

**THE POLICY APPROACH FOR THE THIRD MISSION OF UNIVERSITIES:
THE SPANISH CASE (1983 – 2018)**

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Abstract. Following the international trend, Spanish universities have long ago included among their fundamental tasks the third mission of universities and have advanced in the formalisation and structuration of knowledge transfer, life-long learning and outreach activities. The development of the third mission was not gradual, but shaped by the evolution of the regulatory and funding frameworks affecting higher education. A comprehensive revision of the Spanish regulatory changes and programmes supporting the third mission of universities overtime indicates that the policy agenda has been traditionally supportive mostly to knowledge transfer and innovation activities, although more support is necessary in many fields. Consequently, the production process for knowledge transfer is nowadays further developed than the one for continuing education and social engagement. Notwithstanding, even the true potential of knowledge transfer is still to be achieved due to weak incentives for researchers to transfer knowledge to society and managerial and cultural barriers that still remain. Besides, this issue is relevant to higher education managers and policy makers because it entails that part of the activity of universities and their contribution to society is not fully visible.

Keywords: third mission, knowledge transfer, continuing education, social engagement, Spanish Higher Education system, university policy, university social responsibility.

JEL classification: I21, I23.

1. Introduction

In the new 21st century, the engagement or third mission of universities has become a prominent issue in the European Higher Education Area (European Commission, 2017). Universities have become key actors of economic and cultural growth, and are evolving into engaged institutions with industry and society at large (Etzkowitz, 2000; Vorley and Nelles, 2008; Berbegal Mirabent and Solé Parellada, 2012). Third mission, knowledge transfer, innovation, social engagement, university social responsibility, sustainable development and life-long learning have increase their importance in Europe. However, these activities have been developed by (European and Spanish) universities since long, but in an unmethodical way and through extremely dissimilar approaches, and usually with very low financial support.

According to different authors and experts, the third mission of universities may be defined as “the university’s ‘relationship with the non-academic outside world: industry, public authorities and society’ (Schoen et al., 2007, p.127) and involves

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collaboration ‘between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources’ (Driscoll, 2008, p. 39) and for the benefit of the economy and society (Molas-Gallart et al., 2002)” (de la Torre et al., 2017, p. 211). Consequently, third mission is closely connected to the university stakeholders and the concepts of (corporate) social responsibility (Neave, 2000) or horizontal accountability. It consists of engagement strategies (Driscoll, 2008) and activities related to: (i) knowledge transfer and innovation; (ii) life-long learning; and (iii) outreach (E3M, 2010).

Since third mission duties are relatively recent, most countries are still structuring this type of activities in order to boost them and increase their visibility. The Spanish case is not different. Despite being a decentralised system in which the regions (*Comunidades Autónomas*) have fundamental responsibilities in Higher Education (HE) (e.g. university funding), the Spanish HE System is predominantly homogeneous, in some features ~~but not all~~. For example, they are homogeneous in the sense that the legal framework that coordinates the system at national level assigns the same rights and duties to all universities, only considering some differences for private universities (a laxer regulation) and for the universities directly controlled by the Ministry of Education (*Universidad Internacional Menéndez Pelayo* and *Universidad Internacional de Andalucía*). Thus, all (public and private) Spanish universities have the legal duty of developing three functions: teaching, research and third mission; which have been termed in the literature as the ‘one-size-fits-all-model’ (Sánchez-Barrioluengo, 2014). As pointed by Guisan and Aguayo (2005) and Guisan (2017) there are important differences among universities, regions and fields of research, as seen in the Annex.

Being the most recently assigned function to universities, this paper provides a description of the degree of development of the third mission for the Spanish case from a policy-driven perspective. In so doing, we analyse in depth the evolution of the different regulations, policies and initiatives that have fostered the third mission of universities over time, as well as the barriers and difficulties still prevailing. Most of these initiatives did not only support third mission but had wider aims, rendering it cumbersome to identify the third mission related measures enforced overtime. We provide a synthetic study of the public-policy approach to third mission by disentangling these elements of the university-related policy initiatives in Spain. In this way, this study sheds light on the current configuration of the community engagement of Spanish universities, which is explained up to a certain extent by the third mission support provided overtime.

