The basic questions /1

1. How big is an economy?
2. How developed is an economy?
3. How costly it is to live in an economy?
4. Is the economy doing well or badly?
5. How is the economy's output used?

Topic 1

6. How much money has an economy?
7. Why do financial assets exist?
8. Why are interest rates so important?
9. How does an economy create money?

Topic 2

1. How big is an economy?

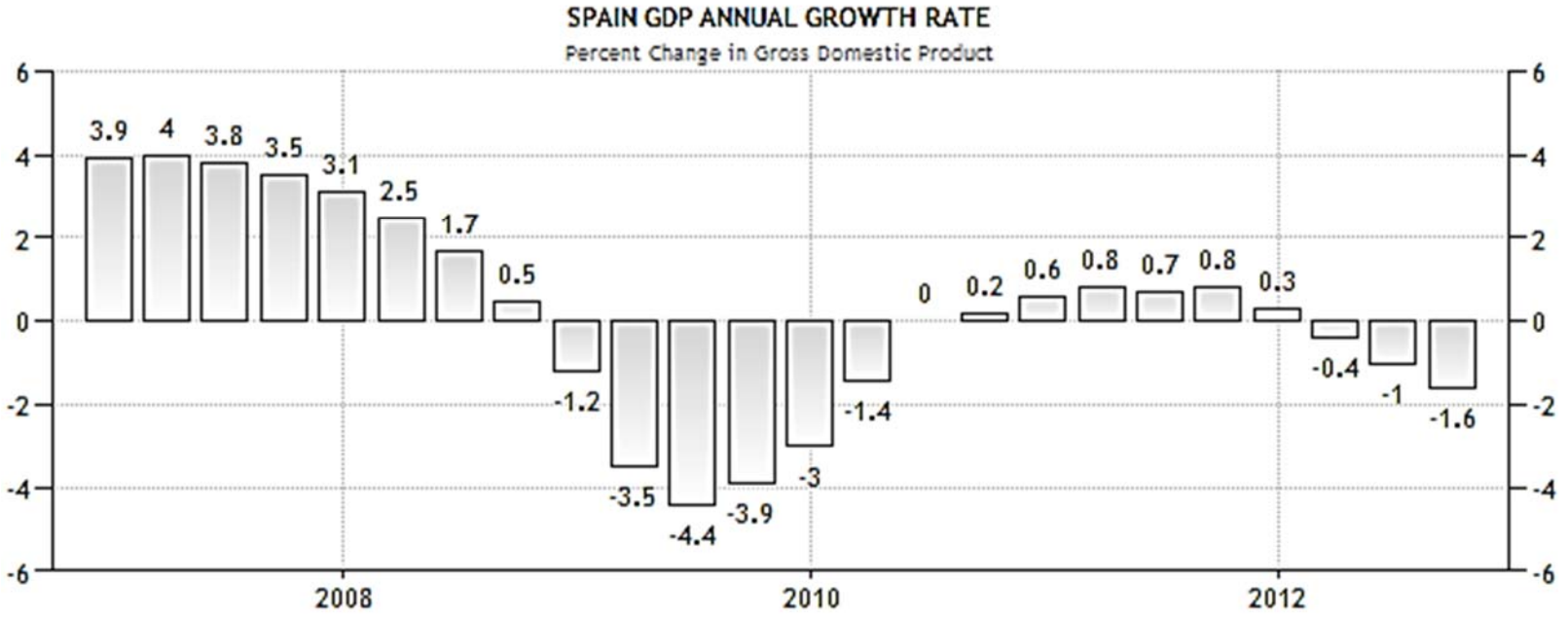
- Macroeconomics is the field in economics that studies the overall economic activity in a country or region by means of indicators of that activity.
- The "overall economic activity in a country" will be called, for short, "an economy".
- One basic question with which macroeconomics is concerned refers to the size of an economy.
- A simple measure of the size of an economy: to evaluate the aggregate production in the economy.

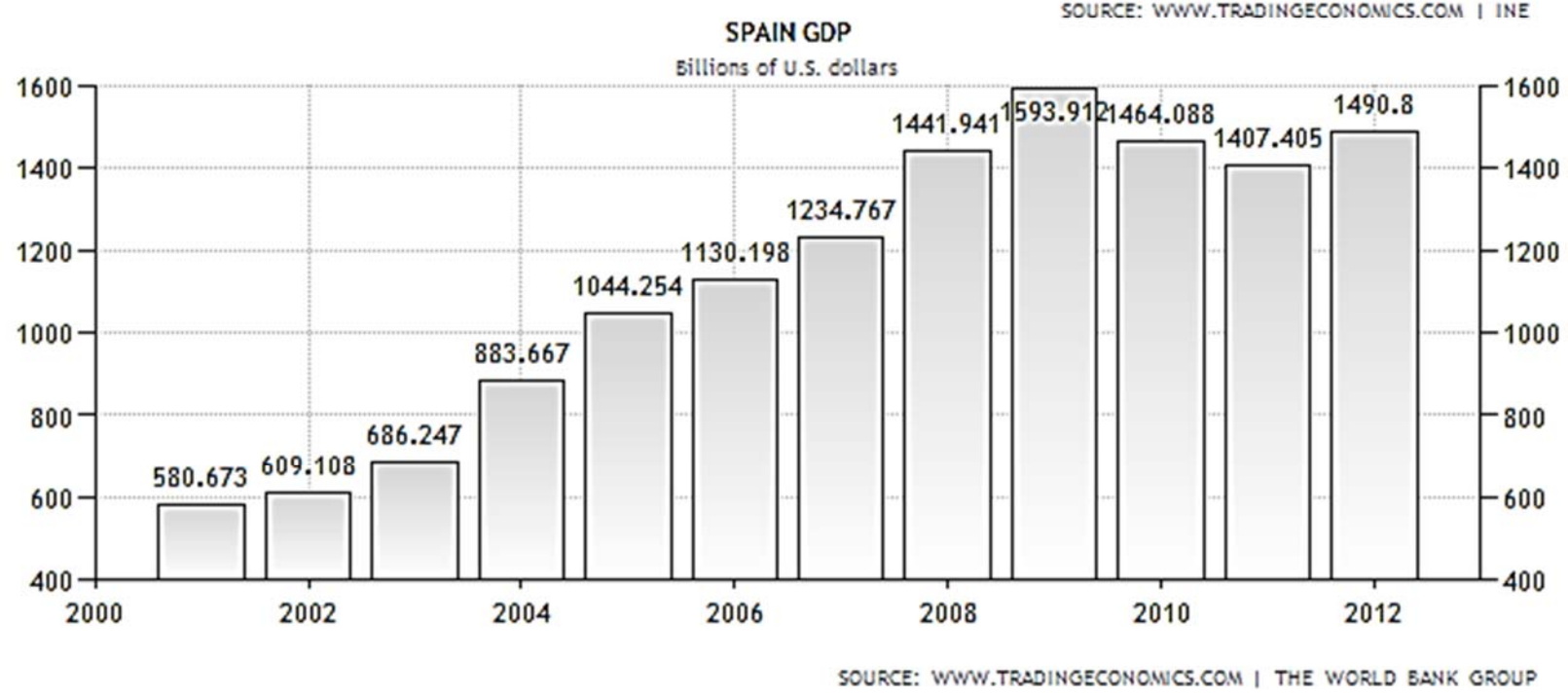
Gross domestic product (GDP)

- GDP is the value of all the final goods ("goods" will always mean "goods and services") produced in an economy (or territory) within a given period.
- Final good = not used to produce other goods
- Value = market value
- The rate y at which GDP varies is the growth rate of the economy, where GDP_{-1} is the GDP from the previous period (to get a percentage, add "×100").

$$y = \frac{\mathrm{GDP} - \mathrm{GDP}_{-1}}{\mathrm{GDP}_{-1}}$$

Spain GDP & GDP growth





http://www.tradingeconomics.com/spain/gdp-growth-annual
http://www.tradingeconomics.com/spain/gdp

Nominal GDP (GDP^n)

- GDP^n, or GDP at current prices, is the value of the final goods produced in an economy during a given period of time when the value is computed using current prices (the prices of the period).
- GDP^n is obtained by adding up the quantities of final goods multiplied by their current prices.
- GDP^n may vary because prices change or because the quantities of final goods produced change.

Computing GDP^n: an example

time t	p_1^t	q_1^t	p_2^t	q_2^t
1	4	6	2	8
2	9	5	3	5

- GDP^n at $t = 1$ is $p_1^1 q_1^1 + p_2^1 q_2^1 = 4 \cdot 6 + 2 \cdot 8 = 40$ (monetary units of $t = 1$).
- GDP^n at $t = 2$ is $p_1^2 q_1^2 + p_2^2 q_2^2 = 9 \cdot 5 + 3 \cdot 5 = 60$ (monetary units of $t = 2$). From $t = 1$ to $t = 2$, GDP^n has increased a 50% = (60 – 40)/40 multiplied by 100.

Real GDP (GDP^r)

- GDP^r, or GDP at constant prices, is the value of the final goods produced in an economy during a given period when the value is computed using the prices of a given fixed period (the base period).
- GDP^r is obtained by adding up the quantities of final goods multiplied by their prices in the base period.
- GDP^r is also called GDP adjusted for inflation or GDP in the monetary units of the base period (for instance, real GDP of 2010 in 2005 euros).

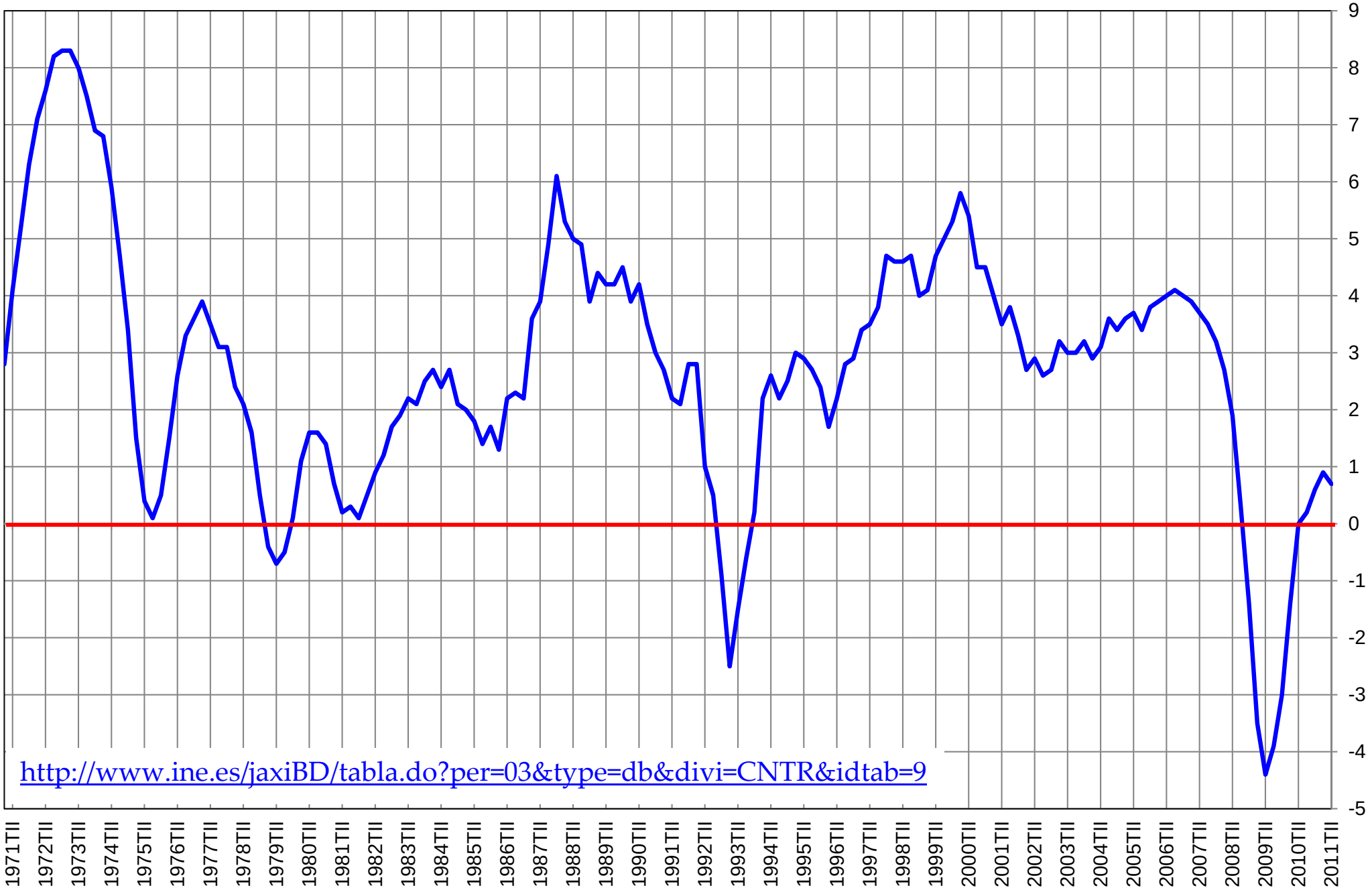
Computing GDP^r: an example

- Continuing with the GDP^n example, GDP^r in $t = 1$ at constant prices of period $t = 1$ is $p_1^1 q_1^1 + p_2^1 q_2^1 = 4 \cdot 6 + 2 \cdot 8 = 40$ (monetary units of $t = 1$). So $GDP^r = GDP^n$ at the base period (this always happens).

- GDP^r in $t = 2$ at constant prices of period $t = 1$ is given by $p_1^1 q_1^2 + p_2^1 q_2^2 = 4 \cdot 5 + 2 \cdot 5 = 30$ (monetary units of $t = 1$). Hence, GDP^r has fallen a 25%.

- If the base period is $t = 2$, GDP^r in $t = 1$ is $p_1^2 q_1^1 + p_2^2 q_2^1 = 9 \cdot 6 + 3 \cdot 8 = 78$ and GDP^r in $t = 2$ is $p_1^2 q_1^2 + p_2^2 q_2^2 = 9 \cdot 5 + 3 \cdot 5 = 60$. Now, GDP^r has fallen a 23%.

