



NEWS HIGHLIGHTS

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Spanish science needs a new structure

Cristina Jiménez

In the second part of its [series](#) looking at science in Spain, Science|Business looks at how facing up to budget cuts has put the spotlight on structural reform.

Research budgets are facing the chop in Spain, but many among the scientific community believe the biggest problem facing Spanish science is not finance - which is of course important - but the rigidities of the country's scientific infrastructure.

Jose Luis López Barneo, physiology professor at Sevilla University, is not particularly optimistic about change happening now. "We missed the right time, when the Spanish economy was doing well, between 2000 and 2008, to make the structural reforms to create a robust system," he believes.

Those reforms, which would optimise available resources, include the introduction of a scientific career based on principles of merit and a funding agency independent of political influence.

Now the axe has fallen on the science budget, reform seems the best way forward, to get the most out of the money that is available. "If we cannot touch investment, at least we could improve systems, processes and laws," says Alfons Sauquet, Dean of ESADE business school in Barcelona.

While a new law relating to science is currently before the Spanish parliament, there are many who do not believe this tackles the shortcomings of the system. At the heart of the problem is the civil service operating model in public research organisations and universities, which makes it impossible to fire unproductive scientists and fails to incentivise excellent scientists.

One of the biggest obstacles to changing this is the total opposition from trade unions, says Emilio Muñoz, professor of science, technology and society at CSIC's Philosophy Institute in Madrid and former CSIC president (1988-1991).

Autonomous centres needed

Centres managed through public foundations, such as Centro Nacional de Investigaciones Oncológicas (CNIO) or the Centre for Genomic Regulation (Centre de Regulació Genòmica - CRG), are good examples of how a more modern governance system can make a better use of resources, helping institutions to become internationally competitive in a relatively short period of time and with a limited budget.

For example, half of the ten Advanced European Research Council grants secured by Spanish institutions in the 2008-09 call went to investigators based at CNIO, an institution founded as recently as 1998.

The budget CNIO receives per investigator from the Ministry of Science is similar to that of the Spanish National Research Council (Centro Superior de Investigaciones Científicas - CSIC), at around €40,000 per year. But, says CNIO's Director Mariano Barbacid, "CNIO can decide how to use its money, it can hire technicians, buy equipment or upgrade its infrastructures, a flexibility not available to the public research organisations such as CSIC."

"Also, CNIO faculty, which are not hired as civil servants, have been able to obtain significant levels of competitive financing from the EU and to attract philanthropic funding, an area in which Spain lags behind most European countries," Barbacid said.



Budget cuts hit Spanish science

In the first part of this series, Science|Business looks at cuts aimed at reducing the budget deficit. Government spending on R&D will fall by more than 8 per cent next year, according to one analysis [[read more](#)].

In terms of funding, CNIO is for now maintaining its budget, "The current budget won't affect us negatively, I understand that we'll stay at 2010 level, including the 5 per cent cut in salaries [in the budget]," Barbacid told Science|Business.

CNIO is in an ongoing process of transforming its basic research programme, "Experimental Therapeutics Programme" into a public company to commercialise PI3K (Phosphoinositide Kinase-3) inhibitors it has discovered. This model will allow CNIO Therapeutics to form a joint venture with a private company, whilst maintaining complete control of its operations, since the CNIO Foundation will retain a 99 per cent stake. "With this model in place, we will be able to operate almost as a private company," says Barbacid.

Prevalence of the old-boy network

The lack of an open, transparent and merit-based recruitment system is another of the ills of universities and research in Spanish. This, together with scientists having permanent jobs as civil servants, is seen as resulting in a general lack of competitiveness. To overcome this, centres like the CRG have modelled their hiring policies on those used at the European Molecular Biology Laboratory. So, for example, group leaders can stay a maximum of 9 years, with an evaluation after the first 4-5 years. After this, the scientist has to find a permanent position elsewhere, "If, after 9 years with the resources we provide, they haven't made themselves a name in their research field, this says something," Serrano believes.

