Technological Forecasting & Social Change xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

Shaping Portuguese science policy for the European horizon: The discourses of technological change☆

Tiago Brandão

IHC, FCSH-UNL, Portugal

ARTICLE INFO

Article history:
Received 24 January 2015
Received in revised form 11 September 2015
Accepted 14 September 2015
Available online xxxx

Keywords:
Portugal
History
Science policy
Technological policy
Technology transfer
JNICT
European integration

ABSTRACT

An empirical approach to scientific institutions and science policies is essential for a historical and political understanding of the management of science. Working within this understanding, the main purpose of this article is to analyse Portuguese scientific policy as proposed by the important actors of a peripheral 'science, technology and innovation system'. Based on archival and printed sources, this is a qualitative study of historical evidence based on influential personalities, policy measures and institutional trajectories. As such, the purpose is to understand and evaluate the interconnections within science policy, for the purpose of understanding technological change strategies in Portugal, identifying its trends and agents, as well as pointing out the policy measures and programmes proposed between those transitional years. As an empirical and contextual study of the national situation, the aim of the article is to provide a reflexive view in order to consider, in a wider contextual manner, the main issues within Iberian science policies, during a transition period that took place between the 1970s and the 1990s.

1. Introduction

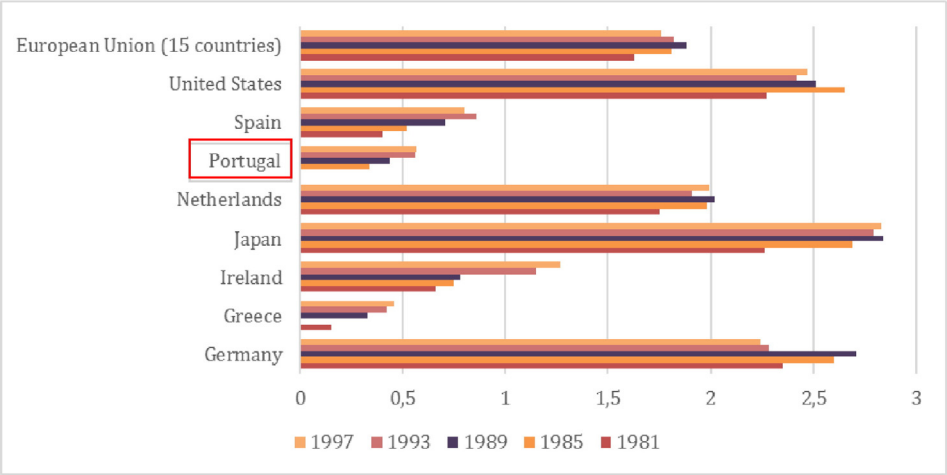
Recent historiography regarding Portuguese science policy has made some important contributions and enlightened us as to the institutional identity of some of the main organisations within the Portuguese Science and Technology (S&T) system (Ruivo, 1998; Heitor and Horta, 2004, Heitor and Horta, 2011; Henriques, 2006). There is however a feeling that we must deepen and understand scientific policy thinking with regard to the past 40 years of Portuguese history. Above all, if nowadays the institutional genesis of the organisation of Science in Portugal is better known, as well as the main institutional developments within democratic Portugal, there is on the other hand a lack of an understanding (and even of an identification) of its main determining issues, the conformation of its policy process, its influential stakeholders and the meaning of these institutional trajectories.

Despite not being yet the much needed comprehensive account on the Portuguese history of science and technological policy, this article will show how, in the Portuguese case, a number of developments from the 1970s and 1980s would favour the affirmation of a set of rationalities within the "discursive space" of Science and Technology policy, which would be prolonged beyond the 1990s (Braun, 2006; Elzinga and Jamison, 1995). Stimulated by the Japanese miracle and by the pressures of the economic culture, scientific policy orientation from the 1980s onwards would in various countries give *emphasis to industrial innovation and technological forecasting*, a trend that was pervasive if not clearly visible in Portuguese science policy during the 1980s, which would be increasingly adopted after Portugal's European accession and particularly during the transition to the 1990s, when the 'sectorization of S&T policy' became evident, mainly at a European-level, deepened by a process of *locking individual countries into a technocratic mode of development steered by the new bureaucracies concentrated in Brussels* (Elzinga and Jamison, 1995: 591 and 594).

This article will start by contextualising this European horizon and the contours and implications of the process of Europeanisation of the Portuguese 'scientific system'. It will introduce the reader to the a debate of scientific policy on technological policy, including the original issues involved, from the transition to the 1970s, following the participation of Portuguese consultants and the way in which technological challenge was analysed in Portugal. Evidence of the profound institutional and organisational reconfiguration of the Portuguese 'scientific system' will be invoked, following the rise of JNICT — *Junta Nacional de Investigação Científica e Tecnológica* (National Board for Scientific and Technological Research) and qualitatively evaluate the impact of Community subsidiary programmes within the Portuguese science policy process. Have been identified some stakeholders whose influence moulded a strategic orientation, which established a technological rationality within the scientific policy process throughout the period

☆ PhD and Integrated Researcher at the Institute of Contemporary History, of the Faculty of Social and Human Sciences, New University of Lisbon (IHC, FCSH–UNL), and 'Senior Research Fellow' at the Centre for Innovation, Technology and Policy Research (IN+/IST). His research field is contemporary history, using historiographical methodology and stressing a historical perspective for a deeper and empirical understanding of science policy issues.

http://dx.doi.org/10.1016/j.techfore.2015.09.014
0040-1625/



Source: OECD, Main Science and Technology Indicators.

