

Taxation in fostering innovation: a direct or indirect impact?

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This article goes briefly through the goals and development of our tax framework to foster private research, development and innovation (R&D&I), emphasising especially on the creation and evolution of according support tools. Available data by the Ministry of Industry, Trade and Tourism (MITYC) on business projects produced before revenue authorities are given and some data from the Research, Development and Innovation Accreditation Agency (AIDIT) are explained. Finally, several challenges and recommendations are posed that are meant to be useful to improve the impact of tax incentives on public financing of our entrepreneurial structure.

Introduction

Innovation is in many cases a result of interaction and synergy between public authorities, universities and companies, together with the rest of players the innovation system consists of. Factors associated to innovation are basically related to the economic R&D effort, the capacity to acquire technologies and to facilitate collaboration between the different players, produced knowledge and human resources.

According to the 2006 data of the Spanish National Institute of Statistics (INE) – the latest available – Spain progressed from 1.12% of R&D expenditure on GDP in 2005 to 1.2% in 2006. This increase basically comes from the raise in private investment. Catalonia spent 1.43% of GDP, lying behind the Basque Country (1.6%), Navarre (1.92%) and Madrid (1.98%).

Innovation a result of interaction and synergy between public authorities, universities and companies.

On its meeting in Barcelona in 2002, the European Council set the target to increase overall research investment in the EU from 1.9% to 3% by 2010 as well as to raise the private fund rate from 55% to two thirds. Member states were asked to reform and strengthen their public R&D&I systems, to foster collaboration between the public and private sectors and to encourage a favourable legal framework and the development of according financial markets. Among the key factors of EU policies, improving and enlarging tax incentives for R&D&I was singled out in different notices published in late 2006.

Tax allowances for R&D&I can be an objective indicator of innovating capacity, and qualitative information on its users can also be useful for industrial and technology policy. In order to have more objective and analysable information as to the use of tax allowances for R&D&I, the INE in-

troduced in its annual enquiries items related to the evaluation of this tool and its impact on companies, the first results of which will be available in late 2009.

Tax incentives as a tool for public support to R&D&I

The socioeconomic benefits associated to R&D&I and the basic complexity and risk inherent to technology projects justify public incentives and financing. Public policies have to act on all stages of the innovation process and place the emphasis on generating and transforming scientific knowledge into new products and processes with the ultimate goal of improving social welfare.

The existing public financing tools can be divided into two categories: direct and indirect incentives. Direct incentives allow the government to act selectively on the system. Subsidies, as well as subsidised loans, are examples of such financial incentives and require big management structures. Indirect incentives come up as corporate tax (CT) allowances for those companies able to prove that they are doing R&D&I. Incentives are part of the big bundle of measures fostering innovation. Unfortunately, tax schemes are not easy to lay out and the government has not enough control over the budget.

For one decade it has been said that tax incentives have a whole set of advantages compared to other tools to foster R&D&I, like minimum interference with the market and autonomy of the private sector in deciding on research priorities. Indirect incentives do not give priority to certain industries or companies of a given size or at a given location but they encourage them to make R&D&I efforts instead of having success in one single project. In order to reward an increase in efforts compared to previous years, hiring skilled workforce and cooperating with research institutions yields further allowances. Tax incentives are the tool to foster R&D&I that is closest to the



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needs of companies, thanks to their horizontal, swift and free application.

The limits between activities leading to innovation through applying research and those based on adapting existing technologies are not obvious. Although the Frascati and Oslo reference manuals provide internationally accepted definitions of R&D&I, every institution focuses, enlarges or narrows the concept according, for instance, to each industry or particular political strategy.

Article 33 of the Spanish CT Act defines business activities that can be considered R&D&I processes. According to these definitions, AIDIT issues a certificate to assess the technical nature of a proj-

ect and determines if it is an activity related to research, development or technological innovation.

Origin and evolution of the tax framework: legal basis and current legislation

The approval of the CT Act (43/1995) in 1995 meant that tax allowances for R&D were explicitly recognised. In 1999, allowances for R&D&I were increased and a third concept for allowances, technological innovation (TI), was further included in order to provide access to tax advantages for a wider range of business activities,

which increased the problems of applicability due to legal insecurity companies had to face when classifying and proving the technical nature of their projects.

The discussion focuses on the legal criteria adopted to define R&D and TI on the one hand and on the need for a technically capacitated, independent and objective body that determines which investments are actually considered to be devoted to such activities on the other.