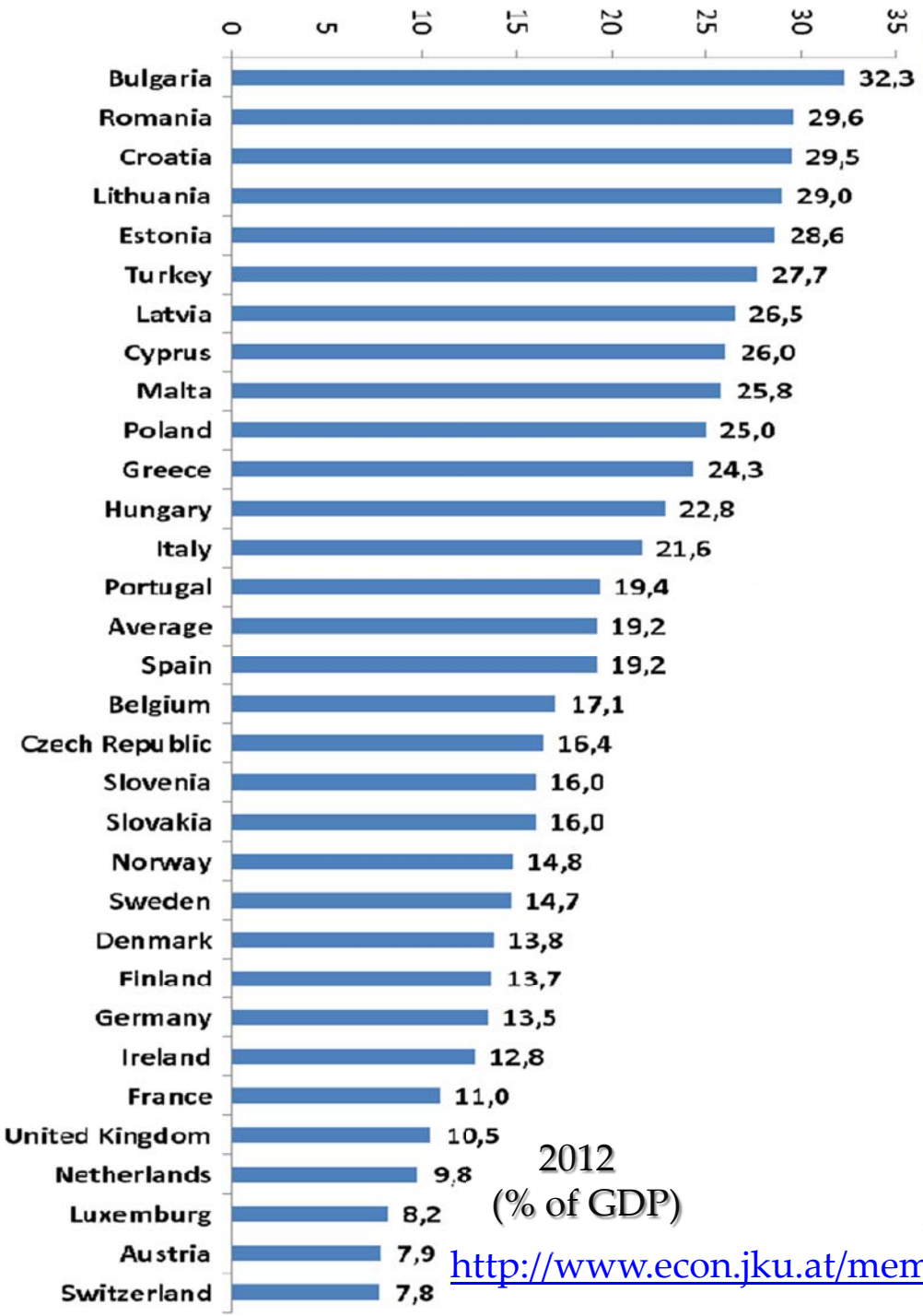
Spain, GDP^{r} base 2000, annual growth



Objections to real GDP

- Theoretical: depends on the prices of the base period, which is always an arbitrary choice.
- Practical: excludes black market activities (underground or shadow economy, that is, legal economic activity that is not taxed) and does not value goods that are not exchanged in markets, like
  - political institutions (democracy vs dictatorship)
  - social and cultural institutions (people's values)
  - the quality of education or of the environment
  - the leisure time
  - the way wealth is distributed among people…

Underground economy (estimation)



2012
(% of GDP)

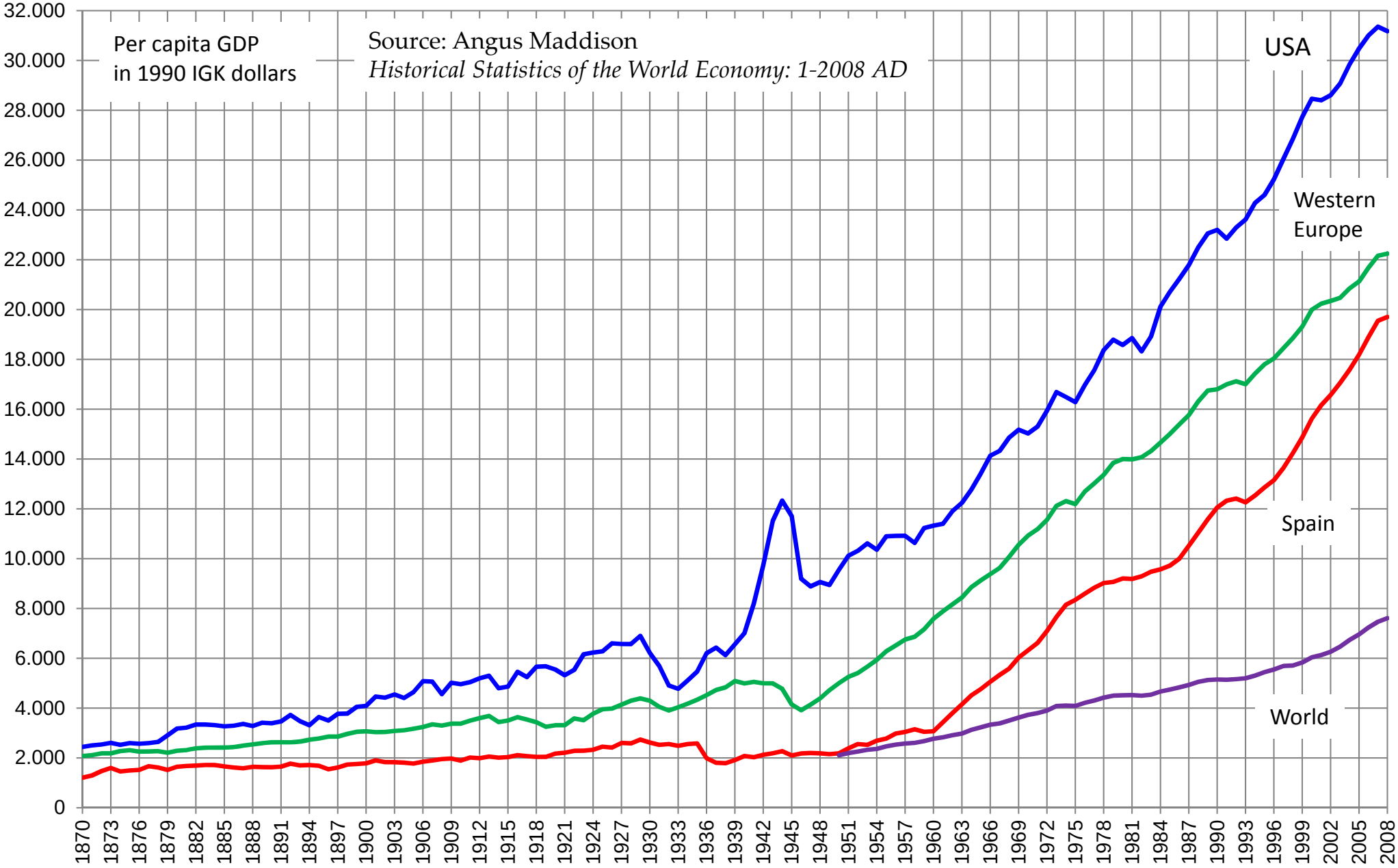
http://www.economist.com/node/16784402

http://www.econ.jku.at/members/Schneider/files/publications/2012/ShadEcEurope31.pdf

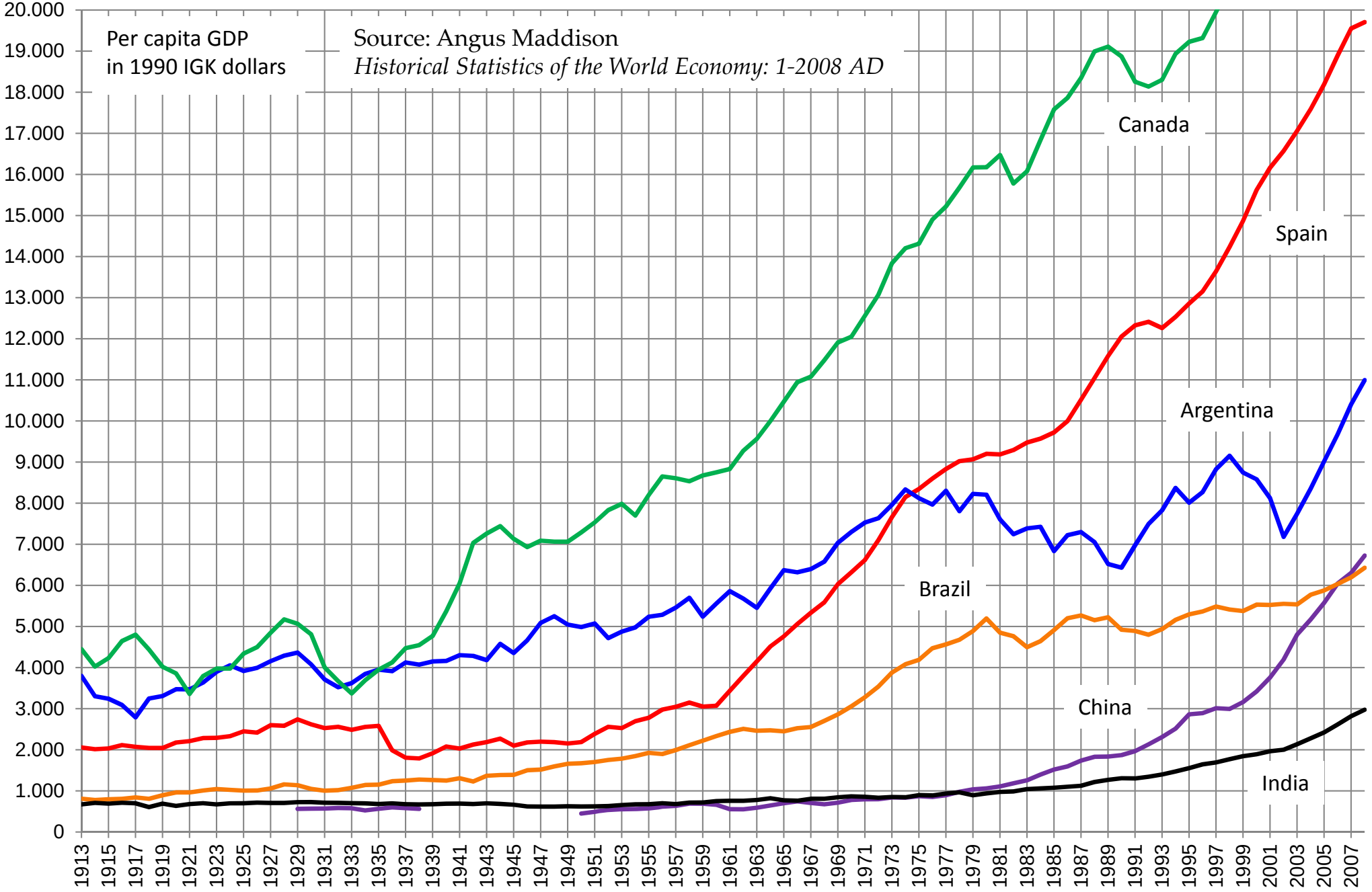
2. How developed is an economy?

- Real GDP per capita provides a measure of how developed or "prosperous" an economy is. It can be interpreted as a measure of the average standard of living in the economy.
- Real GDP per capita is defined as the ratio of real GDP to the population of the economy.
- Real GDP per capita is positevely correlated with many indicadors of economic development and the quality of life: life expectancy, subjective well-being, education, health care expenditure…

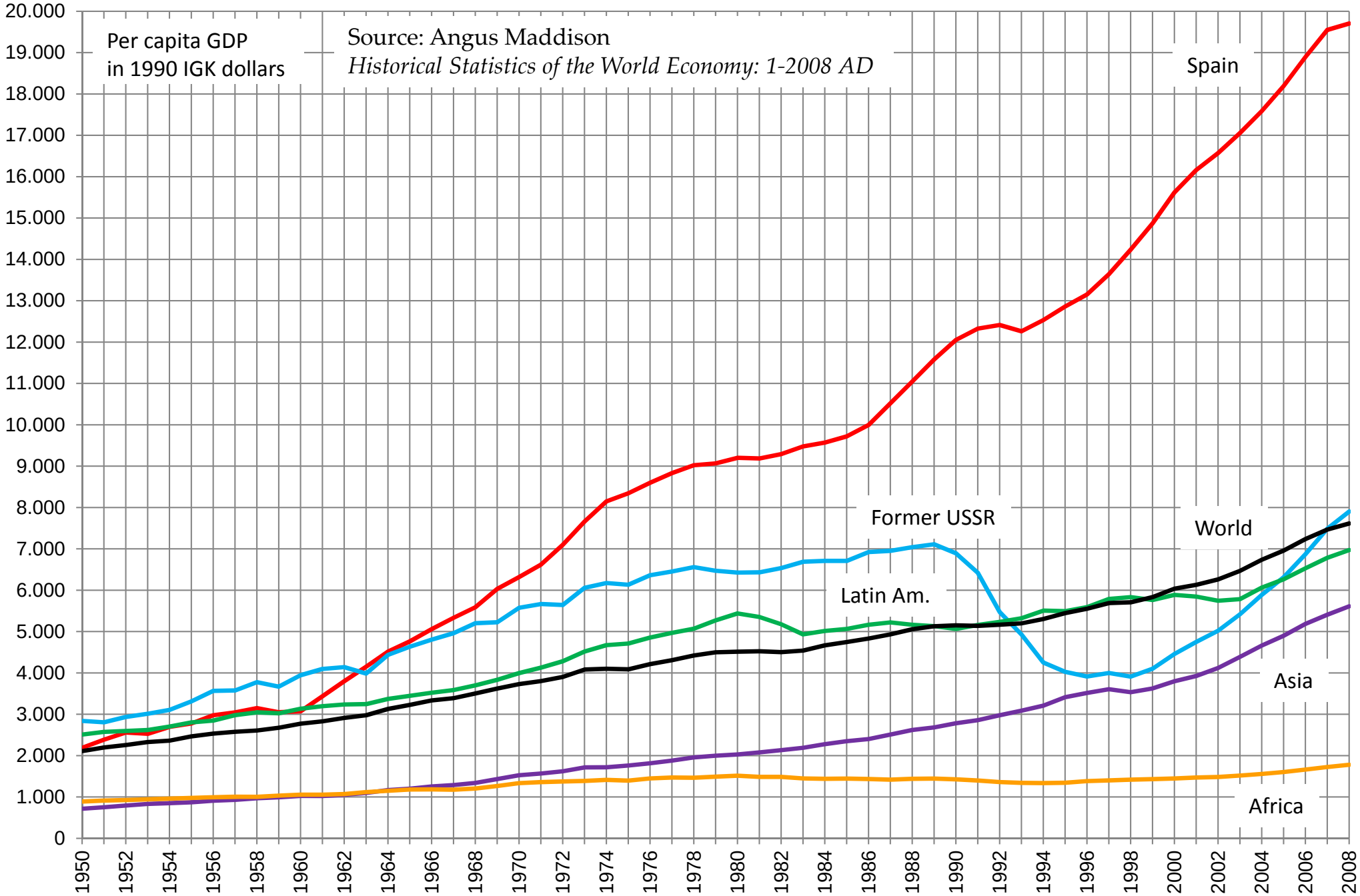
GDP per capita (1820-2008)