Ignacio Cirac, the Spanish physicist who is currently director of the Max Planck Institute for Quantum Physics in Garching, Germany, thinks that Spain needs better mechanisms to reincorporate scientists who have been trained abroad back into the Spanish system, to encourage them to come home, "at a relatively young age."

Independent scientific council

Many Spanish scientists think that the lack of independent scientific advisors to the government is part of the problem and recommend the creation of an independent Scientific Council. One possible role model is the German Wissenschaftsrat, which dates back from 1957, suggests Javier López-Facal, researcher at CSIC's Philosophy Institute in Madrid. "It would be better if this body was accountable to Parliament, or the Government as a whole, rather than one Ministry, and its members should be proposed by universities and public research centres," said López-Facal.

Lack of continuity

Continuity is something that Spanish scientists have also found missing in the country's R&D policies. "Improvising when making policies is a national ill," says Serrano. Any new government changes the previous policy, and it is almost impossible to know what will happen in a year's time, he adds.

"One cannot expect that money that has been properly invested now [in R&D will] provide returns in the short term, but this is what politicians don't understand –nothing that cannot be shown in four years time is worth it for them," says Jose Mari Valpuesta, director of CSIC's National Centre for Biotechnology (Centro Nacional de Biotecnología – CNB).

Also, since the Science Ministry was created thirty years ago it has been moved three times, and since 2000, it has had 7 different ministers, points out López-Facal.

The "Coffee for Everyone" problem (or diluted funding)

Another of the problems in Spanish R&D policies is the "coffee for everyone" mindset, which distributes funding thinly to too many groups, leaving less money for good scientific groups. "If you dilute money so much it's difficult to make an impact, so maybe not all research groups should have funding," Serrano says.

Joan Guinovart, director of the Institute for Research in Biomedicine (IRB) in Barcelona, thinks there are, "Too many different programmes that scientists can try and ask for money: Every new government sets up its own programmes to add to the previous ones. But money could be more useful if it was more concentrated," Guinovart believes.

In addition, Spanish universities perform badly in international rankings and urgently need to change if they are to guarantee a good education for future scientists. "One of the problems is the rigidity in the structure of the Spanish university structure," says Muñoz. So for example, Spanish universities don't have politically independent governing boards, as in the UK.

Prioritising investment

Many experts think that it's important to prioritise where Spain invests, particularly at a moment of tight budgets. For example, Anton Costas, an expert in economic policy at Barcelona University thinks that the construction of high velocity AVE trains lines doesn't have economic rationality, because the contribution to competitiveness is almost zero.

But while building infrastructure is very visible and cutting them has political toll, science is an activity that only bears fruit in the long run. "Investing in science now won't bring us out of the current crisis. But it will save us from the next one," concludes Eduard Batlle, a researcher at the Institute for Research in Biomedicine in Barcelona.

This is part two of two articles looking at the situation for science in Spain. [Part one](#) appeared on 14 October.

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Budget cuts hit Spanish science

Cristina Jiménez

Cuts aimed at reducing Spain's budget deficit from 11 per cent to 6 per cent of GDP by 2011 have hit science funding, with one estimate saying spending on R&D as a whole will fall by 8.37 per cent in 2011, compared to 2010.



The austerity measures announced this week translate into a 1.65 per cent cut in the budget of the Science and Innovation Ministry (MICINN). When R&D loans for companies are excluded from this, the cut in direct funding for scientific programmes and grants goes up to 4 per cent.

But all ministries are facing severe cuts, ranging from 8.2 per cent in health, to 30 per cent in public works. Since many ministries also fund R&D activities, Spain's R&D expenditure will see an 8.37 per cent drop, according an analysis by the Confederation of Spanish Scientific Societies (Confederación de Sociedades Científicas Españolas -COSCE).

And Spanish scientists complain there is an even bigger problem than this sharp drop in public spending, which is a weak and inflexible science structure that offers no incentives to scientists to increase their productivity.