The paper is organised as follows: in Section 2, we reviewed the regulations, policies and funding priorities that have supported the third mission of universities overtime in Spain. Section 3 describes the consequent advancement of knowledge transfer and the main barriers still encountered. Section 4 focuses on the development of the specific framework supporting life-long learning and social engagement dimensions of the third mission. Finally, the discussion is set, drawing some concluding remarks.

2. Shaping the third mission development through regulation

Following the global trend, the university model in Spain has evolved and currently encompasses the teaching, research and third missions as core objectives. The

first regulatory change was introduced by the University Reform Law (*Ley Orgánica de Reforma Universitaria* – LRU, 1983) which basically assigned research and third mission duties to Spanish universities. It considered that, in addition to teaching and research functions at the service of society, universities were to provide scientific and technical support for cultural, social and economic development, as well as outreach outputs (LRU, 1983 – Article 1). Additionally, it created the figure of the *Consejo Social*: a governing body, that consists on a stakeholder board in charge of representing the public interests and acting as bridge between society and university. However, this law considered third mission or community engagement in a residual manner; thus, incentives were mainly directed to encourage R&D contracts with socioeconomic agents (Bricall, 2000) and the *Consejos Sociales* were formulated more as (accounting) control bodies than as a linkage between society and university (Tiana, 2015).

Later on, the Science Law (*Ley de Fomento y Coordinación General de la Investigación Científica y Técnica*, 1986) introduced the first science and technology policy in Spain, which explicitly compromised public funds (and fiscal incentives) for the encouragement of research and the transfer of research results to the productive fabric ~~firm~~ (?). The LRU and this Science Law entailed a turning point for the Spanish research and innovation system, and particularly for Spanish universities, thanks to the incentives implemented: regulation of the field, remuneration incentives to researchers (*sexenios*), R&D national plan, European funds, etc. (Vilalta, 2013). The real distribution of incentives (*sexenios* evaluation) among scientific fields have presented several important problems as seen in the Annex.

But the evolution of the third mission was finally triggered by the abolition of the University Reform Law (LRU, 1983) and the enforcement of the still in force Fundamental Law of Universities Act (*Ley Orgánica de Universidades* – LOU, 2001) together with its modification (LOMLOU, 2007). In particular, the LOU states that the functions of Spanish universities are the following (Article 1):

- The creation, development, transmission and criticism of science, technology and culture.
- Preparation of individuals for the development of professional activities that require the application of scientific knowledge and methods as well as their preparation for artistic creation.
- Dissemination, valorisation and knowledge transfer at the service of culture, quality of life, and economic development.
- Dissemination of knowledge and culture through university outreach and life-long learning.

These functions include knowledge transfer, life-long learning and social engagement duties. However, LOU and LOMLOU only recognise the academics' right to the evaluation and recognition of their knowledge transfer activity for the assessment of their professional activity (Article 41.3), which is one out of the three dimensions of the third mission. This right has been translated into the inclusion of knowledge transfer criteria in: (i) the accreditation process of candidates to university academic positions; and (ii) the remuneration incentives to researchers (*sexenios*).

The accreditation process of candidates to university academic positions (LOMLOU, 2007) entails that before applying to an academic position in public and private universities, candidates have first to be evaluated and accredited by the Spanish

National Agency for Quality Assessment and Accreditation (*Agencia Nacional de Evaluación de la Calidad y Acreditación – ANECA*). All candidates are required to meet specific criteria before being hired by a university, comprising: teaching experience, research experience, educational background, and work-professional experience. Tables 1 and 2 show the criteria and weights assigned to academic staff's activities required to reach each academic position accreditation.

Table 1. Criteria and weights in accreditation processes. Assistant and Ph Assistant Lecturers

Criteria	Indicator	Assistant lecturer (ayudante)		PhD assistant lecturer (ayudante doctor)	
Educational background	PhD	21		6	
	Scholarships and grants (pre-, post-doctoral)				
	Academic background (undergraduate and graduate programs)				
	Mobility (internships at other universities)				
	Research posts (coordination)				
Teaching experience	Teaching experience	9		30	
	Teaching training (courses, seminars and conferences)				
	Teaching innovation and teaching material				
	Mobility (internships at other universities)	-		-	
	Academic posts (coordination)				
	Academic supervision (bachelor, master and PhD thesis)				
Research experience	Research projects and research contracts	5-9	60	5-12	60
	Technology transfer	26-35		26-35	
	Publications (articles)	3-16		3-16	
	Books and book chapters	9		2-5	
	Conferences and seminars taught	-		4	
	Academic supervision (bachelor, master and PhD thesis)	4		1-2	
	Other research merits				
Work experience	Work experience outside the university	5		2	
Other merits	Other merits	5		2	
Coordination	Academic posts	-		-	
Total		100		100 (+2 extra)	
Minimum required score for a positive evaluation		55		55	