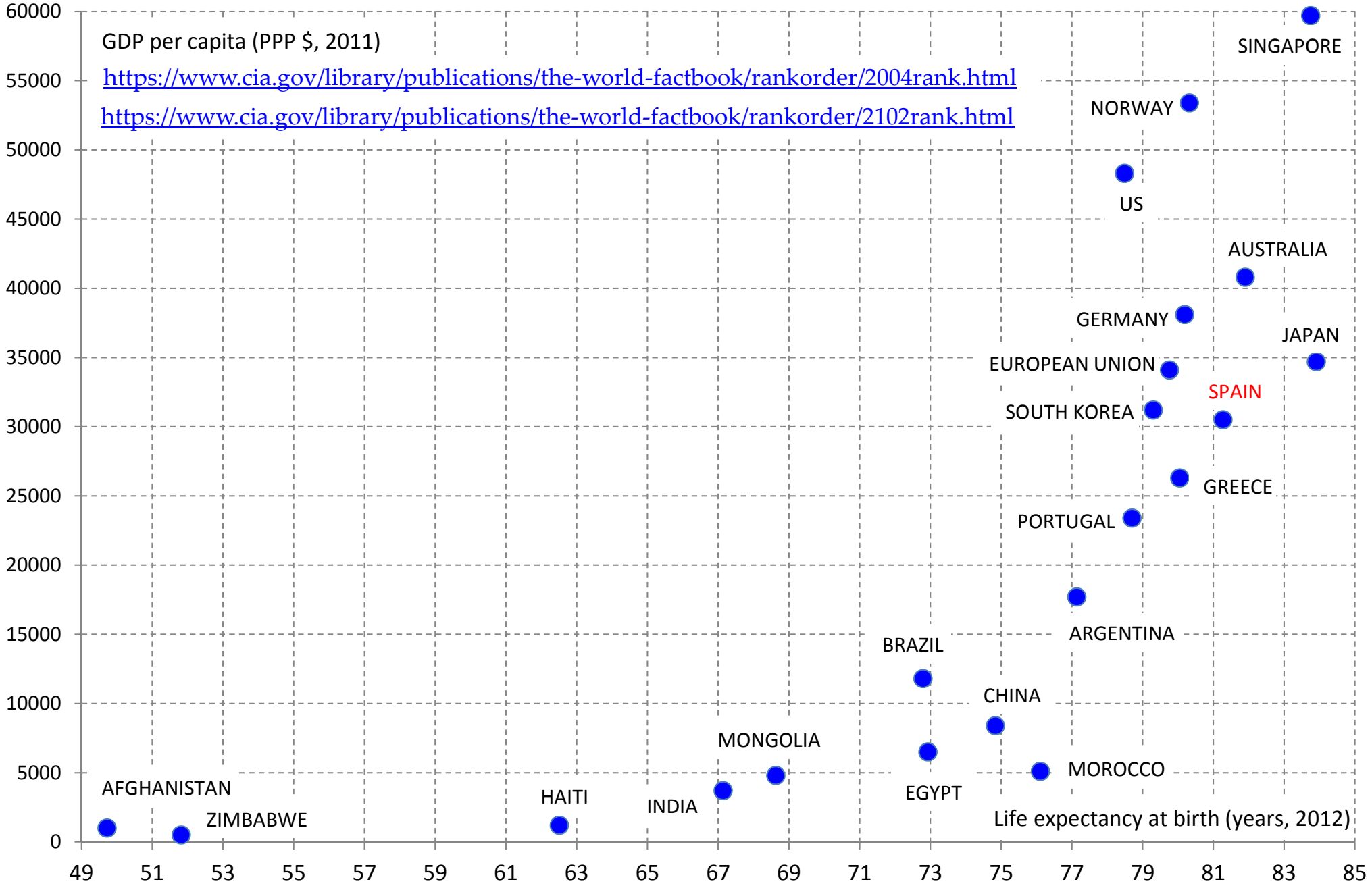
GDP per capita (1913-2008)



GDP per capita (1950-2008)



GDP per capita & life expectancy



GDP per capita & internet usage

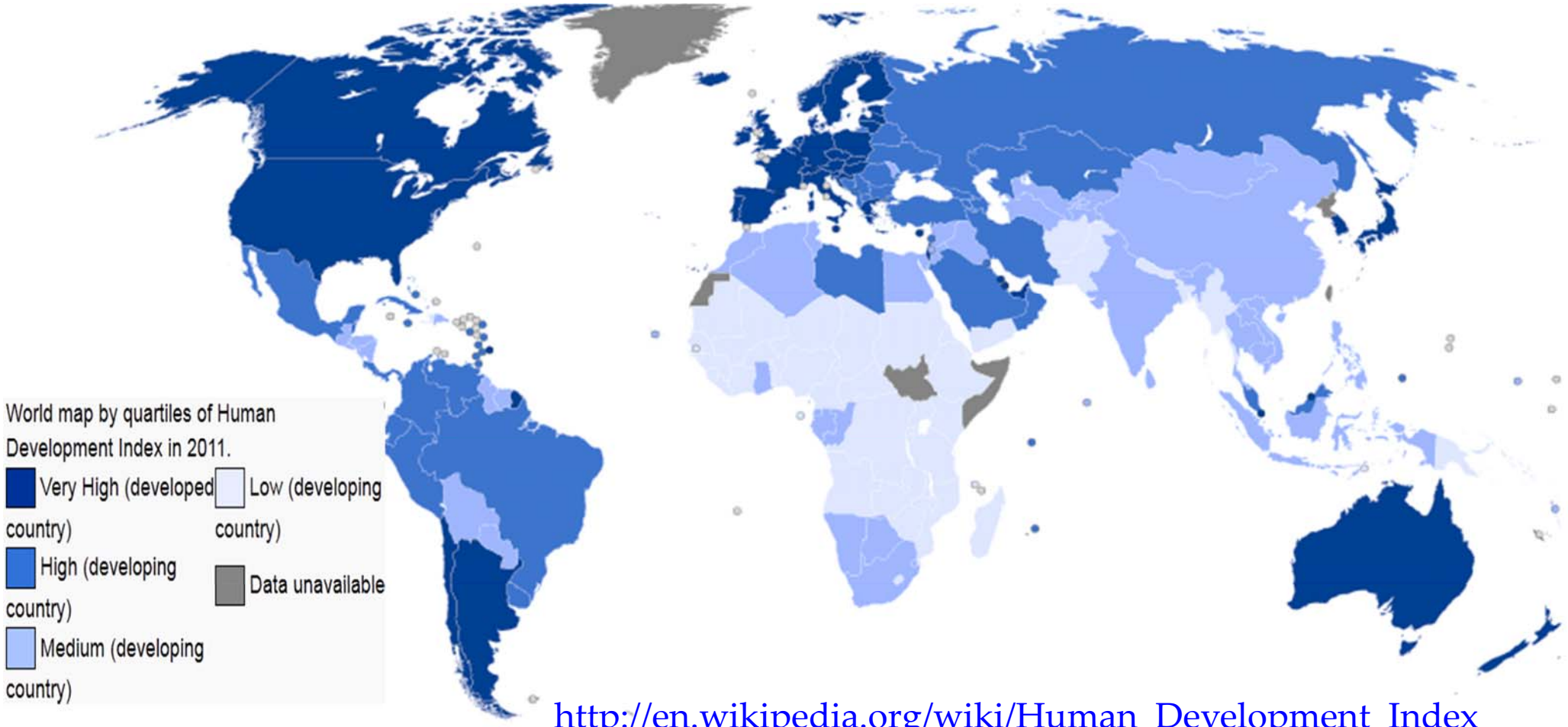
Country	Real GDP per Person (2007)	Life Expectancy	Adult Literacy (% of population)	Internet Usage (% of population)
United States	$45,592	79 years	99%	63%
Germany	34,401	80	99	45
Japan	33,632	83	99	67
Russia	14, 690	66	99	15
Mexico	14,104	76	93	18
Brazil	9,567	72	90	19
China	5,383	73	93	9
Indonesia	3,843	71	92	7
India	2,753	63	66	3
Pakistan	2,496	66	54	7
Nigeria	1,969	48	72	4
Bangladesh	1,241	66	54	0.3

Source: *Human Development Report 2009,* United Nations. Data on real GDP, life expectancy, and literacy are for 2007. Data on Internet use is for 2005.

Principles of Economics, 6th ed., NG Mankiw, p. 508 (books.google.es/books?isbn=0538453052)

GDP per capita & HDI

- GDP per capita is strongly correlated with the Human Development Index.



http://en.wikipedia.org/wiki/Human_Development_Index

3. How costly it is to live in an economy?

- In essence, all the activities in an economy involve flows of either goods or money. A basic question in macroeconomics is how these flows are related.

- The purchasing power of an amount of money is its capacity to be exchanged for goods (the "quantity" of goods that the money can purchase).

- An "average price" of an economy is defined to quantify purchasing power and account for changes in the cost of living. The smaller the purchasing power of the money, the higher the cost of living.

Price indices

- A price index is a measure of the general price level of an economy. This level can be thought of as a weighted average of the prices of all the goods.
- By assuming the fiction that there is a unique good in the economy (the domestic product), if GDP measures the quantity of the good, then the price level would represent the price of the good.
- As distinguished from GDP, price indices have no units and the value by itself means nothing. It is the rate of change of the index that is informative.

GDP (implicit price) deflator

- The GDP deflator is a price index defined as

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} .$$

- It measures the changes in prices in all the goods produced in an economy between the base period used in the real GDP and the current period.

- If $GDP^n_{2009} = 100$, $GDP^r_{2009} = 80$, $GDP^n_{2010} = 135$, and $GDP^r_{2010} = 90$, then GDP_{2009} deflator = 1.25 and GDP_{2010} deflator = 1.5, indicating a price increase.

Consumer price index (CPI)

- The CPI is a measure on the cost of purchasing a fixed basket of goods of a consumer considered representative.
- The CPI_t at period t is defined as

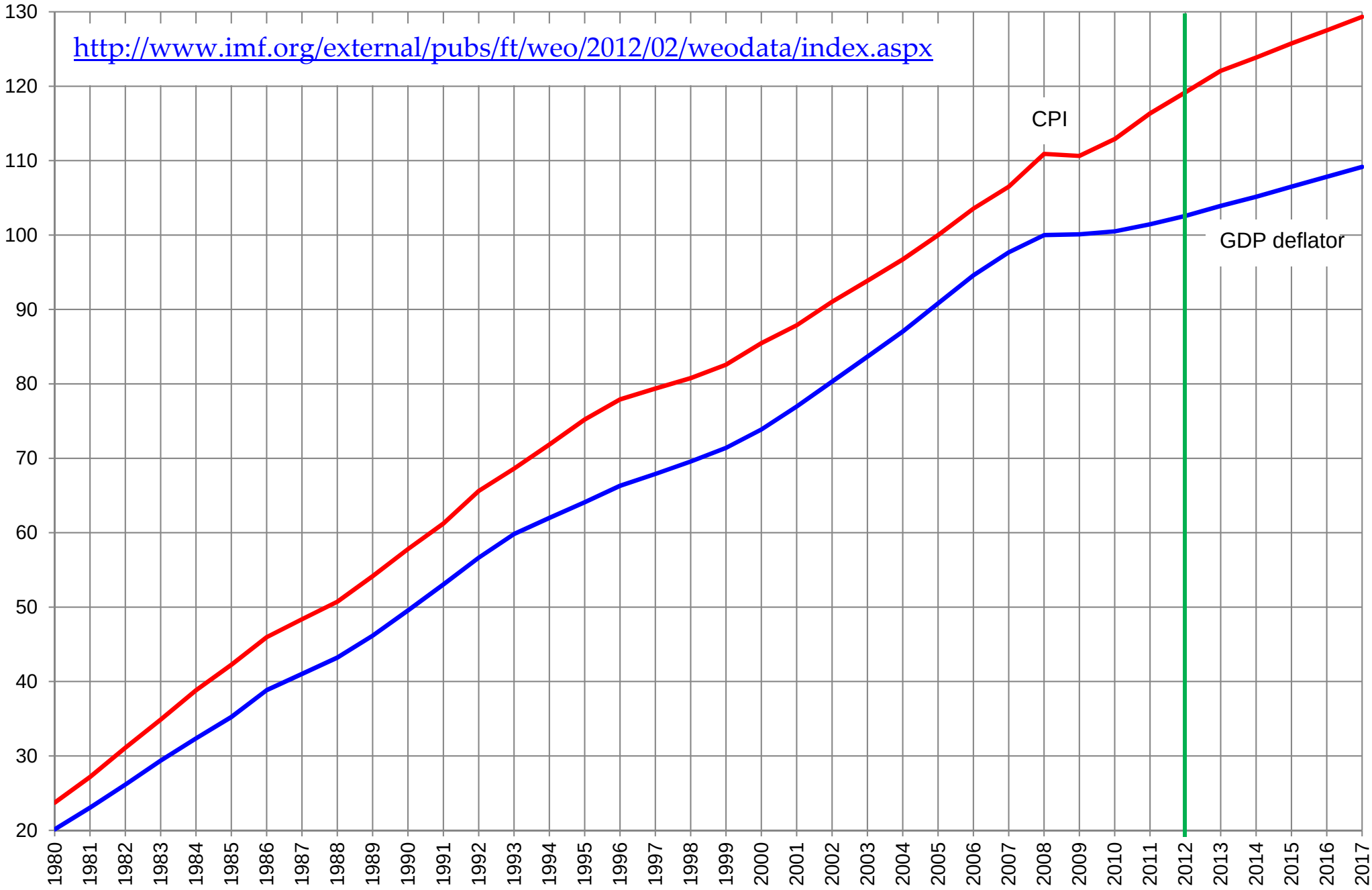
$$\mathrm{CPI}_t = \frac{\text{Value of the basket at prices in period } t}{\text{Value of the basket at prices in the base period}}.$$

- For the index to have base 100, just multiply the right-hand side by 100.

Difference between CPI & deflator

- The CPI generally includes imported goods.
- The GDP deflator does not: it only includes the goods produced in the economy, not abroad.
- The basket of goods in the GDP deflator may vary from period to period.
- The basket in the CPI generally does not.
- Despite all this, both indices are strongly correlated and tend to move in parallel.

