Interview: Manuel Heitor – Minister for Science, Technology and Higher Education, Portugal

"The goal is to promote the necessary conditions to establish in Portugal a young, innovative and skilled labor force by bringing together research centers, universities and polytechnics with the broader Portuguese and foreign business community."

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Portugal's Minister for Science, Technology and Higher Education, Manuel Heitor, details his plan to bring Portuguese scientific and business practices above European averages. Collaboration across industries, increased public and private investment into R&D and innovative global projects will pave the way for Portugal's progression in Europe.

Can you please outline your current priorities for science, technology and higher education to our international readers?

In brief, my priority is to make Portugal's future grounded in knowledge-based practices by 2030. The goal can only be achieved if we succeed in absolute European convergence. Following the years' crisis period of 2010-2015, which particularly affected European peripheries including Portugal, Spain, and Greece, Portugal has since diverged from the European averages to show an increase in R&D and innovation. The good news and the reason why we have adopted a strategy oriented towards scientific progress is that we know it leads to growth and prosperity. After five years of disinvestment into Portugal, 2016 was the first year of a new convergence period. The official data is clear; public expenditure increased by 40 million euros in R&D last year, and private spending increased by 90 million.

Given that we have now exited recession and experienced a small revival, our objective is to make growth sustainable in the medium-long term—and to ensure that by 2030 Portugal is at least by

the European averages. The three pillars of this plan are: first, increasing business and public expenditure into R&D, using interface and collaborative arrangements; secondly, increasing the number of students that attend higher education to penetrate society at large by half; and thirdly, to develop digital skills across Portugal. Indeed, by 2030, our goal is to be a European leader in digital skills.

Let us consider the three primary proxies we use to register growth. Firstly, investment into R&D which has been a reference point since the mid-80s. To ensure a three percent level of investment into R&D investment year on year, through a robust and innovative economy, we need to multiply by fourfold our business expenditure in R&D, and to double public spending by 2030. The current year shows a marked trend that is based on the success of the construction of interfaces between the science and the business communities.

The interface program’s key element is its collaborative labs, CoLABs. These labs are public-private risk sharing partnerships that build interface structures while fostering skilled employment. We have already created six of these labs based on an expert international review process, with another 23 proposals under evaluation for future release. These labs cover several business aspects including the pharmaceutical and biotech areas because we believe that by diversifying our economic structure, we will nurture a public-private collective towards European convergence. The challenge now is to ensure growth over the next 12 years.

The second project within this plan is training and building our human resources in higher education institutions. Only four in ten adults aged 20 years old participate in higher education, which is close to the current European average, but it is not enough for a fully engaged knowledge economy. In the next 12 years, we should increase this figure and have 6 in 10 adults aged 20 years old attending higher education. Growth should occur, above all, in the polytechnic sector (i.e., non-university higher education), in close association with professionally oriented, practice-based research and innovation. Consequently, we will provide more people with access to higher education studies, opening up the door to more diverse, varied systems.

Thirdly, we seek to promote digital skills. In all areas of the economy and society, and especially within the health sector, we have launched a national initiative to foster digital skills, INCoDe2030. The effort covers inclusion, advanced computing issues and comprises a number of measures from community building, to sophisticated research into advanced computer and emerging areas of computer science. The initiative addresses training, education and specialization, and the inclusion of citizens at large in a society that will be more and more digitally driven.

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What is your assessment on the current environment in biomedical sciences, particularly in light of the government's investment of up to 20 million euros into Porto's Agency for Clinical Research and Biomedical Innovation (AICIB)?

Over the past thirty years, we have built a powerful biomedical research community. For instance, if we look at the number of European research council grants and the overall increase in public expenditure in R&D, it is clear that biomedical research and institutional development throughout the country are advanced. A considerable amount of investment into the biomedical sphere is public funded (national and European), although there are several private institutions including the Champalimaud and Gulbenkian Foundations.

Despite the success, we face a number of challenges either concerning collaboration with the business sector and, above all, within clinical research practice. Ten years ago, we launched the first clinical academic center, a network of biomedical institutes, schools of medicine and nursery, and hospitals. Now we have eight of such centers throughout the country (Lisbon, Porto, Coimbra, Braga, Covilhã and Faro), but we have to bring together medical doctors, patients and all those who practice healthcare, across the spectrum, to improve education and research quality.

The future agency in Porto will be a light structure for funding and assessment, with the foremost objective of bringing public funding from the science system—the Portuguese Science Foundation—public money in the health system—INFARMED—and private funding from the pharmaceutical industry—notably, APIFARMA. The goal is to build this structure as a funding process to clinical research so that by 2030 we have a relative level of funding similar to other countries in Europe, in particular, the UK. We target 20 million euros per year to fund our clinical research.