Source: Berbegal-Mirabent (2018, p. 71). * For those criteria that scores vary depending on the discipline, Berbegal-Mirabent (2018, p. 71) presents the range of values.

For the lower academic positions (Table 1), knowledge transfer criteria are residually included among research experience, which is the one with the highest weight assigned. For the case of senior lecturer and full professor positions, new criteria have been established in 2016 and weights are not considered: for the teaching, research, knowledge transfer, university management activities and educational background performance candidates may reach A, B, C, D or E scores according to

their merits (Royal Decree 415/2015 – *Real Decreto 415/2015*). It is clear that teaching and research are still the most relevant outcomes given that they are compulsory (see Table 2) and that knowledge transfer, professional work experience, university management and educational background are considered compensatory merits in case of C marks in teaching and research (ANECA, 2017).

Table 2. Criteria in accreditation processes. Senior lecturer and full professor.

Criteria	Minimum score to get accredited by area										
	Full professor (<i>Catedrático</i>)						Senior lecturer (<i>Titular</i>)				
Research	B	A	B	B	C	C	B	A	B	B	C
Teaching	B	C, E	C	C	B	B	B	C, E	C	C	B
Knowledge transfer/ Professional work experience			B		A				B		A
University management				B		A				B	
Educational background	-	-	-	-	-	-		B	B	B	B

Source: authors' elaboration based on Royal Decree 415/2015 (*Real Decreto 415/2015*).

* A stands for exceptional, B = good, C = compensable, D = insufficient, and E = special circumstances (i.e. the applicant has developed his/her career outside the university system or in a foreign university, where the quality of teaching merits is difficult to measure).

As for the system of remuneration incentives to researchers (*sexenios*), it dates from 1989 and consists on the complementation of the salary of those university researchers¹ whose research activity in the last six years has achieved a particular level of quantity and quality, accordingly to a system of evaluation in some cases controversial (see Annex). Researchers can apply to the annual call launched by the National Commission for the Evaluation of Research Activity (*Comisión Nacional Evaluadora de la Actividad Investigadora* – CENAI to get their last six years research evaluated. There are 11 fields of knowledge considered with different evaluation criteria, and researchers can choose according to which of them they want to be evaluated.

In 2010 an additional and alternative field was included, the so-called Field 0. This field evaluates, not the research activity of academics, but their knowledge transfer and innovation through the following indicators (BOE, 1st December 2017 – see Table 3):

- Participation in spin-offs based on the applicant research results.
- Patents and other property rights in exploitation and patents granted: national, European and international – being better valued the international patents and worse valued the national ones.
- Patent applications – taken into account secondarily.
- Contracts with socioeconomic agents that lead to knowledge transfer.
- Publications result of knowledge transfer collaborations.
- Contributions to standards of industrial or commercial nature for government agencies, professional associations and other entities.

¹ It also applies to researchers of the Spanish Research Council (*Centro Superior de Investigaciones Científicas* – CSIC). The evaluation criteria is revised annually.

- Contributions to the development of protocols in various areas of knowledge such as archaeological research, identification of new diseases, environmental protection, etc.

In order to apply to Field 0 it is necessary to have previously obtained a positive evaluation in a *research* field (Fields 1 to 11). Table 3 contains the third mission criteria considered by the Spanish system of remuneration incentives to researchers by field. It shows that indicators related to ‘patents’ are also taken into account in other fields of knowledge and not only in Field 0 (with the exception of fields 9, 10 and 11). However, it also reveals that the third mission is reduced to the knowledge transfer activities and is usually measured by patent related indicators. Only Field 0 considers more extensively the knowledge transfer of researchers, but it is still too narrowly characterised and it has a residual consideration.

