



European  
Research Area

# EUROPEAN POLICY BRIEF

## SPINTAN – Policy Brief No. 13



### Public IT investment in reaction to the economic crisis – a case study on measuring IT-related intangibles in the public sector<sup>\*</sup>

November 8, 2016

#### SUMMARY

##### Objectives of the research

We investigate public spending on IT-related intangibles following the economic crisis and develop a framework for computing nuanced aggregates of such investment based on project-level information. This has the twofold goal of (1) serving as a use case for categorising IT-related intangibles in the public sector and (2) analysing the nature of the capital created by the German IT investment programme 2009-11.

##### Scientific approach / methodology

Based on descriptions of the German federal IT investment programme 2009-2011, we classify projects according to different types of tangible and intangible investment and estimate the share of funds made available for each type. These shares are again spilt by thematic pillars of the programme and by different dimensions related to E-government. We compare the results with budget information available on regular IT spending of federal public authorities.

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

The well-established framework for classification of intangibles developed by Corrado, Hulten and Sichel can be applied to the anti-crisis programme and proves useful for classifying for project-level data in the public sector.

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

Public IT-related investment is not limited to hard- and software and could be evaluated ex-ante and ex-post in a much more nuanced way if the specific intangible assets are properly accounted.

<sup>\*</sup> This Policy Brief is based on the SPINTAN Working Paper No. 17: Saam, M., L. Weinhardt and L. Trottner (2016): "Public ICT investment in reaction to the economic crises – a case study on measuring IT-related intangibles in the Public Sector", available on the SPINTAN website. <http://www.spintan.net/c/working-papers/>.

**Objectives of the research**

We address the question how recovery programs that were being introduced after the financial and economic crisis 2007-08 influenced the creation of intangible assets in the public sector and how these assets can be usefully classified and measured.

More specifically, we analyse post-crisis investment in IT-related intangibles as a particular subset of intangibles. Many stimulus packages had a focus on IT investment. They did not only invest in tangible assets such as broadband infrastructure but also to an important extent in intangible assets. Beyond software, investment in IT-related intangibles was made in categories such as training, consulting or developing new concepts.

In the overall spirit of the SPINTAN project, we aim at investigating how public intangible investment, which often goes unmeasured as such, can be usefully identified and quantified. This is done in view of better assessing the economic effects of public spending on the public sector itself and on the organisations and citizens it intends to serve. While a number of tasks in the SPINTAN project are concerned with national accounting, this paper is concerned with project-level accounting. We compare the results at the project level with the regular IT budget of federal government.

**Scientific approach / methodology**

We consider the German federal IT investment programme 2009-2011 as a use case for categorising IT-related intangibles in government beyond software.

Based on documentation of the individual projects of the investment programme, we build up a database that allows us to gauge how much of the funds were actually invested in intangible assets and particular categories of them. Within intangibles, the categories software, consulting, organisational capital, databases, IT-Training and concepts are identified. As quantitative information from a project monitoring study did not become available, we often had to estimate shares based on qualitative information.

The German federal IT investment programme intended to consolidate and to modernise the IT infrastructure of the federal government and to make it more secure. Moreover, it aimed at the development of a more citizen-oriented and eco-friendly federal administration as well as at sustainably strengthening the German ICT economy after the crisis. In order to examine the different functions of assets created, we examine different di-

mensions of E-government actions (information, communication and transaction) and different relationships relevant for E-government (government-to-government, government-to-business, government-to-citizen) being supported by the assets created. Furthermore, we assess the share of different intangibles within each of the four thematic pillars of the investment programme (IT security, IT organisation, Green IT and Innovation).

Finally, we examine the regular German federal IT spending based on the individual budgets of administrative departments and their specific subject groups and compare it with the data from the anti-crisis programme. Moreover, the programme is put into a wider international context as we compare it with the size and composition of IT-related stimulus packages in other countries.

### New knowledge and European added value

The German federal IT investment programme saw € 477 million spent on 371 projects. Half of the funds went into improving the IT security of federal institutions. According to our estimations, a bit more than half of the investment was intangible. Nearly half of the intangible investment went in turn into software and a quarter into consulting. Own-account investment associated with the measures is, however, missing from the numbers and may contain a higher share of creation of organisational structures and of training. Within the pillar IT security, nearly half of the spending was on consulting. Within the pillar IT organisation, 37 percent was spent on organisational structures. With the large potential of “big data” and “open data” in mind, investment into databases appears surprisingly low with an overall share of two percent. Another five percent, however, were invested in other assets, such as software, to support the creation of databases.

Since the anti-crisis programme was not a research programme but rather aimed at the practical implementation of new infrastructure and processes, intellectual property was mainly created in practical development and implementation. Thus we identified the category of “concepts” as the relevant category for intellectual property in our context. This may inspire other research on intangibles in contexts where intellectual property output beyond patents can be observed. Some “concepts” may as well be created as part of organisational capital.

We document that the well-established framework by Corrado, Hulten and Sichel for classifying intangibles can be applied via keyword search to the German anti-crisis programme and proves

very useful in evaluating project-level data in the public sector. In contrast to budget data, project-level data more frequently allow the identification of outputs rather than inputs of intangible investment. Within the regular budget, categories of spending do not attain the same level of detail as in the anti-crisis programme and give us only rough indications of the spending on IT-related intangibles. Approximations point to a share of intangible investment in total investment that could also amount to about 50 percent.

When compared at the international level with regard to IT spending, the German stimulus package had a relatively low focus on broadband. Compared with the US, budget for modernising IT at the federal level was relatively high in Germany and the societal goals to be promoted (e.g. Green IT) were formulated in an explicit way. US investment was more concentrated on the technical performance of the infrastructure, e.g., a high amount was spent on building up a new data centre. Both programmes share a strong focus on IT security. The publically available records of the US programme contain industry classifications for the goods and services purchased.

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

It is common sense that public IT spending in stimulus packages should target the present economic situation as well as future economic benefits. A large part of public IT-related investment is intangible. The benefits of such investment can be analysed ex-ante and ex-post in a much more nuanced way if the specific assets created are properly accounted. With regard to the content of the German IT spending programme, we find that half of the intangible investment was made in categories other than software, highlighting the need for a broader accounting framework. Our research shows that German project-level data allow such an accounting based on keyword search. Better quantification would be possible if purchased assets were identified with industry or product codes consistent with national accounting, as was done in the US stimulus package.

The total budget of the three-year spending programme roughly corresponds to the annual IT-related investment of federal government within the regular spending titles, that is, outside specific policy areas directly related to IT. The additional public sector assets created by the programme were thus substantial.

## SPINTAN – Smart public intangibles

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<b>Budget</b>	3,260,536.40 €
<b>Website</b>	<a href="http://www.spintan.net">www.spintan.net</a>
<b>Further reading</b>	<a href="http://www.spintan.net/wp-content/uploads/public/WP_17_Saam_Weinhardt_Trottner.pdf">http://www.spintan.net/wp-content/uploads/public/WP_17_Saam_Weinhardt_Trottner.pdf</a>
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