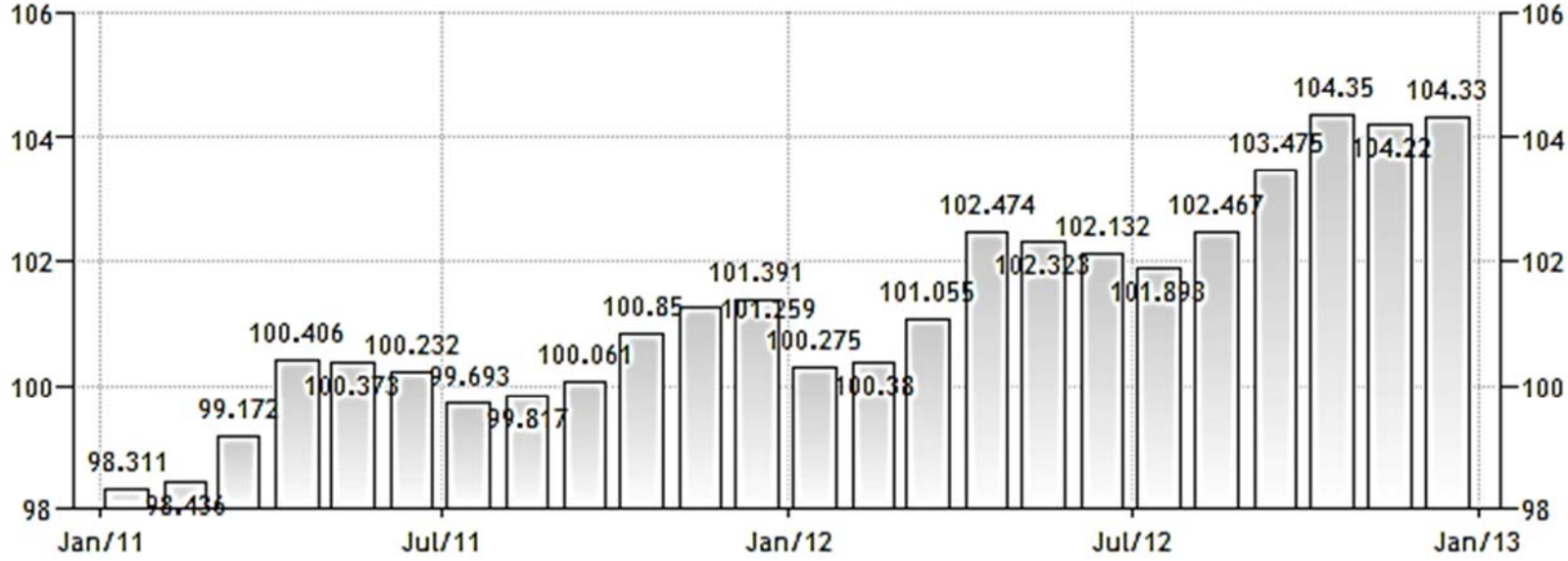
Spain, CPI & GDP deflator



GDP deflator and CPI, Spain

http://www.tradingeconomics.com/spain/gdp-deflator-imf-data.html

SPAIN CONSUMER PRICE INDEX (CPI)



SOURCE: WWW.TRADINGECONOMICS.COM | NATIONAL STATISTICS INSTITUTE, SPAIN

http://www.tradingeconomics.com/spain/consumer-price-index-cpi

Computing a CPI: an example

- The basket is given by $(x, y, z) = (3, 2, 1)$.

time	p_x	p_y	p_z	V_t = *value of the basket at period t*
1	1	4	5	$3 \cdot 1 + 2 \cdot 4 + 1 \cdot 5 = 16$
2	2	1	8	$3 \cdot 2 + 2 \cdot 1 + 1 \cdot 8 = 16$
3	3	1	1	$3 \cdot 3 + 2 \cdot 1 + 1 \cdot 1 = 12$
4	2	5	4	$3 \cdot 2 + 2 \cdot 5 + 1 \cdot 4 = 20$

- Taking t =1 as the base period, $\text{CPI}_1 = V_1/V_1 = 1$; $\text{CPI}_2 = V_2/V_1 = 16/16 = 1$; $\text{CPI}_3 = V_3/V_1 = 12/16 = 0.75$; and $\text{CPI}_4 = V_4/V_1 = 20/16 = 1.25$.

Inflation rate

- The inflation rate π associated with the price index P is the rate of change in the price index P:

$$\pi = \frac{P - P_{-1}}{P_{-1}}$$

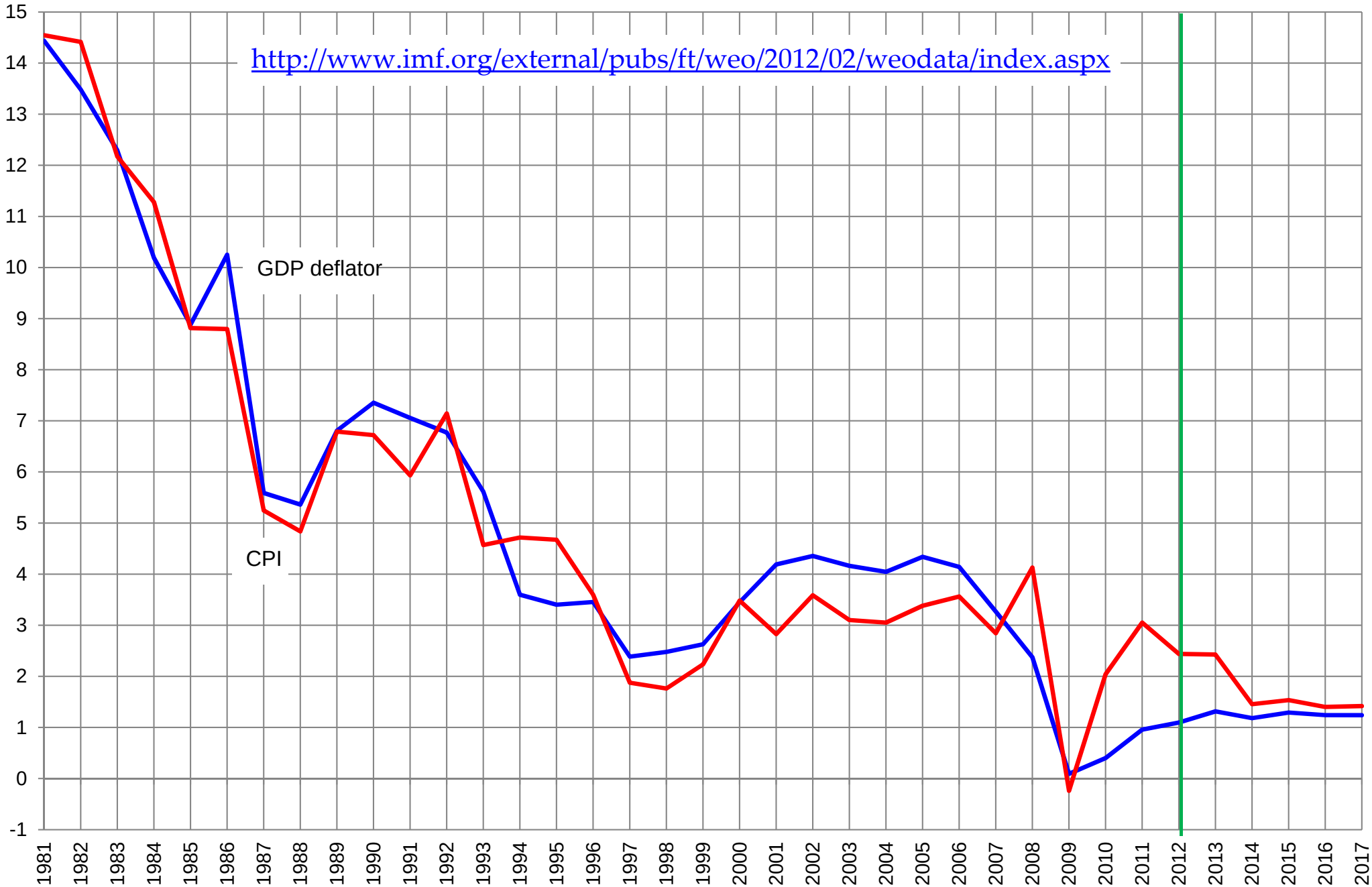
where P is the price index in the current period and P_{-1} is the one in the immediately preceding period.

- To express the inflation rate as a percentage, multiply by 100 the right-hand side. For instance, if $P = 50$ and $P_{-1} = 40$, then $\pi = ¼ = 0.25$ (= 25%): the price index has been pushed up a 25%.

Inflation rate, Spain (Jan11–Dec12)

http://www.tradingeconomics.com/spain/inflation-cpi

Spain, CPI & deflator inflation rate



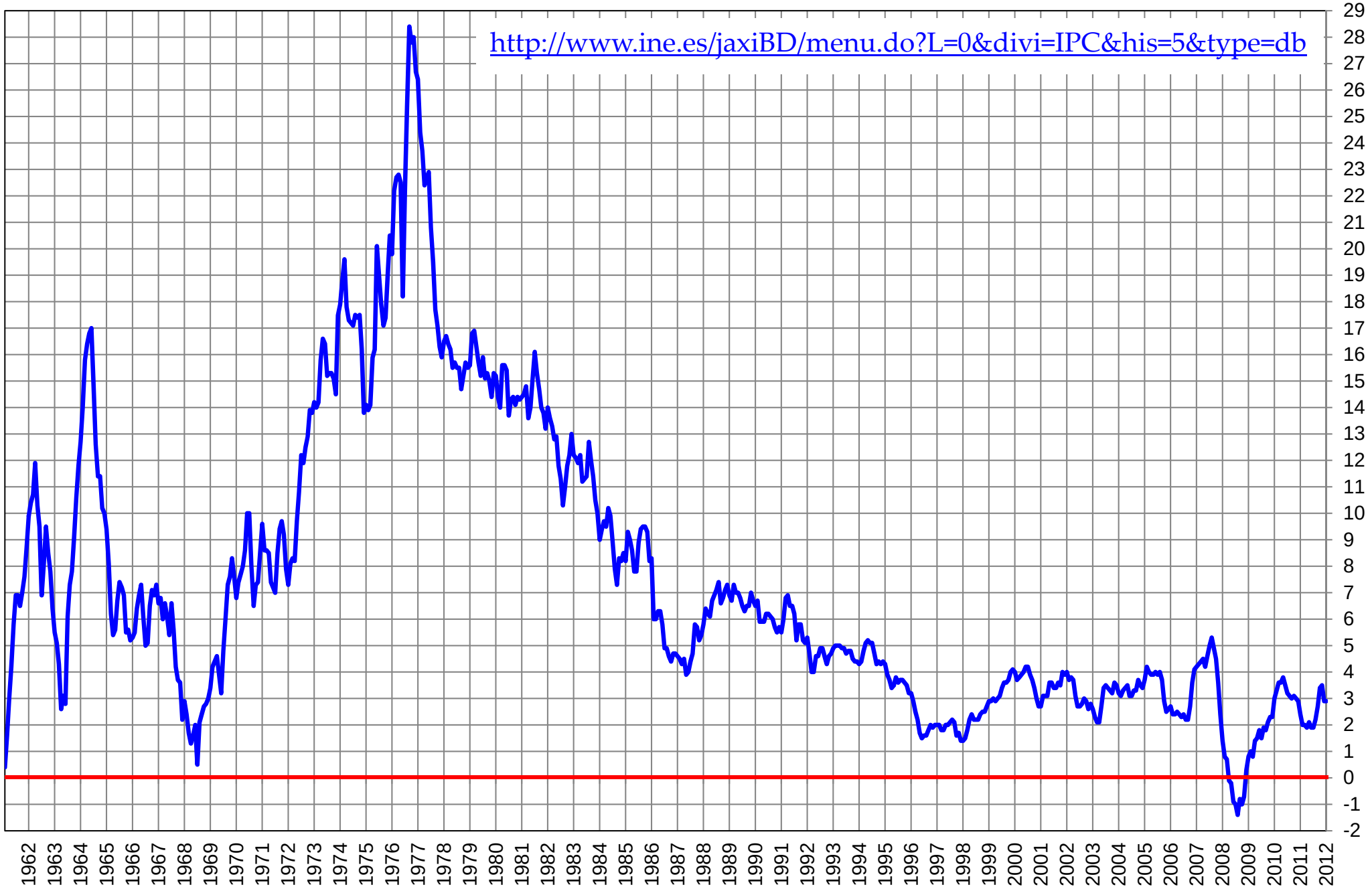
Inflation rate: an example

- Let π be the inflation rate associated with the CPI of the previous example.
- In this case:
  - π_1 is not defined (since there is no CPI_0)
  - $\pi_2 = (CPI_2 - CPI_1)/CPI_1 = (1 - 1)/1 = 0$
  - $\pi_3 = (CPI_3 - CPI_2)/CPI_2 = (.75 - 1)/1 = -.25 = -25\%$
  - $\pi_4 = (CPI_4 - CPI_3)/CPI_3 = (1.25 - .75)/.75 = 66.6\%$.
- If π is calculated, for instance, from $t = 1$ to $t = 4$, then $\pi = (CPI_4 - CPI_1)/CPI_1 = (1.25 - 1)/1 = .25 = 25\%$.

