



***R&D and environmental objectives of the  
"Europe 2020" strategy: assessment by the  
NEMESIS model***

**R&D efforts during crisis and  
beyond: Some lessons from  
NEMESIS simulations**

**Bureau fédéral du Plan  
Brussels, June 11 , 2010**

## *Introduction*

- First idea: Active R&D Policies can be useful to « restore equilibrium », to reach the levels of G.D.P and employment that were forecasted before crisis**
- Second idea : reversely the cost of R&D Policies is lowered by crisis**
- Third idea: Its now time to make active R&D Policies in spite of Finance constraints.**

## *Outline*

- 1- R&D policies are useful during crisis**
- 2- A new scenario for 3% Barcelona objective**
- 3- Increasing R&D effort: doubling FP8**
- 4- Conclusions and perspectives**

# ***1-R&D policies are useful during crisis***

## **□ 1.1- R&D effort is lowering during crisis (procyclical):**

### ***❖ Countercyclical view:***

- Need for efficiency
- Opportunity cost
- Bental and Piled (1960)
- François Lloyd Ellis (2003)

### ***❖ But majority for procyclical view:***

- Finance constraints
- Demand driven
- François Lloyd Ellis (2009)

# 1- R&D policies are useful during crisis

## □ 1.2- The durability of crisis

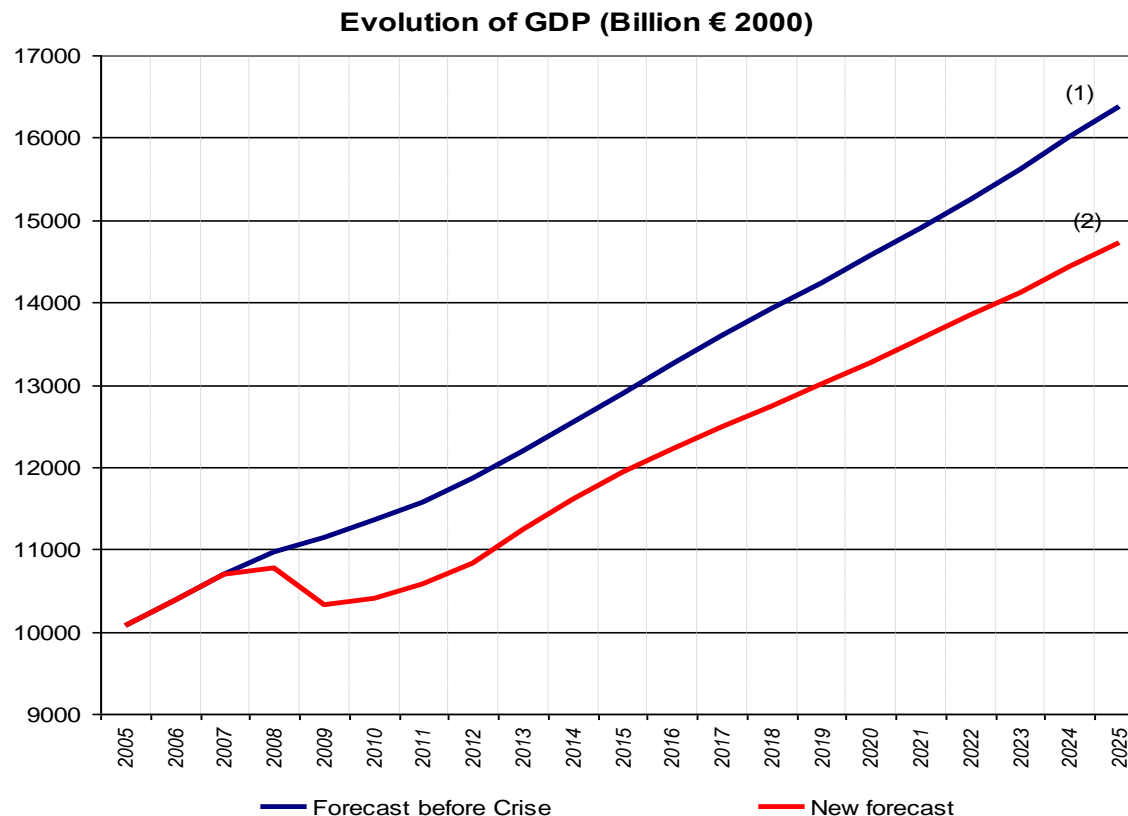
### □ Short term effects of crisis: DG ECFIN (Fall prospect)

