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**COINVEST:**  
**Competitiveness, Innovation and Intangible Investment in Europe**

# French Intangible Capital: Dynamic Evaluation and the Contribution to Growth

Vincent Delbecque   Sylvie Le Laidier  
Jacques Mairesse   Laurence Nayman

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**Website :** [www.coinvest.org.uk](http://www.coinvest.org.uk)

**Email:** [coinvest@qmul.ac.uk](mailto:coinvest@qmul.ac.uk)



# Where do we stand?

- Data collection
- Refining definitions and methods
- Cross-section estimates
- Time-series data
- Growth accounting exercise
- Dissemination of work
  - Encouraging comments
  - Demand for comparison between countries

# Sources (1)

- Data are provided by the INSEE
  - Input/output tables (national accounts)
  - Supply and Use tables (national accounts)
  - Employment survey
  - Tax forms
- Other sources
  - IREP
  - France Pub

# Sources (2)

## Items recorded as GFCF:

- *Computer software*
- *Copyright and licence costs*
- *Mineral exploration*
- *Arch. and engineering design*

## Items indistinctly recorded:

- *Training*
- *Advertising (own-account)*
- *Organisation structure (own-account)*
- *Financial innovation*

## Items recorded as distinct IC:

- *Scientific and non-scientific R&D*
- *Computer databases*
- *Advertising and market research*
- *Organisation structure (purchased)*

# Methods (1)

- Items recorded as distinct IC:

$$\begin{aligned} & \text{Total IC} \\ & \text{Minus} \\ & \text{Non-market sector} \\ & \text{Minus} \\ & \text{Non-asset expenses} \\ & = \\ & \text{GFCF} \end{aligned}$$

- Employment based evaluation

$$\begin{aligned} & \text{Number of employees (in} \\ & \text{NACE and occupation of interest)} \\ & \quad \times \\ & \text{Average net wage (in NACE} \\ & \text{and occupation of interest)} \\ & \quad \times \\ & \text{Average social contribution} \\ & \text{rate} \\ & = \\ & \text{GFCF} \end{aligned}$$

# Methods (2)

	HMA (2008)		INSEE	
	Source	Method	Source	Method
R&D	EUROSTAT	Exclude R&D from software industry and non-market sector	I/O tables	Exclude intra-industry consumption. Different assumptions on <i>Experimental development</i>
Copyright and licence costs	Screen Digest	Proxy based on the cost of motion picture development	Table of final Use	Own-work capitalised by firms in entertainment industry
Financial Innovation	EUKLEMS	20% of IC purchased by financial firms	Employment survey	Based on Hunt (2008) Employment cost of “research occupations” in the financial industry
Human Capital	CVTS, LCS, EUKLEMS	Include apprenticeship	Tax forms	Include formal internal and external training, provided by the firm or training centres
Own-account advertising			Employment survey	Retains advertising and communication occupations outside the advertising industry.

# Methods (3)

- Detailed evaluation of financial innovation:

Activities retained:

- *NACE 65*
- *NACE 67*
- *We exclude NACE 66*

Occupations retained (PCS):

- *Economic, financial and commercial managers*
- *Managers in financial markets*
- *Managers in insurance*

Average social contribution rate:

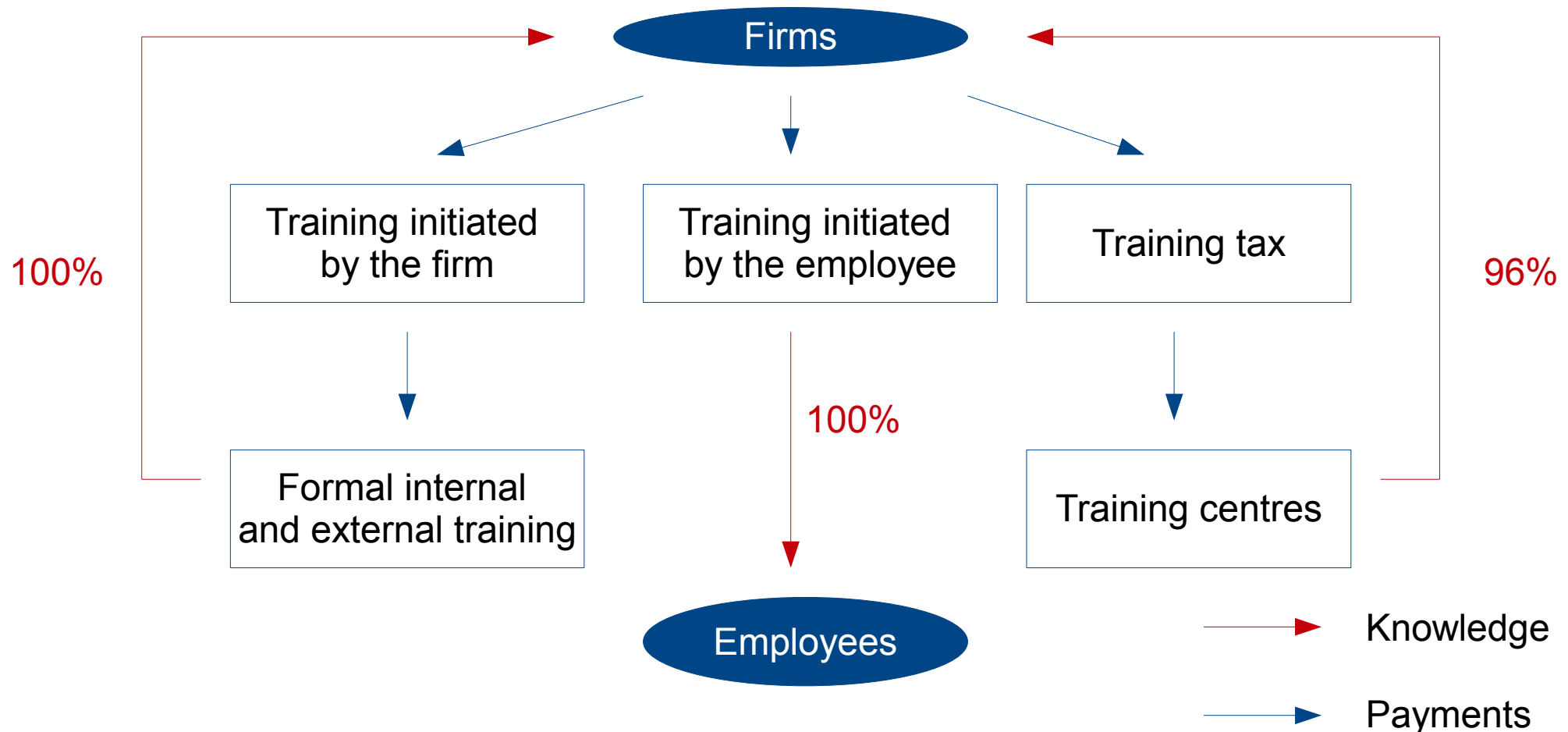
- *Total employer and employee social contribution divided by*
- *Total gross wage bill*