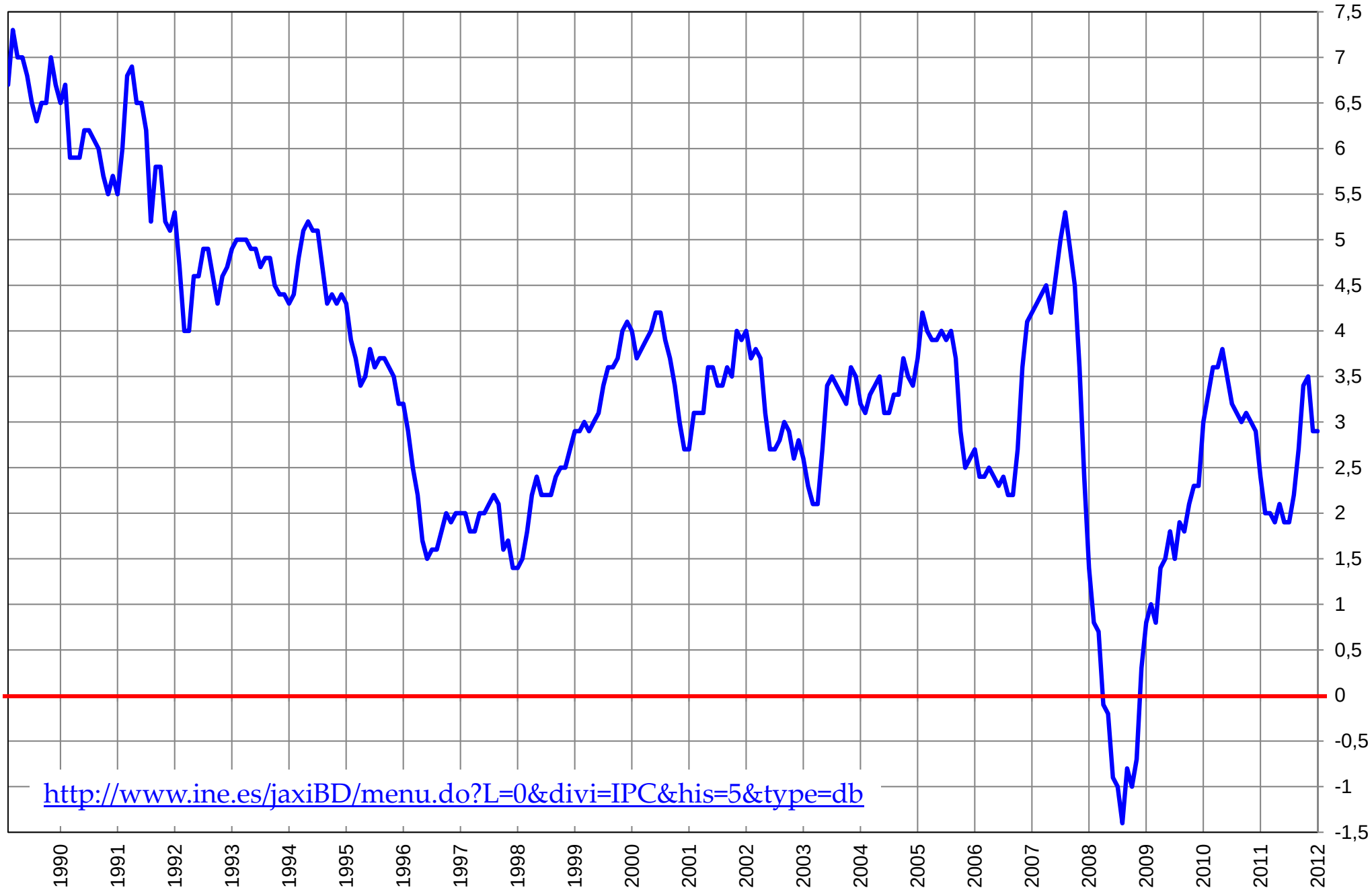
Inflation concepts

- As an economic phenomenon, inflation refers to the sustained increase of the CPI. It occurs for periods during which the inflation rate is positive.
- Deflation is the opposite phenomenon: sustained decrease of the CPI (negative inflation rates).
- Disinflation takes place when, during inflation, the inflation rate diminishes (but remains positive).
- Hyperinflation occurs with astronomical inflation rates (montly inflation rates of at least 50%). Under a hyperinflation, inflation is out of control.

Inflation rate, Spain (1962M1–2012M12)

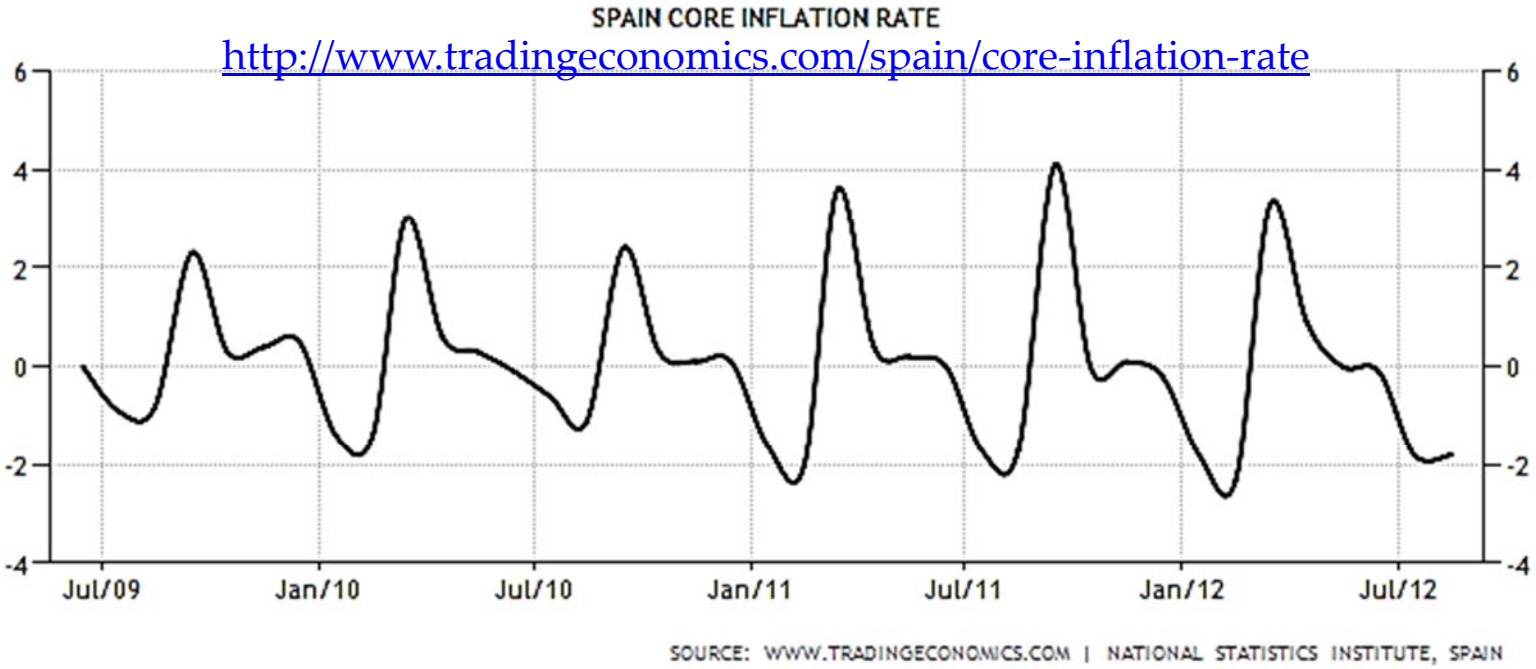


Inflation rate, Spain (1990M1–2012M12)



Core inflation rate

- The core (as opposed to headline) inflation rate is computed by excluding the prices of food and energy prices, which tend to be very volatile.
- It is a measure of underlying long-term inflation. It can also be used as an indicator of future inflation.



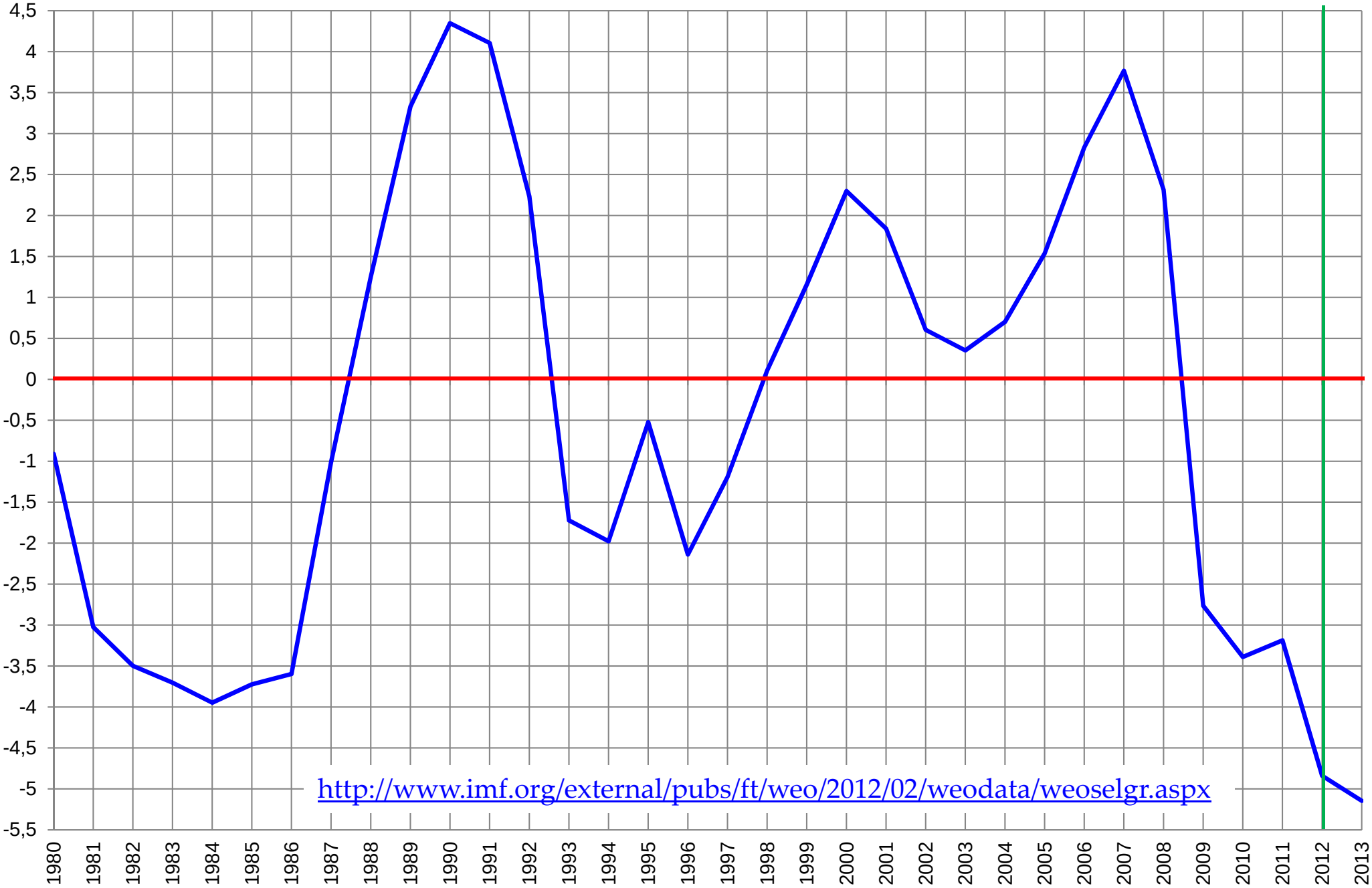
4. Is the economy doing well or badly?

- Potential (or "natural") GDP refers to the maximum GDP level that an economy can sustain over time. The output gap is the difference between actual GDP and potential GDP.

- When GDP is below potential, some production inputs must lie idle (remain unused).

- Since labour services constitute one of the main inputs, its rate of employment is a measure of the degree to which an economy is performing well.

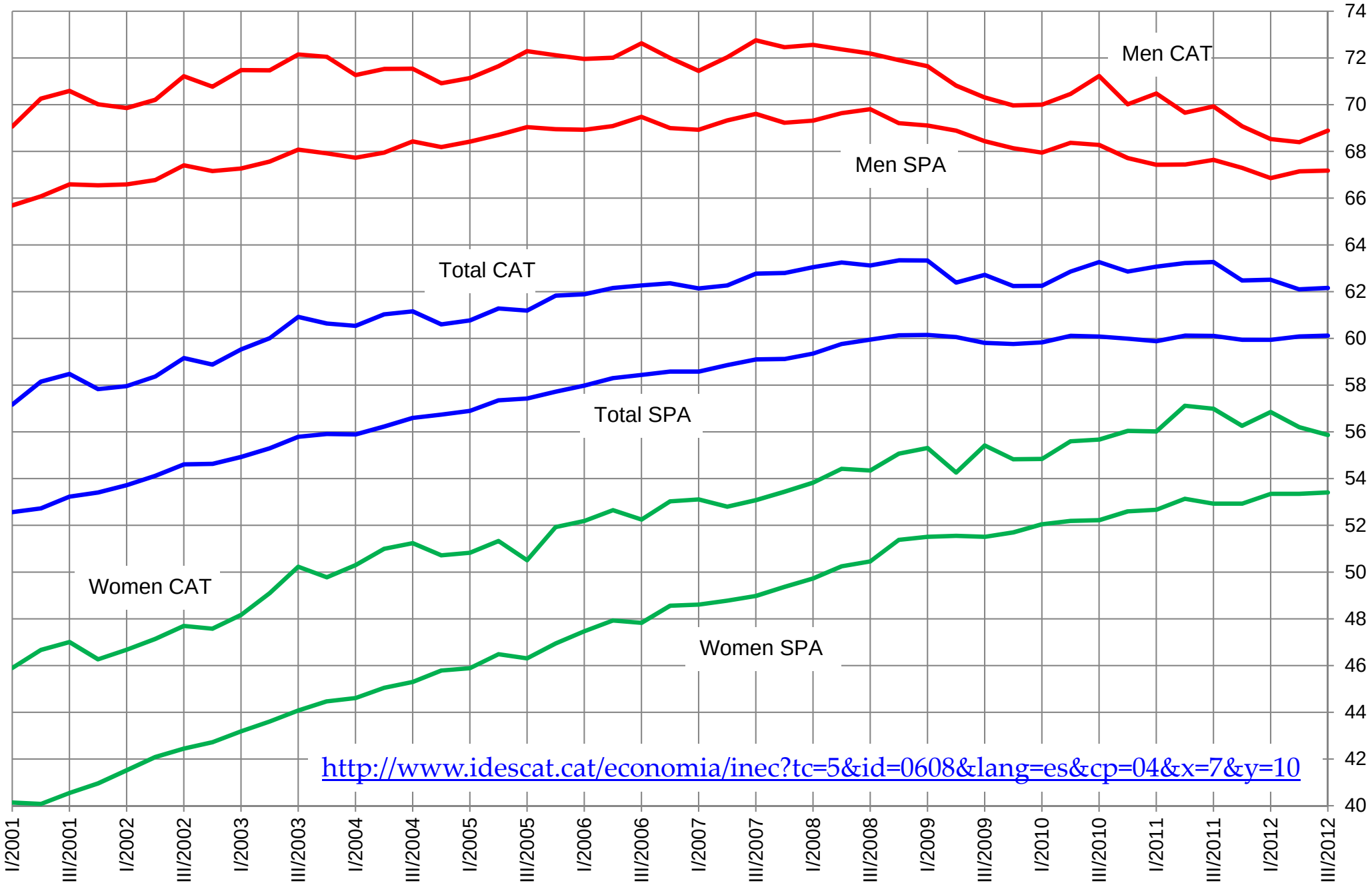
Output gap, Spain (in % of potential GDP)



Unemployment rate

- Employment = number of people having a job
- Unemployment = number of people not having a job but looking for one
- Labour force = Employment + Unemployment
- $\text{Unemployment rate} = \dfrac{\text{Unemployment}}{\text{Labour force}}$
- $\text{Participation rate} = \dfrac{\text{Labour force}}{\text{Total population of working age}}$