	2008		2009		2010	
	<i>GDP</i>	<i>Employment</i>	<i>GDP</i>	<i>Employment</i>	<i>GDP</i>	<i>Employment</i>
<i>Trend (growth rate)</i>	2.7%	1.4%	1.6%	-0.4%	1.8%	-0.3%
<i>Crisis (growth rate)</i>	0.8%	1.2%	-4.1%	-2.3%	0.7%	-1.2%
<i>Cumulative GAP (%)</i>	1.9%	0.2%	7.6%	2.1%	8.7%	3.0%

# 2- R&D policies are useful during crisis

## □ 1.2- The durability of crisis

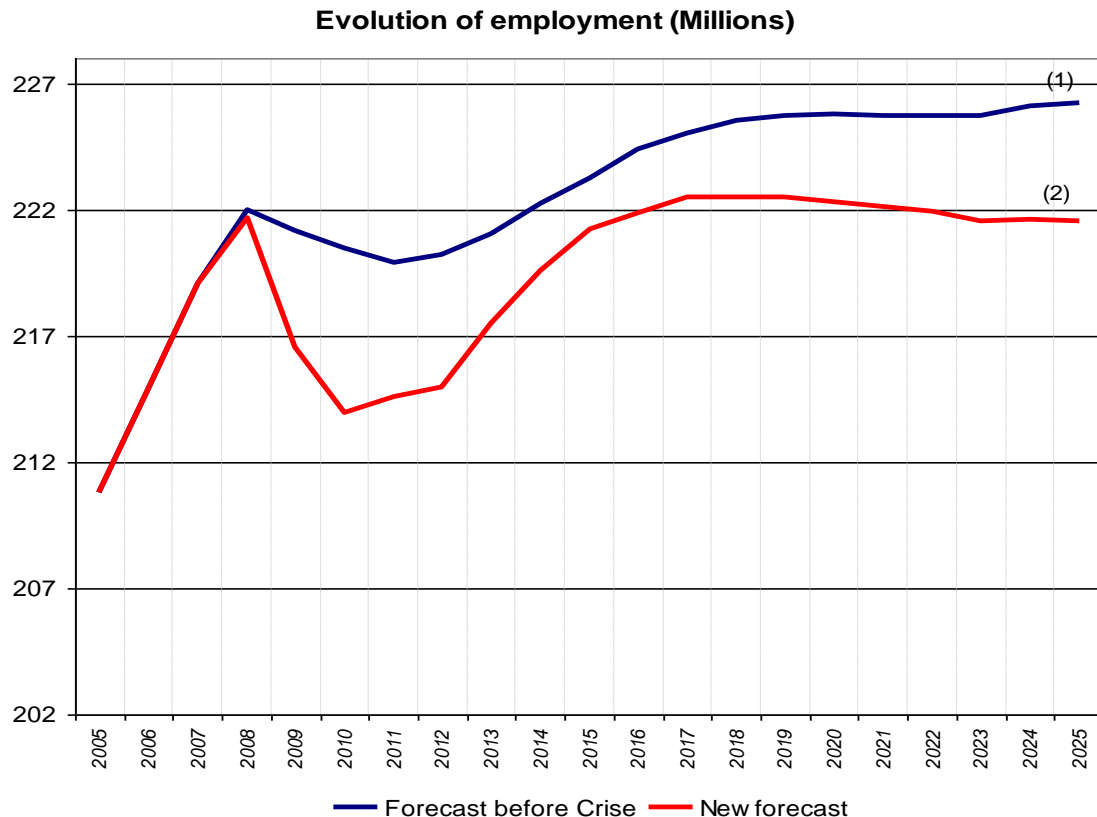
- ❖ Evolution of GDP in pre- and post-crisis forecast scenarios