In 2008 the Spanish government launched the University Strategy 2015 (*Estrategia Universidad 2015 – EU2015*) aiming at: (i) modernising the Spanish HE System according to the Modernisation Agenda for Universities (European Commission, 2006), (ii) improving the position of Spanish universities in the global rankings and (iii) boosting the social and economic development of the country through the coordination of the regional university systems. In 2011 the strategic lines of the EU2015 were defined: (i) *missions*, encompassing the three university missions; (ii) *people*, referring to the three main stakeholders belonging to the university community (students, academics and administrative staff); (iii) *capacity building*, related to university funding, governance, internationalisation, assessment and communication; and (iv) *environment*, comprising the socio-economic contribution of universities, their local and regional interaction and the improvement of the facilities of the campus.

The most important strategic initiative launched within the EU2015 in order to boost the performance of Spanish universities was the Campus of International Excellence programme (*Campus de Excelencia Internacional – CEI*). The programme started in 2008 and was based on the French and German university excellence programmes already launched in 2006 and 2005 respectively (*Pôle de recherche et d'enseignement supérieur – PRES* – in France, and *Excellence Initiative* in Germany). It consisted of three calls for projects (2009, 2010 and 2011) each one providing subventions (to fund the definition process of the pre-selected projects) and loans to be returned at a low interest and after waiting periods (to fund the implementation of the selected projects).

The CEI programme brought together most of the strategic priorities identified by the EU2015, specially focusing in the last one: *environment*. Thus, the CEI programme was developed through three transversal lines of action, of which we highlight the areas related to third mission and university-community interaction:

- Campus and environment. It considers the extension of universities’ activities to education, research and innovation, comprising: (i) the configuration of research and innovating ecosystems for socio-economic contribution where universities are to be the central pole attracting other legally independent entities and businesses located in their area of influence; and (ii) the socioeconomic contribution of universities to their regions through research on the potential solutions for the social, cultural and environmental challenges of

our society. Universities are also to encourage the contribution of other institutions.

- Excellence in teaching, research and innovation: to be achieved through the improvement of the efficiency and effectiveness of the Spanish HE system and universities. It encourages the strategic behaviour of universities regarding: (i) the definition of strategic Collaborations, Alliances or Mergers (CAMs) of universities with public research institutions, companies or third sector institutions; (ii) international cooperation in education, research, innovation and social engagement; and (iii) specialisation by mission, subject mix and geographic scope.

Table 3. Third mission criteria of the Spanish system of remuneration incentives to researchers (*sexenios*) by field. Call 2017.

Type of sexenios: Research field of knowledge		Third mission indicators
Field 1. Mathematics and Physics		▪ Patents in exploitation ▪ Patents granted (after prior examination)
Field 2. Chemistry		▪ Patents in exploitation ▪ Patents granted (after prior examination)
Field 3. Cellular and molecular Biology		▪ Patents in exploitation ▪ Patents granted (after prior examination)
Field 4. Biomedical sciences		▪ Patents in exploitation ▪ Patents granted (after prior examination)
Field 5. Natural sciences		Not specified
Field 6. Engineering and Architecture	6.1. Mechanical and Production Technology	▪ Patents and other property rights in exploitation ▪ Patents granted (after prior examination)
	6.2. Communication, Computer and Electronics Engineering	
	6.3. Architecture, Civil Engineering, Building and Urban Planning	
Field 7. Social, Political, Educational and Behavioural sciences		-
Field 8. Economics and management		▪ Patents and other property rights in exploitation ▪ Patents granted (after prior examination)
Field 9. Law		-
Field 10. Arts and history		-
Field 11. Philosophy, Philology and Linguistics		-
Type of sexenio: Knowledge transfer and innovation		
Field 0. Knowledge transfer and innovation. Third mission indicators:		
▪ Participation in spin-offs, Patents and other property rights in exploitation. Patents granted (after prior examination). Patent applications. Knowledge transfer contracts. Publications result of knowledge transfer collaborations. Contributions to standards of industrial or commercial nature. Contributions to the development of protocols		

Source: authors' elaboration based on BOE (1st December 2017).