The Ministry of Science and Technology created through ENAC an accreditation system for bodies certifying R&D&I projects.

In order to increase the efficiency of this tool and minimise the tax risk in applying incentives, the polytechnic universities of Catalonia and Madrid created AIDIT in 2001 with the purpose of providing a capacitated and independent body to issue technical qualification reports.

The Royal Decree RD 2060/1999 defined binding consultation with revenue authorities, and in late 2003 the RD 1432/2003 finally allowed that taxable persons produce a motivated report on the compliance with scientific and technological requirements according to the law and binding for revenue authorities. In Article 35 of the RD 4/2004 we found the revised text of the CT Act and later the consideration of textile and footwear samples as TI. Finally the Act 35/2006, of 28 November, sets out some legal modifications that can be summarised in the reduction of allowances on the total CT rate to encourage R&D&I at a given coefficient (0.92 in 2007 and 0.85 from 2008), the introduction of a bonus on welfare contributions for research staff (40%, incompatible with the application of the allowance regime), the abolition of Article 35 of the revised text of the Act in 2012 and finally the proposal that in the second half of 2011 the MEYH, supported by the MITYC, publishes a survey on

the efficiency of the different aid and incentive schemes for such activities, adapting legislation to its results if applicable.

Motivated reports for tax allowances for r&d and technological innovation 2006

Given the size of this tax framework and the difficulty in its implementation, the Ministry of Science and Technology created through ENAC an accreditation system for bodies certifying R&D&I projects in 2003, AIDIT being the first to obtain this accreditation.

From that moment on, the Ministry of Industry has been issuing motivated reports, binding for revenue authorities, that refer to the qualification of a project as R, D or TI.

The Royal Decree 1432/2003 regulates the issuing of motivated reports and the administrative steps a company needs to take to have access to tax benefits without any risk (cf. chart 1). The tool was implemented in 2004, with over 2000 motivated reports having been issued by now.

Tax incentives in europe

In late 2006 the European Commission (EC) passed a notice on the most efficient way of using tax incentives for R&D with the aim of fostering investment in that area, increasing economic development and job creation and encouraging member states to improve the application and coordination of specific tax schemes.

Tax incentives have currently grown to become one of the main tools to foster private R&D investment in most member states. Besides, the in-

Chart 1. Administrative steps for obtaining access to tax benefits without any risk



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dustry is progressively adopting the model of open innovation and cross-border cooperation.

The EC criticised the restrictions imposed by Spanish legislation on recruiting projects outside Spain. It argued that this attempted against the freedom of establishment and the freedom to provide services and asked this limitation to be lifted. The proposal of the Spanish government is to comply with the request of the EC, but requiring at the same time – according to law, which defines a project as the unit to determine the qualification of R&D or TI activities – both technical and accounting documentary proof for assessing and issuing the corresponding motivated report. This procedure to have access to allowances allows unlimited cross-border subcontracting while ensuring control against potential abuse.

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All in all, the current situation offers an opportunity to reform legislation on tax incentives for R&D&I, consolidates the framework beyond 2012 and complies with European legislation.

There are different kinds of tax incentives in most developed economies. Tax incentives for R&D activities are widely considered to be an important political tool to stimulate private investment in innovation in general. OECD reports indicate that in 2005 70% of member states, including the United States, Canada, Japan and Australia, had such incentive schemes.

Whether by means of a deferred tax or a bonus on the CT taxable amount or tax rate, the mixed method is the most widespread. It rewards R&D&I expenditure within a fiscal year as well as the portion of additional efforts compared to previous years. Public collaboration contracts are also often rewarded.

As has been mentioned, an increasing number of member states has been introducing, in a way or another, R&D tax incentives in recent years. Fifteen of the twenty-five EU member states have currently tax incentives schemes for private R&D in place, namely Austria, Belgium, Denmark, France, Hungary, Ireland, Italy, Malta, the Netherlands, Poland (2006), the Czech Republic (2006), Portugal, Slovenia, Spain and the United Kingdom.

Although their layout and implementation depends on the circumstances, structure and technological business level and its nature, a set of principles needs to be followed: reaching out to

all companies, including current expense, examining assessment and control criteria, defining and assessing the later impact, ease, reliability and stability, transparency, accessibility, auditing rules to clearly define data relevant for assessment and the way data are collected as well as certainty in application to allow previous planning, considering of course its overall social effects.

