LECTURE -2

ECONOMIC FLUCTUATIONS AND UNEMPLOYMENT

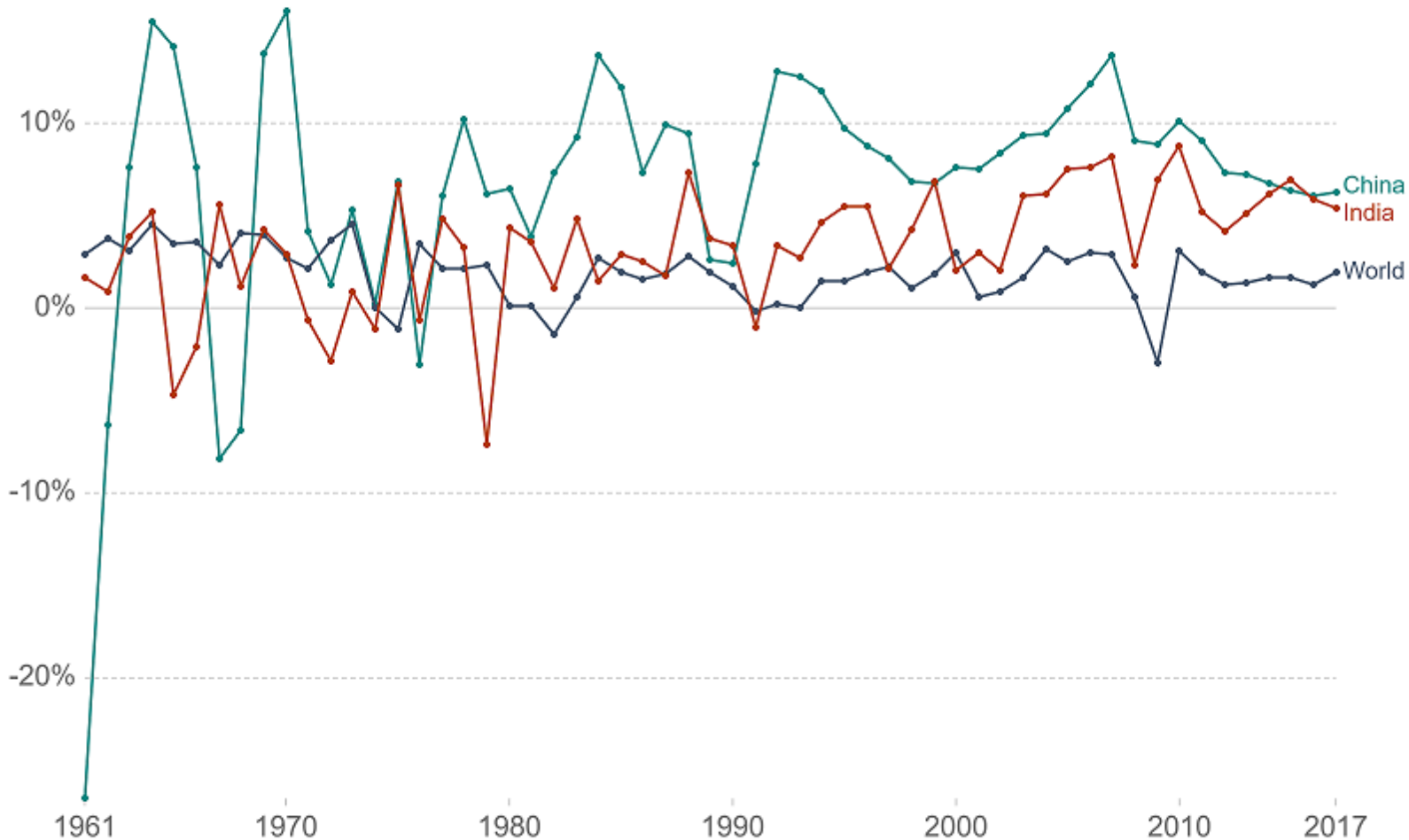
- Measuring the size of an economy: GDP

- Understanding inflation

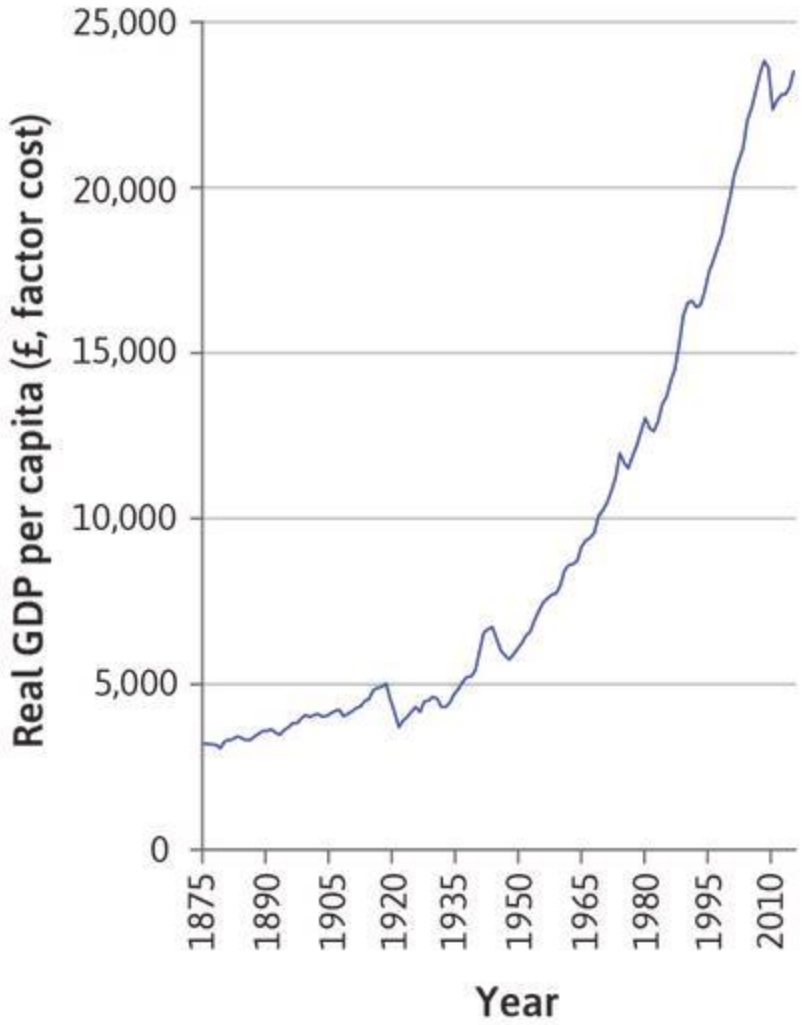
Annual growth of GDP per capita, 1961 to 2017

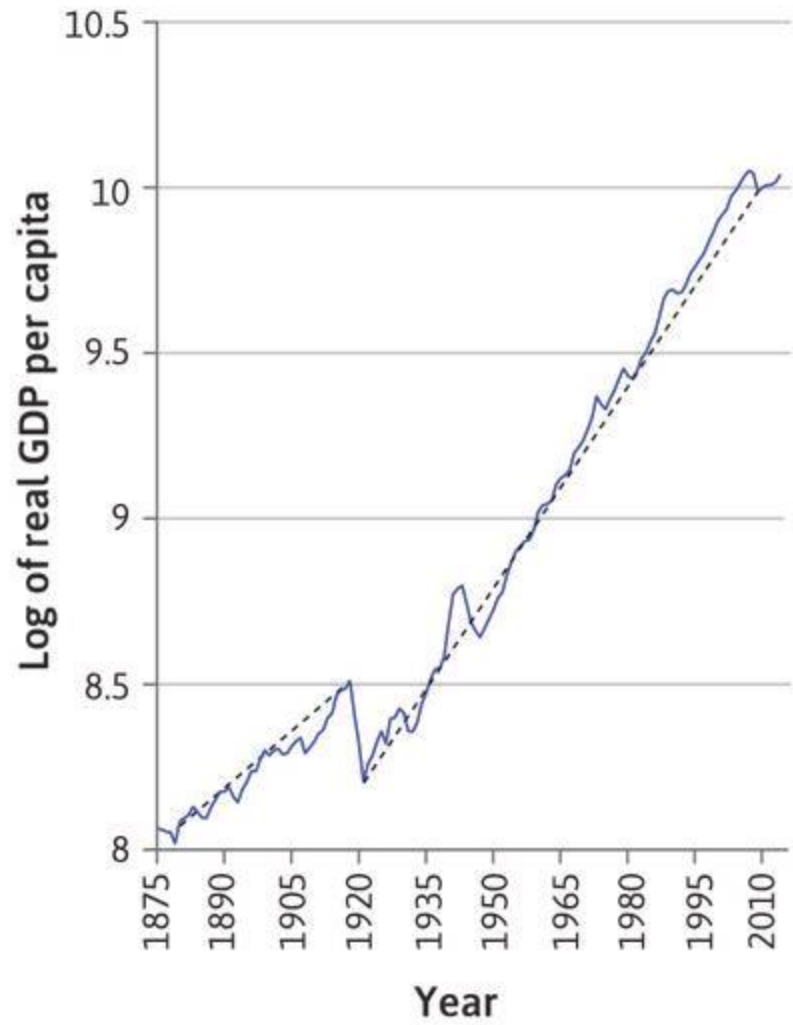
Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.

Our World in Data



Source: World Bank


Real GDP per capita (£, factor cost)
25,000
20,000
15,000
10,000
5,000
0
1875
1890
1905
1920
1935
1950
1965
1980
1995
2010
Year


Log of real GDP per capita
10.5
10
9.5
9
8.5
8
1875
1890
1905
1920
1935
1950
1965
1980
1995
2010
Year

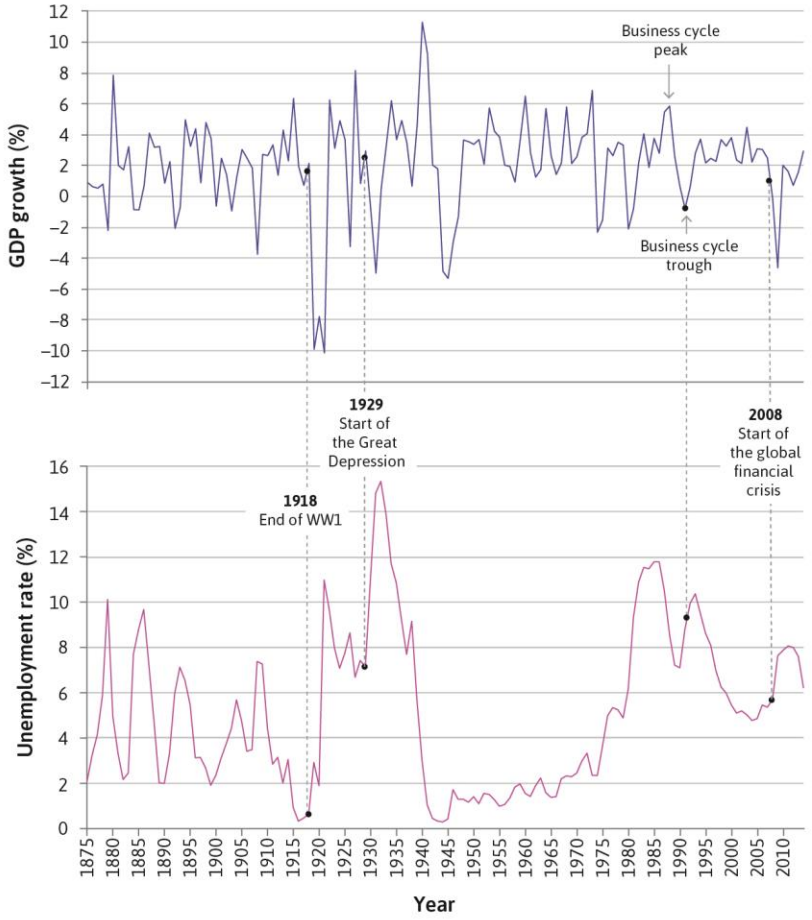
THE BUSINESS CYCLE

Economic growth is not a smooth process.