- Results in 2004

- 50200 employees in 2004
- Average net wage = 39300€
- Average social contribution rate = 33%

# Methods (4)

- Financing training scheme



# Definitions

- Different assumptions lead to different estimates

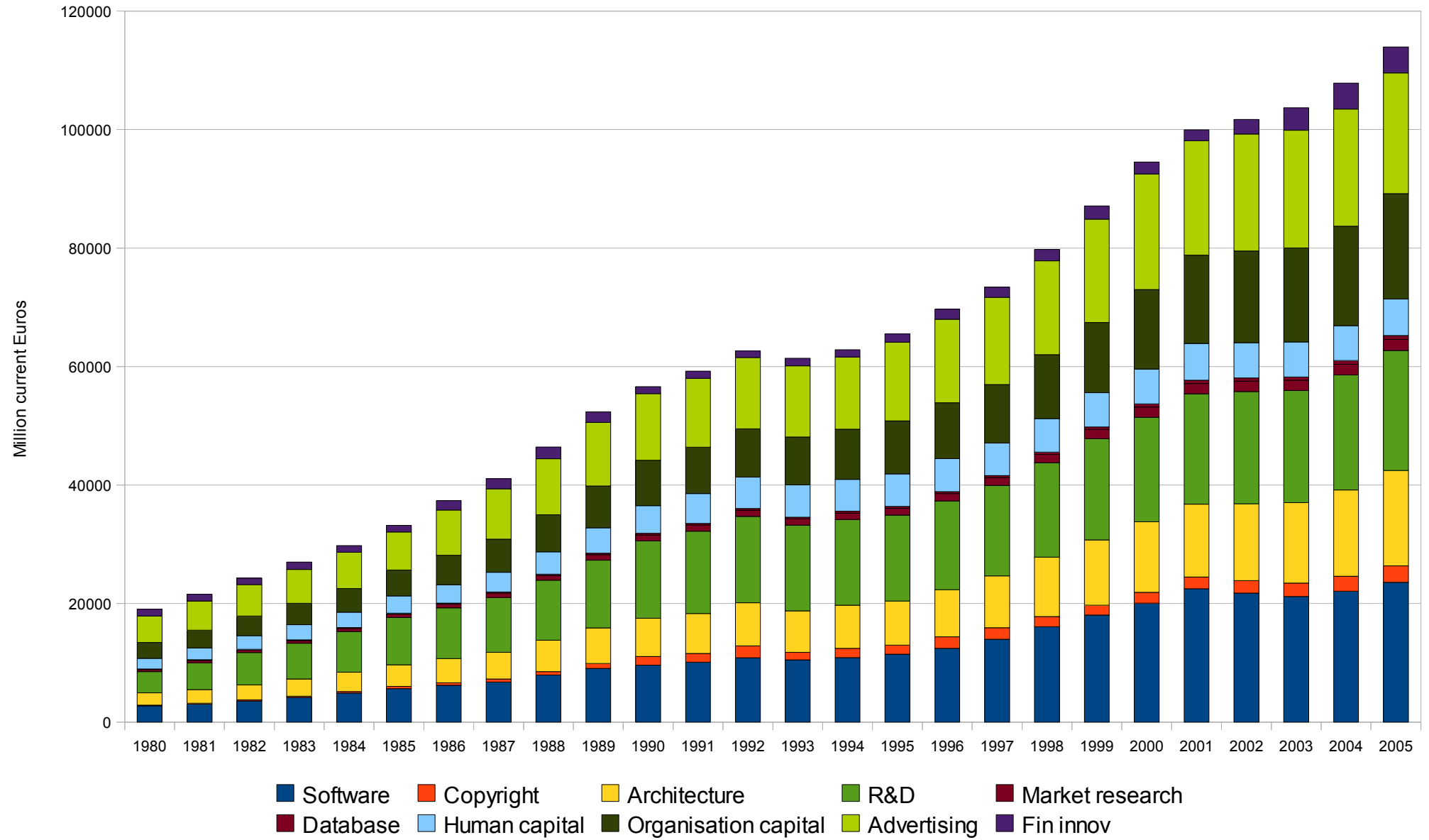
	Assumption	Min	Max
R&D	Should we include experimental development?	12 970	19 426
Advertising	Does spending in short term promotion increase brand-value?	16 651	20 019
Human capital	Does apprenticeship build firm human capital?	9 976	20 119