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In Spain there is a process to reform the Act 35/2006, which is to lead to an imprecise change of mechanisms to stimulate innovation. Our system currently provides for two basic tax benefits applicable to CT: freedom to amortise assets allocated to R&D activities and a tax rate reduction for R&D and TI activities. Legislation on tax loans led to the introduction of a regulation with definitions of research, development and, more recently, technological innovation based on the Frascati and Oslo manuals, with a set of restrictions that did not bring any more clarity nor therefore certainty to taxable persons as to how much tax benefit is obtained for such activities, with consequent doubts on its efficacy due to a lack of certainty about its correct handling.

The problem posed by the technical difficulty of qualifying the nature of activities is solved in a straightforward way with some administrative formulas binding for revenue authorities and available to taxpayers, namely the motivated reports issued by the MITYC based on independent certificates by a body accordingly accredited by ENAC.

To go more in detail, a report promoted by the EC gives a general view of the tax incentive schemes currently in place.

Objective assessment of incentive schemes

The goals of tax incentives for R&D&I are the same everywhere: to generate benefits for society in general, increase investment in R&D and create a return higher than cost. The question is, how does our current incentive scheme create additional investment in R&D?

Economic evidence from different OECD countries suggests tax incentives as an effective means of generating additional research, though the effects are not noticed immediately. A great deal of studies has tried to draw comparisons between countries with different models but the great variation in results shows the difficulties of comparing schemes. Economic evidence suggests that the whole positive effect of tax measures on increasing innovation will only be visible in the long term.

It is also known that a process to assess R&D activities serves as a tool to strengthen the planning and development of policies and financing preferences and can further be used as a legitimating instrument that provides transparency and accuracy to background distribution. Assessing R&D&I activities is of course a complex task, both as to related stimuli and criteria as well as to who finances and executes them, further the measurement of tangible and intangible results, impact and affected players, variables and periods.

This complexity may increase due to a difference in goals, perspectives and expectations on behalf of involved players, which can also turn objectivity more difficult.

Evidence suggests that the return on investment is high on average, considering that literature states the heterogeneity of such return. Besides, collateral effects based on the application of the tax incentive model and the certification of these activities also needs to be considered.

Many surveys suggest an asymmetric distribution of direct economic return on R&D investment. We find products that failed in their market launch while others were a big success and generated considerable profit. This asymmetry needs to be taken into account. Also important externalities generated in the innovation system have to be considered. These are positive effects that add to results other than those produced by investment. Identifying and calculating generated externalities is a very complicated but indispensable task.

Such a big and complex evaluation process should have been considered when setting out measures – what do we want to measure, and who is going to be involved when and how?

To study the effect of tax incentives on R&D&I a long period of time is needed – the risk of starting to assess too early may lead to wrong conclusions. We cannot wait until we are able to state the direct economic impact and the positive externalities generated in the short term.

It is a requirement to have historical data, an evaluation scheme during the necessary period for effects to come about as well as a sufficient horizon to gather these data. Besides, revenue authorities should publish their latest information history update related to their analysis.

We all know that the effects of incentives are clearly different according to the industry and the size of the company, which requires a differentiated analysis.

Different surveys on this subject calculate that for each dollar in tax allowance there is an increase of one to two dollars in reported R&D expenditure. Additionally, research by J. Kenneth suggests that factors such as cash flow, ability to capitalise development costs and unexpected high profit clearly affect investment in research. Different attitudes according to companies, with or without financial limitations, also play an important role.



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Chart 1. Evolution of applications for motivated reports since their creation, based on expenditure submitted by companies, tax allowance related to each qualification and comparison with allowance forecast by the government

Year	2004 (FY 2003)		2005 (FY 2004)		2006 (FY 2005)		2007 (FY 2005)	
Applications for motivated reports	298		561		905		2010	
Million euros	Expen- diture	Estimated allowance	Expen- diture	Estimated allowance	Expen- diture	Estimated allowance	Expen- diture	Estimated allowance
R&D	203.5	81.4	238.7	276.0	110.4	95.48	-	-
I	52.8	5.28	126.7	201.0	20.1	12.67	-	-
Total	256.3	86.68	365.4	477	130.5	108.15	-	-
Allowance forecast in government budget	159.96		215.55		261.44		375.98	
Allowance estimate based on motivated reports	86.7		108.1		130.5		-	

- ▲ The comparison shows that despite the strong growth of applications for motivated reports, Spain is still very far from taking advantage of tax allowances for R&D&I activities.