Business cycle = Alternating periods of positive and negative growth rates.

Recession = period when output is declining or below its potential level

The business cycle affects labour market outcomes.

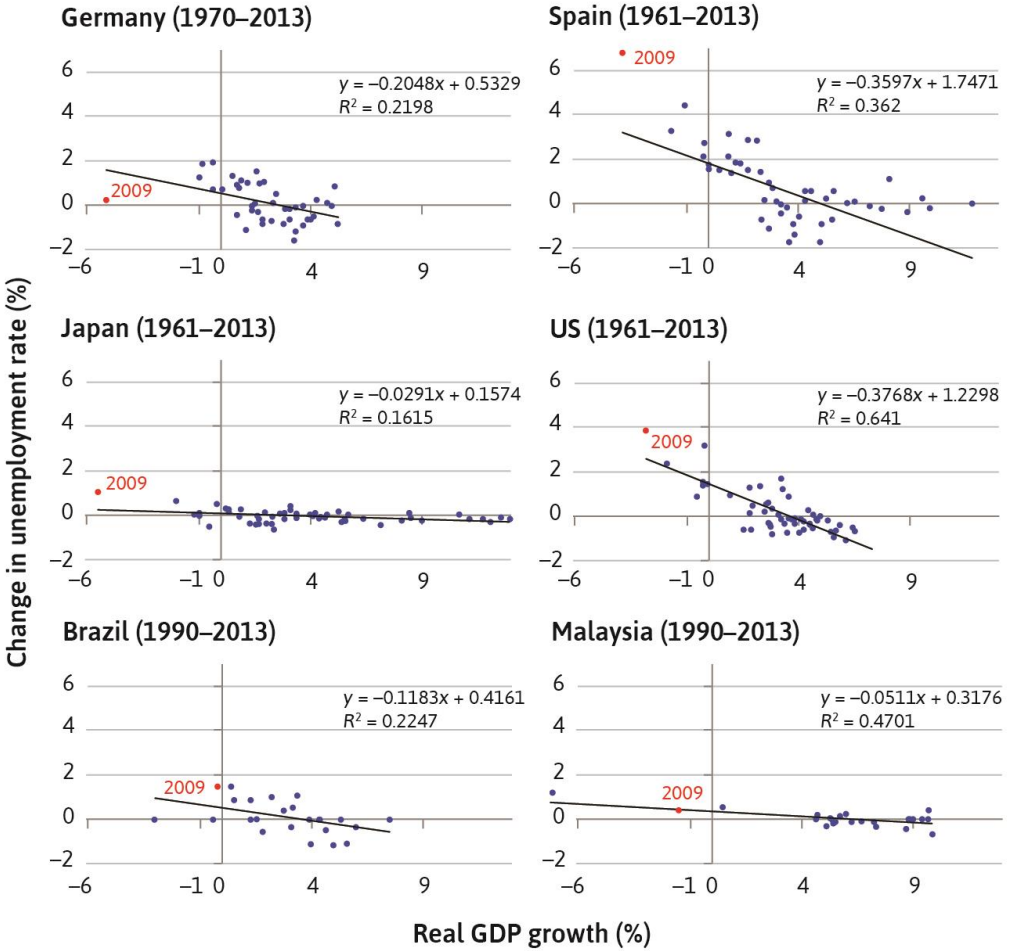


OKUN'S LAW

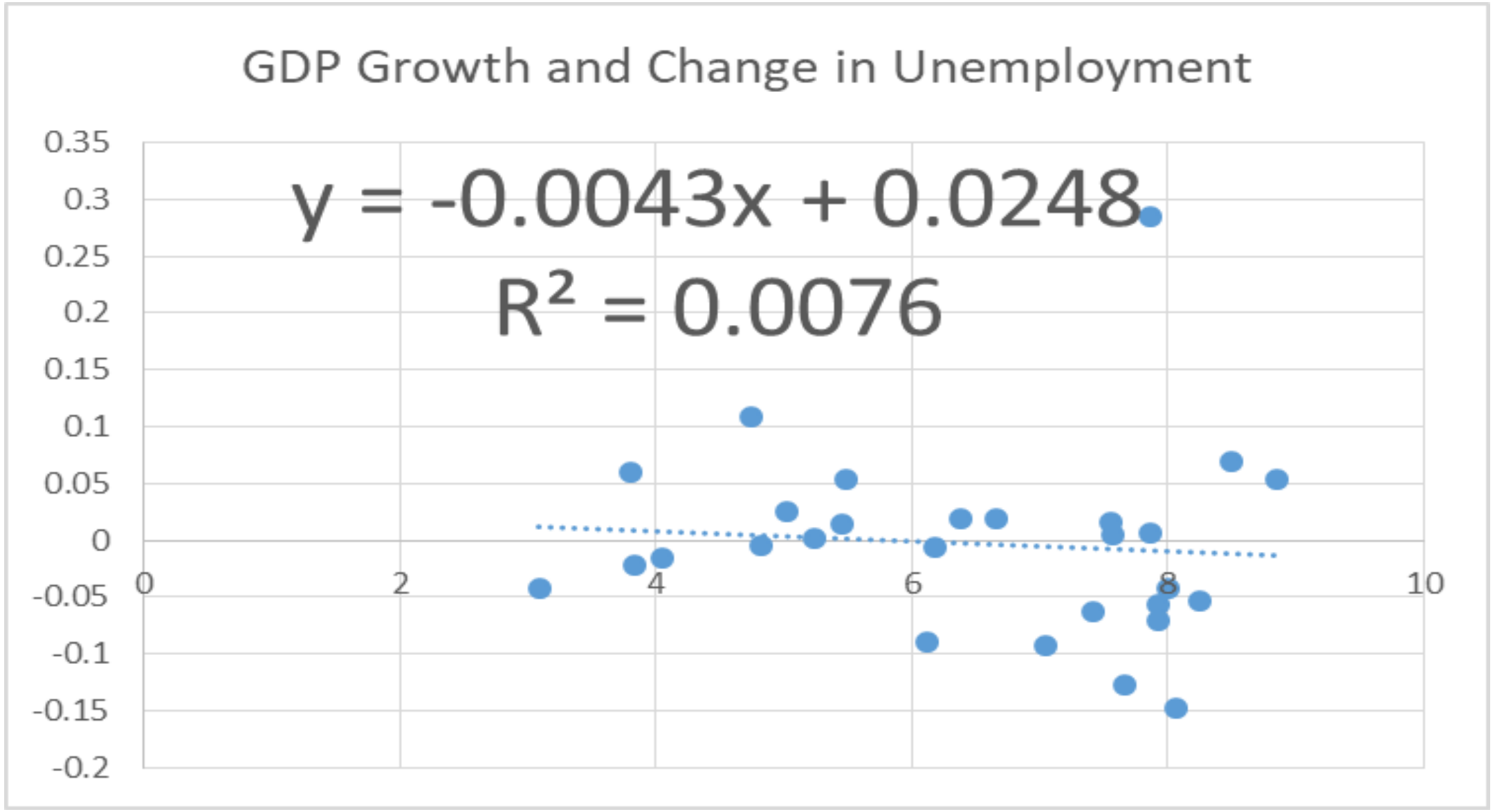
Okun's Law = a strong and stable relationship between unemployment and GDP growth.

Changes in the rate of GDP growth are negatively correlated with the unemployment rate.

Output falls → Unemployment rises → Well-being falls



Okun's coefficient = Degree of correlation


GDP Growth and Change in Unemployment
y = -0.0043x + 0.0248
R² = 0.0076
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
-0.2
0
2
4
6
8
10

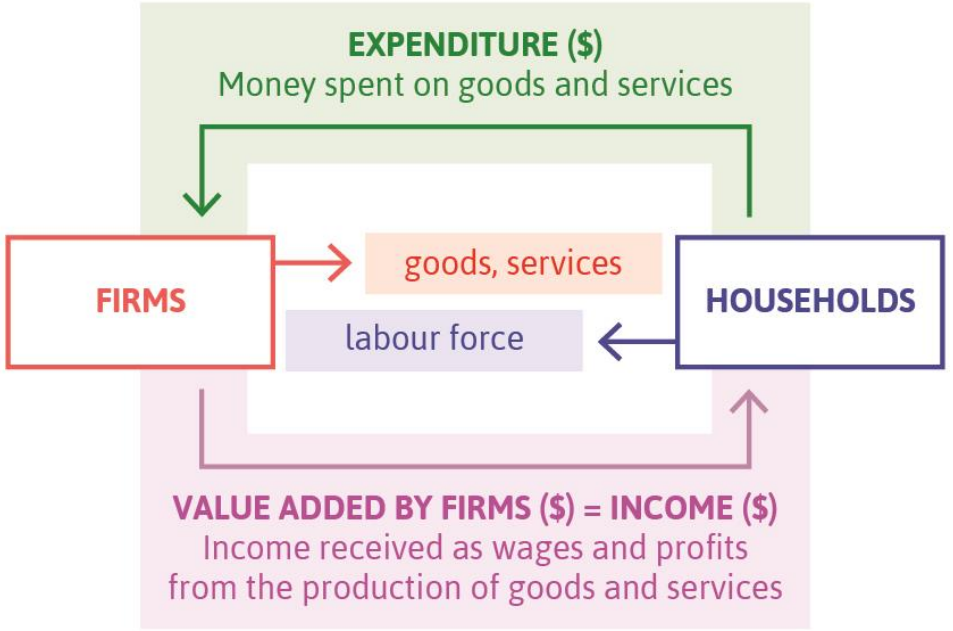
MEASURING THE AGGREGATE ECONOMY

MEASURING THE AGGREGATE ECONOMY

National accounts = system used to measure overall output and expenditure in a country.

3 equivalent ways to measure **GDP:**

1. Total <u>spending</u> on domestic products
2. Total domestic <u>production</u> (measured as **value added**)
3. Total domestic <u>income</u>



Circular flow model shows this equivalence

EXPORTS, IMPORTS, AND GOVERNMENT

How do we account for international transactions?

- e.g. foreign production is domestic consumption (**imports**); or domestic production is foreign consumption (**exports**)

→ We include exports and exclude imports, so that GDP includes value added, income from, or consumption of, domestic production.

How do we incorporate government?

→ Treat it as another producer – public services are "bought" via taxes

→ Assume that cost of production captures the value added

COMPONENTS OF GDP GROWTH

$$\text{Percentage change in GDP} = \begin{aligned}&(\text{percentage change in consumption} \times \text{share of consumption in GDP}) \\ &+ \\ &(\text{percentage change in investment} \times \text{share of investment in GDP}) \\ &+ \\ &(\text{percentage change in government spending} \times \text{share of government spending in GDP}) \\ &+ \\ &(\text{percentage change in net exports} \times \text{share of net exports in GDP})\end{aligned}$$

	GDP	CONSUMPTION	INVESTMENT	GOVERNMENT SPENDING	NET EXPORTS
2009	-2.8	-1.06	-3.52	0.64	1.14

Although consumption makes up about 70% of US GDP, the effect of investment on GDP was more than three times larger.