In other words, the CEI programme drove greater specialisation and differentiation, the establishment or strengthening of collaborations and alliances between universities and other institutions of their area of influence, as well as greater internationalisation and accumulation of talent. With regard to the third mission, the programme encouraged stronger interaction with private institutions, linking the positive evaluation of the projects proposed, among other criteria, to the inclusion of a strategic plan for building regional clusters for the interaction between universities, other research institutions, companies and (local, regional) government. The CEI programme influenced mainly in the knowledge transfer and innovation dimensions of the third mission, being the life-long learning and social engagement secondary targets once again.

In 2011, Spain introduced a new Law on Science, Technology and Innovation (*Ley de la Ciencia, la Tecnología y la Innovación* – LCTI, 2011). The new law brings together into a single document the existing dispersed rules regarding the duties and rights of the research staff. But more essential to our study, it also fosters the knowledge transfer through: (i) easing the staff mobility among public and non-profit research institutions, as well as among private institutions established or participated by the researcher's employer; and (ii) regulating the 'young innovative companies'. Besides, the Law of Sustainable Economy (*Ley de Economía Sostenible*, 2011) regulates the technology-based companies, start-ups, spin-offs, research consortia, or innovation clusters for transferring research results to society. Finally, within the framework of the LCTI, in June 2016 was established the National Research Agency (*Agencia Estatal de Investigación*) that manages many research and innovation programmes in Spain in order to ensure a stable framework for funding public research and transparency. It was established in June 2016 and it coordinates and manages many research and innovation programmes in Spain.

Regarding the Spanish funding system for HE, the core funding for public universities is provided by the regional governments and is mostly related to teaching and research output indicators or costs, as well as to investment and capital expenditures. Table A2 in the Annex presents data of the main sources of financial support to universities research in Spain.

Some regions also provide additional funds for the diversification of the services offered by universities, but the third mission funds come mainly from: (i) public contracts and tenders (with the European, central and regional governments) and contracts with the productive and non-profit sectors; (ii) life-long learning tuition fees; and (iii) donations and philanthropy. Therefore, despite the university funding system does not include third mission performance among the funding allocation criteria, some of the third mission activities involve complementary income sources for universities, a strong incentive for universities to develop them especially in a context of economic crisis and decreasing amount of their block grant.

Finally, in line with the legal rules, policies and funding incentives aforementioned, the indicators available for the third mission activity in Spain mainly approximate the knowledge transfer dimension. For indicators at the university level the main data sources are the RedOTRI (www.redotriuniversidades.net) and its report on university knowledge transfer, the IUNE observatory (www.iune.es), and the various patent offices. Additionally, the Spanish Ministry of Education provides data

on university graduates access to labour market. The Foundation CYD also provides some data on knowledge transfer at the university level (www.fundacioncyd.org).

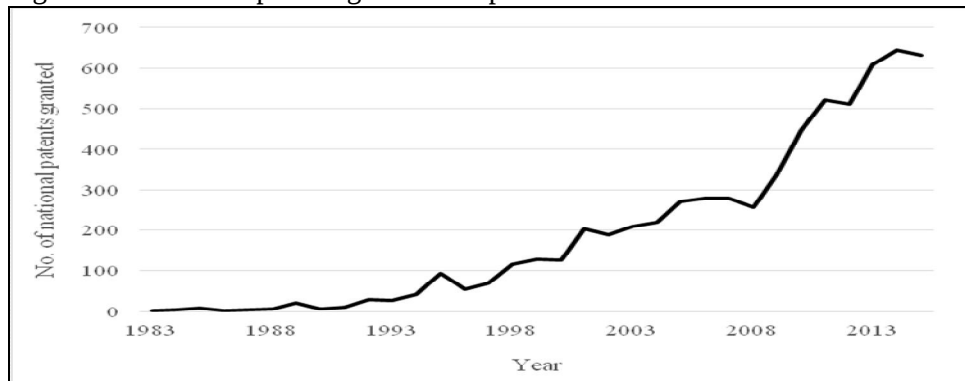
Besides, the biannual report of the CRUE (www.crue.org) delivers highly disaggregated data on the funding of universities that allows following the evolution of, for example: income from life-long learning courses, third party funds, current transfers from companies or private research funds. However, the coverage of this data is heterogeneous depending on the variable and since the academic year 2013-2014 most data is only published aggregated at regional level.