# *1- R&D policies are useful during crisis*

## □ 1.2- The durability of crisis

### ❖ Evolution of employment in pre- and post-crisis forecast scenarios



# *1- R&D policies are useful during crisis*

## □ **1.2- The durability of crisis**

- ❖ In the new forecast, NEMESIS is constrained in 2008, 2009 and 2010 to reproduce DG ECFIN GDP prospects
- ❖ After 2010, NEMESIS shows that the effects of crisis are durable : the GDP gap (8.7% in 2010) increases up to 2025
- ❖ Evolution of employment is different than for GDP, employment gap is half filled in 2015
- ❖ The lowering of wages during crisis allows a growth richer in employment during economic recovery



# ***1- R&D policies are useful during crisis***

## **□ 1.3- The research for economic recovery**

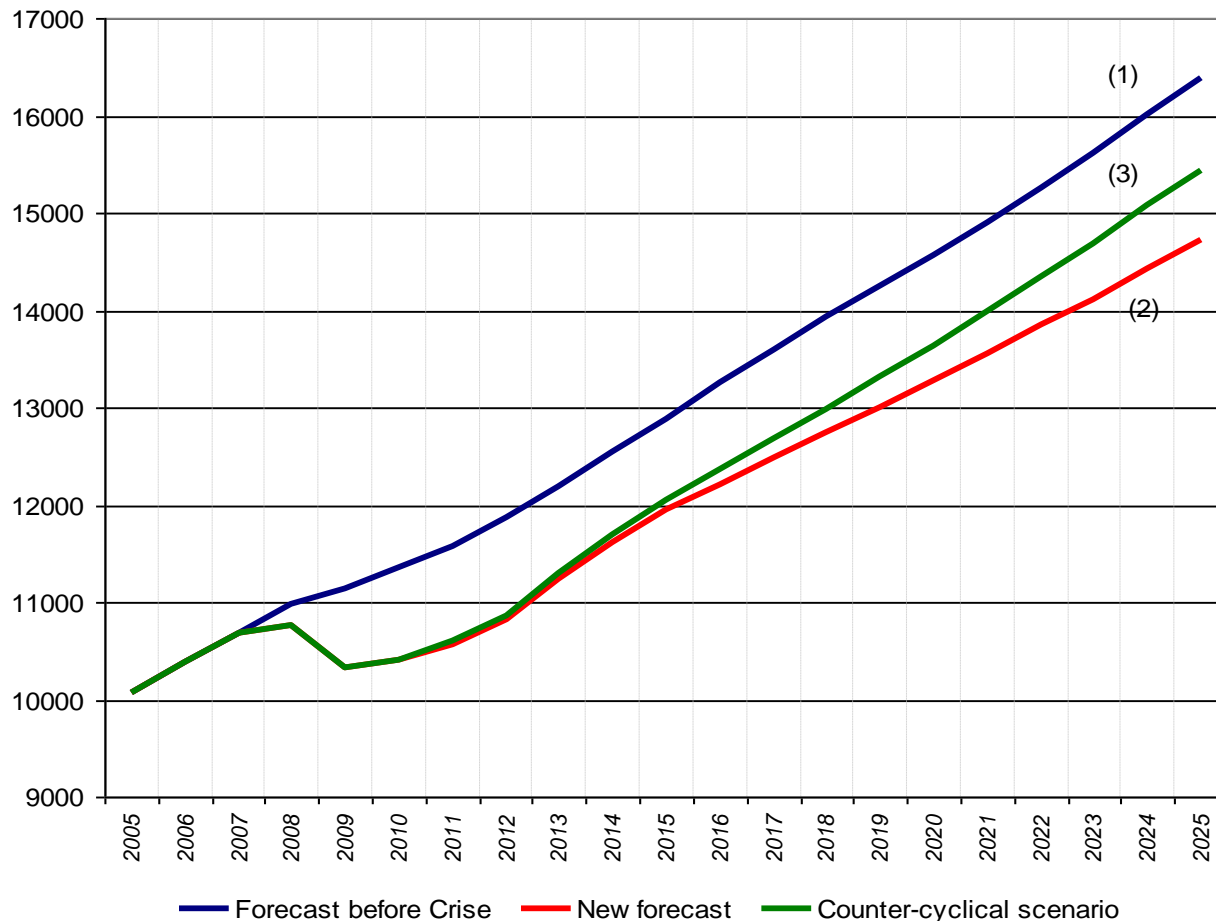
### ***❖ Post-Crisis scenario with countercyclical R&D***

