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Intellectual Capital for
Communities
In the Knowledge Economy

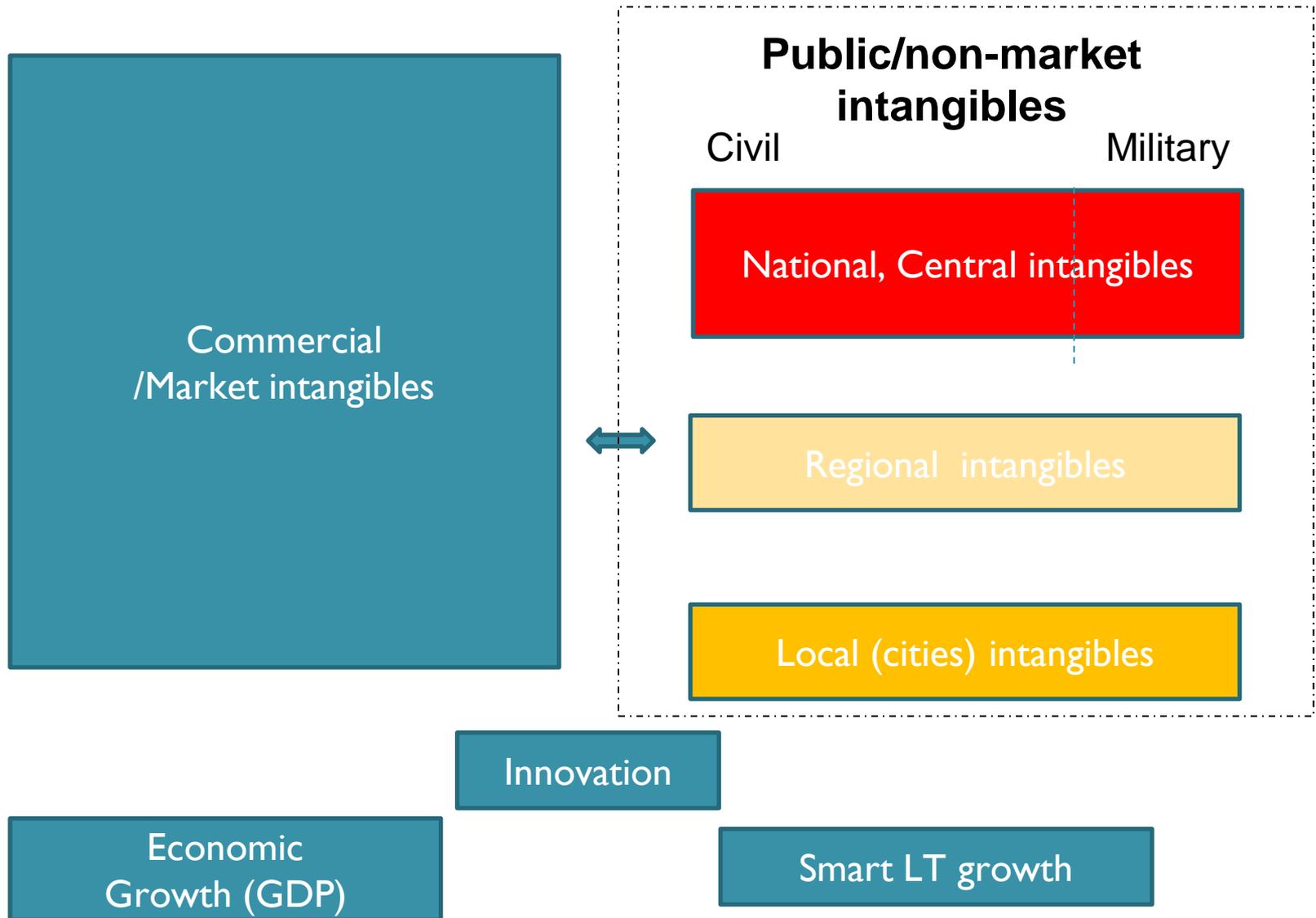
Intellectual Capital for Communities in the Knowledge Economy Emerging Worlds, Growing Intangibles