Balance of the evolution of the 2006 motivated report and certificate scheme

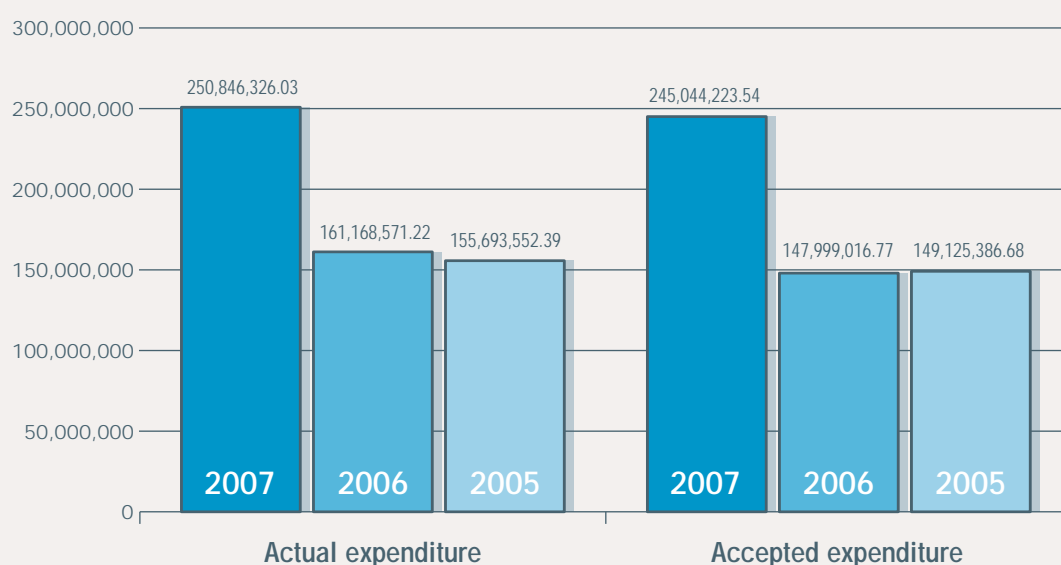
In its 2006 internal report, the MITYC states that the reported amount and overall estimated allowances in Spain amount to 275 and 201 million euros for R&D and TI respectively, which means an estimated 130.5 million euros in allowances. In Catalonia, these data amount to 87 million euros for R&D and 12 million euros for TI, which led to roughly 36 million euros in allowances.

In the same report, the allowance forecast for 2006 in the government budget is 261.44 million

euros, which differs from the allowance estimate based on motivated reports. This comparison shows that despite the strong growth of applications for motivated reports, Spain, and especially Catalonia, is still very far from taking advantage of tax allowances for R&D&I activities (cf. chart 1).

Analysing the 2006 project sums by concepts, it can be observed that the highest absolute expense relates to human resources (46%), followed by external collaborations with other companies (26%). Positions related to cooperation with universities, technology centres and public research institutions are much less relevant, namely 1.2% – this amount on total economic cost is produced by 14% of overall public collaboration. In the case of innovation projects, the highest absolute expense relates to external collaboration, followed

Graph 1. Comparison of R&D&I expenditure executed between 2005 and 2007 (dark blue) by fifty companies having certified their projects every year



▲ If we compare the most significant data associated to those companies that have been evaluating their projects for the last three consecutive years, we can conclude that total investment has increased by over 60%.

by human resources, while cooperation with universities, technology centres and public research institutions hardly reaches 1%.

The allowance forecast for 2006 in the government budget is 261.44 million euros, which differs from the allowance estimate based on motivated reports.