Science has low visibility

"The draft budget does the only thing it can do under the current circumstances, which is to reduce deficit, but it could be more ambitious, it should bet more for science and education. But this sort of investment doesn't get high political visibility compared to investing in physical infrastructure, such as high velocity trains," says Germà Bel, professor of economic policy at Barcelona University.

And the cuts for science arrive at a bad moment, he says, because they add to the cuts that the Spanish scientific system suffered last year, when MICINN was cut by 15 per cent.

These austerity measures mean scientists in Spain are starting to see the future of the country's science as uncertain. "Prospects are not too encouraging for 2011. We won't be hiring new group leaders because we can't guarantee their salary payments and the working conditions of their groups," says Luis Serrano, researcher at the Centre for Genomic Regulation (Centre de Regulació Genòmica - CRG) in Barcelona, and head of the Systems Biology programme that CRG is running with the European Biology Molecular Laboratory (EMBL).

"Freezing positions will delay the development of the CRG, but more importantly could affect the confidence gained internationally of Spain as an interesting place to do cutting-edge science," says Serrano.

The CRG is one of the flagship research institutes in Spain that, together with other centres, such as the National Cancer Research Centre (Centro Nacional de Investigaciones Oncológicas - CNIO) in Madrid, were set up in the late 90s and are managed through autonomous public foundations.

These centres have proved to be far more scientifically productive than their older counterparts. Many Spanish scientists think that one the ways to remove the rigidities in the country's science structure would be to increase their number. They argue the centres offer greater flexibility and autonomy in allocating resources than public research centres that are dependent on MICINN, like the Spanish National Research Council (Centro Superior de Investigaciones Científicas CSIC), which is often stifled by excessive red-tape. Also, unlike older centres, they don't employ civil servants.

At the CRG, the budget coming from non-competitive sources accounts for 47 per cent of its total income. The Spanish government's overall contribution is very small, at only 5 per cent. It decreased by 30 per cent in 2010. But, at the moment, the CRG is living in an uncertain situation,

trying to hold onto €4.5 million that the local Catalan government economics department wants to claw back.

"We don't know what it will happen in the end, if we'll have to return this amount, or if it will be cut from next year's budget," says Serrano, who was hired by the CRG as part of the Catalan Institute for Research and Advanced Studies (ICREA) programme, which is designed to attract talented scientists by offering them a tenure-track career.

The ICREA programme, 100 per cent funded by the Catalan Government, has kept its entire budget this year and next year, and will have created twenty new openings every year since its inception in 2000, according to Angel Pina, ICREA's financial manager.

CSIC under strain again

As last year, CSIC centres have taken the worst hit in this year's draft budget, with an overall cut of 5.37 per cent. Rafael Rodrigo, astrophysicist and CSIC president, last week told a Parliamentary committee for science and innovation that 20 per cent of new positions will be cancelled next year. Staff expenses will go down by 9 per cent, due to a 5 per cent cut in salary across board for all public sector employees in Spain. The biggest hit at CSIC will be in infrastructure spending, which will go down by 31.1 per cent, Rodrigo said.

For now, the smaller cut in the 2011 budget of the Science Ministry means there will be minimal impact on grants and scientific programmes according to Science Minister Cristina Garmendia. She has said that, taking into account the Spanish government's current austerity measures, the draft budget guarantees the continuity of scientific programmes, and she expects the final budget could equal that of last year, following a parliamentary debate on the budget.

"We are now in a 'war economy'," says Jose Mari Valpuesta, director of CSIC's National Centre for Biotechnology (Centro Nacional de Biotecnología - CNB) in Madrid. "Scientists will get ahead as always with strong will and hard work." But high spirits won't buy the machines that Valpuesta says the centre needs.

The hiring prospects for next year are not so good either, he says. However, it is very likely that CSIC's budgets for hiring PhD students, postdocs and technicians won't be reduced.

Part two of this two part series, appearing next week, will consider the need for changes to the structure of science in Spain.