Participation rate, Spain & Catalonia



Types of unemployment

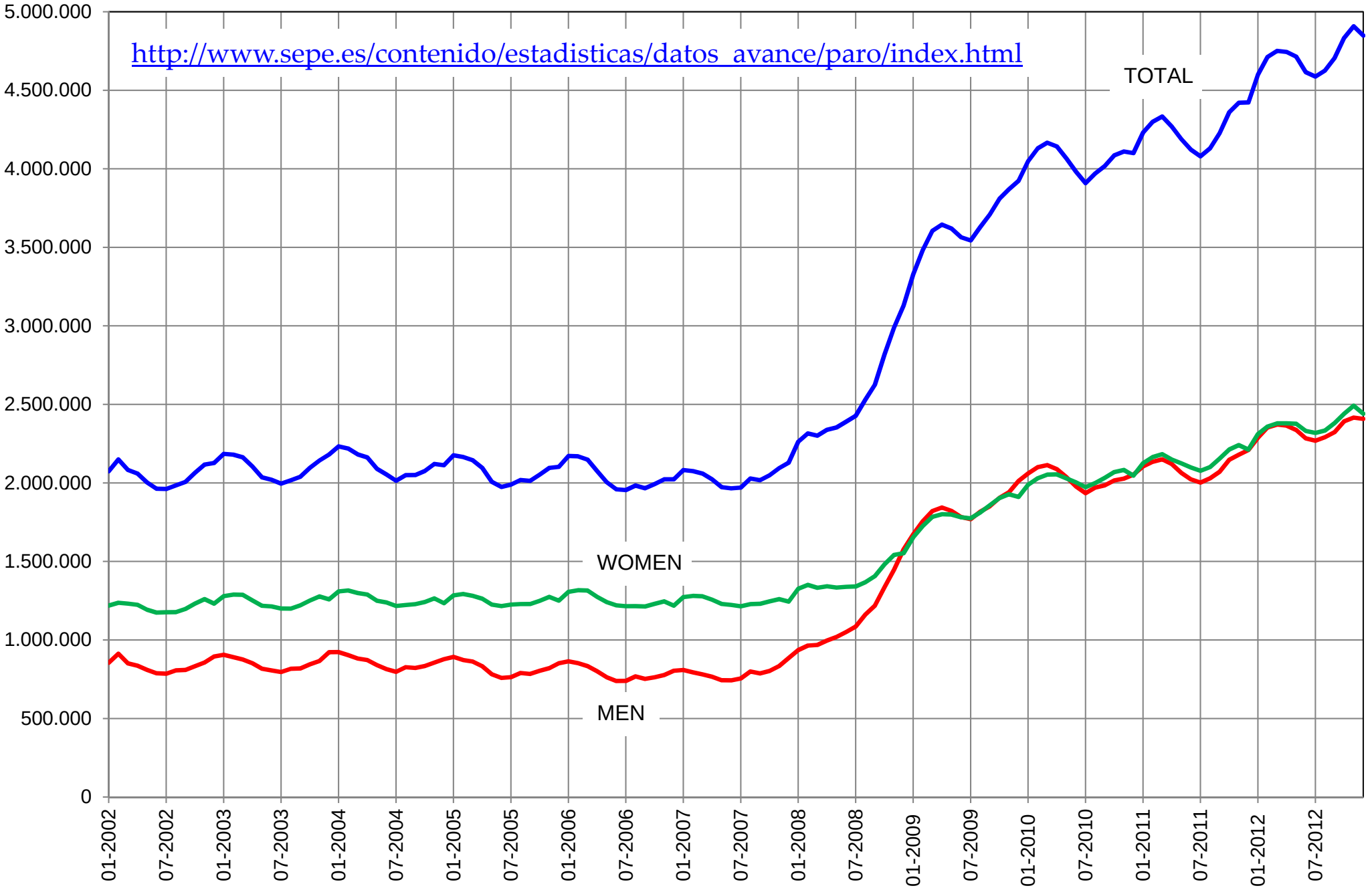
- Actual unemployment is divided into 3 categories (the first two define "natural unemployment").
- Frictional. Occurs while workers are changing jobs.
- Structural. Due to structural changes in the economy that create & eliminate jobs and to the institutions that match workers and firms (firing & hiring costs, minimum wages, unemployment benefits, mobility restrictions, lack of training…).
- Cyclical. Generated by the short-run fluctuations of GDP (rises with recessions, falls with booms).

Registered unemployment, Spain

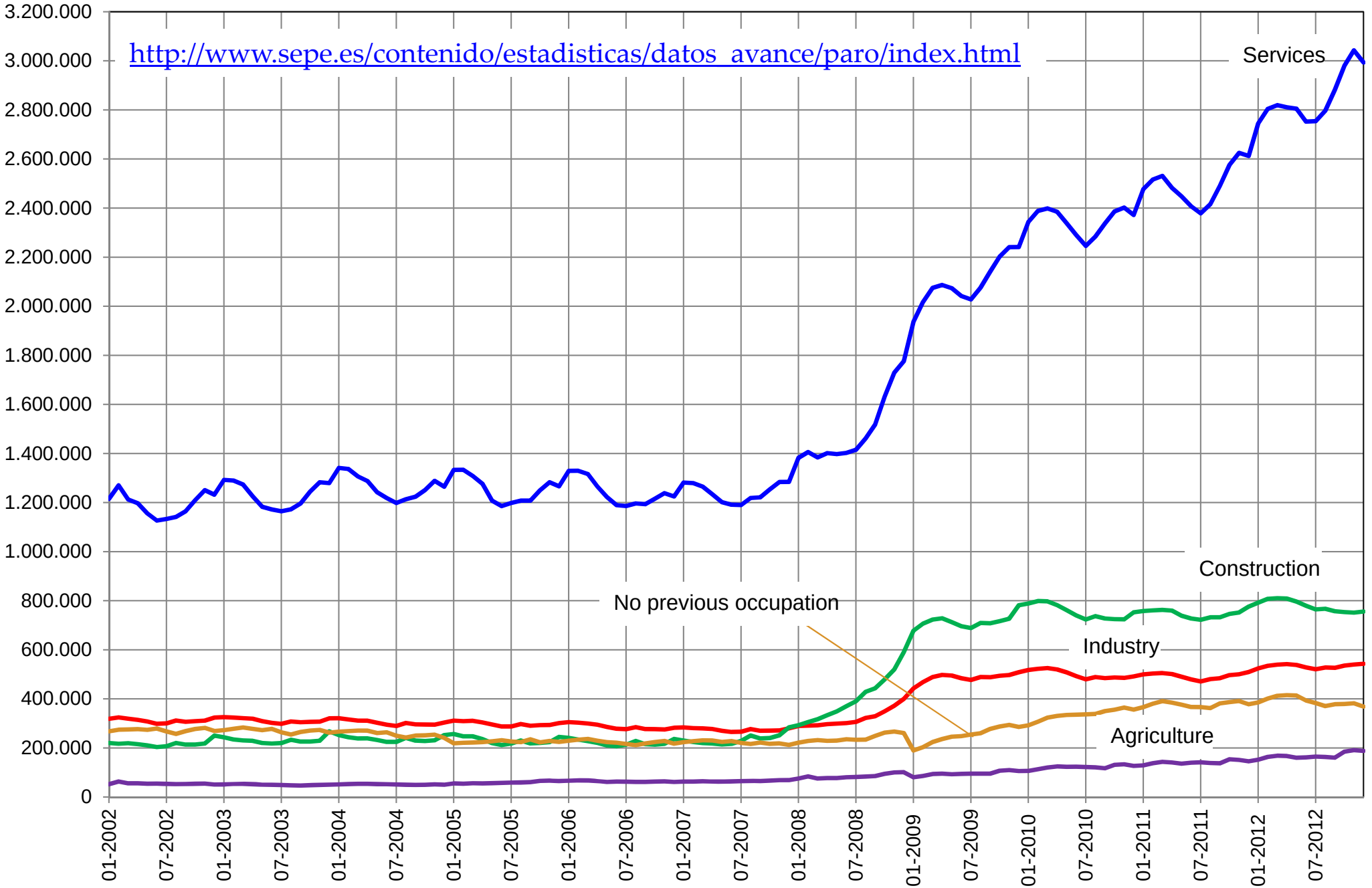
Diciembre 2012		DATOS ABSOLUTOS MES	VARIACIONES			
			MES ANTERIOR		INTERANUAL	
			ABSOLUTA	RELATIVA	ABSOLUTA	RELATIVA
SEXO	HOMBRES	2.407.907	-8.321	-0,34	198.169	8,97
	MUJERES	2.440.816	-50.773	-2,04	228.195	10,31
	AMBOS SEXOS	4.848.723	-59.094	-1,20	426.364	9,64
MENORES 25 AÑOS	HOMBRES	241.810	-14.400	-5,62	-7.118	-2,86
	MUJERES	214.825	-15.338	-6,66	3.192	1,51
	AMBOS SEXOS	456.635	-29.738	-6,11	-3.926	-0,85
MAYORES 25 AÑOS	HOMBRES	2.166.097	6.079	0,28	205.287	10,47
	MUJERES	2.225.991	-35.435	-1,57	225.003	11,24
	AMBOS SEXOS	4.392.088	-29.356	-0,66	430.290	10,86
SECTORES	AGRICULTURA	187.876	-3.092	-1,62	41.915	28,72
	INDUSTRIA	543.055	2.794	0,52	33.585	6,59
	CONSTRUCCIÓN	755.832	4.325	0,58	-20.096	-2,59
	SERVICIOS	2.993.492	-49.438	-1,62	380.963	14,58
	SIN EMPLEO ANTERIOR	368.468	-13.683	-3,58	-10.003	-2,64