- ✓ Increase of R&D effort up to 3% GDP in 2020**
- ✓ Additional R&D financed mainly by private sector such as to reach 2% private financing in 2020**

# 1- R&D policies are useful during crisis

## 1.3- The research for economic recovery

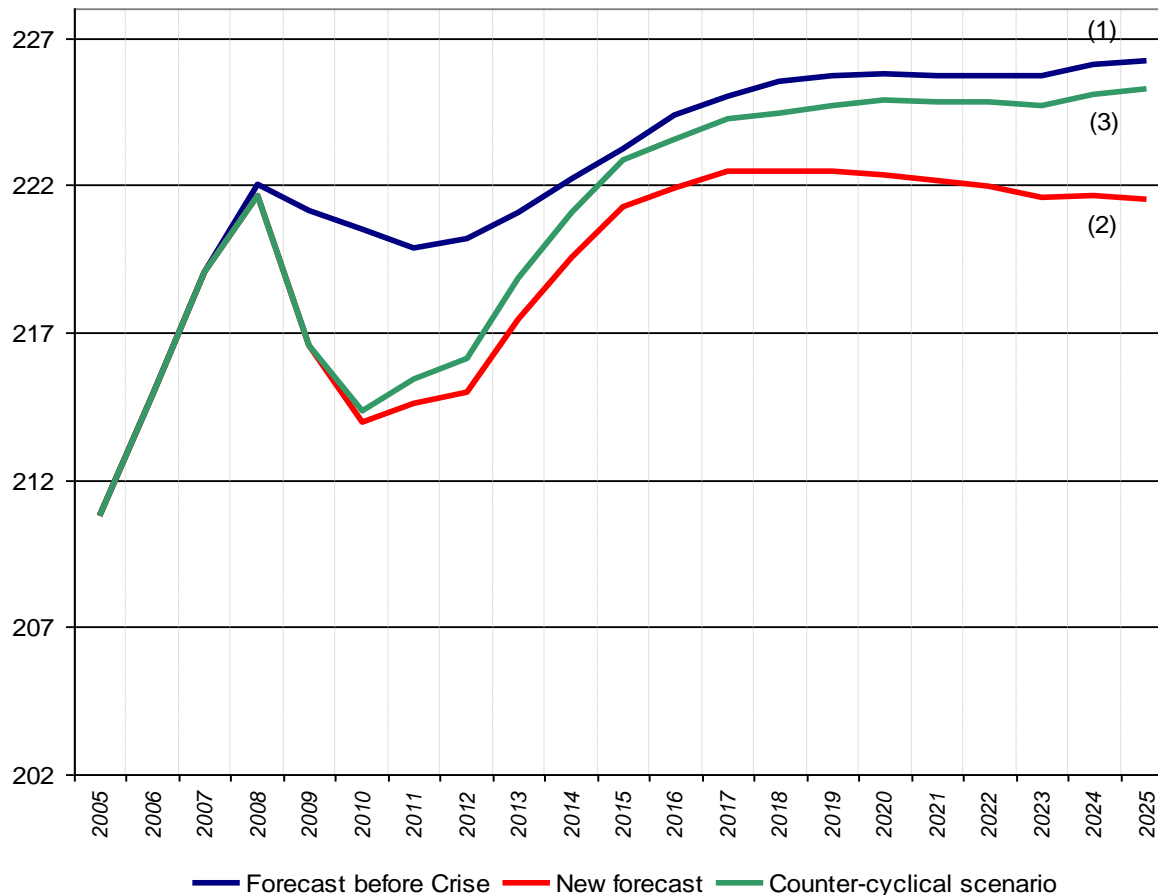
Evolution of GDP (Billion € 2000)



# 1- R&D policies are useful during crisis

## 1.3- The research for economic recovery

Evolution of employment (Millions)