# Dynamics (1)

- GFCF and IC time series items are evaluated using the same method back to 1999
  - Highly detailed data in the national accounts (4-digit NACE)
- From 1980 to 1999
  - Using constant share in super-category
- Constraint on employment data
  - Changes in employment classification
  - Some categories are little represented
  - Volatile over time

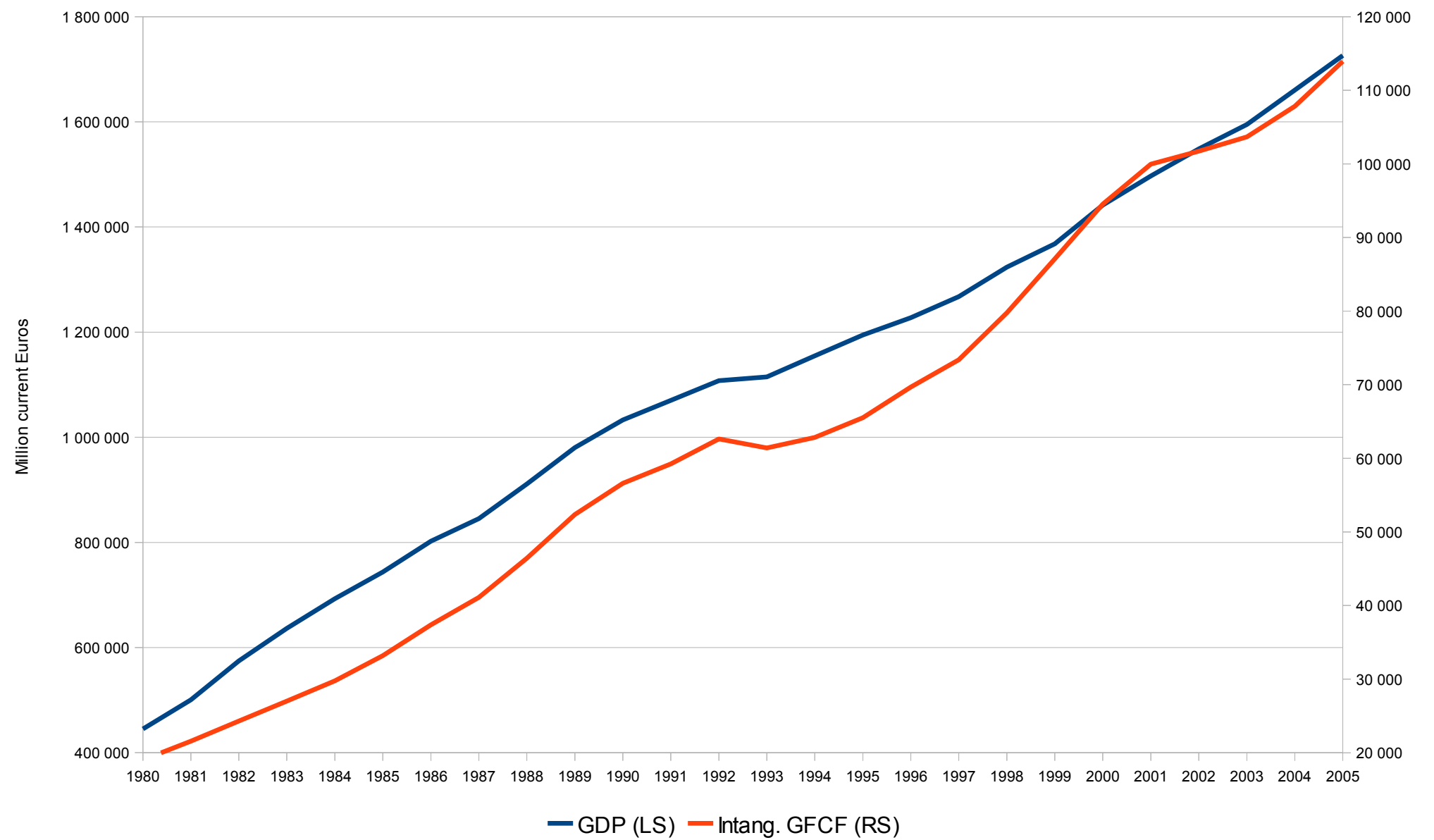
# Dynamics (2)