Furthermore, the Cátedra UNESCO in university management and policies (*Cátedra UNESCO en Gestión y Política Universitaria*) has launched its observatory on university students' employability and employment (www.oeeu.org) which already provides extensive data on the employability of university students in the near future. As far as we are aware, for the social engagement of universities there is no data available, but the CRUE and the Spanish Network for Sustainable Development (*Red Española para el Desarrollo Sostenible – REDs*) are jointly defining a set of indicators to assess the commitments of the Spanish Universities with the achievement of the 17 Sustainable Development Goals².

3. Knowledge transfer development and prevailing barriers

The above-mentioned policy frameworks and funding priorities for the development and reinforcement of permanent structures for the university regional commitment, led to an increase in the public expenditure allocated to universities' third mission activities (mostly knowledge transfer and innovation), and new (existing) structures to support the knowledge transfer were established (reinforced), among others: Technology Transfer Offices (*Oficinas de Transferencia de Resultados de Investigación – OTRIs*) and its network RedOTRI, the Units for Research Management (*Unidades de Gestión de la Investigación – UGIs*) and their network RedUGI, scientific and technological parks, incubators, the University-Business Foundation (*Fundación Universidad-Empresa – FUE*) or the EC Business & Innovation Centres (BICs - CEEIs).

Figure 1. Number of patents granted to Spanish universities. 1983 – 2017.



Source: author's elaboration from ESPACENET and RedOTRI.

² See <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

But third mission outputs also increased, particularly those related to traditional knowledge transfer and innovation activities, since these are the activities that have been more explicitly and strongly encouraged by governments and the ones taken into account for the evaluation of researchers – even though still residually. Figure 1 shows the evolution of the total number of national patents granted to Spanish (public and private) universities since the enforcement of the LRU. Data illustrates that since 1983 this knowledge transfer outcome has gradually increased, with a steep rise after the LOMLOU (2007).

In fact, two decades after the LRU and the Science Law, Spain was among the first performance HE systems regarding scientific publications and access to public research funding (Vilalta, 2013). The Spanish HE system (particularly public universities) has become one of the main elements of the Spanish R&D and innovation system. According to the National Statistics Institute (*Instituto Nacional de Estadística* – INE), in 2016 Spanish universities accounted for 27.52% of the national R&D expenditure, although they only produced 4.36% of the R&D revenue, because their fundamental objective is still the production of basic research results, and not the commercialisation of knowledge. Consequently, most of the Spanish R&D funds come from companies (46.70%) and public administrations (39.96%)³. Additionally, universities have 36.52% of the full-time staff in the sector (88.88% hired by public universities) and 46.13% of its researchers⁴ (87.98% employed by public universities).

However, the process for the knowledge transfer and valorisation is not still mature and despite the strong improvement overtime in patents and other knowledge transfer indicators (see the various reports from RedOTRI), Spain is not yet one of the first performance European countries in this field (Vilalta, 2013). Additionally, the evidence on the efficiency achieved by the abovementioned knowledge transfer and innovation organisations is inconclusive since results are still far from their true potential (Rodríguez-Pomeda and Casani, 2008) and are heterogeneous across universities (Berbegal-Mirabent et al., 2013). This situation is consequence of the poor starting point of Spain on this issue (Grau Vidal, 2012) and the difficulties and barriers that universities still have to face (Berbegal-Mirabent et al., 2013). In order to identify such barriers the *Consejo Social* of the Universidad Autónoma de Madrid and the Superior Council of Chambers of Commerce (*Consejo Superior de Cámaras*) organised a two-days meeting of practitioners and experts on knowledge transfer in Spain. The panel of experts was composed by researchers in this field and leaders from various organisations: universities, the Superior Council of Chambers of Commerce, Scientific Parks, Technology Transfer Offices, the Foundation for Technological Innovation (*Fundación para la Innovación Tecnológica* – COTEC⁵) and the

³ According to INE, in 2008 Spanish public administrations provided a higher percentage of R&D funds (45.57%) than companies (44.95%).

⁴ This percentage has dropped along the economic crisis: in 2008 universities hired 56.11% of the researchers of the Spanish R&D sector (INE).

⁵ COTEC aims at promoting innovation as source of economic and social development. It publish an annual report on the Spanish R&D and innovation.