# ***1-R&D policies are useful during crisis***

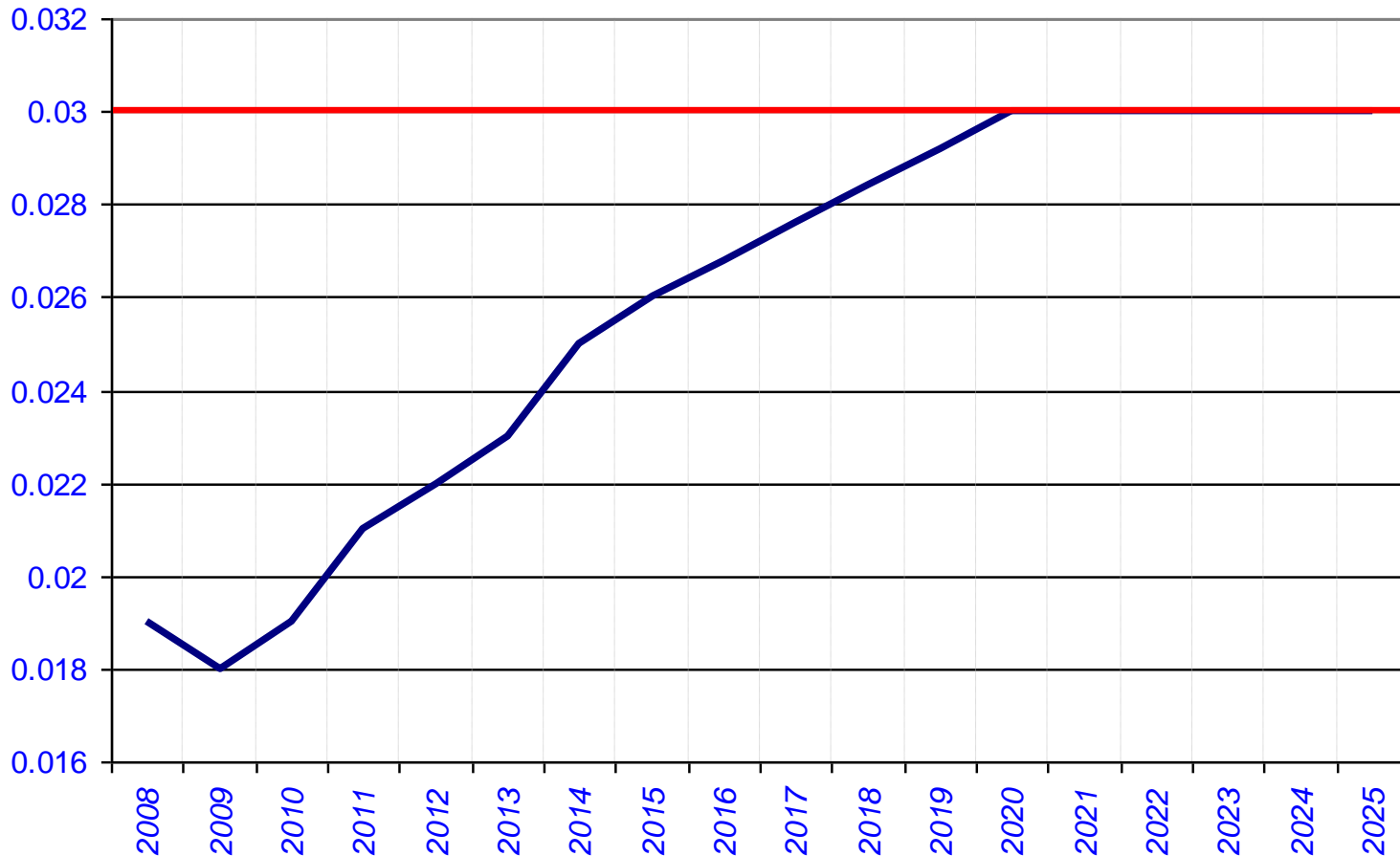
- 1.3- the research for economic recovery
  - ❖ 43% of GDP gap is filled in 2025
  - ❖ But at this date, GDP growth in the new scenario is faster than in the before crisis one, allowing a convergence in a remote future
  - ❖ The employment Gap is almost filled in 2015
  - ❖ Better result of scenario (3) on employment for the same reason: the fall in wages due to crisis allow a growth richest in employment

## ***2- A new attempt for the 3% Barcelona objective***

- ❑ Former assessment in 2002 for EU15**
- ❑ Extension to new member States**
- ❑ New agenda**
- ❑ Crisis**