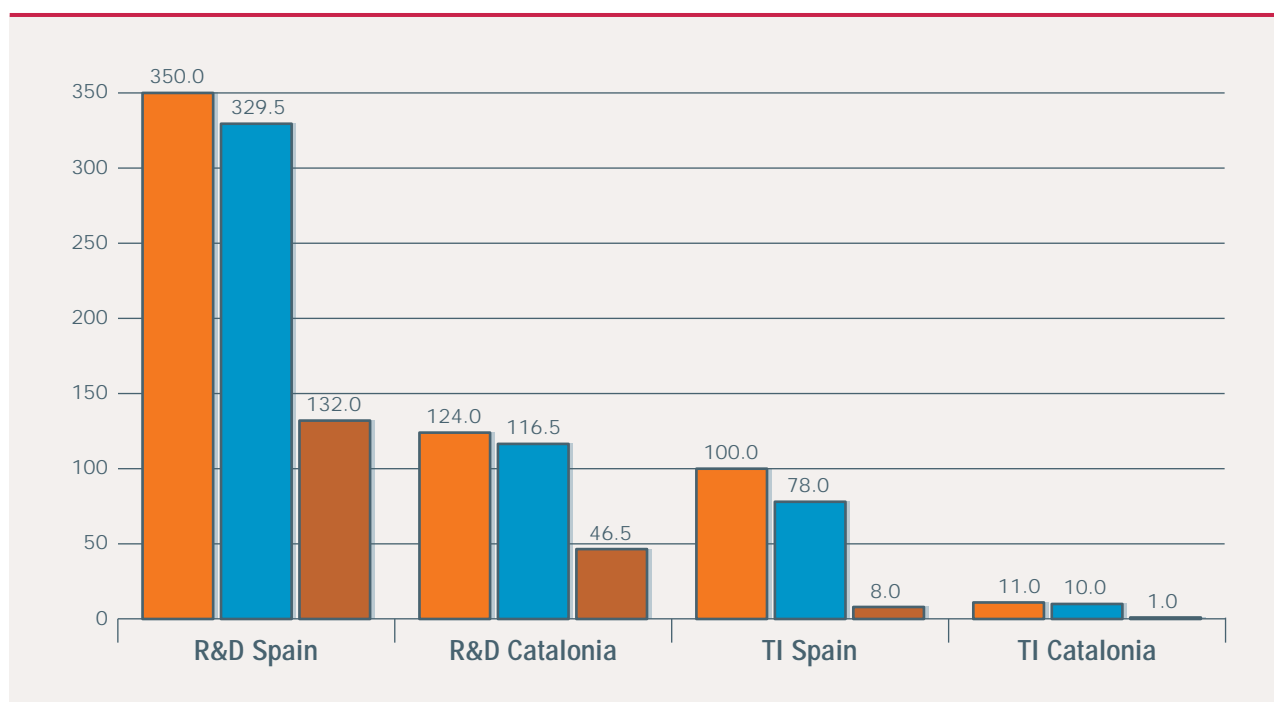
Looking by industries, the most prominent are automotive, traditional branches (capital goods, manufacturing, industrial assembling, paper, graphic arts, metalworking, furniture, engineering) and construction. The industry with the

highest amount qualified as R&D is automotive (97 million euros), followed by traditional industry (28 million) and energy and chemistry (18 million each). Furthermore, the relevance of CNAE 73, i.e. companies doing exclusively R&D, also increases (18 million). The industry with the highest amount qualified as technological innovation is chemistry (54 million euros).

Of the 166 projects attributed to Catalonia, the most relevant industries are car manufacturing, chemistry, wholesale, financial brokerage and machine manufacturing.

The Spanish regions with the highest rate on total applications are Madrid (41%), Catalonia (19%), Valencia (10%) and Castile-Leon (9%).

Graph 2. Private expenditure (in blue) assessed by AIDIT in 2007 and accepted (in orange) and estimated overall allowance volume in million euros (in brown)



- ▲ The Spanish regions with the highest rate on total applications are Madrid (41%), Catalonia (19%), Valencia (10%) and Castile-Leon (9%).

According to data gathered by AIDIT:

- ▶ Catalonia did 25% of projects qualified as R&D, Madrid 34%, Castile-Leon 11.5% and Valencia 10%.
- ▶ Chemistry, automotive, food – mainly based in Catalonia – construction and air transport – based in Madrid – are the branches applying for most certificates and motivated reports. In this period, the industries having applied for most certificates have been construction (17%), chemistry (12%) and mechanical engineering (6%).
- ▶ As to volume of certified projects by area of knowledge, computer science and construction technology range first with 12%, with mechanical and material engineering, telecommunications and textile at around 7%.

