



European  
Research Area

# EUROPEAN POLICY BRIEF

**SPINTAN**  
smartpublicintangibles

## SPINTAN – Policy Brief No. 2

### Public Capital. Measurement Issues\*

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#### Objectives of the research

The SPINTAN Working Paper *Public Capital. Measurement Issues* reviews the main problems faced in measuring capital services in the non-market (or public) sector of the economy with special reference to intangible assets.

#### Scientific approach / methodology

It takes two complementary perspectives. First, it presents the most relevant statistical issues related to measuring public/non-market investment. Second, it highlights some methodological problems associated with the measurement of the *value of capital services*, namely, *i)* the use of a rate of return for public capital; *ii)* the endogenous *vs.* exogenous approach and the consistency requirements when the former is used; and *iii)* the selected user cost expression and its consequences for measurement. Third, it refers explicitly –though not exclusively– to intangible capital. Finally, it also shows the implications for the value of capital services —levels and growth rates— of the different options open.

#### New knowledge and/or European added value

The role of intangible assets in economic growth has attracted much attention since Corrado, Hulten and Sichel (2005) opened up this research avenue. The first step in the analysis is to define the intangibles' boundaries, which assets should be included in the intangibles list? The following step is to address the problems posed from the measurement side: how should

\* This Policy Brief is based on the SPINTAN Working Paper No. 2: Mas, M. (2016): 'Public capital. Measurement issues', available on the SPINTAN website <http://www.spintan.net/c/working-papers/>.

intangibles be measured? and how should their contribution to economic activity be measured? These problems are especially relevant when referring to the non-market sector due to the lack of a commonly accepted methodology. For this reason, this is groundbreaking research with many important implications as highlighted by other WP from the SPINTAN WP series.

The main conclusions to be drawn from SPINTAN Working Paper *Public Capital. Measurement Issues* are the following. First, the lack of statistical data providing cross-referenced information for both industrial and institutional sectors is a major hurdle to appropriate measurement of public capital. The availability of this information has worsened rather than improved in the last years and there is little hope that things will change in the near future.

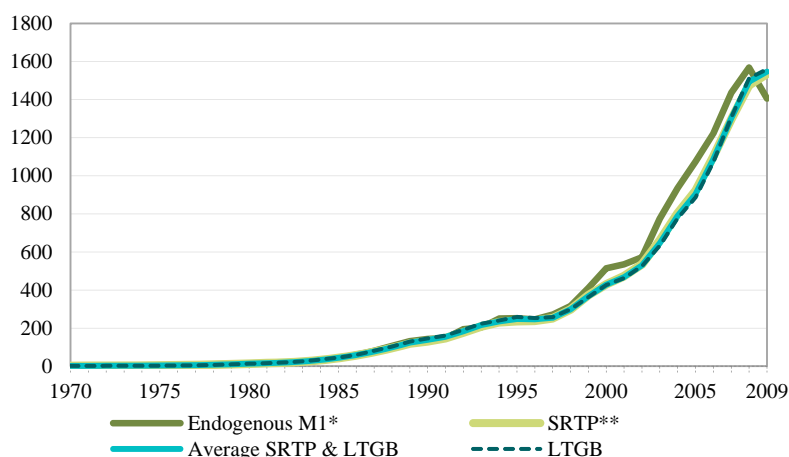
Second, it is now commonly accepted by researchers—but not, or at least not yet, by the National Statistical Institutes—that public capital should be assigned a net return that goes beyond the National Accounts practices of considering only the depreciation component measured by the consumption of fixed capital.

However, there is less agreement on how this rate of return should be computed. The four main questions are: i) Should the imputation consider the same rate of return for private and public capital, or should it be different? ii) Should the non-market sector follow the endogenous (ex-post) or endogenous (ex-ante) approach? iii) Should the rate of return used for public capital calculations be selected taking into account only the consequences of public GFCF on private investment or also in private consumption? iv) Does this discussion have practical consequences or is it irrelevant from the practical perspective?

The answers to these questions can be summarised as follows. First, from our perspective the reasons provided by the Working Paper recommend a different rate of return for the non-market economy. Second, in principle both endogenous and exogenous approaches could be used for both market and non-market. However, the consistent use of the former requires statistical information which clearly distinguishes between the investment made by industries and institutional sectors, market and non-market, or public and private. Since this information is not readily available for the great majority of countries, the most consistent alternative is to use the exogenous approach. Third, since public investment crowds out both private consumption and private investment, at least in principle, it is probably

advisable to use a combination of the opportunity cost of both of them. Our suggested alternative is to use a combination of the *social rate of time preference* (SRTP) and the *long-term government bond yields* (LTGB) as measures of both opportunity costs. And fourth, selecting one of the various alternatives proposed indeed has practical consequences when the economy is going through phases of strong cyclical movements as the Spanish data shows for the most recent economic crisis (see Figure 1 and table 1).

**Figure 1. Capital services. Non-market economy. Spain. Software (1970-2009)**  
(millions of euros)



\* See equation 9 in Mas, M. (2016): 'Public Capital. Measurement Issues', SPINTAN Working Paper No. 2. Available from [http://www.spintan.net/wp-content/uploads/public/WP\\_02\\_Mas.pdf](http://www.spintan.net/wp-content/uploads/public/WP_02_Mas.pdf).

\*\* SRTP = 3.0.

Source: BBVA Foundation-Ivie and own elaboration.

**Table 1. Value of Capital Services. Non-Market Economy. Spain. Software**  
*Differences from the endogenous M1 assumption*

a) Levels (percentage over M1)

	1970	1980	1990	2000	2005	2009
<b>SRTP</b>	0.90	0.89	0.92	0.85	0.89	1.15
<b>LTGB</b>	0.84	0.86	1.01	0.83	0.82	1.11
<b>Average SRTP &amp; LTGB</b>	0.87	0.87	0.97	0.84	0.86	1.13

b) Average annual rates of growth (percentage points difference)

	1970-1980	1980-1990	1990-2000	2000-2005	2005-2009	1970-2009
<b>SRTP</b>	-0.15	0.36	-0.80	0.84	6.43	0.62
<b>LTGB</b>	0.20	1.70	-2.01	-0.14	7.42	0.72
<b>Average SRTP &amp; LTGB</b>	0.02	1.04	-1.41	0.36	6.91	0.67

Source: BBVA Foundation/Ivie and own elaboration

**Key messages for  
policy-makers,  
businesses,  
trade unions and  
civil society actors**

- This Working Paper, like many others from the SPINTAN project, shares Stiglitz, Sen and Fitoussi's (2009) view as summarized in their frequently cited statement: "What we measure affects what we do. If we have the wrong metrics we will strive for the wrong things", and also Stiglitz's (2015) "What we measure affects what we do and what we don't measure affects what we don't do".
- It highlights the relevance of having a clear-cut definition of intangible assets in the public sector as well as a theory-rooted measurement methodology.
- It warns about the practice common among National Statistical Offices of not providing cross-referenced statistical information for both industrial and institutional sectors. One consequence of this practice is that it is impossible to separate non-market and market activities within a given industry such as in the case of, for example, education and health. The end result is the potentially incorrect measurement of key economic variables.

## SPINTAN – Smart public intangibles

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<b>Website</b>	<a href="http://www.spintan.net">www.spintan.net</a>
<b>Further reading</b>	
<b>Related websites</b>	
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