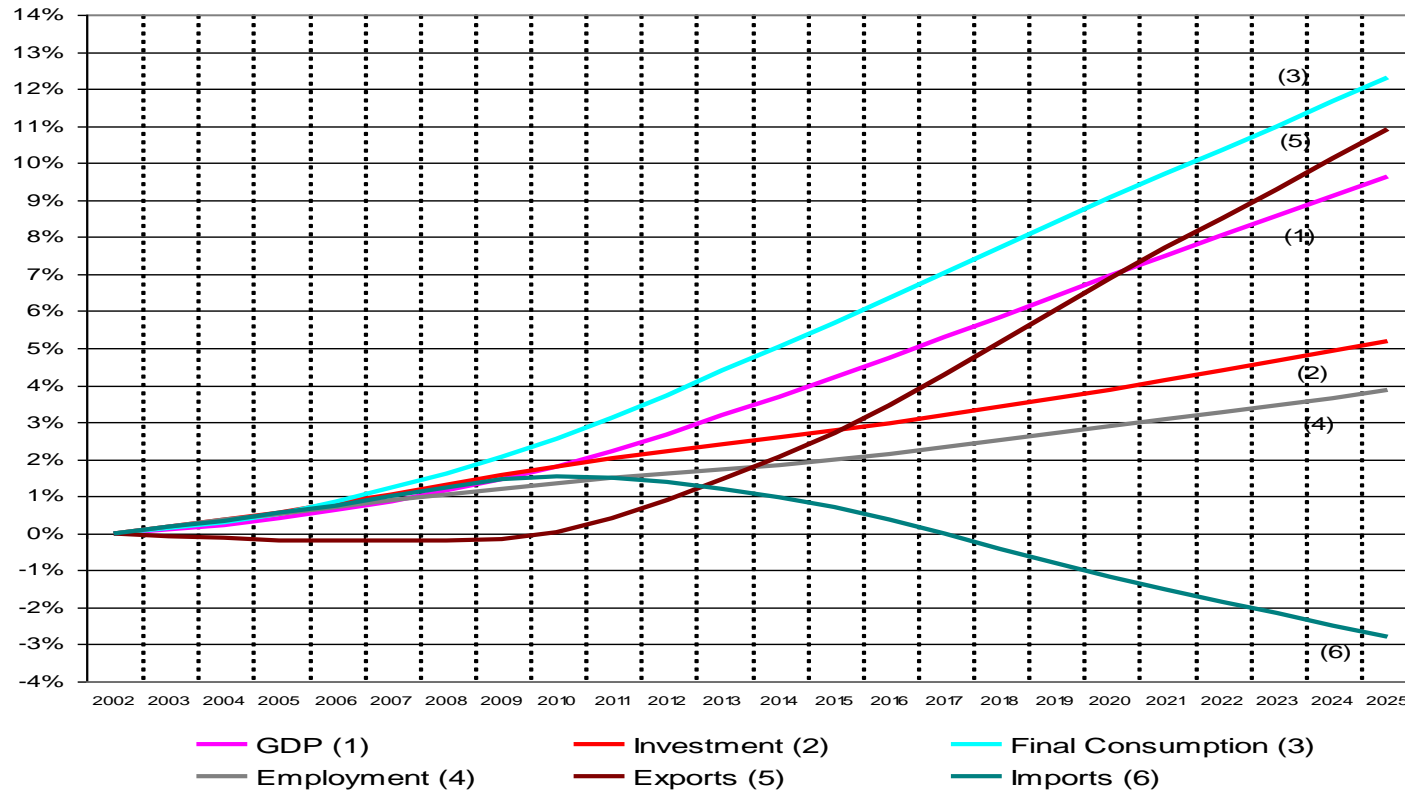
# 2- A new attempt for the 3% Barcelona objective