INCOME CONCEPTS

Gross Domestic Product (GDP)

Net Domestic Product (NDP)

Gross National Product (GNP)

Net National Product (NNP)

Private Income

Personal Income

Personal Disposable Income

Net National Disposable Income

$$\mathrm{GDP}_{\mathrm{M}} = \mathrm{GDP}_{\mathrm{F}} + T_i - S$$

GROSS DOMESTIC PRODUCT

- The GDP at factor cost stands for the monetary value of all goods and services that are
  - (a) Currently produced
  - (b) Not resold or used in further production during the measurement period
  - (c) Sold through the Official Markets
  - (d) Produced on the nation's geographical territory
  - (e) Valued at factor cost.

GROSS NATIONAL PRODUCT

Net Domestic Product

national income

private income

Personal income

personal disposable income

Real GDP vs Nominal GDP

$$GNP_F = GDP_F + NIA$$
$$GNP_M = GDP_M + NIA$$

National Income and Related Aggregates (at Current Prices)

(₹ *Billion*)

Variable	*1990-91*	*2000-01*	*2011-12*
1. GDP at factor cost	4778	18920	83535
1.1 Indirect taxes	763	2408	9703
1.2 Subsidies	186	433	3489
2. GDP at market price (1+ 1.1 – 1.2)	5355	20895	89749
2.1 Net factor income earned abroad	-75	-181	-768
3. GNP at market price (2 + 2.1)	5280	20714	88981
3.1 Capital consumption	522	1979	8767
4. NDP at factor cost (1 – 3.1)	4256	16941	74768
5. NNP at factor cost (NI)(4 + 2.1)	4181	16760	73999
5.1 Income of govt. administration depts. from entrepreneurship and property	49	169	1558
5.2 Saving of govt. non-dept. enterprises	26	141	1371
5.3 National debt interest	202	1141	3801
5.4 Current transfers from govt. administration depts.	156	607	2642
5.5 Other net current transfers from abroad	37	588	3049
6. Private income (5 – 5.1 – 5.2 + 5.3 + 5.4 + 5.5)	4502	18785	80562
6.1 Retained earnings of nation's private sector	62	306	3203
6.2 Corporate tax	53	296	3327
7. Personal income (6 – 6.1 – 6.2)	4387	18183	74032
7.1 Household direct tax	76	529*	2391
7.2 Miscellaneous receipt of govt. admin. dept.	21		
8. Personal disposable income (7 – 7.1 – 7.2)	4290	17654	71641
9. NNP at market price (3 – 3.1)	4758	18735	80214
10. Net national disposable income (9 + 5.5)	4795	19323	83263

i. A careful study of the above data would reveal that the difference (positive) between the incomes at each of the market price and factor cost stands at about nine per cent.

ii. domestic and national incomes is around one per cent.

iii. gross and net incomes comes to around eleven per cent.

iv. private and national incomes approximates nine per cent.

v. personal income and national income is shrinking and currently stands at little less than one per cent.

vi. national income and personal disposable incomes are currently close to three per cent

Pvt. I = NNP_F – IAD – END + NDI + TAD + OTA

PI = Pvt. I – RE – CT

PDI = PI – HDT – MAD

Pvt. I = private income

IAD = income of government administration departments from entrepreneurship and property (e.g. railways, post and telegraphs departments)

END = earnings of government non-department enterprises (public sector units)

NDI = national debt interest on domestic debt

TAD = current transfers from government administration departments

OTA = other net current transfers from abroad

RE = retained earnings of nation's private corporate sector

CT = corporate tax

HDT = household direct tax

MAD = miscellaneous receipts of government administration departments (court fee, etc.)

VALUE ADDED APPROACH

Stage of production	Factors of Production	Value of Intermediate inputs	Value of Output	Value Added
Seed Collection	Labour	Zero	INR 100	INR 100
Wheat Production	Labour Land	INR 100	INR 500	INR 400
Flour Production (Mill)	Labour Land Capita Entrepreneurship	INR 500	INR 10000	INR 9500
Bread Production (Baking factory)	Labour Land Capita Entrepreneurship	INR 10000	INR 100000	INR 90000

INCOME APPROACH

- Labour earns wages (W) for services to the producers
- Profits (P) for Entrepreneurship, and income for self-employment.
- Capital earns rental income (R) for renting out structures and equipment and
- Interest (I) on money lending to producers.
- $NDP_F = W + R + I + P$
- P = dividend + retained earnings + corporate tax

NDP AT FACTOR COST BY FACTOR INCOMES (AT CURRENT PRICES) (% SHARE)

	Factor income	*1960–61*	*1974–75*	*1980–81*	*1990–91*	*1993–94*	*2003–04*
1.	Compensation of employees	33.7	42.2	36.8	38.4	37.4	35.6
2.	Operating surplus			7.7	11.5	12.9	
	2.1 Rent		5.2	3.5			
	2.2 Interest	3.2	8.6				
	2.3 Profit and dividend	6.7	6.0				
3.	Mixed income	51.2	39.7	55.5	50.1	49.7	64.4
4.	NDP at factor cost (₹ billion)			1,103	4,256	6,513	22,661
5.	Property incomes (₹ billion)				99	497	7,762
	5.1 Rent				24	21.4	22
	5.2 Interest				76	78.6	78

Note: Rent paid by an industry for land, structures, machinery, equipment etc. is treated as a factor payment. Except for residential buildings, no imputation for rent for using own buildings, machinery and equipment is made.

EXPENDITURE APPROACH

$GDP_M = C + I + G + X - Z$

- Consumption (**C**) = Expenditure on consumer goods and services
- Investment (**I**) = Expenditure on newly produced capital goods (incl. equipment, buildings, and inventories = unsold output)
- **Government spending (G)** = Government expenditure on goods and services (excluding transfers to avoid double-counting)
- Net exports (**trade balance**) = Exports (**X**) minus imports (**M**)

GDP = C + I + G + X – M

(Also known as Y, or **aggregate demand**)

COMPONENTS OF GDP

	US	Eurozone (19 countries)	China
Consumption (C)	68.4%	55.9%	37.3%
Government spending (G)	15.1%	21.1%	14.1%
Investment (I)	19.1%	19.5%	47.3%
Change in inventories	0.4%	0.0%	2.0%
Exports (X)	13.6%	43.9%	26.2%
Imports (M)	16.6%	40.5%	23.8%

In most countries, private consumption makes up the largest share of GDP

Components of GDP India

	C	G	I	X	M
2011-12	56.02	11.05	39.46	24.46	30.98
2012-13	56.47	10.62	39.33	24.97	31.39
2013-14	56.51	9.96	35.32	25.10	26.89
2014-15	55.78	10.15	35.54	23.74	25.21
2015-16	55.85	9.90	35.43	21.21	22.39
2016-17	56.23	11.07	33.39	20.54	21.22

http://rbidocs.rbi.org.in/rdocs/Publications/DOCs/TABLE4CBD60075D2E84946A5528805CBF60ED8.XLSX

EXAMPLES

- Maruti Suzuki buys a **new** robot worth 1 crore **made in India** for its factory in Gurugram
- Krishna Traveller (car rental company) in IIT Kharagpur spends INR 1 core to buy 10 **new** cars that are **made in Japan**
- Krishna Traveller (car rental company) in IIT Kharagpur spends INR 1 crore to buy 10 **new** cars that are made in **Gurugram Maruti Suzuki plant**
- Korean car manufacturer in Korea buys a **new** robot worth INR 1 crore **made in India** for its factory
- You buy INR 1 lakh of **Reliance stock**
- **Reliance** buys INR 100 crore of **Amazon stock**
- Government Social Security Department Pays INR 20000 to a retiree
- Government Social Security Department buys a **new** computer of INR 40000 **made in India**

GROSS DOMESTIC PRODUCT AT FACTOR COST BY ECONOMIC ACTIVITY (AT CURRENT PRICES) (% SHARE)

Sector	*1950–51*	*1990–91*	*2000–01*	*2011–12*
Primary	**56.5**	**33.5**	**27.3**	**20.0**
1. Agriculture	52.2	28.3	22.7	15.2
2. Forestry and fishing	3.6	2.7	2.2	2.4
3. Mining and quarrying	0.7	2.5	2.4	2.4
Secondary	**14.5**	**26.9**	**24.5**	**24.3**
4. Manufacturing	11.5	18.7	15.8	14.4
5. Electricity, gas and water supply	0.2	2.2	2.6	1.7
6. Construction	2.8	6.0	6.1	8.2
Tertiary (Services)	**29.0**	**39.7**	**48.2**	**55.7**
7. Trade, hotels and restaurants	6.5	13.0	13.8	18.0
8. Transport, storage and communication	3.5	7.1	7.3	7.1
9. Banking and insurance	0.8	4.4	6.2	5.7
10. Real estate, dwellings and business services	9.2	3.7	6.3	10.8
11. Public administration and defence	3.0	5.7	6.6	6.1
12. Other services	6.0	5.8	8.0	7.9
GDP at factor cost (₹ billion)	**90**	**4,778**	**18,958**	**83,535**

Source: National Accounts Statistics, CSO, various issues.

Gross Domestic Product at Factor Cost by Economic Activity (at Current Prices) (% Share)

Sector	*1950–51*	*1990–91*	*2000–01*	*2011–12*
Primary	**56.5**	**33.5**	**27.3**	**20.0**
1. Agriculture	52.2	28.3	22.7	15.2
2. Forestry and fishing	3.6	2.7	2.2	2.4
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Source: National Accounts Statistics, CSO, various issues.

PERCENTAGE DISTRIBUTION OF WORKERS IN USUAL STATUS (PS+SS) BY BROAD INDUSTRY DIVISION DURING 1977-78 (NSS 32ND ROUND) TO 2017-18 (PLFS)

broad industry division	category of worker	NSS round (survey period) 32nd (1977-78)	38th (1983)	43rd (1987-88)	50th (1993-94)	55th (1999-00)	61st (2004-05)	66th (2009-10)	68th (2011-12)	PLFS (2017-18)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
agriculture	rural male	80.6	77.5	74.5	74.1	71.4	66.5	62.8	59.4	55.0
	rural female	88.1	87.5	84.7	86.2	85.4	83.3	79.4	74.9	73.2
	urban male	10.6	10.3	9.1	9.0	6.6	6.1	6.0	5.6	5.4
	urban female	31.9	31.0	29.4	24.7	17.7	18.1	13.9	10.9	9.1
mining & quarrying	rural male	0.5	0.6	0.7	0.7	0.6	0.6	0.8	0.5	0.5
	rural female	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2
	urban male	0.9	1.2	1.3	1.3	0.9	0.9	0.7	0.9	0.6
	urban female	0.5	0.6	0.8	0.6	0.4	0.2	0.3	0.3	0.2
manufacturing	rural male	6.4	7.0	7.4	7.0	7.3	7.9	7.0	8.1	7.7
	rural female	5.9	6.4	6.9	7.0	7.6	8.4	7.5	9.8	8.1
	urban male	27.6	26.8	25.7	23.5	22.4	23.5	21.8	22.4	22.4
	urban female	29.6	26.7	27.0	24.1	24.0	28.2	27.9	28.7	25.2
electricity, water, etc.	rural male	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.5
	rural female	-	-	-	-	-	0.0	0.0	0.1	0.0
	urban male	1.1	1.1	1.2	1.2	0.8	0.8	0.7	1.4	1.3
	urban female	0.1	0.2	0.2	0.3	0.2	0.2	0.4	1.0	0.6