http://www.sepe.es/contenido/estadisticas/datos_avance/paro/index.html

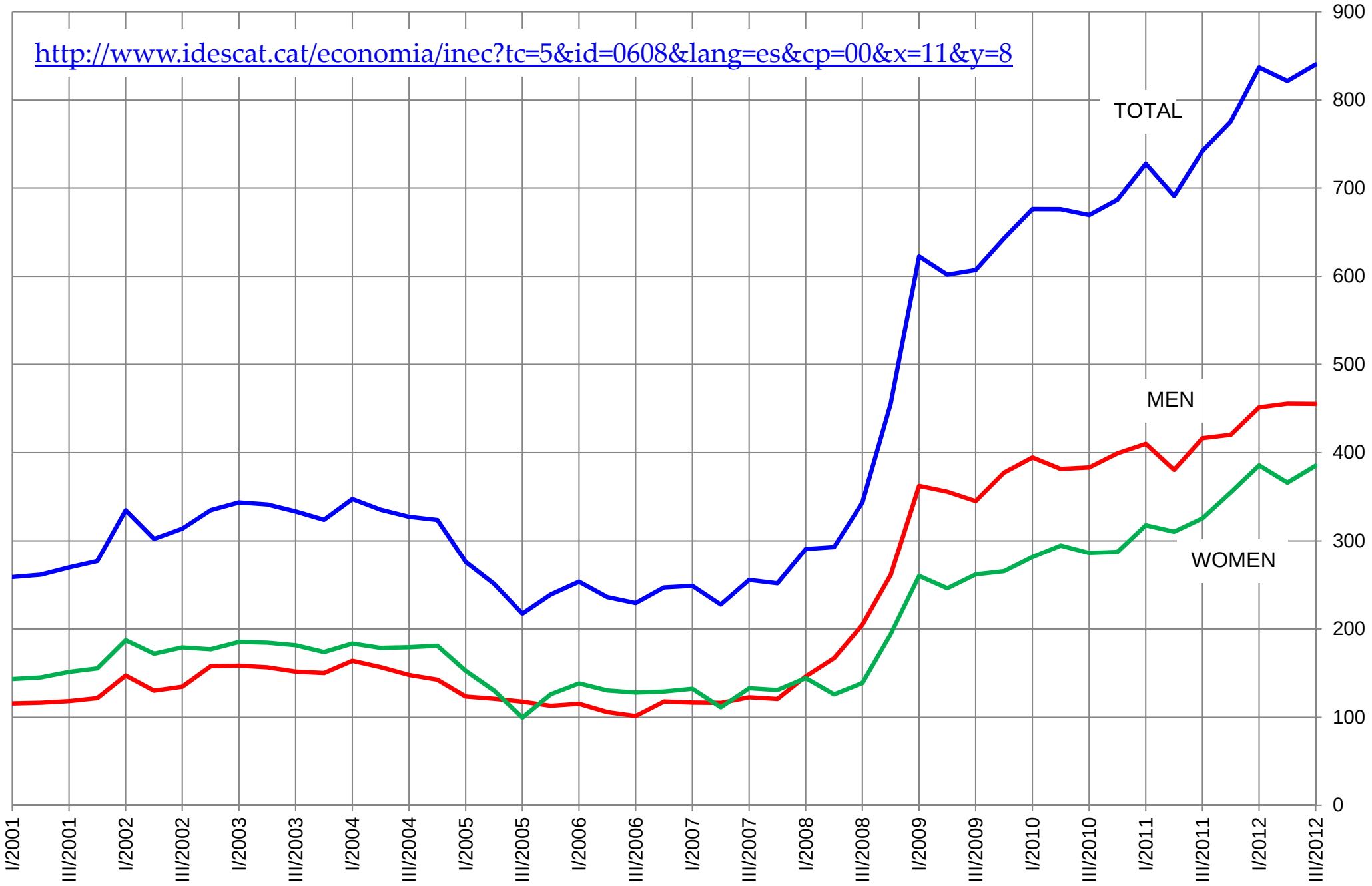
Registered unemployment, Spain



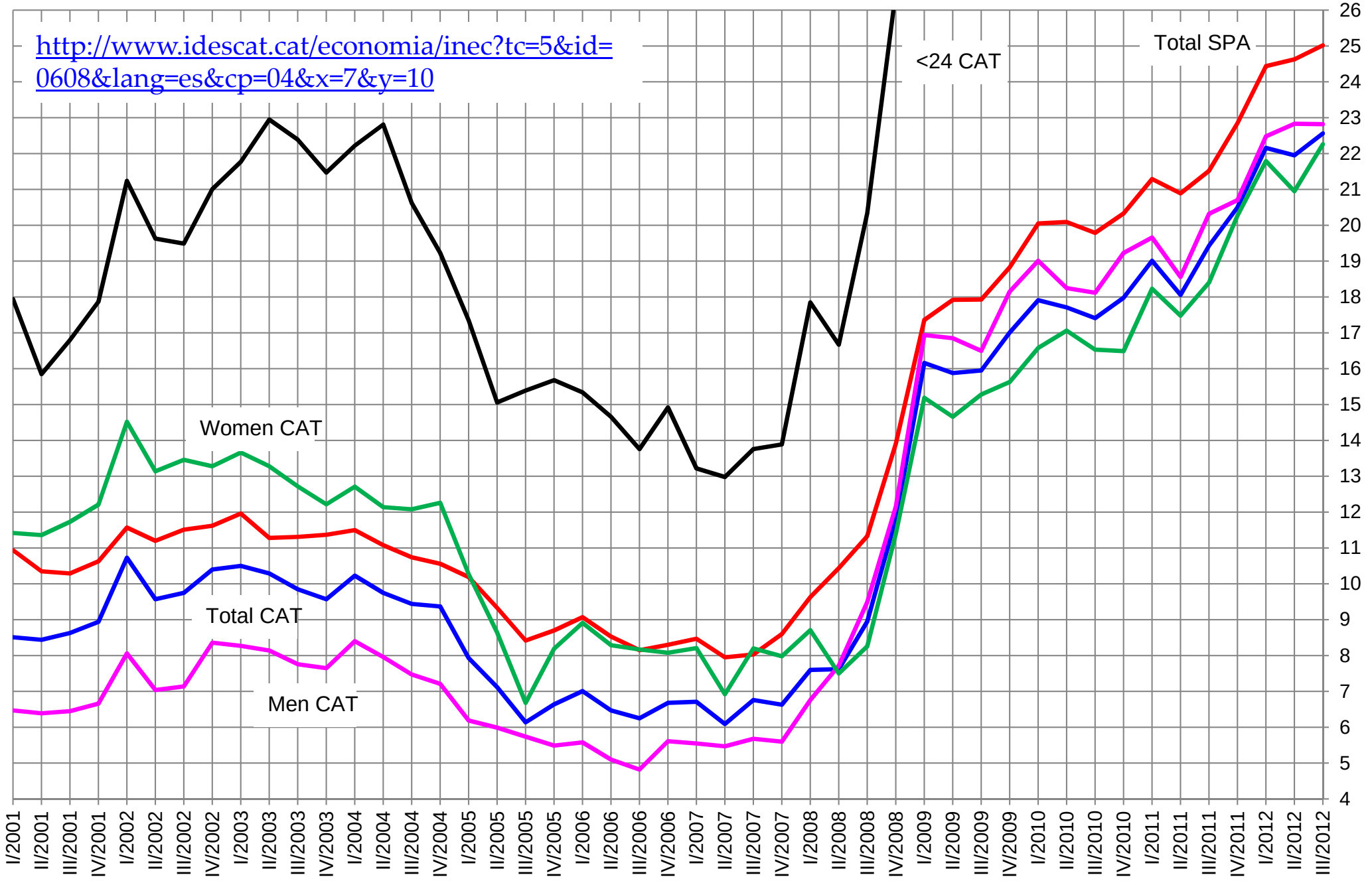
Registered unemployment, Spain



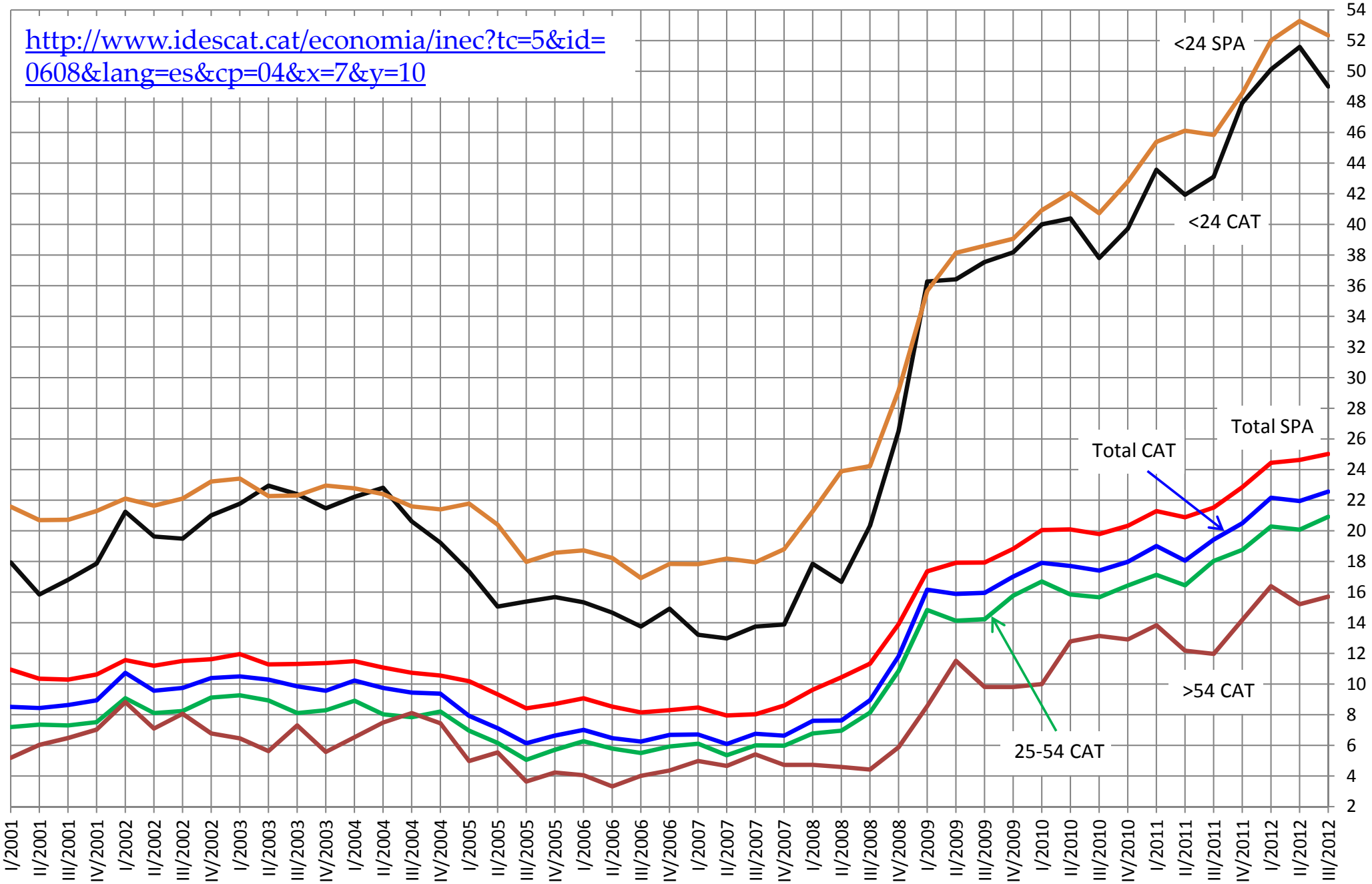
Estimated unemployment, Catalonia



Unemployment rate, Spain, Catalonia



Unemployment rate, Spain, Catalonia



Spain & Catalonia at a glance (3 Feb 2013)

Indicator	Period	Value	Variation (%)		
CPI	2012M12	104.298	2.9		
EAPs Employed (thou.)	2012T4	16,957.1	-2.10		
EAPs Unemployment rate	2012T4	26.02	3.18	1	
GDP (million €)	2012T3	263,342	-1.6	2	
Total population (thou.)	2011	46,815.9	--	3	

1 Value as a %. The variation is the difference as compared with the rate for the same period the previous year
2 Seasonal and calendar effects adjusted data
3 Population and Housing Census 2011

http://www.ine.es/ss/Satellite?pagename=INEHome%2FHOMELayout&L=1

Basic data of Catalonia

Population	**7,570,908**	**GDP**	**−1.6%**
January 1, 2012		var. between 3Q 2012 and 2011	
Unemployment	**23.94%**	**CPI**	**+3.6%**
rate 4th quarter 2012		var. between Dec. 2012 and 2011	

http://www.idescat.cat/en/

Country	GDP Billion USD	GDP YoY	GDP QoQ	Interest rate	Inflation rate	Jobless rate	Gov. Budget	Debt to GDP
United States	15094	2.60%	3.10%	0.25%	1.80%	7.80%	-8.70%	103.00%
Euro Area	13076	-0.60%	-0.10%	0.75%	2.20%	11.80%	-4.10%	87.30%
China	7298	7.40%	2.20%	6.00%	2.50%	4.10%	-1.10%	25.80%
Japan	5867	0.50%	-0.90%	0.00%	-0.20%	4.10%	-9.70%	211.70%
Germany	3571	0.40%	0.20%	0.75%	2.10%	6.70%	-0.80%	80.50%
France	2773	0.15%	0.10%	0.75%	1.30%	10.30%	-5.20%	86.00%
Brazil	2477	0.90%	0.60%	7.25%	5.84%	4.90%	2.60%	66.20%
United Kingdom	2432	0.00%	0.90%	0.50%	2.70%	7.80%	-7.80%	85.00%
Italy	2195	-2.40%	-0.20%	0.75%	2.40%	11.10%	-3.90%	120.70%
Russia	1858	2.90%	0.60%	8.25%	6.60%	5.40%	0.80%	9.60%
India	1848	5.30%	0.60%	8.00%	7.24%	3.80%	-4.60%	68.05%
Canada	1736	1.50%	0.10%	1.00%	0.80%	7.10%	-1.50%	85.00%
Spain	1491	-1.60%	-0.30%	0.75%	2.90%	25.02%	-9.40%	69.30%
Australia	1372	3.10%	0.50%	3.00%	2.00%	5.20%	-4.10%	22.90%
Mexico	1155	3.30%	0.45%	4.50%	3.57%	5.12%	-0.50%	43.80%
South Korea	1014	1.50%	0.10%	2.75%	1.40%	2.90%	-2.00%	34.00%
Indonesia	847	6.17%	3.21%	5.75%	4.30%	6.14%	-1.60%	25.00%
Netherlands	836	-1.50%	-0.90%	0.75%	2.90%	7.00%	-4.50%	65.50%
Turkey	773	1.60%	0.20%	5.00%	6.16%	9.10%	-1.40%	39.40%
Switzerland	636	1.40%	0.60%	0.00%	-0.40%	3.30%	0.40%	48.60%
Saudi Arabia	577	5.87%	5.51%	2.00%	3.90%	10.50%	13.00%	7.50%
Sweden	538	0.70%	0.50%	1.00%	-0.10%	7.50%	0.40%	38.40%
Poland	515	1.40%	0.40%	4.00%	2.80%	13.30%	-5.00%	56.40%
Belgium	512	-0.30%	0.00%	0.75%	2.23%	7.40%	-3.70%	97.80%
Norway	486	1.20%	-0.80%	1.50%	1.40%	3.20%	13.60%	43.70%
Taiwan	487	1.13%	0.98%	1.88%	1.93%	4.27%	-1.90%	40.80%
Argentina	446	0.70%	0.60%	15.25%	10.60%	7.60%	0.20%	44.20%

I Source: Tradingeconomics.com, accessed the 13th of January, 2013

Nominal variable

- A nominal variable is measured in terms of current prices.
- Changes of current prices may affect the nominal variable.
- The typical nominal variable is measured in (current) monetary units.
- Examples: the GDP at current prices, the stock of money, the (nominal) interest rate, the (nominal) exchange rate, and the CPI.

Real variable

- A real variable measures physical quantities. Real variables are not affected by current prices.
- Some real variables, like total employment or the unemployment rate, need no price to be defined.
- Others are defined by fixing prices, like GDP at constant prices, which measures production using the prices of a base period.
- Still others come from nominal variables by removing the effects of prices, like the real interest rate.

Stock variable & flow variable

- A stock variable is measured in levels rather than rates of change.
- A flow variable is measured in rates per unit of time rather than levels.
- GDP is a flow variable, since it measures production during a period of time (so GDP is production per unit of time).
- Unemployment at a given moment of time is a stock variable.

5. How is the economy's output used?

- With all variables being real, the 1st fundamental national income accounting identity states that

$$\underbrace{Y}_{\text{ex-post supply of output}} \equiv \underbrace{C + I + G + NX}_{\text{ex-post demand for output}}.$$

C = consumption spending by households

I = investment spending by firms and households

G = government purchases of goods

NX = net exports of goods = exports – imports

EX IM

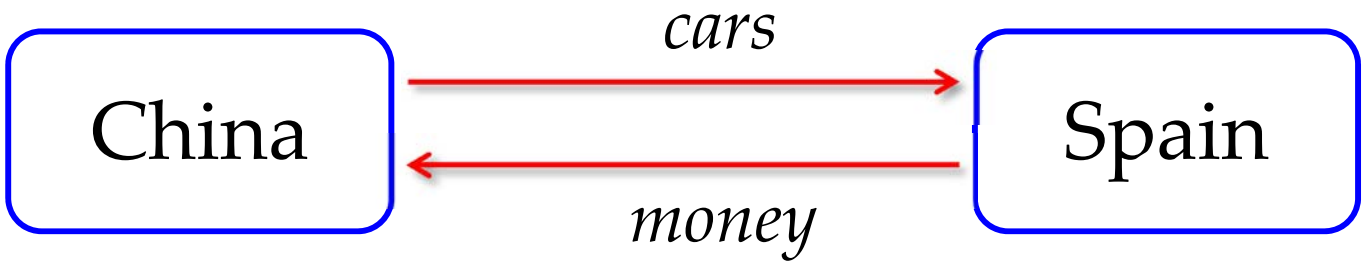
Investment identical to savings

- T = taxes paid by households and firms
- TR = transfers paid to households and firms
- S = private saving (saving by households & firms)
- $C + S \equiv Y_D$ (disposable income) $\equiv Y + TR - T$
- By adding $TR - T$ to each side of $Y \equiv C + I + G + NX$ and rearranging, the following identity obtains:

$$\underbrace{I}_{\text{investment}} \equiv \underbrace{S}_{\substack{\text{private}\\ \text{saving}}} + \underbrace{(T - TR - G)}_{\substack{\text{government}\\ \text{saving}}} + \underbrace{(IM - EX)}_{\substack{\text{foreign}\\ \text{saving}}}.$$

Why IM – EX (or –*NX*) is foreign saving

- Imagine that China exports only cars to Spain and that China imports nothing from Spain.



- China runs a trade surplus (with Spain) and Spain a trade deficit (with China).
- China delivers goods and receives in exchange money. Thus, China is saving and has lending capacity: has money (in general, financial assets) to lend. So trade surplus means lending capacity.

2nd fundamental accounting identity

- The identity in 51 says that <u>domestic investment is financed by private saving, public saving, or foreign saving</u>. It can also be expressed as follows:

$$\underbrace{(S - I)}_{\text{net private saving}} \equiv \underbrace{(G + TR - T)}_{\text{government budget}} + \underbrace{NX}_{\text{trade balance or net exports}} .$$

budget surplus if $T > G + TR$

budget deficit if $T < G + TR$

= spending – receipts (can also be defined the other way round)

lending capacity =

trade surplus if $NX > 0$

trade deficit if $NX < 0$

= *financial need*

Where do savings go?