Measuring intangibles in the French public sector

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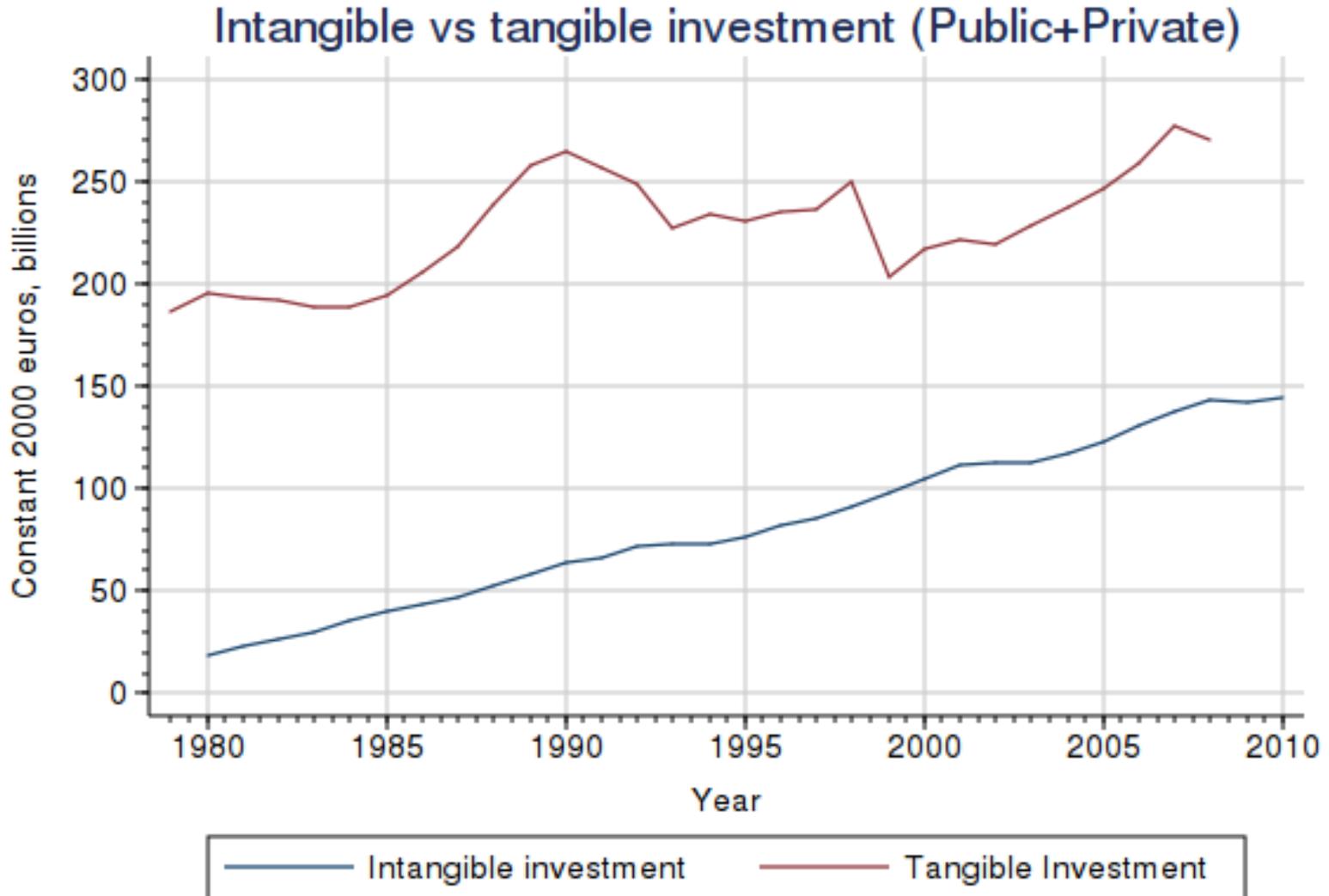
Defining public sector intangibles