## Market sector intangible GFCF distribution



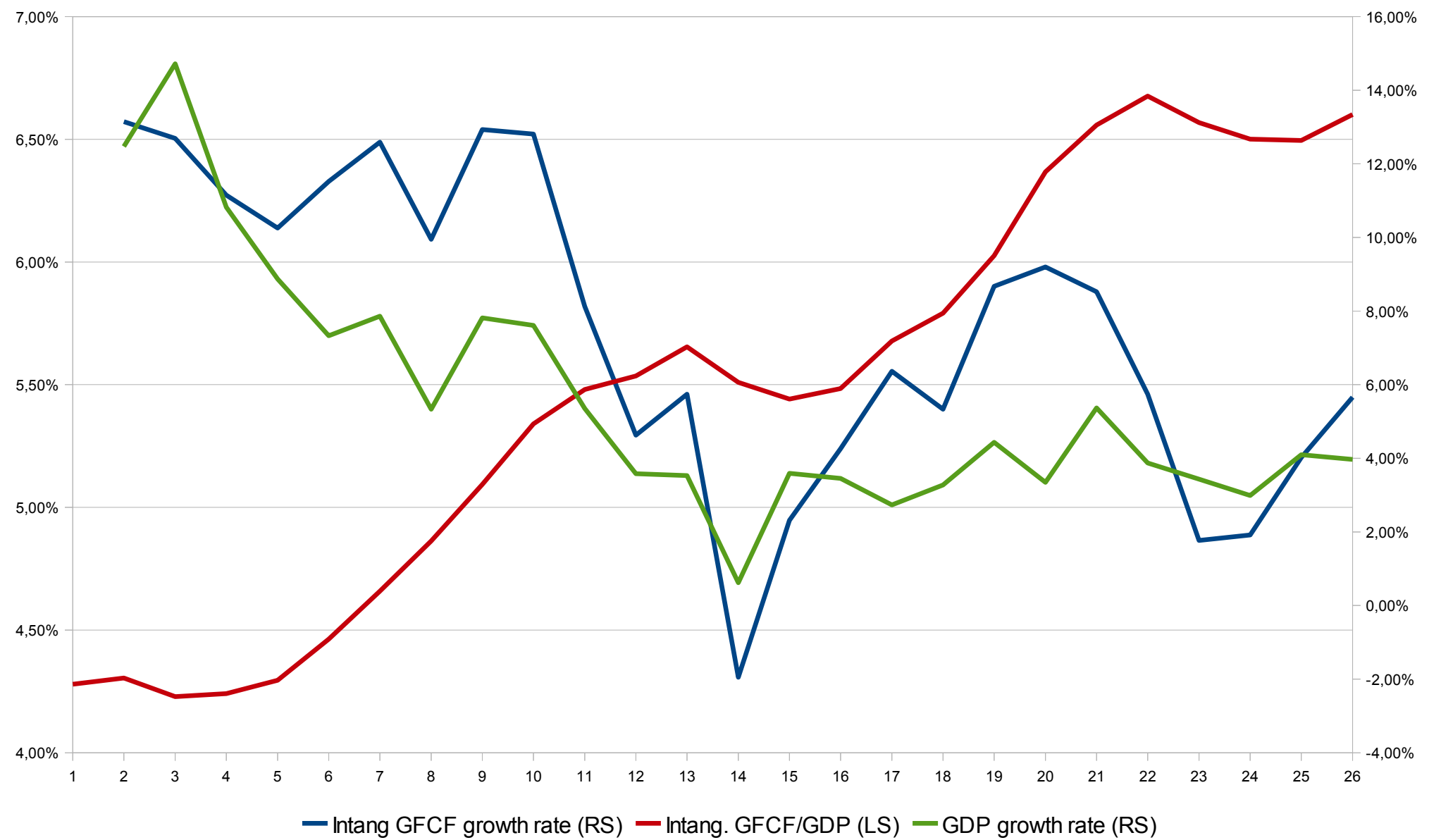
# Dynamics (3)

## GDP and market sector intangible GFCF



# Dynamics (4)

## GDP and Intangible GFCF



# Growth accounting (1)

- Assumptions
  - This the first attempt
  - Based on EUKLEMS output data
  - Depreciation rates:

	Rates
Software	31.5%
Databases	31.5%
R&D	20%
Copyrights	20%
Architecture	20%
Mineral expl.	20%
Advertising	60%
Market res.	60%
Human cap.	40%
Financial inn.	20%
Organis. cap.	40%