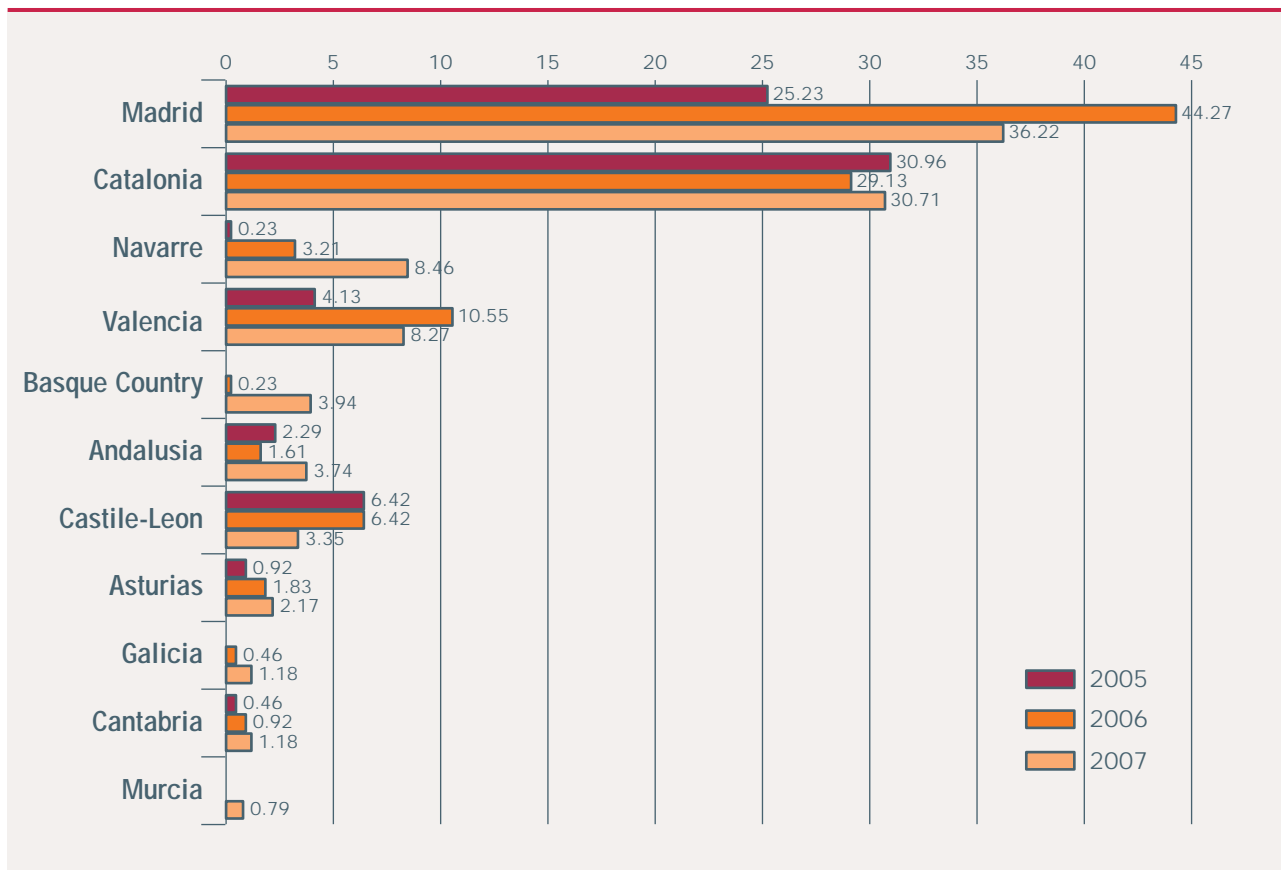
- ▶ Universities take part in 24% of projects.

- ▶ The rate of PhD graduates assigned to projects is under 2%.

If we compare the most significant data associated to those companies that have been evaluating their projects for the last three consecutive years, we can conclude that total investment has increased by over 60% and external collaborations by 45% yearly – after all, collaborative projects stimulate knowledge transfer.

In 2005 AIDIT certified 75% of expenditure reported by the MITYC eligible for tax allowance, while in 2006 this rate was 62%, amounting to 124 million euros or 31% of the government budget allocated to tax allowances for R&D&I. Final data by the MITYC are not in yet, but if we

Graph 3. Geographical distribution by region of applications for certification with AIDIT in 2005, 2006 and 2007.



▲ According to data gathered by AIDIT, Catalonia did 25% of projects qualified as R&D, Madrid 34%, Castile-Leon 11.5% and Valencia 10%.

compare the allowances planned for 2007 in the government budget, amounting to 375.98 million euros allocated to tax allowances for R&D&I, with expenditure certified by AIDIT, the conclusion is that we evaluated 40% of planned allowances.