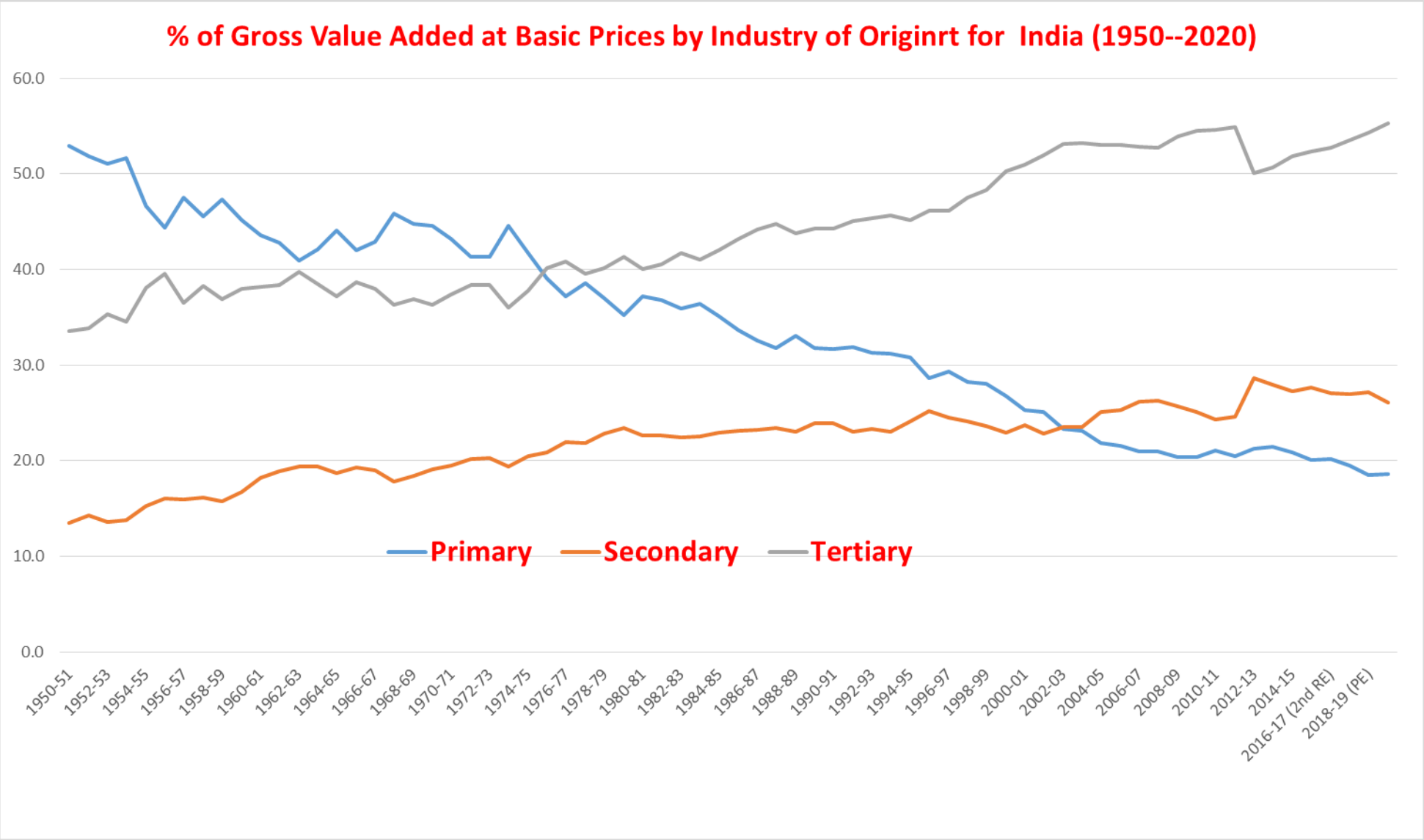
broad industry division	category of worker	NSS round (survey period)								
		32nd (1977-78)	38th (1983)	43rd (1987-88)	50th (1993-94)	55th (1999-00)	61st (2004-05)	66th (2009-10)	68th (2011-12)	PLFS (2017-18)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
construction	rural male	1.7	2.2	3.7	3.2	4.5	6.8	11.3	13.0	14.5
	rural female	0.6	0.7	2.7	0.9	1.1	1.5	5.2	6.6	5.3
	urban male	4.2	5.1	5.8	6.9	8.7	9.2	11.4	10.7	11.7
	urban female	2.2	3.1	3.7	4.1	4.8	3.8	4.7	4.0	4.1
trade, hotel & restaurant	rural male	4.0	4.4	5.1	5.5	6.8	8.3	8.2	8.0	9.2
	rural female	2.0	1.9	2.1	2.1	2.0	2.5	2.8	3.0	4.0
	urban male	21.6	20.3	21.5	21.9	29.4	28.0	27.0	26.0	24.5
	urban female	8.7	9.5	9.8	10.0	16.9	12.2	12.1	12.8	13.0
transport, storage & communications	rural male	1.2	1.7	2.0	2.2	3.2	3.8	4.1	4.2	5.2
	rural female	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
	urban male	9.8	9.9	9.7	9.7	10.4	10.7	10.4	11.7	12.7
	urban female	1.0	1.5	0.9	1.3	1.8	1.4	1.4	2.7	3.3
other services	rural male	5.3	6.1	6.2	7.0	6.1	5.9	5.5	6.4	7.6
	rural female	3.0	2.8	3.0	3.4	3.7	3.9	4.6	5.2	8.9
	urban male	24.3	24.8	25.2	26.4	21.0	20.8	21.9	21.4	21.5
	urban female	26.0	26.6	27.8	35.0	34.2	35.9	39.3	39.6	44.4

Gross valued added percentage shares across major sectors

	Agriculture	Manufacturing	Construction	Services	Other Industries	Economy
1999-2000	29.4	17.1	8.9	36.9	7.9	100.0
2004-05	24.7	17.8	10.3	39.6	7.6	100.0
2009-10	19.0	17.8	9.8	47.2	6.1	100.0
2011-12	18.5	17.4	9.6	49.0	5.5	100.0

Sectoral employment as a percentage of total employment in the economy (%)

	Agriculture	Manufacturing	Construction	Services	Other Industries	Total employment
2000	59.64	10.73	4.68	24.04	0.91	100 (358 251 025)
2005	56.00	11.77	6.11	25.20	0.92	100 (407 651 335)
2010	51.52	11.09	9.74	26.68	0.97	100 (423 730 609)
2012	47.00	12.67	10.74	28.52	1.06	100 (426 913 119)



Primary : Agriculture, forestry & fishing, mining and quarrying

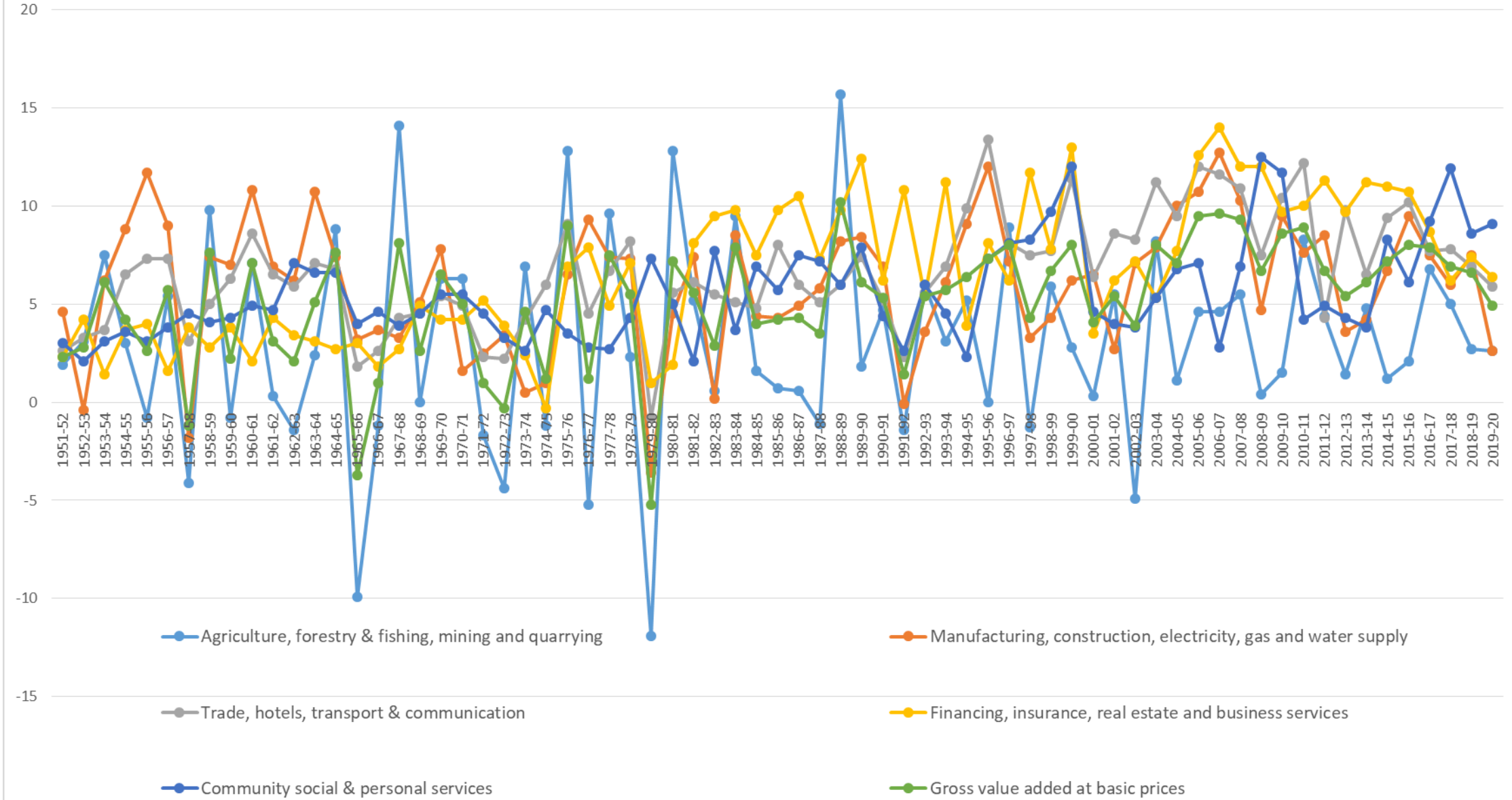
Secondary: Manufacturing, construction, electricity, gas and water supply