# Growth accounting (2)

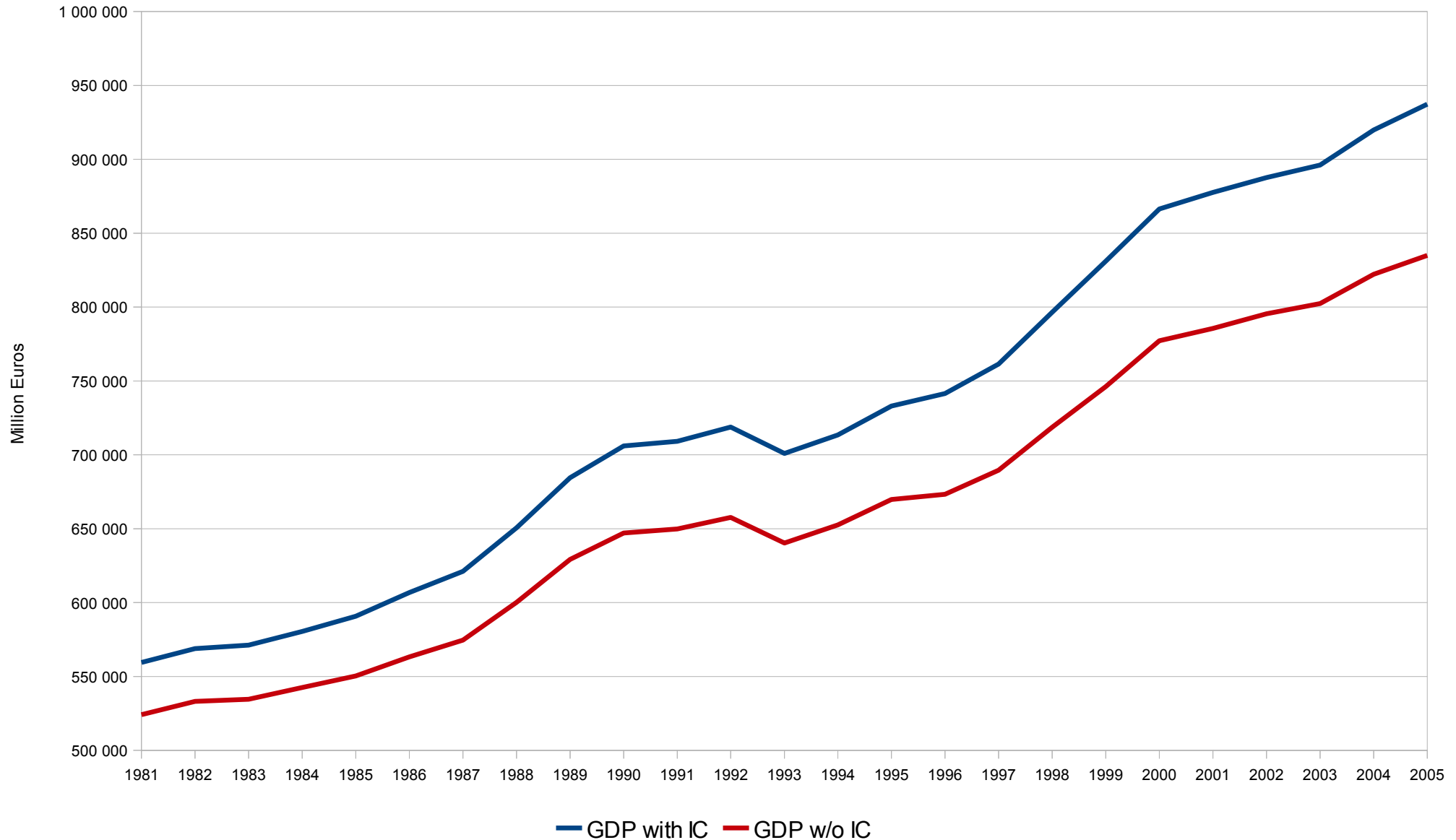
- The impact of Intangible Capital on labour productivity annual growth rates

	Without IC	With IC
1995-2003	2.11%	2.37%
1995-2000	2.48%	2.86%
2000-2004	1.35%	1.44%