However, we need to be very careful in presenting associated data related to this tool in a stabilising market that still has some imbalances such as information on the system. So although these data are relevant food for thought and analysis, in no case shall they be taken for setting out specific public policies.

Problems and challenges

The main difficulty for companies in their first contact with incentive schemes lies in preparing technical and accounting reports since they are still far from implementing management systems that allow them to have this information conveniently collected and treated in real time. Such a change of attitude is not immediate but needs time.

Companies have problems to identify and classify their activities individually and by projects, from a technical and accounting standpoint, due to unfamiliarity, lack of motivation or mainstream schemes far from their strategy.

Other cases, especially SMEs, are not considered a target of such public financing. In many situations, legal insecurity is a barrier that even tax consultants do not try to overcome. Subjective interpretation of activities considered to be research, development or innovation has led during years to controversy with tax inspectors.

The main difficulty for companies lies in preparing technical and accounting reports since they are still far from implementing management systems that allow them to have this information conveniently collected and treated in real time.

Loss of trust by companies in public messages and initiatives to foster innovation. Terminating incentives is an obvious error due to the financial effect on companies having started changing their habits in systematising their activities to justify conveniently their projects as well as to the increased feeling of insecurity caused by the inconsistency of public messages.

The policy to reduce tax allowances and especially uncertainty about its continuation after 2011 has deterred companies from making use of tax allowances for R&D&I activities. The risk of regression in private R&D&I investment is real.

Recommendations

The challenge is to keep an efficient innovation process with qualified and support staff, with tailor-made tools for each project related to budget control, documentary management, generated

knowledge, cost-benefit analysis, access to financing funds and corporate image management. At AIDIT we believe that the need to enter a formalised system accelerates meeting these targets.

Our challenge is to reach out to Catalan companies and capacitate them so they can take the best advantage of financial incentives for innovation. We further intend to give support to coordinating ambitious activities, not with the aim of distributing funds but to achieve excellence.

We have few data providing information on how the tool works. So to be able to measure its effect, we need to get companies to include incentives into their planning and management processes.

Assisting in creating a wide offer in scientists, engineers and technologists with consolidated knowledge of innovation management strategies and tools. Such action would bring about a change in business attitudes and culture and a better understanding and management of internal and subcontracted R&D.

Public authorities intend to attract companies in order to take advantage of technology policy tools, causing R&D investment to increase. However, a control method is necessary to avoid abuse of the system. It is thus obvious to think of assessing financing and executing bodies independently. The usefulness, scope and level of tax incentives needs to vary according to each member state and the specific conditions related to the business structure and technology level.

Public authorities need to do much more than using traditional tools to stimulate research and innovation. The tax incentive framework used to be considered a powerful indirect tool for fostering R&D&I activities. Data currently reveal results that not only show the system's benevolence as a driver for research but also point out derived collateral benefits such as the obligation to manage and record activities, control over related budgets and the acknowledgement of a key intangible asset: knowledge.

The degree of benevolence would admittedly be even higher if corporate tax was managed on the field and allowed to lay out, manage and keep incentives adapted to each specific situation.

We can therefore conclude that, in relation with R&D&I tax incentives, there is a set of tools that will help reduce the risk of their application, facilitate control over meeting budget targets during the project and thus encourage our companies to optimise public and private financing.

Some final thoughts

The fact is that we have few data and they are difficult to assess objectively and directly, also related to externalities resulting from collateral benefits in the implementation of the tax incentive framework with its formal obligations such as indirect output. Despite this uncertain scenario, we can easily make an opinion based on some objective assertions:

- ▶ 1. The tool provides at least 375 million euros for financing private R&D&I projects.
- ▶ 2. It leads to a change of habits in managing research and innovation activities.
- ▶ 3. It becomes an opportunity that provides information and an analysis on who actually does R&D&I.
- ▶ 4. Introducing tax incentives for R&D&I also encourages companies to give more information on their R&D investments than they used to.
- ▶ 5. Processes obliging to review and assess activity carried out by organisations are an opportunity to gather relevant information for assessment that would otherwise not be available.

According to the evidence produced in this article, answering the question of whether tax incentives are direct or indirect turns out to depend on the reasons of who answers the question, and when and how they do it.

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