- The 2nd identity can also be formulated as

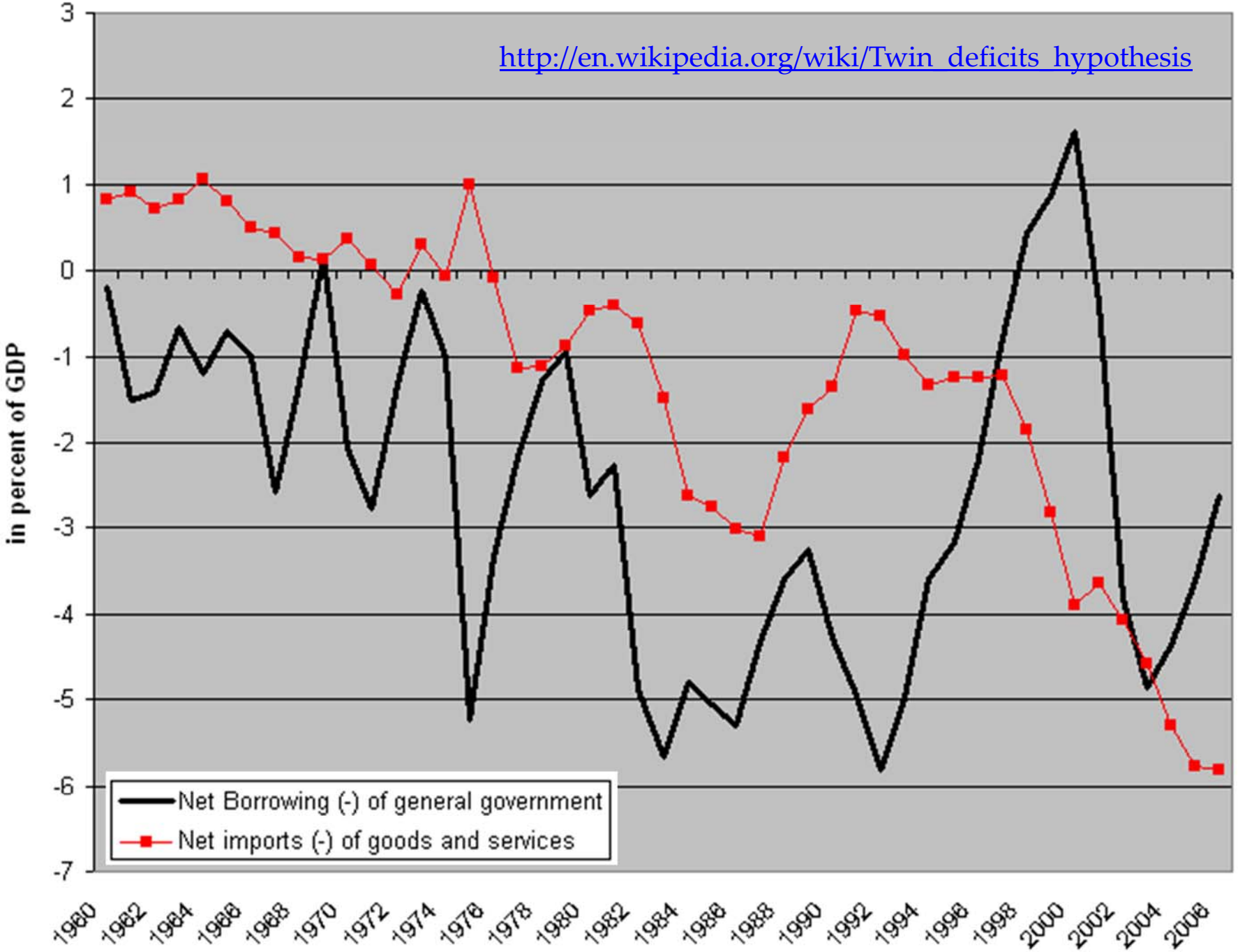
$$S \equiv I + (G + TR - T) + NX \ .$$

- This says that there are three ways of disposing of the savings of an economy.
- Savings can go to firms to finance investment…
- … to the government to finance a budget deficit…
- … or to foreigners, when they buy more from the economy than the economy buys from them.

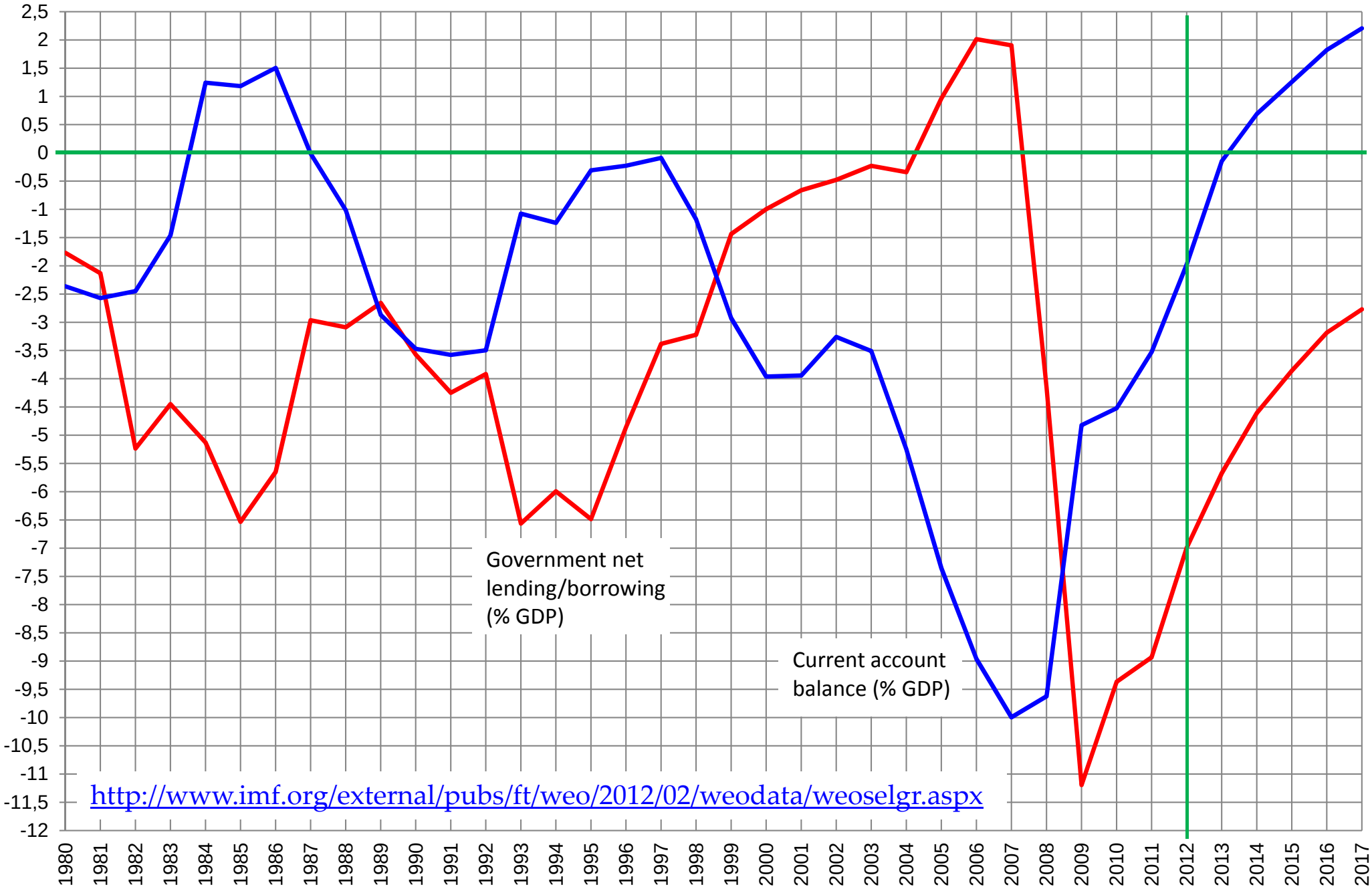
Twin deficits: twice the fun

- If investment equals savings, so $I = S$, the 2nd identity implies that the government budget deficit equals the trade balance.
- This means that if the government runs a budget deficit, then it must be financed by foreigners: if $I = S$, then $G + TR - T > 0$ implies $NX < 0$.
- In sum, the government spends more without having to increase taxes, and households and firms buy from abroad more goods than they sell. The US in the 80s and 90s illustrates this situation.

Twin deficits: the US case (% of GDP)



Twin deficits: the Spanish case



From expenditure to GDP

- According to national income accounting, GDP equals expenditure, income, and value added.
- The expenditure approach to measure GDP splits GDP into four components (C, I, G, and NX) according to the identity of the purchaser (or according to the purpose of the expenditure).
- The expenditure approach leads to the identity $Y \equiv C + I + G + NX$: everything that is produced is purchased by consumers to be consumed, by firms to be invested, by the government, or by foreigners. Hence, production ≡ expenditure.

GDP, Spain, expenditure approach

Billions of €	C	I	G	EX	IM	GDP	
2010 Q1	158	58	47	64	72	256	1,048
2010 Q2	148	58	59	71	77	267	
2010 Q3	147	56	50	73	75	251	
2010 Q4	154	59	67	75	82	274	
2011 Q1	162	56	48	74	82	259	1,063
2011 Q2	151	56	58	80	81	273	
2011 Q3	150	54	49	83	81	255	
2011 Q4	154	55	67	83	85	275	
2012 Q1	165	52	45	77	82	258	
2012 Q2	162	51	56	83	80	269	
2012 Q3	150 59.5%	47 18.6%	47 18.6%	89 35.3%	81 –32.1%	252 100%	

http://www.ine.es/daco/daco42/daco4214/tabcntr.xls

$1{,}06 \times 10^{12}$ €

From income to GDP

- The income approach to measure GDP obtains GDP as the sum of the payments made to all the factors of production (inputs).
- Inputs are aggregated into two categories: labour (workers) and capital (firms). The government, as a third category, collects taxes.
- The income approach leads to the identity *output* (Y) ≡ *wages* + *profits* + *taxes*: everything that is produced becomes the income of workers (wages), of firms (profits), or of the government (taxes). Summing up, production ≡ income.

GDP, Spain, income approach

Billions of €	wages	profits	taxes	GDP	
2010 Q1	121	107	25	256	1,048
2010 Q2	131	112	23	267	
2010 Q3	122	104	23	251	
2010 Q4	136	116	25	274	
2011 Q1	121	112	26	259	1,063
2011 Q2	131	119	22	273	
2011 Q3	131	110	22	255	
2011 Q4	135	121	21	275	
2012 Q1	117	113	26	258	
2012 Q2	124	123	21	269	
2012 Q3	114 45.2%	114 45.2%	23 9.1%	252 100%	

http://www.ine.es/daco/daco42/daco4214/tabcntr.xls

From value added to GDP

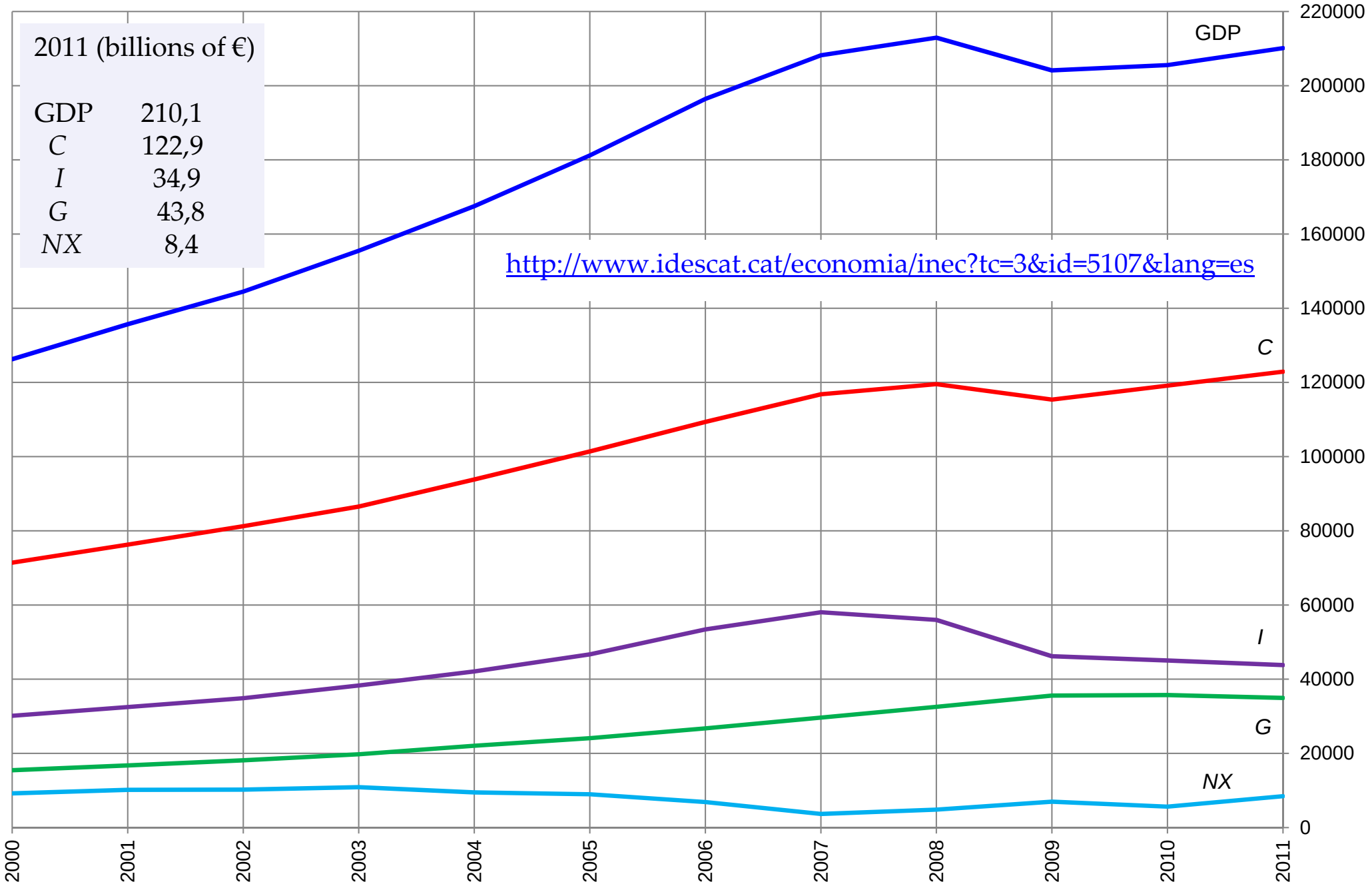
- The value added approach to measure GDP views GDP as the sum of the value that each producer adds to the production purchased by the producer.
- If the reprographic industry buys paper worth 100 and energy worth 200 to make copies worth 600, then the added value of the industry is 600 – 200 – 100 = 300. If that value were 600, the production of paper and energy would be counted twice.
- Value added = value of the final (new) goods produced – value of the intermediate goods. In this case, production ≡ total value added.

GDP, Spain, value added approach

Billions of €	agricul-ture	industry	construction	services	taxes	GDP	
2010 Q1	5	42	25	159	24	256	1,048
2010 Q2	8	38	26	173	21	267	
2010 Q3	4	34	26	163	21	251	
2010 Q4	6	39	26	177	24	274	
2011 Q1	5	45	22	161	24	259	1,063
2011 Q2	7	41	24	178	20	273	
2011 Q3	4	37	25	167	20	255	
2011 Q4	6	40	25	180	21	275	
2012 Q1	5	45	20	163	22	258	
2012 Q2	8	40	22	180	18	269	
2012 Q3	4 1.5%	36 14.2%	21 8.3%	168 66.6%	20 7.9%	252 100%	

http://www.ine.es/daco/daco42/daco4214/tabcntr.xls

Catalonian GDP



A stockpile of definitions

- Government budget: $GB = T - TR - G$.
- A budget surplus occurs when $GB > 0$.
- A budget deficit occurs when $GB < 0$.

- Trade balance: $NX = EX - IM$.
- A trade surplus occurs when $NX > 0$.
- A trade deficit occurs when $NX < 0$.

- Domestic demand for GDP = $C + I + G$
- Net foreign demand for GDP = $NX = EX - IM$
- Disposable income = $Y + TR - T$ (also equals $C + S$)

The circular flux of income