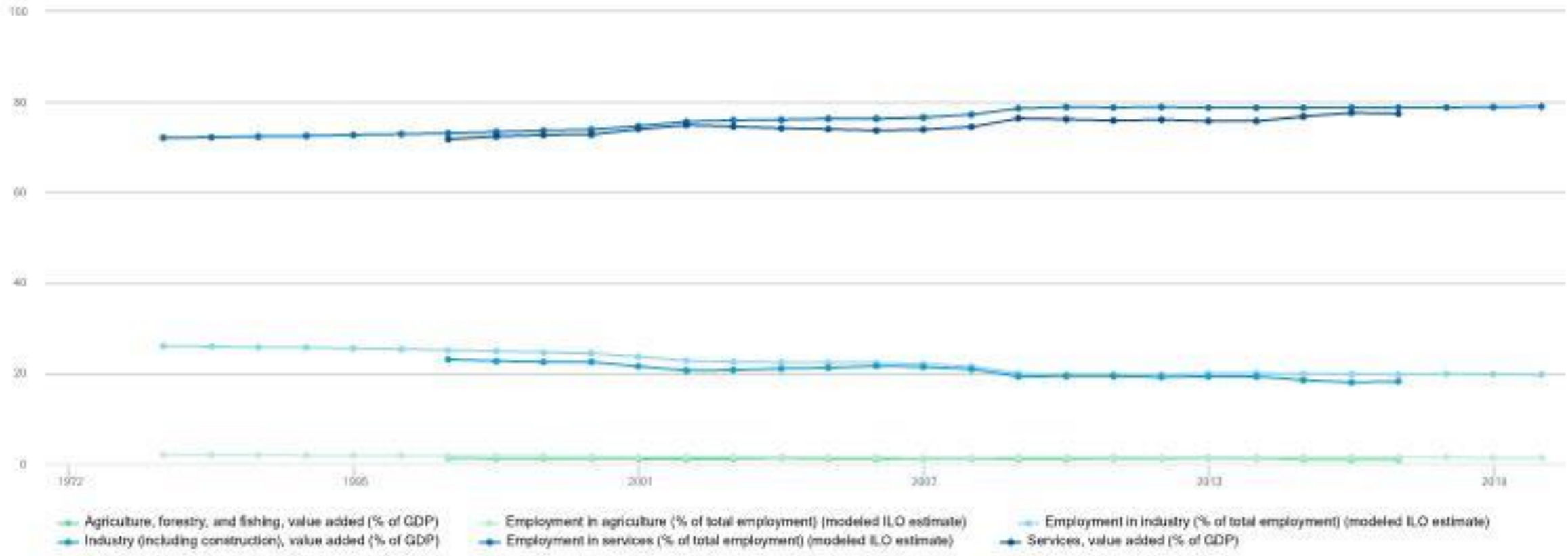
Tertiary : Trade, hotels, transport & communication

Financing, insurance, real estate and business services

Community social & personal services

Annual Growth Rates of Gross Value Added at Basic Prices by Industry of Origin At current prices for India (1951-2020)

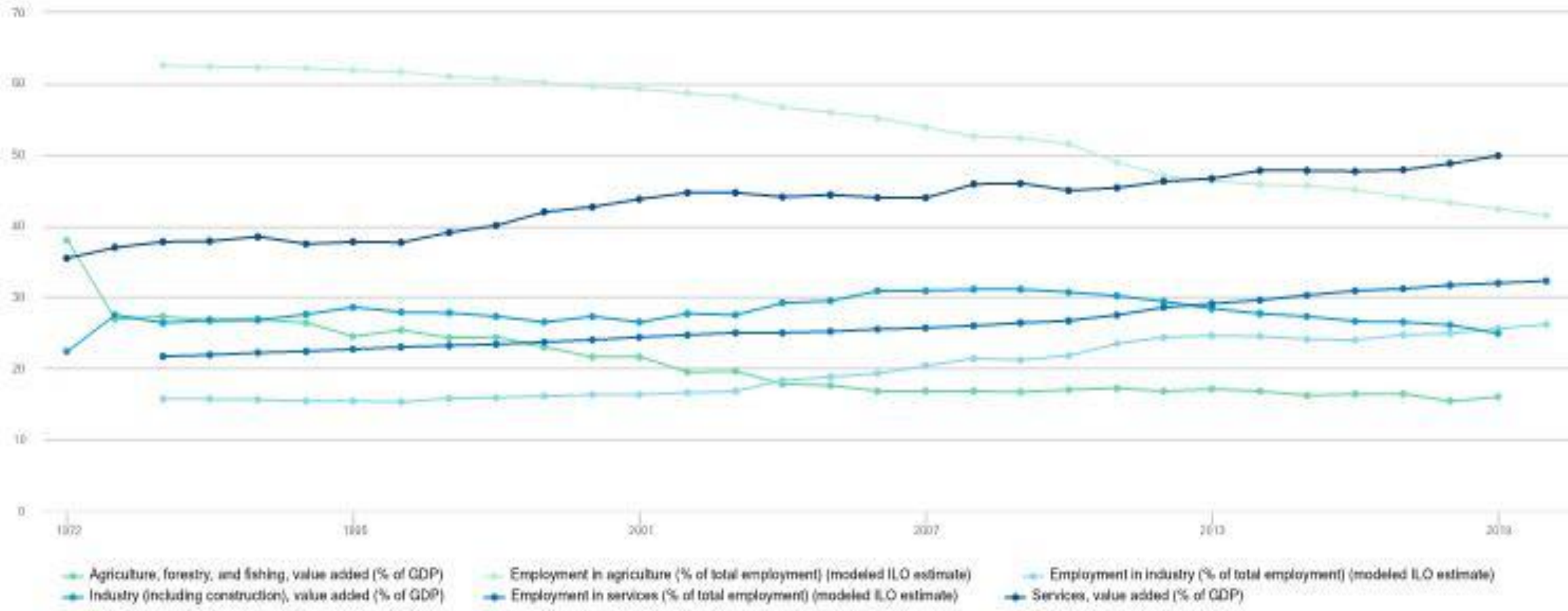




Country : United States

Source: World Development Indicators

Created on: 09/28/2020



Country : India

Source: World Development Indicators

Created on: 09/28/2020

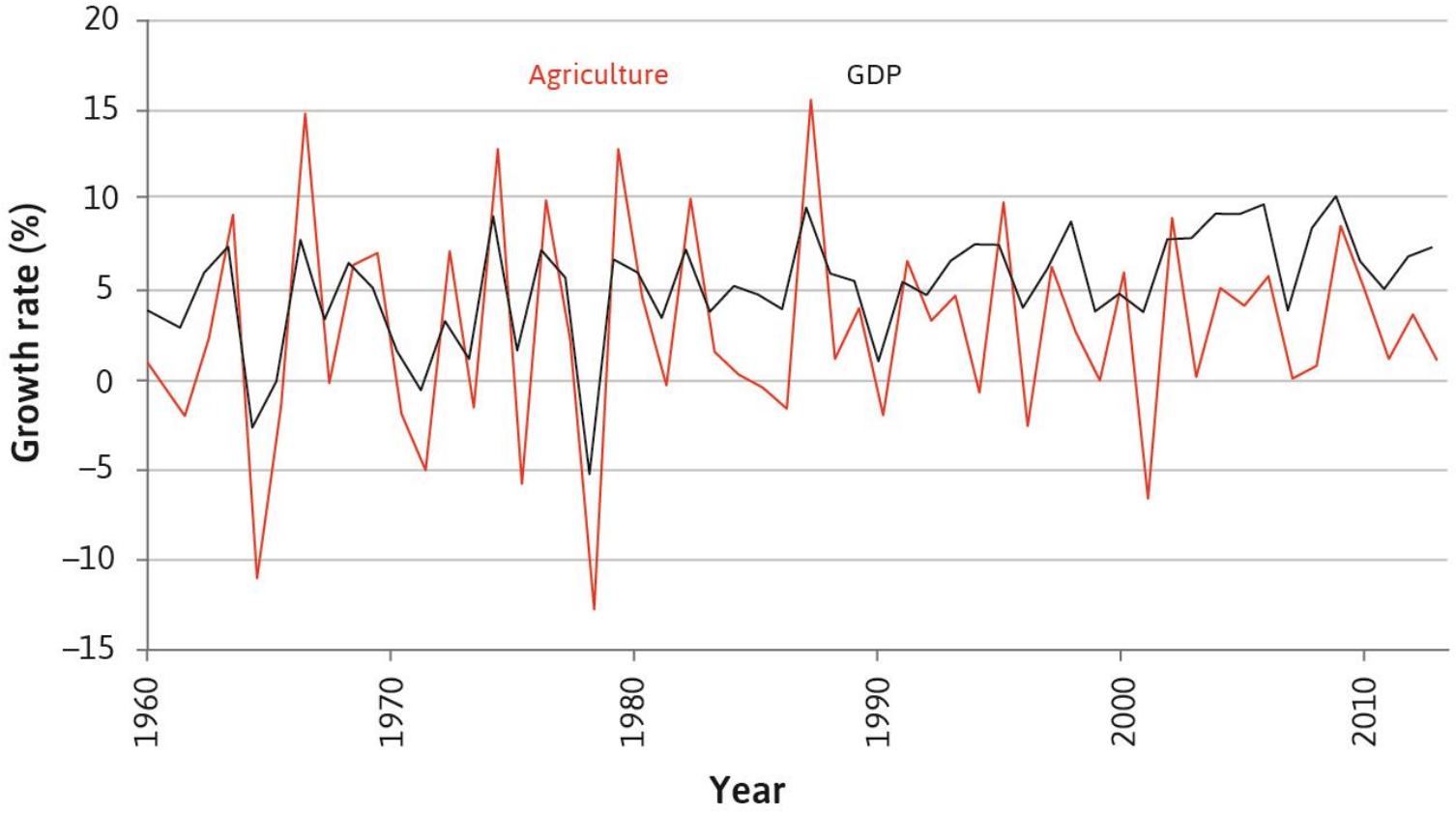
LIMITATION OF GDP

1. non-market transactions
2. improved product quality
3. more leisure
4. the composition of output
5. the distribution of income (inequality)
6. the underground economy
7. GDP and the environment
8. Non-economic sources of well-being
9. Resource depletion
10. Human Development
11. Poverty

ECONOMIC FLUCTUATIONS AND CONSUMPTION

ECONOMIC FLUCTUATIONS

India (1961–2014)



Economies fluctuate between good and bad times. This is true for industrialised as well as agrarian societies.

SHOCKS

Shock = an unexpected event (such as extreme weather) which causes GDP to fluctuate.

There are two broad types of shocks:

1. Good or bad fortune strikes the household
2. Good or bad fortune strikes the entire economy

HOUSEHOLD SHOCKS

People use two strategies to deal with shocks that are specific to their household:

1. **Self-insurance** – saving and borrowing. Other households are not involved.
2. **Co-insurance** – support from social network or government.

This reflects that households prefer to smooth their consumption, and that they are (to a degree) altruistic.

ECONOMY-WIDE SHOCKS

Co-insurance is less effective if the bad shock hits everyone at the same time.

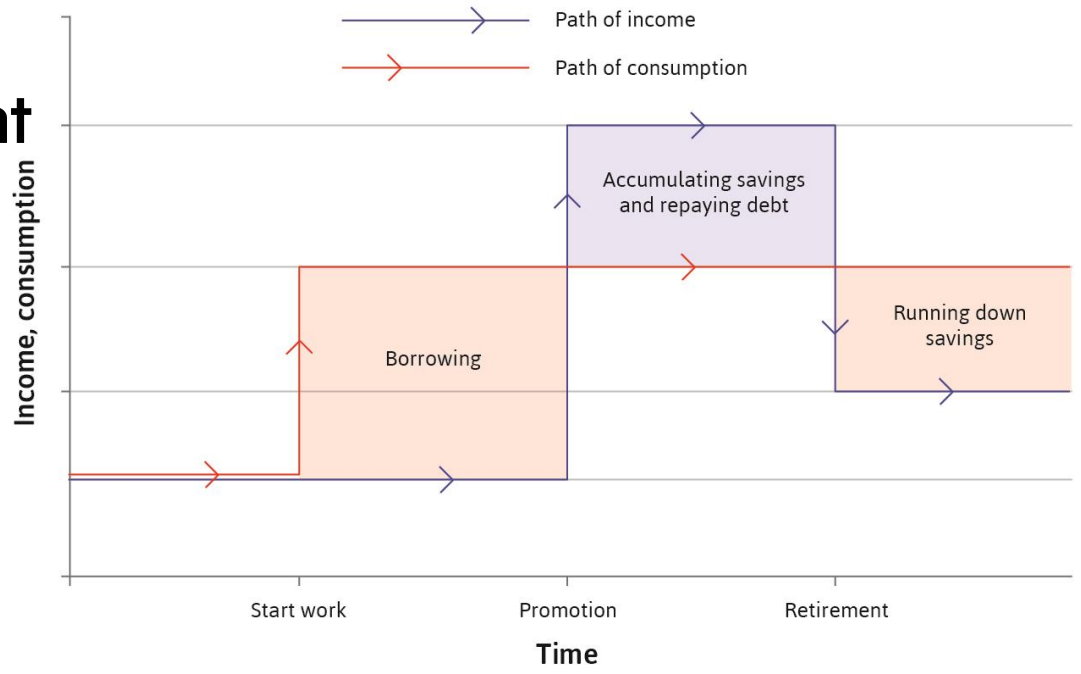
But when these shocks hit, co-insurance is even more necessary.