RD effort in new Barcelona 3% scenario



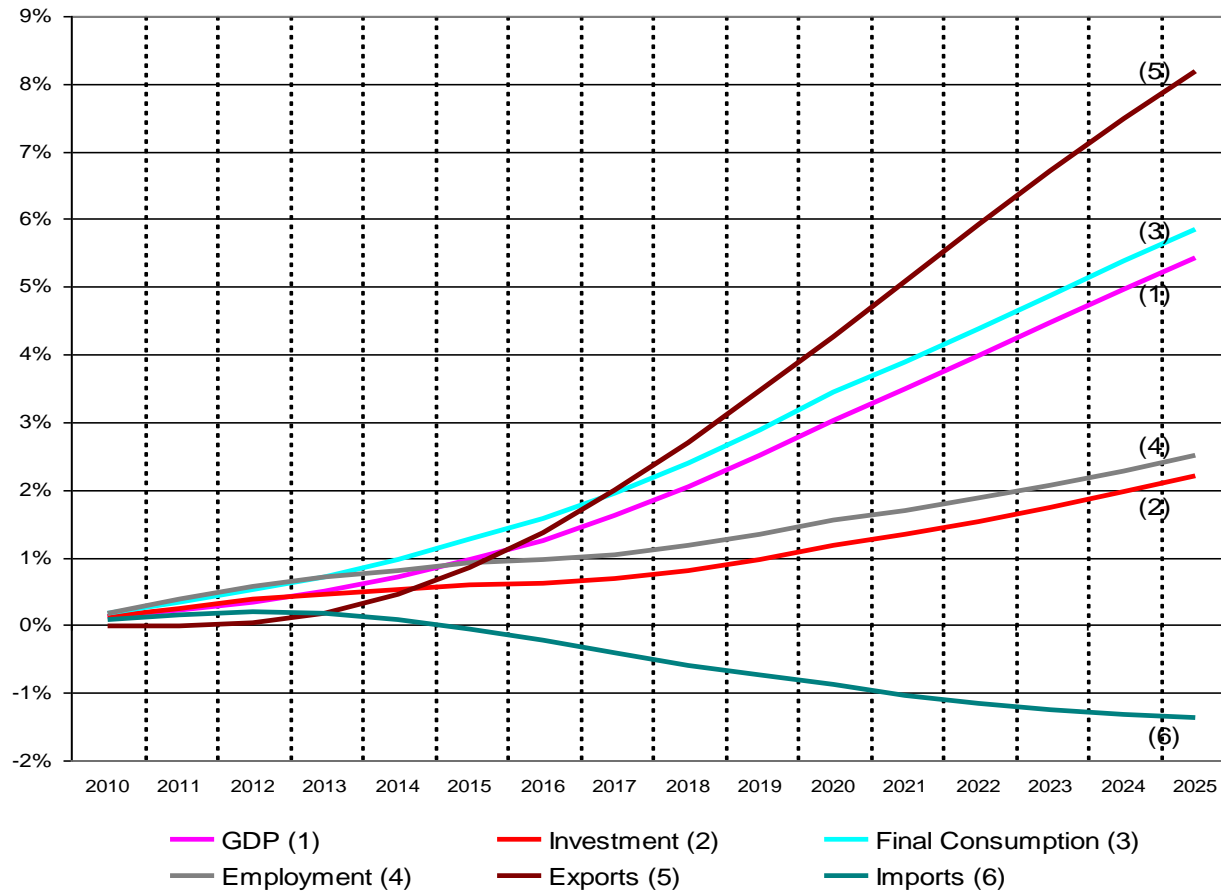
# 2- A new scenario for Barcelona 3% objective

## GDP and its counterparts in the 2002 assessment



# 2- A new scenario for Barcelona 3% objective

## GDP and its counterparts in the new Barcelona scenario for EU27 for EU27





## ***2- A new attempt for the 3% Barcelona objective***

- The new assessment shows less deficits in the first phase due to low inflationary pressure in reason of:**
  - ❖ High unemployment rate
  - ❖ Low production capacity utilisation rate
- In the long term the major driver for GDP growth are first exportations and second final consumption**
  - ❖ It was the reverse in the former assessment
  - ❖ The lowering of wages during crisis stimulates external competitiveness but hampers final consumption

# ***3-Increasing R&D effort : doubling the FP8***

## **□ 3.1-Characteristics of the FP:**

### ***❖ Small share of R&D efforts of the European countries:***

- ✓ 0.054% of EU GDP in 2009
- ✓ Up to potentially 0.076% in 2013 (according to the F.P. 7 financial scheme)
- ✓ 1.9% for total R&D effort

### ***❖ But generates strong incentives (crowding-in effects :Network effects, Best practices transfer, high productivity...)***