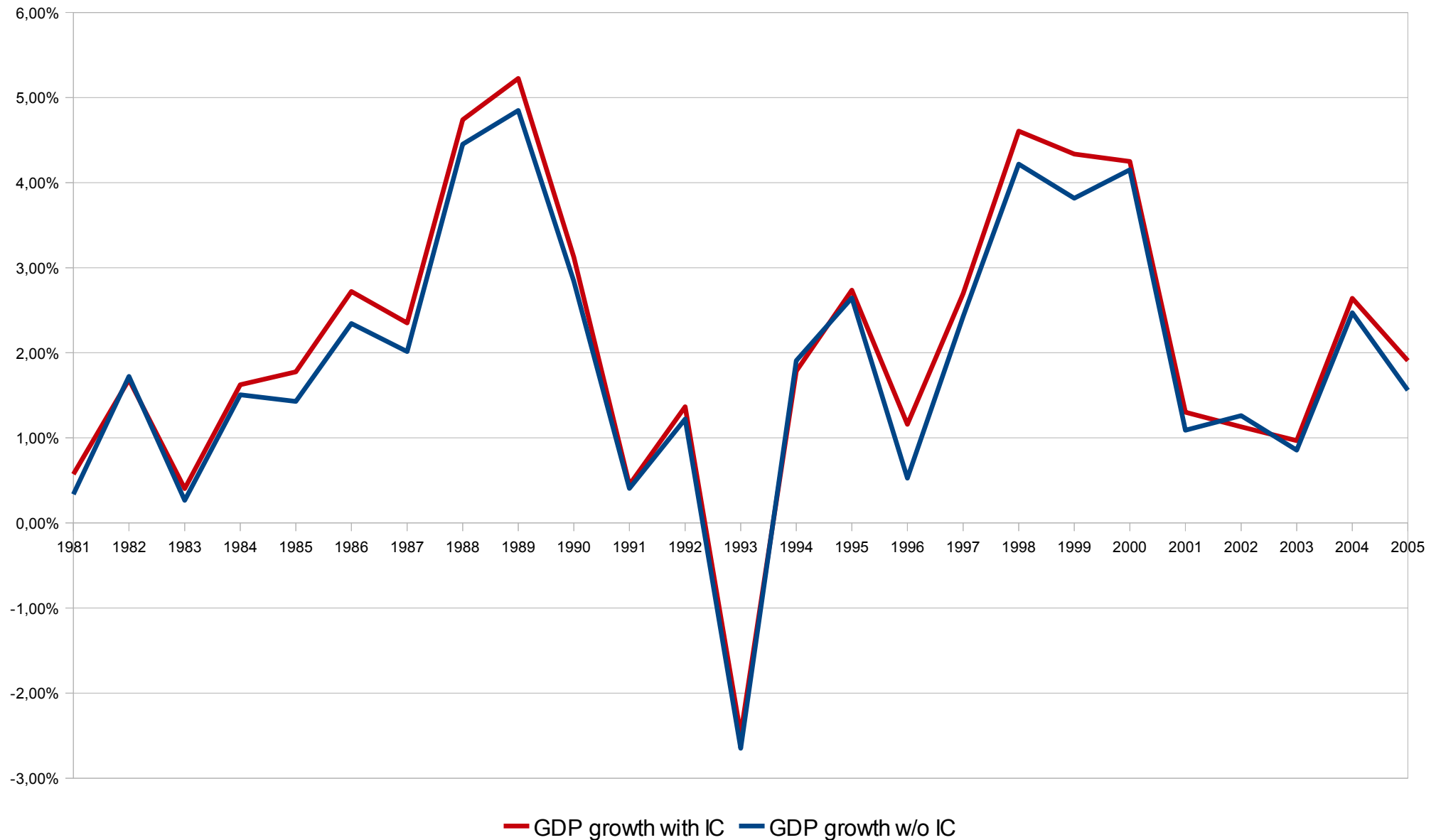
# Growth accounting (4)

## Market sector real GDP with and without Intangible Capital



# Growth accounting (5)

## Market sector real GDP growth with and without IC



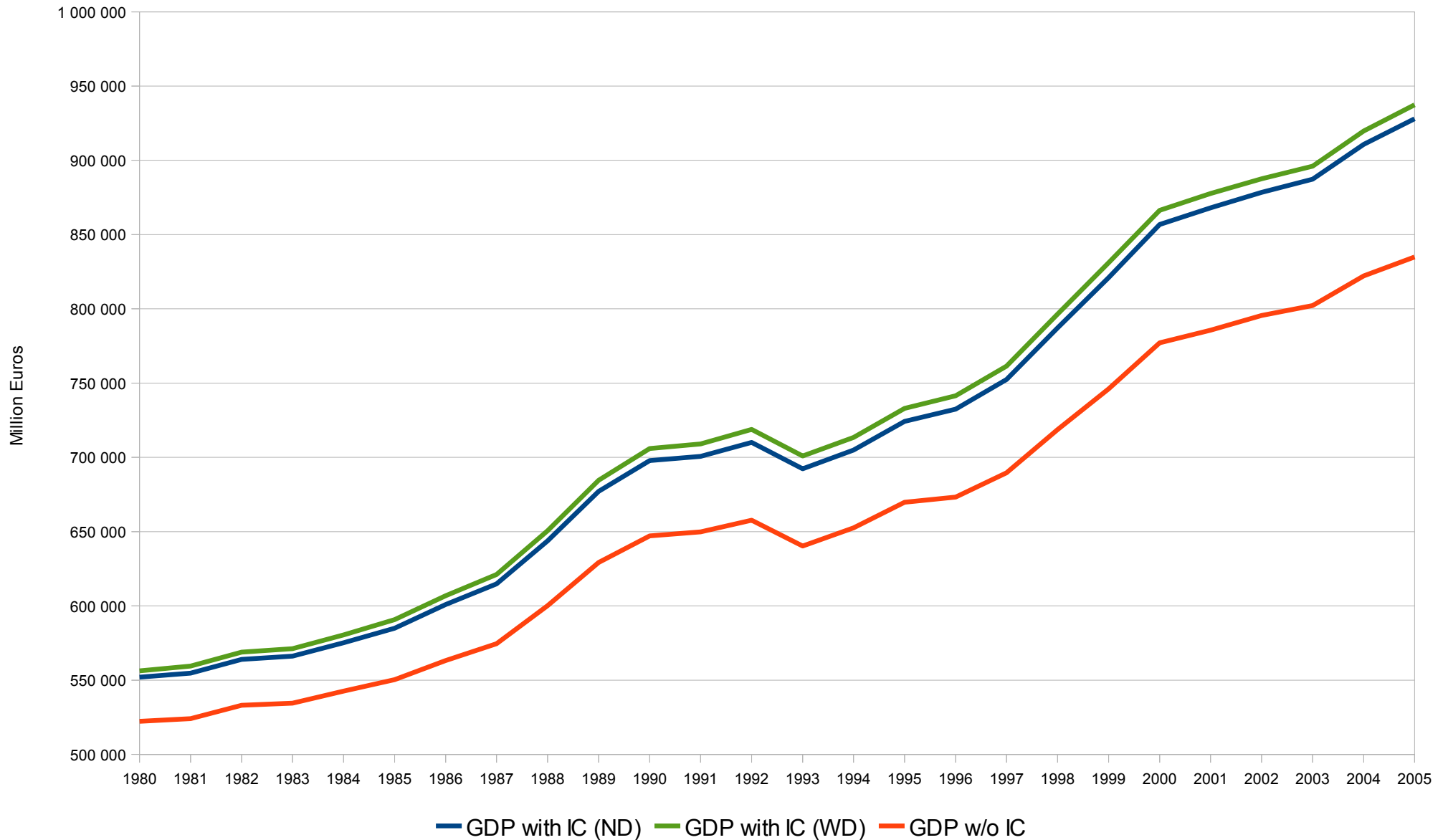
# Sensitivity tests (1)