Association for the Promotion of Innovation in Madrid North (*Asociación para el Fomento de la Innovación en Madrid Norte – InNorMadrid*⁶).

According to this panel of experts, such barriers are related to: (i) the HE and innovation systems; (ii) the productive sector (mainly SMEs); and (iii) the university-industry collaborations. Regarding the HE and innovation systems, difficulties arise from the lack of knowledge within universities of their research activity and outputs, the limited capacity of faculty to own spin-offs' equity, the weak entrepreneurial culture among Spanish faculty as well as the lack of extrinsic incentives to researchers and the unclear identification of the benefits for researchers from knowledge transfer activities. Besides, public universities have weaker organisational autonomy and flexibility than the private ones, and their strategies of formal knowledge transfer mechanisms (e.g. business incubators) are usually unclear (Berbegal-Mirabent et al., 2013), which aggravates the difficulties for universities on knowing the needs of other institutions and communicating their knowledge supply possibilities.

The panel also stated that the Spanish productive sector is mainly composed by small and micro enterprises with insufficient size to develop R&D activities: SMEs represent more than a 90% of the Spanish companies. Usually, these SMEs do not develop a strategic and innovative culture and most of them do not consider innovation as a key element for competitiveness and are not aware of the university technological knowledge available and the patent system. Usually, they also have a poor cooperation culture: universities are perceived by companies as teaching providers but not as potential technology partners. Finally, SMEs have a limited capacity to raise R&D (private and public) funds because: (i) of the traditional lack of private financial support to R&D activities and the weak development of venture capital, business angels or family offices; and (ii) R&D public funding is often related to 'big' projects unaffordable for SMEs, since they usually entail a substantial administrative burden and their calls have not been stable (deadlines, evaluation criteria or funding conditions).

Finally, the experts also pointed out that university-industry collaborations have to overcome the mutual unfamiliarity and the cultural differences between universities and SMEs. As aforementioned, universities are perceived as trainers, while entrepreneurs may be considered managers with a weak professional profile. Besides, academics and SMEs usually display different language, priorities, knowledge dissemination needs or timing, that may could lead to mistrust between potential collaborators.

However, the gap between knowledge production and transfer and innovation is not intrinsic of the Spanish case, but of the European one (*European Paradox* – see European Commission, 1995; Testar-Ymbert, 2012). Notwithstanding, in the case of Spain the levels of public and business investment in R&D are below the European average and far from the group of most innovative and developed countries (Vilalta, 2013). Moreover, as a consequence of the financial crisis the public expenditure in this field dropped since 2009 and despite universities are partly covering this drop with the

⁶ InNorMadrid gathers the Universidad Autónoma de Madrid with the four main business associations from the North of Madrid. Among other activities, InNorMadrid provides support to SMEs in university-business collaboration experiences and aims at generalise innovation and strategic planning in SMEs.

rise in tuition fees and the international R&D sector (e.g. EU funding); the complementary resources do not compensate the drop on the national and regional R&D funding (Perez-Esparrells et al., 2015) and the technology transfer performance of Spanish universities has been considerably affected – although by 2014 some signs of recovery seem to be arising (see RedOTRI and RedUGI reports).

Besides there are important ways of transmission of research results, in Humanities, Social Sciences and other areas, which may also contribute to improve socio-economic development and culture, as seen in the Annex.

4. Social engagement and life-long learning policy in Spain

Further structures and processes for the development of outreach and life-long learning activities have also emerged. However, in this case the presence and configuration of such units at the university level is more heterogeneous given the weaker support provided through policies, governmental specific programmes and funding priorities.

For the case of the social engagement of universities, the first significant initiative encouraging it was the Experts' Forum on Corporate Social Responsibility (*Consejo Estatal de Responsabilidad Social de la Empresa*) created by the Ministry of Labour and Social Affairs in 2005. This Experts' Forum published a report (*Consejo Estatal de Responsabilidad Social de la Empresa*, 2007) in which recommended the inclusion of social responsibility and sustainable development contents in university degrees and (university and non-university) professional development courses. Additionally, in 2014 the Ministry of Employment and Social Security developed a national strategy for corporate social responsibility in Spain for the period 2014-2020 (*Estrategia Española de Responsabilidad Social de las Empresas* –Ministerio de Empleo y Seguridad Social, 2015). Such strategy is supported by the Experts' Forum. Among other lines of action it aims at encouraging the inclusion of social responsibility contents in all education levels and research as well as stimulating the alignment of social responsibility objectives and R&D investments.