In farming economies of the past that were based in volatile climates, people practised co-insurance based on trust, reciprocity, and altruism.

SMOOTHING CONSUMPTION

Households make lifetime consumption plans based on expectations about the future, and react to shocks:

- Readjust long-run consumption (red line) if shocks are permanent
- Do not change long-run consumption if shocks are temporary



CONSUMPTION SMOOTHING AND THE AGGREGATE ECONOMY

Consumption smoothing is a basic source of stabilisation in an economy.

Limitations to consumption smoothing mean it cannot always stabilise the economy; it may amplify the initial shock.

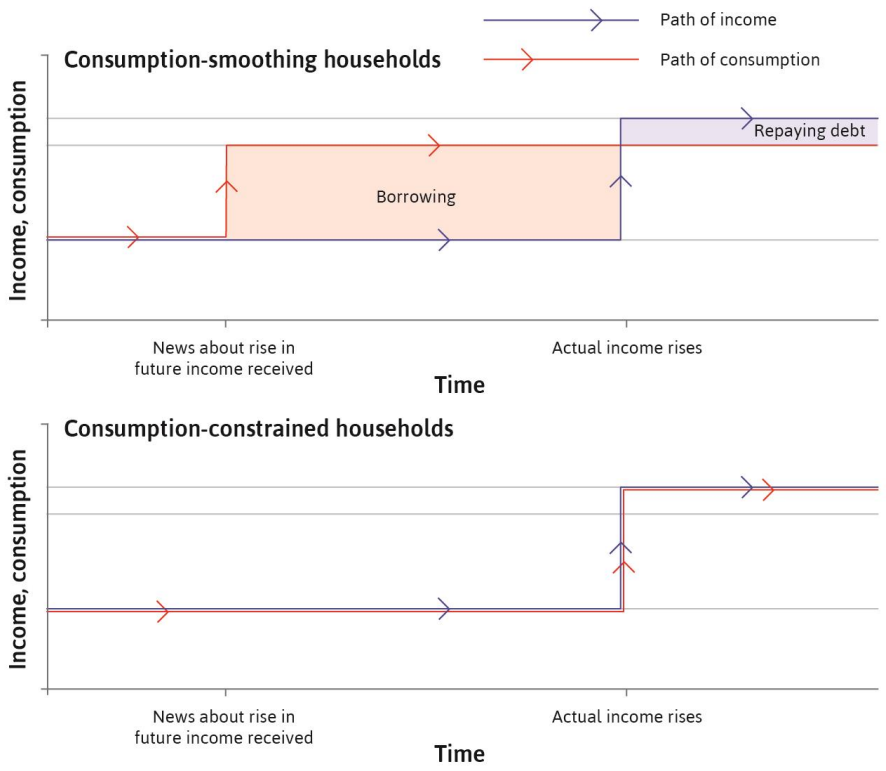
- credit constraints, weakness of will, limited co-insurance

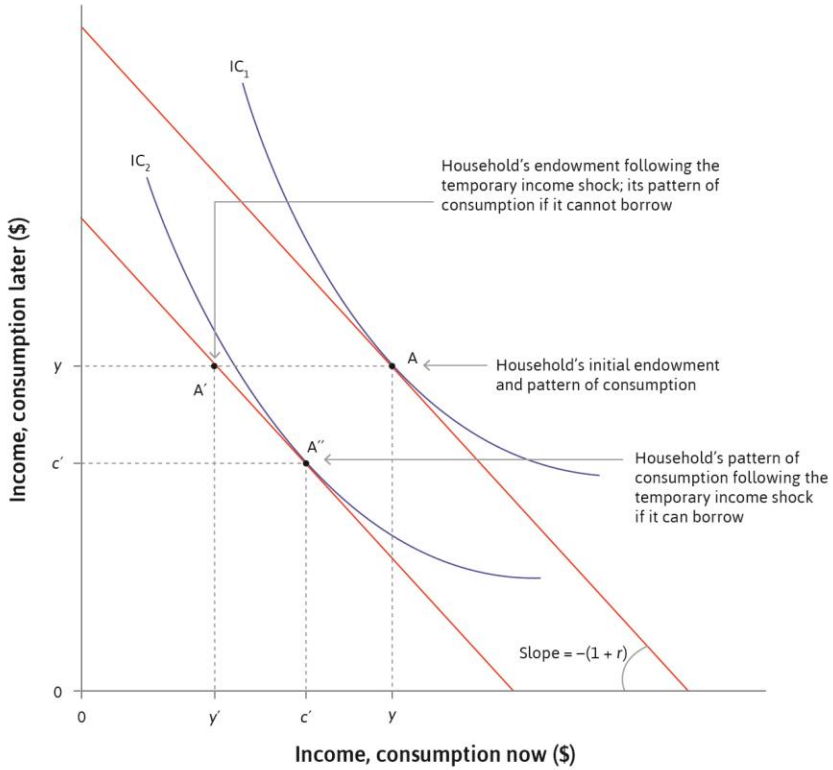
This helps us understand the business cycle and how to manage it.

LIMITATIONS TO SMOOTHING: CREDIT CONSTRAINTS

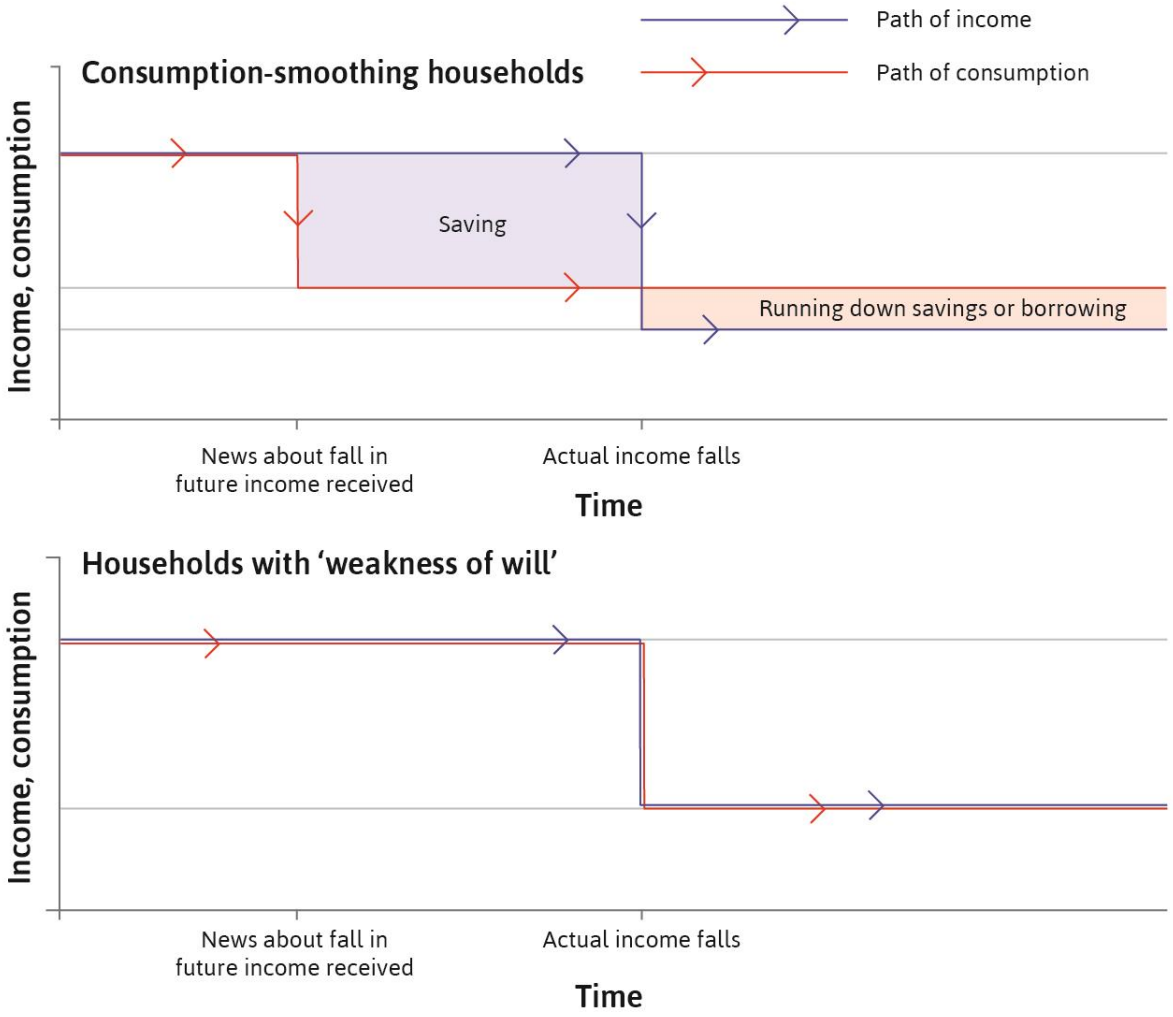
Credit constraints – limits on amount borrowed/ability to borrow.

The households unable to adjust to a temporary income shock have lower welfare.





LIMITATIONS TO SMOOTHING: WEAKNESS OF WILL



Weakness of will – inability to commit to beneficial future plans.

A household is able to smooth consumption but doesn't, and may regret it later.

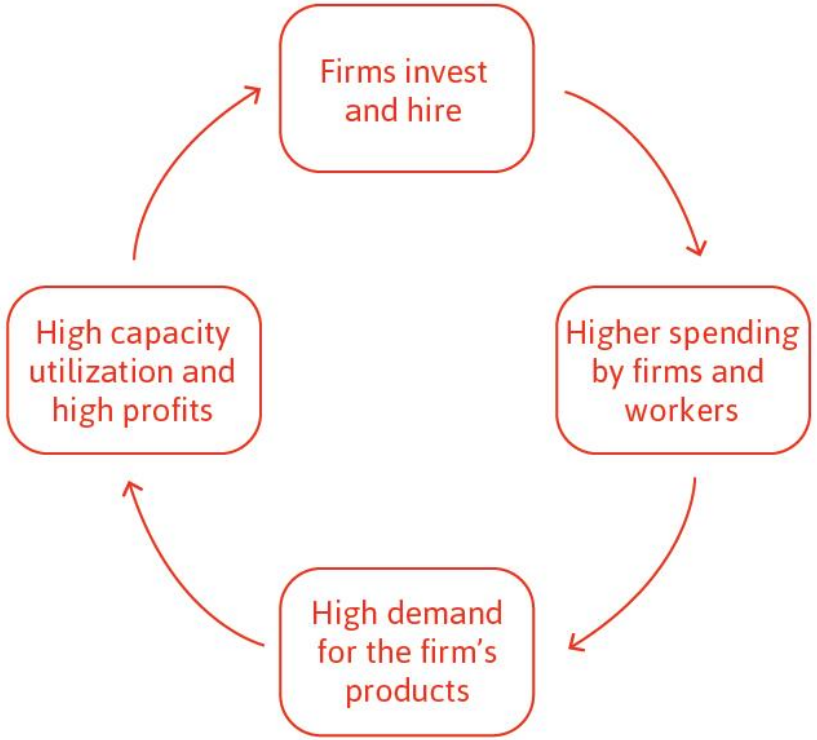
E. ECONOMIC FLUCTUATIONS AND INVESTMENT

VOLATILE INVESTMENT

Firms don't have preferences for smoothing like households. They adjust investment plans to both temporary and permanent shocks, to maximise their profits.