Other countries across Europe are also trying in experiments and face similar challenges because the economic incentives in the health system are manifold. Therefore, we must carry out this operation carefully, step by step, continually accessing the process. This is because the existing schemes for funding and evaluation are not adequate to foster and promote the emerging challenges and opportunities in the health sector, particularly clinical research and biomedical innovation. Currently, basic and applied research is funded and assessed through the Portuguese Science Foundation, schools of medicine are evaluated and assessed by our accreditation and evaluation agency, and the hospital system is funded and assessed through the Ministry of health. Each scheme independently assesses the research centers, the universities, and hospitals through

distinct and specific criteria and schemes. In the future, we will provide additional funding and evaluate the collaboration and coordination between these systems and ensure we are investing more into innovative clinical research, particularly linked to clinical practice.

International companies often look to Portugal as a country offering fertile ground for testing new products, innovations or complex ideas before export to broader markets. To what extent can Portugal act as a testbed for innovation across Europe or worldwide?

Certainly, Portugal has fantastic potential for innovations, although we must be realistic. When we look from London, Berlin, Shanghai to Lisbon, there are unique characteristics that differentiate Portugal from any other part of the world, notably our Atlantic positioning. Moreover, our positioning in regards to Portuguese-speaking countries is an active attribute. Portugal is a medium-sized country, at 10 million people, with an aging population, but there are 250 million people who speak Portuguese worldwide. Portugal can undoubtedly play a role in the Mediterranean, across North Africa, and in some niches of Sub-Saharan Africa and Latin America. The strategy is realistic when we consider the Portuguese location and global Portuguese-speaking community.

Not only do we have a social responsibility to help the biomedical and healthcare systems in those countries, but also, to foster and expand markets in areas where the Portuguese language is a dominant force. We have three main strategies that reinforce this message: i) Go Portugal; ii) the Aga Khan Portugal Research Network; and iii) the “Atlantic International Research Center – AIR Center”. Go Portugal is a global science and technology partnership scheme, a program to strengthen international partnerships in science and technology and to engage in more business. The AIR Center builds a collaborative research network within local and regional systems, particularly in climate change, but encompassing related implication in the health and biodiversity. The Aga Khan Portugal Research Network is promoting a new collaborative research network in health, making use of the experience that leading Portuguese institutions and the AKDN network have in Africa.

Through the internationalization of the science community, we can facilitate more business, especially within technology. The internationalization of science and technology will drive international business in Portuguese companies that export, while simultaneously attracting foreign direct investment. As a medium-sized country, we realize that we cannot be everywhere, and our Atlantic positioning and our influence in the Portuguese-speaking communities worldwide will be crucial for our development. It will drive new frontiers of business and social engagement across

Africa.

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How can the country leverage the creative and flexible labor force present in Portugal to attract investors into Portugal?

Indeed, creativity and flexibility are attractive traits to the Portuguese workforce. However, engagement is vital: The Portuguese people are hard-workers, which differentiates us from many other parts of the European and world work landscape. The question is, therefore, not to see our hard-working attributes as a way of creating more low-skilled jobs in society, but to associate the hard-working and creative characteristics with highly-skilled jobs in the economy, which in turn creates added-value.

Portugal has a long history of exporting Human Resources to other countries. Since the 14th century, the Portuguese people have left Europe or emigrated to neighboring countries, supplying human resources throughout the world. Our research community is no different; only in 2009 did we register the first year in which foreign doctorate researchers working in Portugal numbered more than Portuguese doctorate researchers working abroad. This trend was lost again during 2011-2015, but we are now recovering a brain gain and promoting, above all, a culture of “brain circulation” and international networking

We need serious science-based business activities which create the necessary institutional context so that our people do not perform hard work in low-value jobs, and instead, they combine their hard-work with value-added activities. That is the main reason that we have launched collaborative labs: to promote risk-sharing initiatives to create skilled jobs for value-added working conditions. Similar to the recent Catapult initiatives in the UK, or the 60 years-old German Fraunhofer Institutes, we will create more opportunities for our graduates. These initiatives differentiate from traditional research centers and businesses, to create a diversified institutional context which nurtures this combination of diligence and creativity, with skilled jobs. The goal is to promote the necessary conditions to establish in Portugal a young, innovative and skilled labor force by bringing together research centers, universities and polytechnics with the broader Portuguese and foreign business community.

We are confident in the construction of these collaborative labs and intend to further the collaboration between the biomedical arena, with academia, clinical centers and healthcare professionals across the country and indeed, worldwide.

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