Graph I. GERD as a percentage of the GDP.

considered by this study (1974 to 1997). Finally, the main aspects will be summarised in the conclusion.

2. From the Atlantic to Europe: the Europeanisation of 'national science policy'

> "Portugal has reached not one, not two, but several crossroads. In addition to major reforms in its political, economic and social structure, Portugal will shortly have to choose between two options concerning its history, at the deepest level. Portugal will have to choose between Europe and the Atlantic. (…) If it heads for Europe – this Europe so pleasing for the technocrats – Portugal will once again lose its independence, and return, whether in the short or long term, to the situation of 1580. (…)" (Carvalho, 1982:63–64).

Its positioning and peripheral nature have placed Portugal as an interesting case to rethink the relationship of the peripheries with the decision-making centres of Western culture itself, including the spread of the Anglo-Saxon matrix, given its historical influence on the construction of scientific policies in different nations and, in particular, peripheral, industrial and technologically less developed regions. A small to medium-sized country, especially when compared to Greece, Portugal shares with those regions, and also with Ireland, with the southern regions of Italy and with the western provinces and the south of Spain, delays in development which, all together, have been attributed to the peripheral regions of Europe (Graph I).

On the eve of its European accession, Portugal had an arduous inheritance, resulting both from the profile of the 'scientific system' stemming from the *Estado Novo* dictatorship, as well as the disorganisation which had resulted from the revolutionary turmoil. This was the same for example in Spain, which was similar on various levels (Sanz Menéndez, 1997:156), where the new democratic regime had inherited a legacy characterised by a scientific system in which research carried out by the State laboratories prevailed, with a conservative university system and an industrial-business sector hardly competitive enough for international markets, with both being too closed to change. The Iberian countries thus possessed a weak business and industrial structure in comparison with the scientific and technical standard of the 'new economy' (Tables 1 and 2).

Furthermore, with the loss of the colonial empire following the 1974 Revolution, Portugal saw its economic activity fully exposed to foreign competition. Portugal had been confronted with the growing influence of external phenomena since 1960. With a view to politically coordinate national production, some initiatives had actually been set in motion. The setting up of JNICT — *Junta Nacional de Investigação Científica e Tecnológica* (the National Board for Scientific and Technological Research) in 1967 thus occurred as part of a long-term policy to prepare the Portuguese economy for economic competition.

The alteration in Portugal's economic circumstances in moving into the 1970s, and the end of the colonial Empire, brought with it the challenge to adapt the economic development model of the Country (Telo, 2007) which, historically, had orientated itself towards the Atlantic, exporting to protected markets, and which now had to turn towards Europe and to more competitive global markets operating fully within liberal capitalism (Drain, 1994:124). As Mendes Mourão would warn[1] – an influential individual in defining science and technological policy until the eve of accession to the European Union – *the new conditions of international competition, both at the European and the world*

Table 1
Commercial structure by group of products (by percentage of the total deficit).
Source: FCT–ACT, JNICT, *Exame à Política Científica Nacional Realizada pela OCDE* (Exam to the National Science Policy carried out by OCDE), Junta Nacional de Investigação Científica e Tecnológica, Data collected from this typed version of the Final Report (*Relatório Final*), [n.d.], Cota 03.012.01 Cx4, 6422, DSTI/SPR/84.29, p. 20.

	1971	1978	1981	1982 (a)
Food production	−15.3	−17.9	−19.2	−16.5
Mineral products	−14.0	−29.5	−35.5	−36.6
Fuels	−14.2	−28.6	−36.5	−43.8
Chemicals	−15.4	−20.6	−15.8	−15.0
Wood, cork, cellulose	15.6	10.2	7.3	7.6
Textiles and clothing	13.3	11.8	8.8	11.0
Leather and shoes	0.8	1.6	2.0	2.0
Metal products	−9.7	−10.2	−8.7	−9.6
Machines	−37.5	−28.4	−22.8	−23.5
Transportation	−26.8	−11.9	−12.9	−12.6
Misc.	−10.9	−6.1	−3.4	−3.7
Total deficit (millions of dollars)	−933	−2716	−5711	−5312

(a) Preliminary results.
Notes: This table, also provided by the OECD exam, seems to counteract the data shown in Graph III, namely the idea of positive technological balances in 1981 and 1982.

[1] José C. P. Mendes Mourão, a graduate from the *Escola Superior de Veterinária* (1968) and with a PhD from Bristol University, after an internship at the Atomic Energy Research Centre at Harwell, Great Britain, would take on public duties in the administration of Portuguese scientific policy in the post-revolutionary period, particularly as Secretary of State of the 5th Constitutional Government (1979–1990) and President of the National Board for Scientific and Technological Research (1979–1995). He was also the national administrator for the INVOTAN scholarships programme. He carried out research on biochemistry topics.

Please cite this article as: Brandão, T., Shaping Portuguese science policy for the European horizon: The discourses of technological change, Technol. Forecast. Soc. Change (2015), http://dx.doi.org/10.1016/j.techfore.2015.09.014