High demand → high **capacity utilisation,**
→ investment → even higher demand

Investment decisions depend on firms' <u>expectations about future demand</u>



INVESTMENT: A COORDINATION GAME

Actors: the two firms

Actions: Invest, or Do not invest

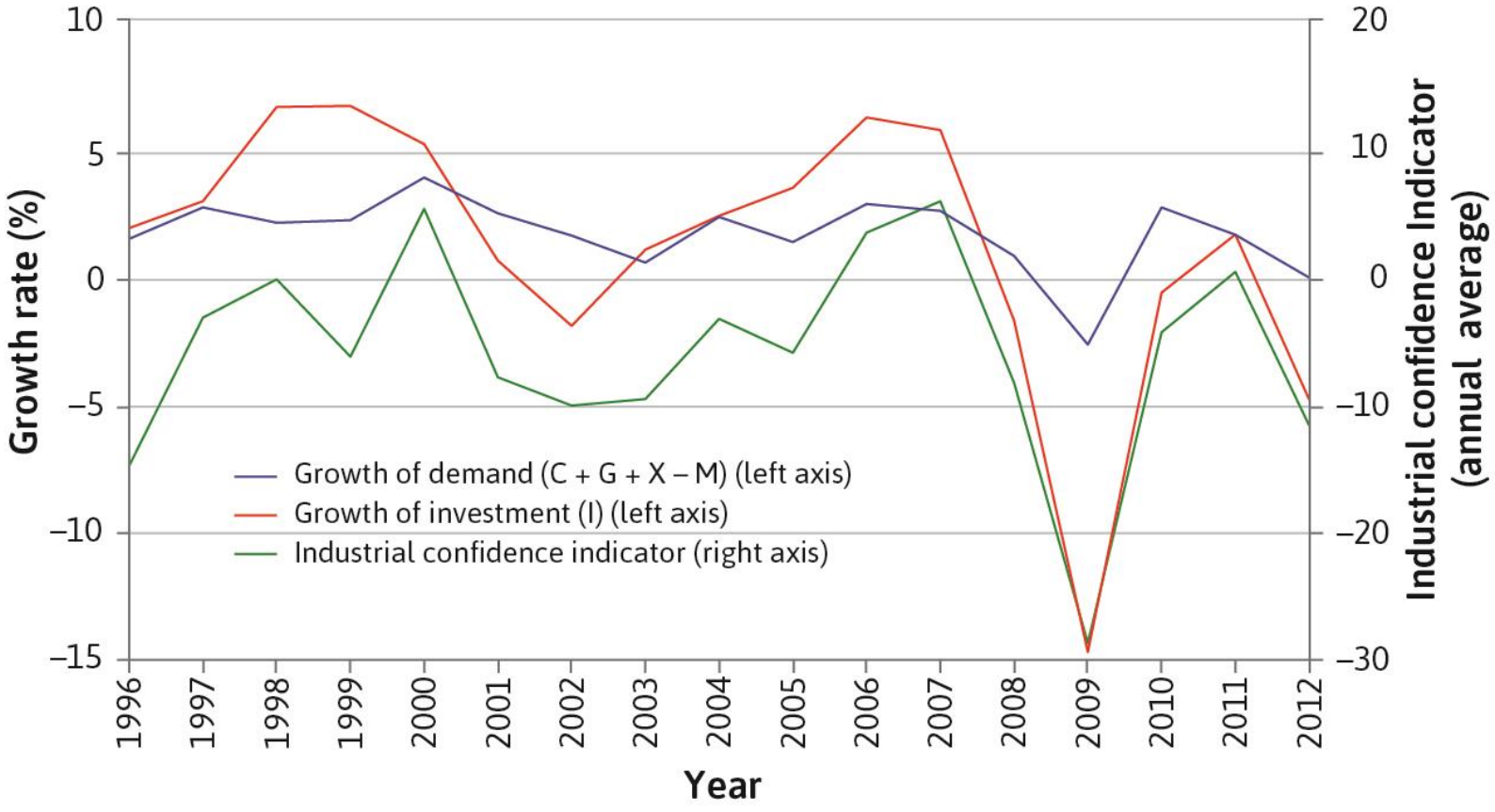
Information: they decide simultaneously

Payoff: profits from investment

		B's profit: B invests	B's profit: B does not invest
A's profit	A invests	100 / 100	80 / –40
	A does not invest	–40 / 80	10 / 10

Investment is the best response to other firms' investment (**coordination game**).

BUSINESS CONFIDENCE



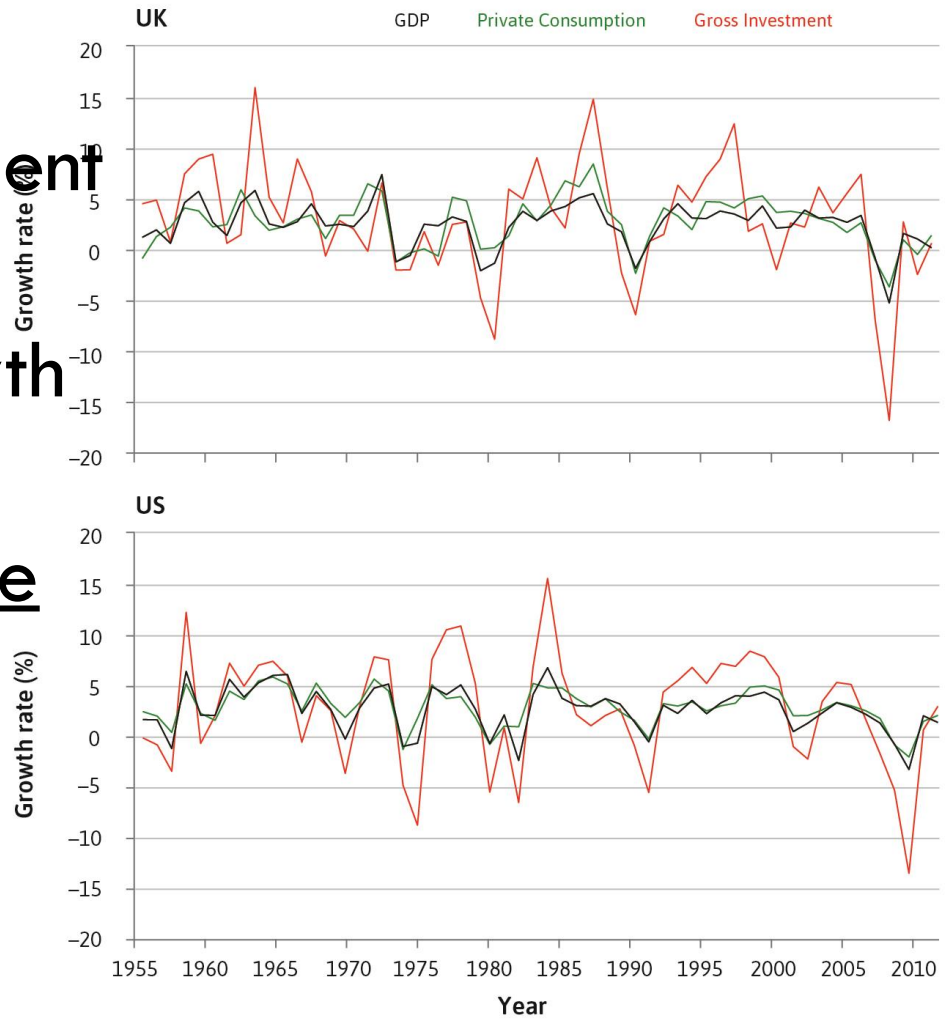
Business confidence coordinates firms to invest at the same time.

INVESTMENT AND THE AGGREGATE ECONOMY

The benefits of coordinating investment makes cycles <u>self-reinforcing.</u>

Firms respond positively to the growth of demand in the economy.

This is why investment is <u>more volatile than GDP.</u>



OTHER COMPONENTS OF GDP

- Government spending is less volatile than investment (does not depend on business confidence)

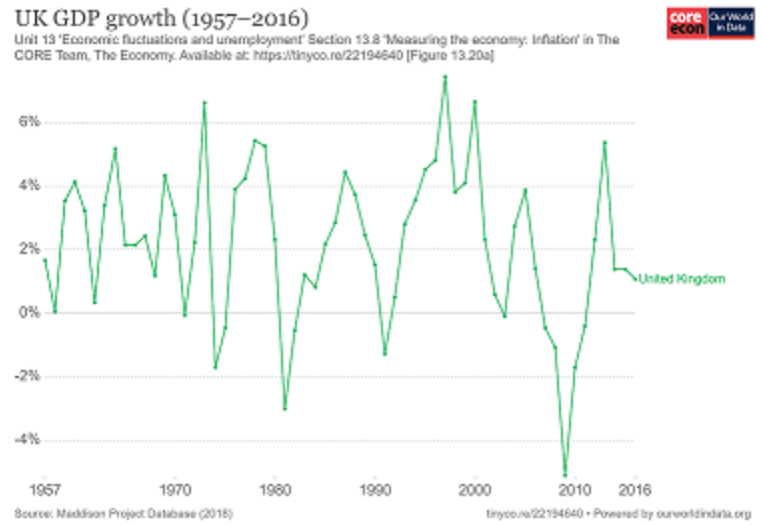
- Exports depend on demand from other countries, so will fluctuate according to the business cycles of major export markets.