- What impact of different definition assumptions?
  - Include/exclude all experimental development in R&D
  - Include/exclude apprenticeship from Human Capital
  - Sizeable impact on GFCF: from 6% to 6.6% of GDP in 2005. (+10bn €)
  - Little impact in the dynamic framework

	Without IC	With IC (ND)	With IC (WD)
1995-2003	2.11%	2.40%	2.37%

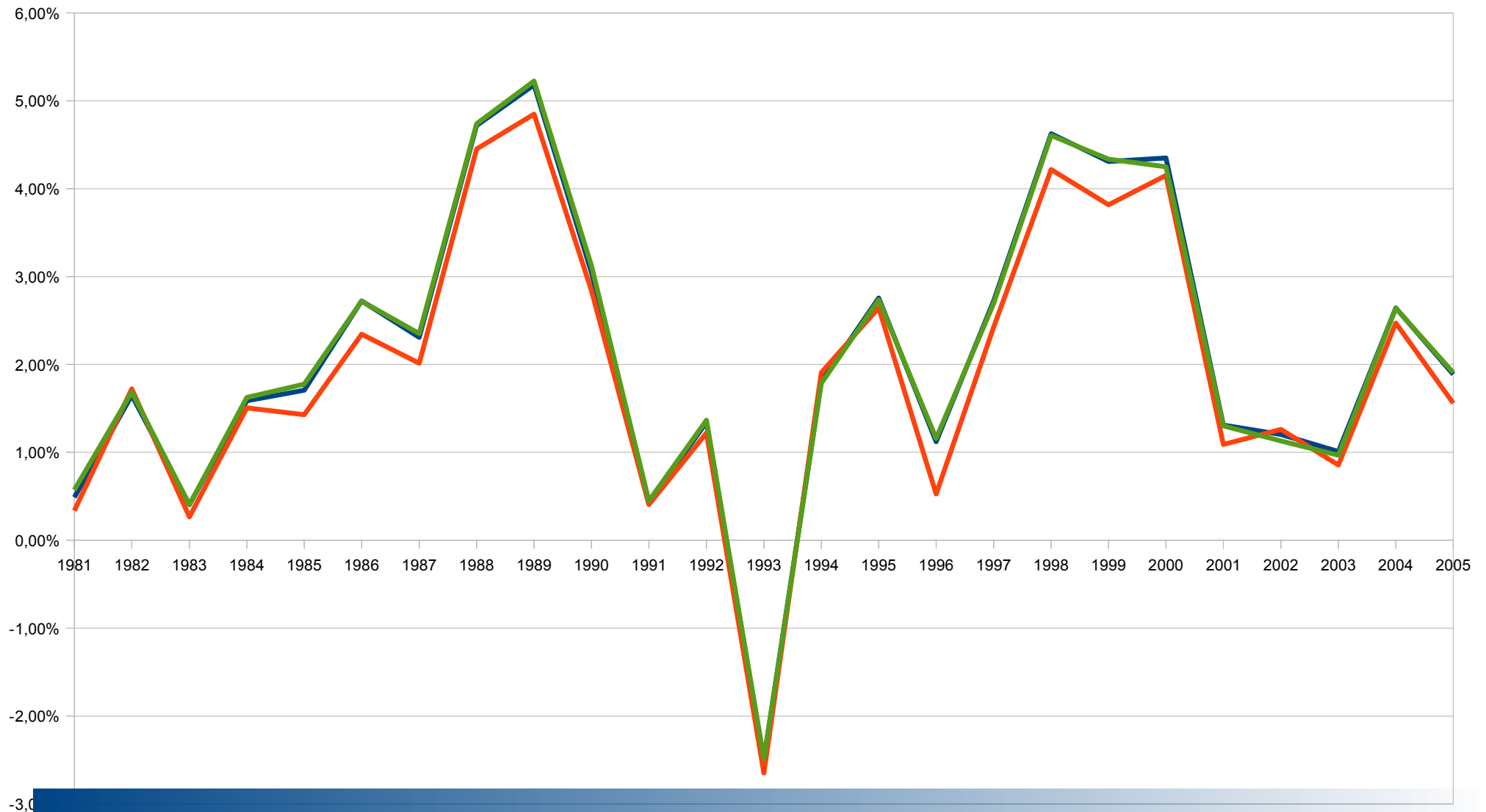
# Sensitivity tests (2)

