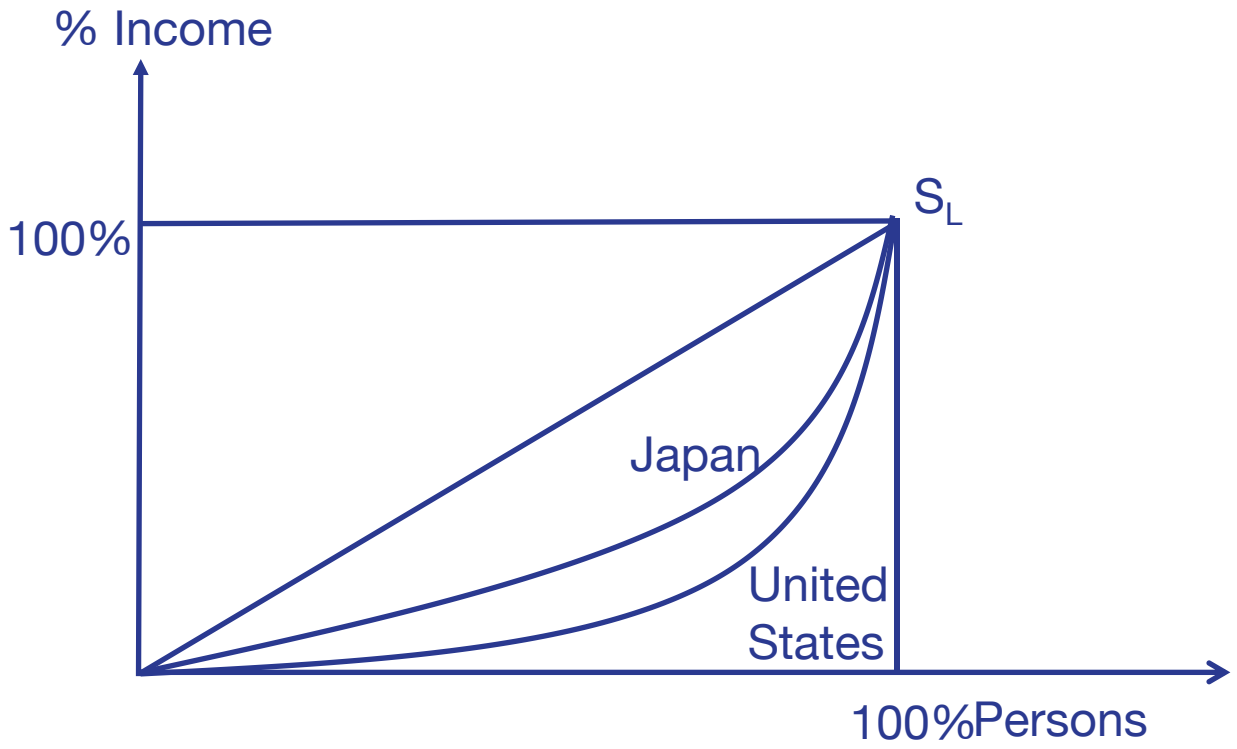
14.4. Income inequality

Income Inequality is measured by the **Gini coefficient**

Gini coefficient:

- 0 to 1 interval
- 0 = complete equality
- 1 = total inequality

Hypothetical Gini indexes for the US and Japan.



–The **Gini coefficient** is the area under a Lorenz curve of ordered income from all persons, from poorest to richest.
–The curve represents the distribution of income in an economy.
–A point (x,y) on a Lorenz curve shows the percentage y of total income of the poorest x% of the population.

Data on inequality in OECD countries

OECD Country	Top 20% vs bottom 20%	Poverty %	Gini coefficient	Poverty 18-25	Poverty 65+
Australia	5.7	12.8	0.337	8	25.7
Austria	4.2	9	0.280	10.4	9.7
Belgium	4	10	0.268	11.1	9.1
Canada	5.5	12.6	0.322	17.1	6.2
Switzerland	4.4	8.6	0.295	7.1	19.7
Chile	10.6	16.8	0.465	15.3	15
Czech Republic	3.7	6	0.262	4.9	3
Germany	4.4	9.1	0.292	13.2	8.4
Denmark	3.6	5.4	0.254	21.4	3.8
Spain	6.7	15.9	0.346	20.1	5.5
Estonia	6.7	16.3	0.361	12.8	23.5
Finland	3.8	7.1	0.262	15.9	6.6
France	4.4	8	0.294	12.6	3.5
United Kingdom	6	10.4	0.358	10.5	13.5
Greece	6.3	15.1	0.343	21.5	8.6
Hungary	4.5	10.1	0.288	11.9	8.6
Ireland	4.8	8.9	0.309	16.4	7
Iceland	3.4	4.6	0.244	6.4	3

Data on inequality in OECD countries

OECD Country	Top 20% vs bottom 20%	Poverty %	Gini coefficient	Poverty 18-25	Poverty 65+
Israel	7.6	18.6	0.360	16.6	22.6
Italy	5.8	13.3	0.325	16	9.3
Japan	6.1	16.1	0.33	19.7	19
Korea	5.4	14.6	0.302	9	48.8
Lithuania	6.2	12.4	0.353	11.8	13.1
Luxembourg	4.2	8.4	0.281	8.6	3.6
Latvia	6.3	14.1	0.352	8.7	19.6
Mexico	10.4	16.7	0.459	12	25.6
Netherlands	4.2	7.9	0.280	21.7	2.1
Norway	3.8	7.8	0.252	24.4	4.3
New Zealand	5.3	9.9	0.333	10.4	8.2
Poland	4.7	10.5	0.300	12.2	7.4
Portugal	6.1	13.6	0.342	17.7	10.2
Slovak Republic	4.1	8.4	0.269	8.5	3.7
Slovenia	3.8	9.5	0.255	7.9	12.2
Sweden	4.2	8.8	0.281	17	7.6
Turkey	7.6	17.2	0.393	14.1	18.9
United States	8.6	17.2	0.394	19.2	20.6

Source: OECD (2017).

Interesting facts

- The only countries in which the 20% richest individuals earn more than 10 times the amount the poorest individuals earn are the two Latin American countries in the sample, Chile and Mexico.
- The myth of the Scandinavian egalitarian society is confirmed, with the low Gini of Denmark, Sweden and Norway and the low ratio on poor and rich individuals. But the intergenerational conflict remains. The same is true in countries with similar political systems, such as Iceland and Finland.
- The US is closer to upper middle income countries (Turkey, Mexico and Chile) than the rich members of the OECD.

Interesting facts

- Most of Western Europe has a pattern of younger individuals being poorer than older individuals, displaying an intergenerational conflict that is at the heart of the welfare state in most countries in Europe.
- Pacific Rim countries (Japan, South Korea, Australia and New Zealand) have relatively low inequality, but not as low as in Scandinavia.

Is the tweet about Jeff Bezos correct?
Can a single person reduce inequality by him/herself?

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No. This would most likely not change income inequality at all. It would be an once-and-for all wealth transfer.
Worse, it would generate a huge capital flight from the US.
Income inequality is more Important than wealth Inequality.