Current situation in France

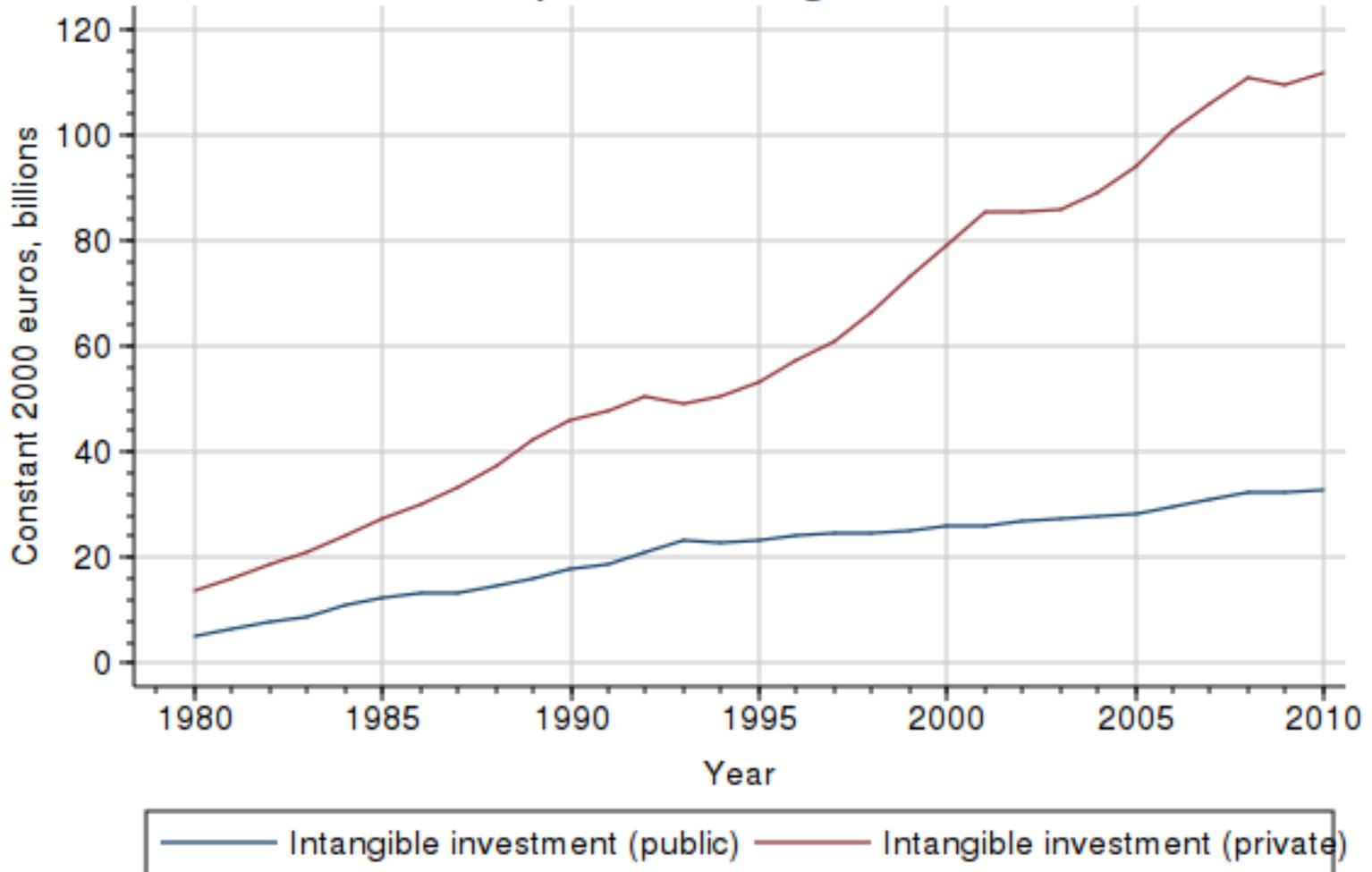
- **Analysis of the following intangible investments**
 - **Advertising**
 - **Artistic Originals**
 - **Databases**
 - **Design**
 - **Marketing**
 - **Organizational Capital**
 - **R&D**
 - **Software**
 - **Training**