# ***3-Increasing R&D effort : doubling the FP8***

## **□ 3.2-Consequences:**

### **❖ *On R&D efforts***

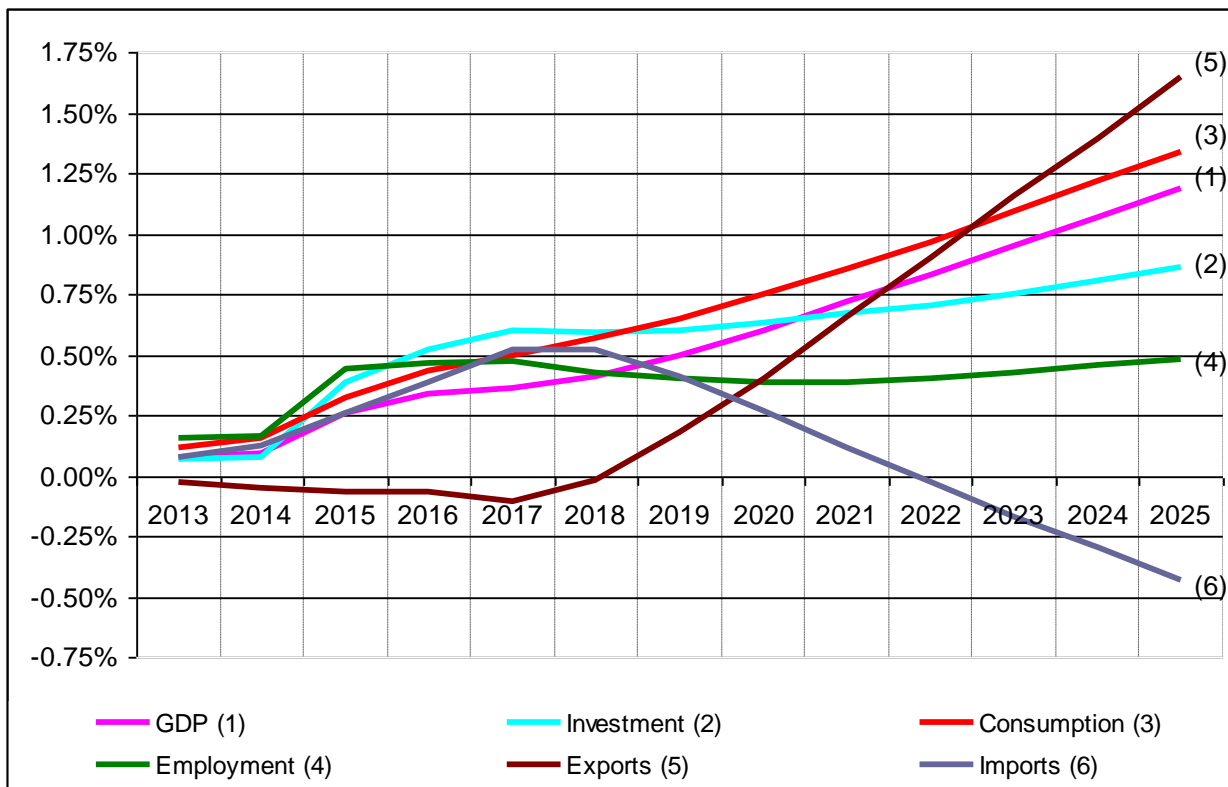
- ✓ In 2020, doubling the fundings yields to a GDP share of 0.15% for the F.P
- ✓ As a consequence, the total R&D effort raises by 0.18 % of GDP.

### **❖ *On growth and employment when financed by taxation***

- ✓ The increase in R&D effort generates a 1.2 % higher level of GDP in 2025
- ✓ This rise in the GDP growth is associated with the creation of 1.1 million jobs (0.5% ) at the 2025 horizon.

# 3- Increasing R&D effort : doubling the FP8

## 3.3-Economic consequences



# *Conclusion and perspectives*

- ❑ **Many results at a detailed level for countries and sectors heterogenous regarding R&D efforts and knowledge spillover must be exploited**
- ❑ **Use of New data bases (EU KLEMS, WIOD)**
- ❑ **Deepening of externalities and knowledge spillovers**
  - ❖ General purpose technologies (ICT, green technologies)
  - ❖ International spillovers
- ❑ **New simulations**