## Market sector real GDP with and without IC



# Sensitivity tests (3)

## Market sector real GDP growth With and without IC

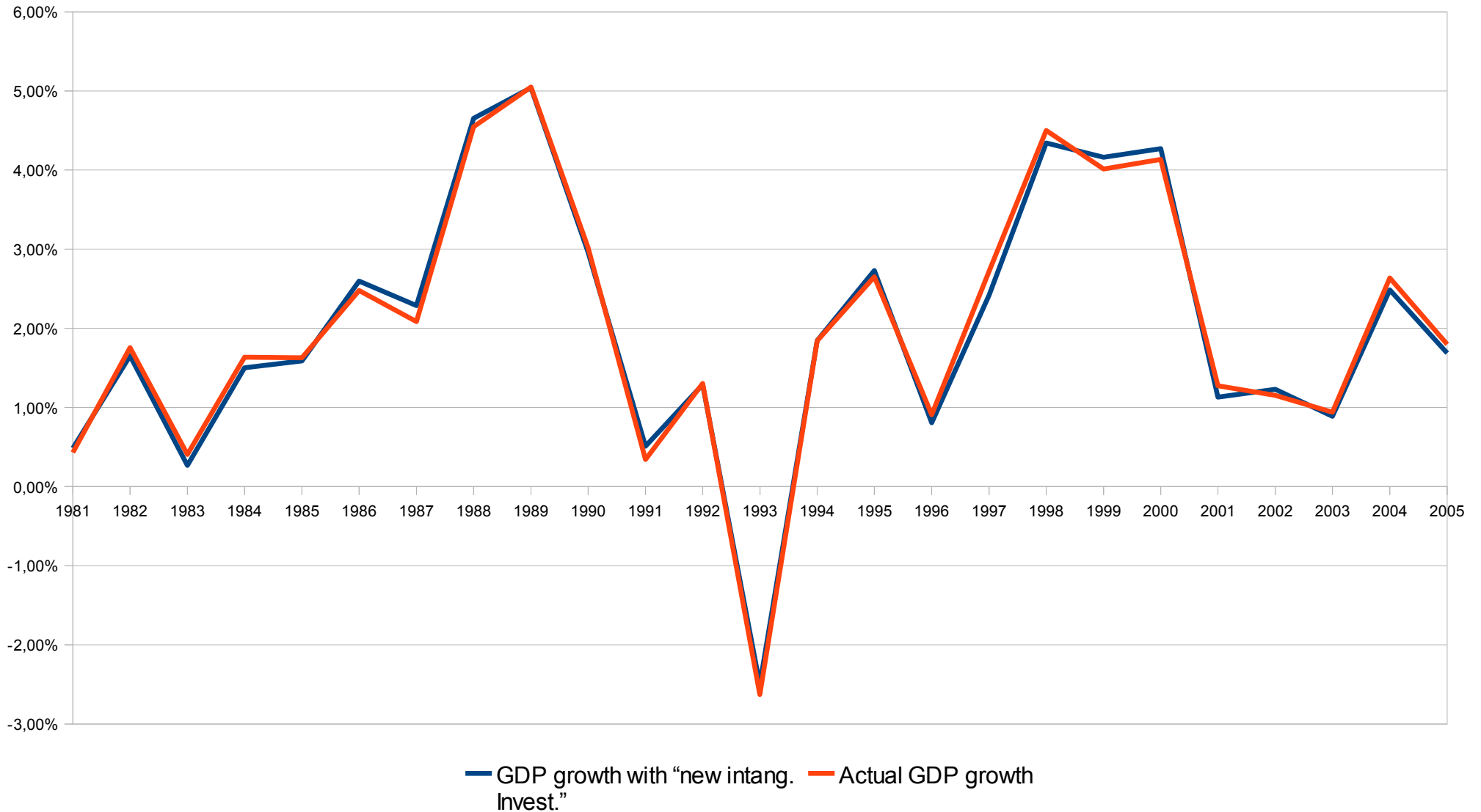


# Actual French case (1)

- The French national accounts already include
  - Software
  - Copyright and licence costs
  - Mineral exploration
  - Architecture and engineering design
- What is the real effect of “new intangible investments” on growth?

# Actual French case (2)

## Actual market sector real GDP growth Comparison with "new intangibles"



# Next step – Micro work

- Deepen financial innovation issues
  - Data availability?
  - Interview with banks?
  - Data covering “Research tax credit”?
- Deepen organisation capital issues
  - Data available
  - “REPONSE” (equivalent to UK Workplace Industrial Relations Survey)
  - “Changement organisationel”