Current situation in France



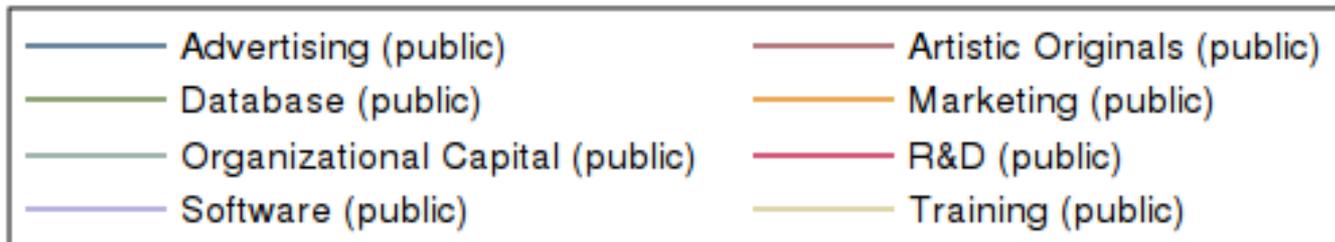
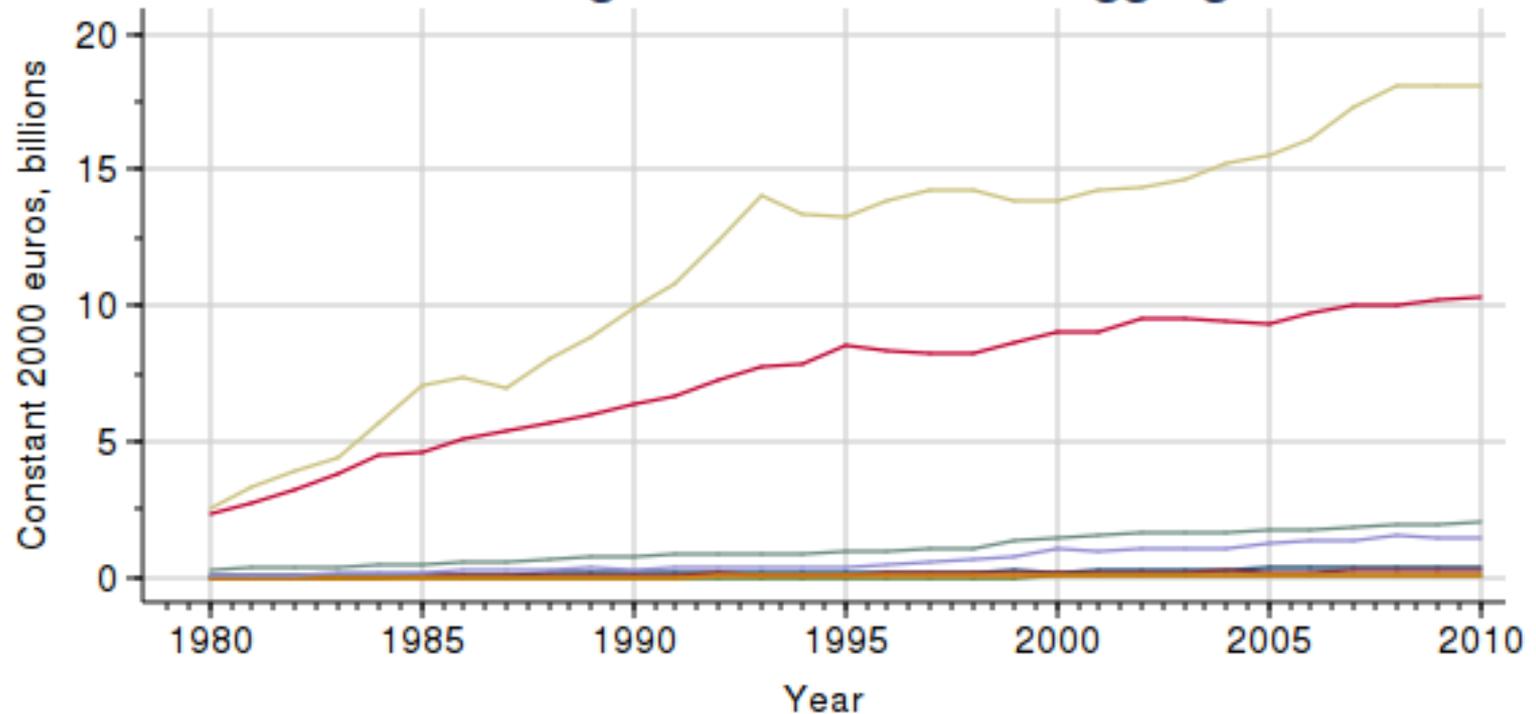
Current situation in France