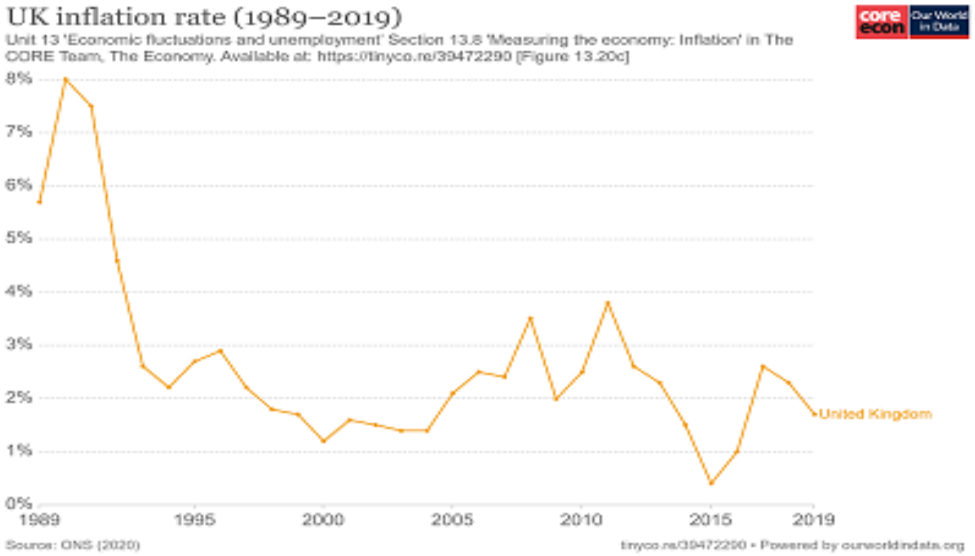
INFLATION

INFLATION, GDP, AND UNEMPLOYMENT

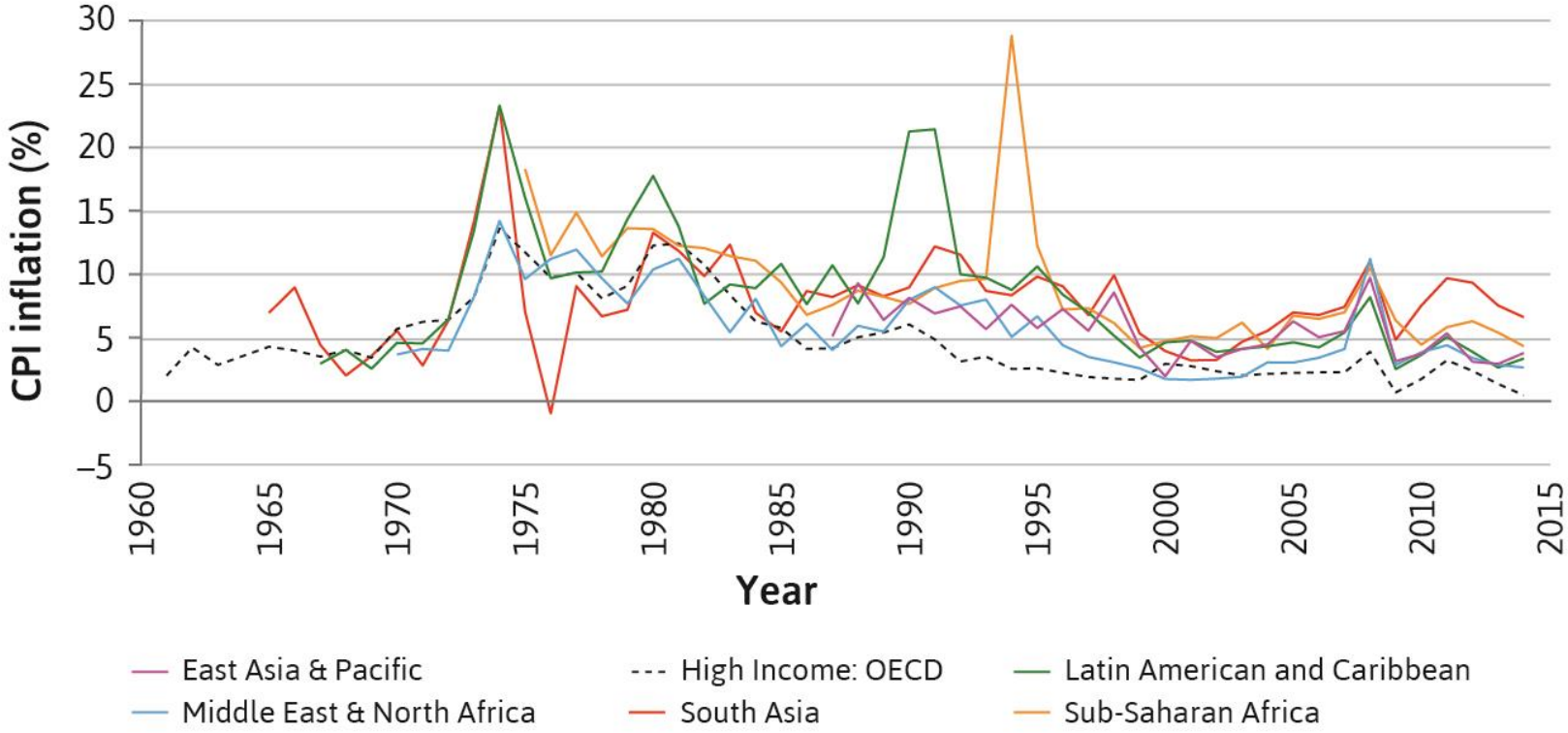
Inflation = an increase in the general price level in the economy

Inflation tends to be lower during recessions (high unemployment)



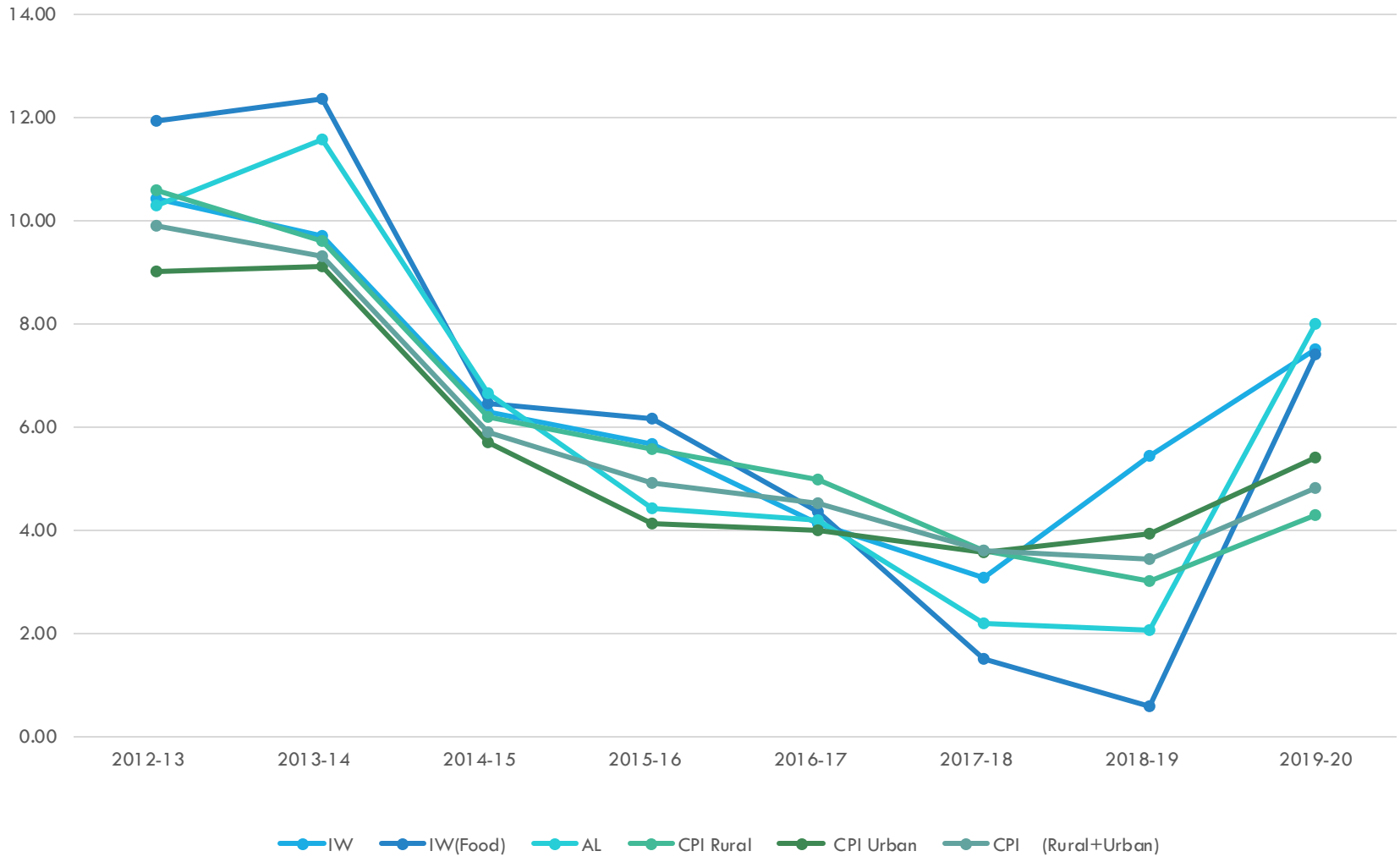


TRENDS IN INFLATION



- Upward spikes in inflation during economic crises
- general downward trend since 1970s
- inflation tends to be higher in poor than in rich countries

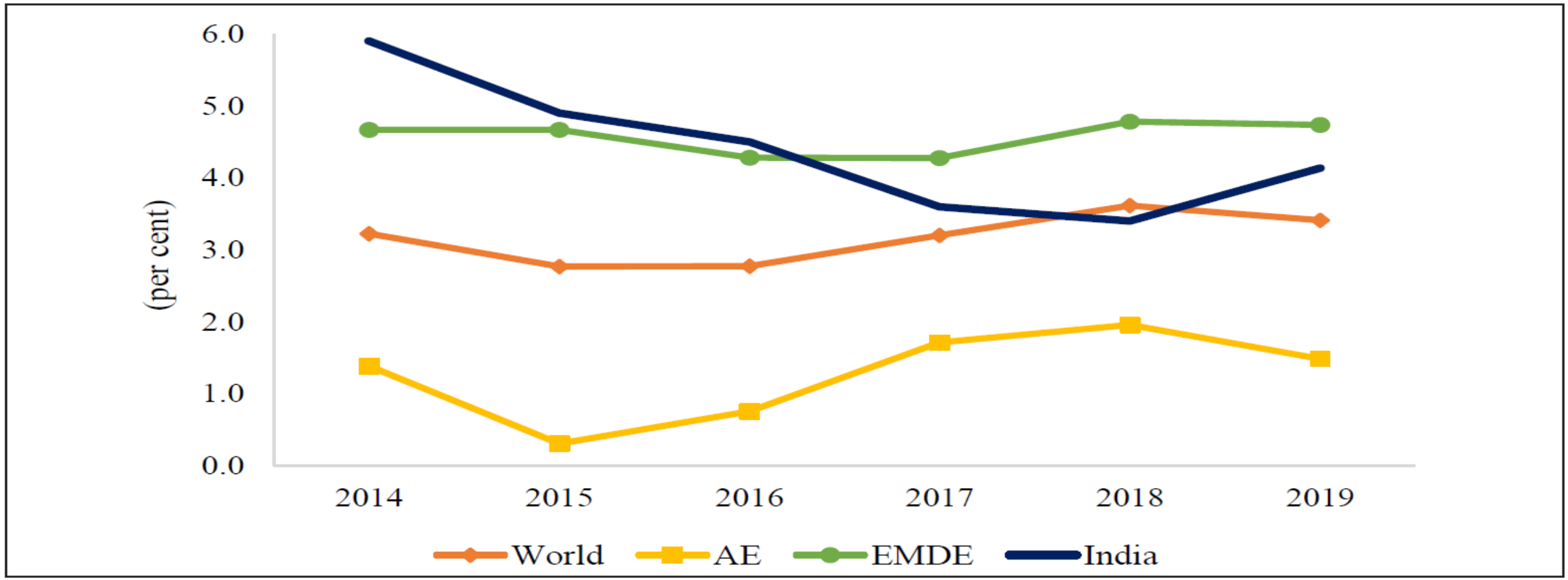
CONSUMER PRICE INDEX (Average of Months) - ANNUAL VARIATION



IW : Industrial Workers, AL : Agricultural Labourers

Source : RBI

Consumer Price inflation across country groups



Data Source: World Economic Outlook, October 2019 database, National Statistical Office
Notes: 1. AE – Advanced Economies, EMDE – Emerging Market and Developing Economies, EDA – Emerging and Developing Asia.
2. For India, years are from April to March and data for 2019 is for April to December.

Source: Economic Survey, 2020

MEASURING INFLATION

The **Consumer Price Index** (**CPI**) measures the general level of prices that consumers have to pay for goods and services, including consumption taxes

- Based on a representative bundle of consumer goods – "cost of living"
- Common measure of inflation = change in CPI

GDP deflator = A measure of the level of prices for domestically produced output (ratio of **nominal** to **real GDP**)

- Tracks prices of components of GDP (C, I, G, NX)
- Allows GDP to be compared across countries and over time