Public vs private intangible investment



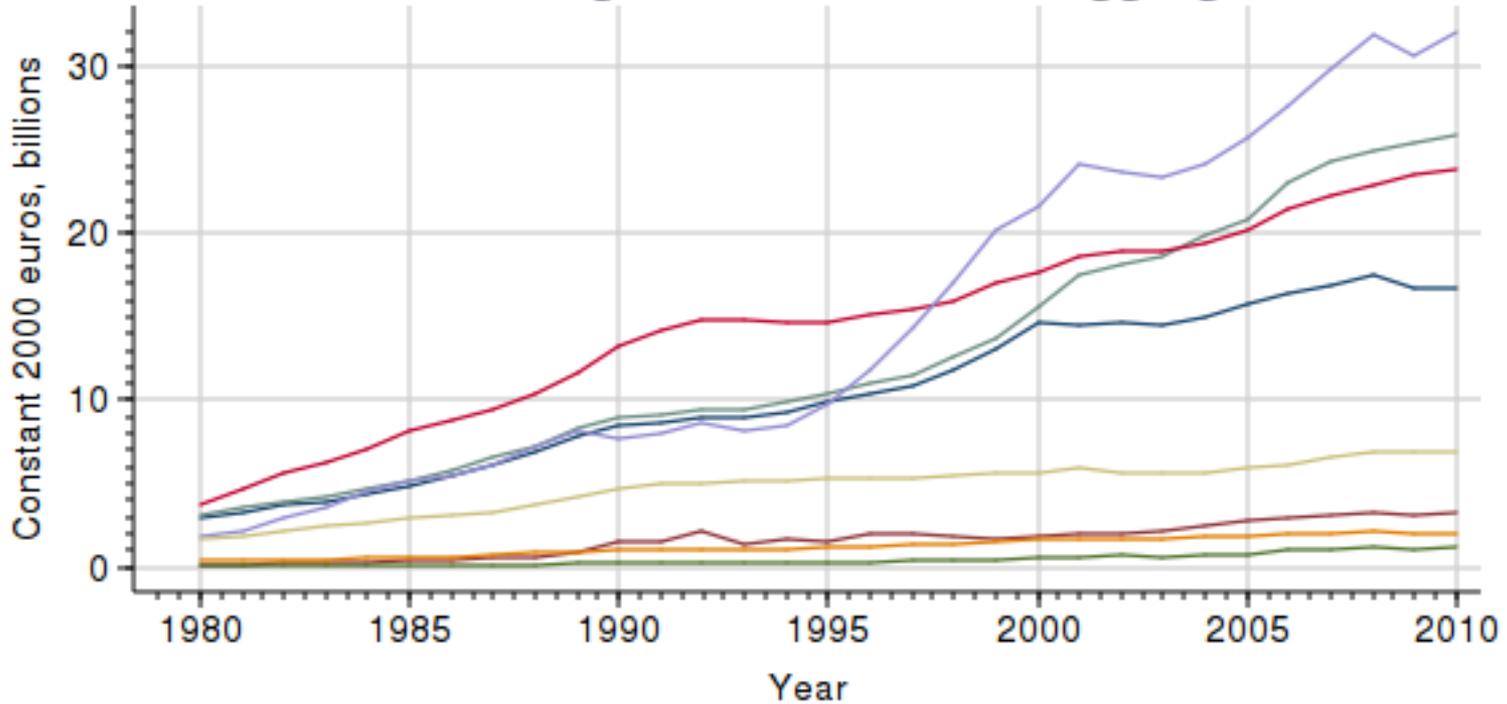
Current situation in France

Public intangible investment disaggregated

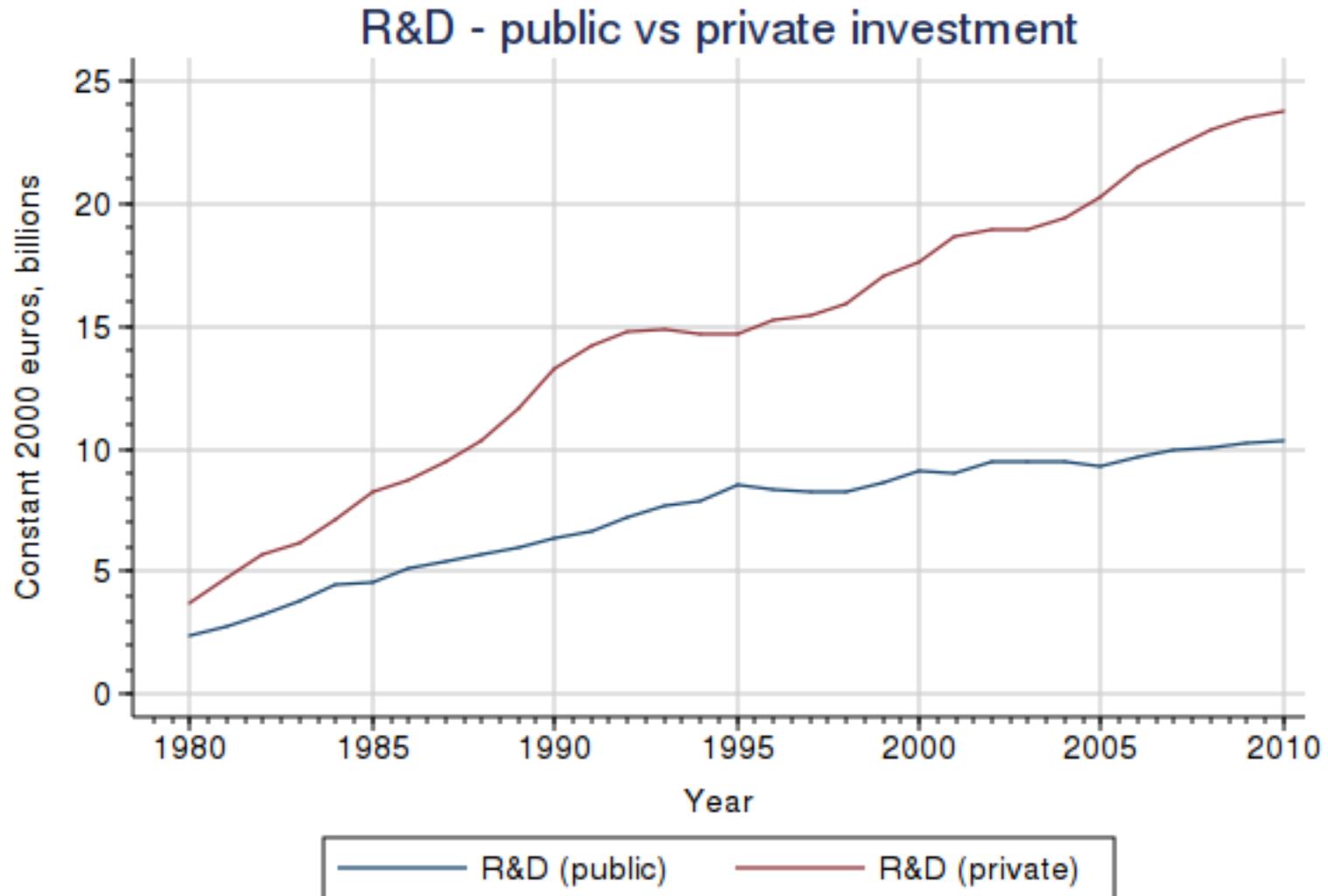


Current situation in France

Private intangible investment disaggregated

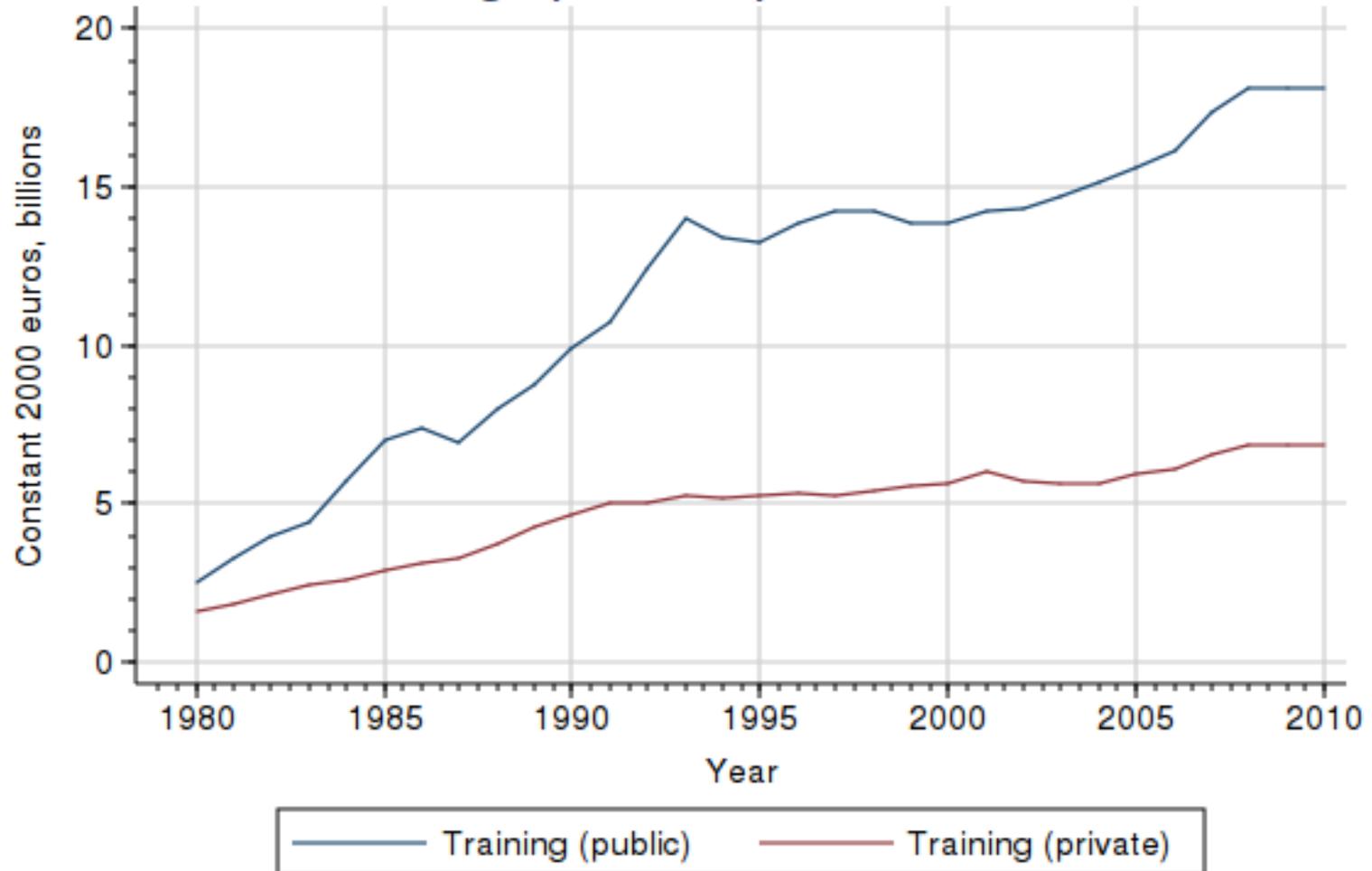


Current situation in France



Current situation in France

Training - public vs private investment



Current situation in France

- **Summary:**
 - **Increased role of intangible assets in the economy.**
 - **A decreasing proportion of investments in the public sector, with respect to the private sector.**

The role of public intangible investment

- Estimating**

$$\Delta GDP = \beta_1 \Delta \text{IntanPub} + \beta_2 \Delta \text{IntanPri} + \beta_3 \Delta \text{TangPub} + \beta_4 \Delta \text{TangPri} + \beta_5 \Delta \text{EmplTot} + c + \epsilon$$

```
. reg gdp totINTpublic tangpublic totINTprivate tang empltot, r
```

Linear regression

```
Number of obs = 27
F( 5, 21) = 14.43
Prob > F = 0.0000
R-squared = 0.7286
Root MSE = .00655
```

gdp	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
totINTpublic	-.0059224	.0063872	-0.93	0.364	-.0192052	.0073604
tangpublic	-.0178146	.0126104	-1.41	0.172	-.0440394	.0084101
totINTprivate	.013663	.0057374	2.38	0.027	.0017315	.0255945
tang	.0466194	.0288627	1.62	0.121	-.0134039	.1066428
empltot	.6060744	.1312794	4.62	0.000	.3330639	.8790849
_cons	.0115657	.0021993	5.26	0.000	.0069921	.0161393

No significant correlations with GDP growth and public assets.

Identifying interactions

- **Fractional polynomial method to investigate interactions between predictors (applications in clinical trials) (Royston and Sauerbrei, 2009).**
- **MPIgen, algorithm to fit the function:**

$$Z = \beta_1 x^{p1} + \beta_2 y^{p2} + \beta_3 x^{p1} y^{p2}$$

- **Where $p1$ or $p2$ may take the following values: -2, -1, -0.5, 0, 0.5, 1, 2, 3.**
- **Chooses interaction with best fit.**

A first application

- **Searching for public-private interactions**

$$\Delta GDP = \beta_1 \Delta \text{AssetPub} + \beta_2 \Delta \text{AssetPri} + \beta_3 (\Delta \text{AssetPub} * \Delta \text{AssetPri}) + \sum \beta_i (\Delta \text{TotalOtherAsset}_i) + C + \epsilon$$

- **For public-public investments:**

$$\Delta GDP = \beta_1 \Delta \text{AssetAPub} + \beta_2 \Delta \text{AssetBPub} + \beta_3 (\Delta \text{AssetAPub} * \Delta \text{AssetBPri}) + \sum \beta_i (\Delta \text{TotalOtherAsset}_i) + C + \epsilon$$

Note: Labor is considered as an “asset” under this specification.

Public-Private Interactions

1% increase in this <u>public</u> asset	And 1% increase with this <u>private</u> asset	Is connected to <u>β3%</u> of GDP growth	P-value
Advertising	Advertising	0.000074	**
	Database	0.000081	**
	Marketing	0.000070	**
	Organizational Capital	0.000083	**
	Software	0.000054	***
Database	R&D	0.000034	*
	Training	0.000057	**
Marketing	Advertising	0.000070	**
	Marketing	0.000059	**
	Software	0.000054	**

*** p < 0.01; ** p < 0.05; * p < 0.1

Public-Private Interactions

1% increase in this <u>public</u> asset	And 1% increase with this <u>private</u> asset	Is connected to <u>β</u>3% of GDP growth	P-value
Organizational Capital	Advertising	0.000160	*
	Software	0.000105	***
	Training	0.000153	**
R&D	Artistic Originals	0.000059	**
	Software	0.000045	*
Software	Advertising	0.000114	***
	Marketing	0.000108	**
	R&D	0.000042	**
	Training	0.000056	**
	Employment	0.000192	**
Training	Employment	0.000395	**

*** p < 0.01; ** p < 0.05; * p < 0.1

Public-Public Interactions

1% increase in this <u>public</u> asset	And 1% increase with this <u>public</u> asset	Is connected to <u>β</u>3% of GDP growth	P-value
Advertising	Organizational Capital	0.000056	**
Marketing	Organizational Capital	0.000050	*
Organizational Capital	Software	0.000122	***
R&D	Software	0.000063	**
Software	Tangible	0.000051	**

*** p < 0.01; ** p < 0.05; * p < 0.1

Conclusions

- **Measuring the contribution of public intangibles is problematic as there is no consensus regarding a measure of “public output”.**
- **This is a first approach seeking to test for interactions between public intangibles and the market economy.**
- **Further advance in our understanding of the contribution of public intangibles will nourish policy decisions for the knowledge economy.**