Furthermore, the EU2015 places university social responsibility as a core concept of third mission in Spain (García-Benau, 2014). According to the EU2015 (Ministerio de Educación, 2011), university social responsibility is to be achieved through sustainable development strategies and through the inclusion in the curricula of university degrees of sustainability contents.

Previous to the EU2015, the Spanish Rector's Conference (*Conferencia de Rectores de las Universidades Españolas* – CRUE) created in 2002 a task force for fostering the sustainability activity of universities. The task force became consolidated in 2008 as its Sectoral Commission on Environmental Quality, Sustainable Development and Risk Prevention at Universities (*Comisión Sectorial de Calidad Ambiental, Desarrollo Sostenible y Prevención de Riesgos en las universidades* – CADEP) in which 65 universities out of 76 participate. Since 2002, The CADEP aim has been to promote sustainability performance and its measurement in Spanish universities. Also, in 2017, CRUE signed a collaboration agreement with the Spanish Network for Sustainable Development (*Red Española para el Desarrollo Sostenible* – REDs) aiming at raising the awareness of the university community about the Sustainable Development Goals, its integration the institutional strategies of universities, and its implementation through specific initiatives.

Raising awareness on university responsibility in social, cultural and environmental issues and their contribution to sustainable development have taken place in recent years (García-Benau, 2014). In this line, CADEP states that almost all Spanish universities perform some activity related to sustainability and social responsibility, and most of them have specific managerial structures for them; however, there is strong heterogeneity (within and across universities) in the sustainability initiatives implemented (CADEP, 2010) and only seven universities have published social responsibility reports following the GRI⁷ methodology (Ministerio de Educación, 2011). The fields of further advancements are environmental awareness, waste management, climate change, urban planning and biodiversity, energy and mobility, and teaching; being advancements moderated for social responsibility, environmental impact assessment, water management and green procurement issues (Hidalgo et al., 2012). Some universities have published reports on these (and other) partial issues related to the university social responsibility and sustainable development. However, university social responsibility is not yet a strategy integrated within the university structure, i.e. it is not yet understood as a university management approach for the improvement of the quality of universities (García-Benau, 2014). An in-depth description of particularly innovative strategies on social responsibility in Spanish universities is available in Casani et al. (2010).

With regard to the continuing education, Spanish universities have provided life-long learning programmes since long ago, including summer schools, seminars, *títulos propios*⁸, workshops, etc. In the academic year 2014-15, life-long learning provided Spanish universities with the 72.23 percent of their postgraduate and the 7.51 percent of their total teaching income (Hernández Armenteros & Perez Garcia, 2016).

As we have already mentioned, the LRU considered the third mission in a residual manner, but it already recognised the autonomy of universities in the design and approval of curricula (LRU, art. 2.f) as well as the issuance of diplomas and degree's certificates (LRU, art. 2.i). This, allowed Spanish universities to provide other type of HE studies, apart from those regulated and recognised by the Ministry of Education (official degrees, e.g. Bachelor degrees). The subsequent LOU and LOMLOU were more specific, stating that such autonomy also included the design and approval of life-long learning studies (LOMLOU, art. 2.d) and the issuance of their corresponding diplomas and degree's certificates (LOMLOU, art. 2.g), being able to supply *non-official* studies (LOMLOU, art. 34.2).

Such regulatory framework lead in the 90s to a wide supply of continuing education programmes (CFC, 2010a), which was also strongly heterogeneous. It was then when the first initiatives looking for a set of basic rules that homogenised the main characteristics of the Spanish life-long learning took place. In this way, universities could recognise and compare the life-long learning studies offered by the rest of Spanish universities. The first attempt was the agreement of the *Consejo*

⁷ The Global Reporting Initiative (GRI – www.globalreporting.org) is the independent institution that created the first guideline for sustainability reports, being the most commonly used framework in social responsibility reports.

⁸ The so-called *títulos propios* are university degrees regulated by internal rules stated by the universities; unlike *official* degrees, which are regulated according to specific rules stated by the Ministry of Education.

Interuniversitario de Cataluña (DOGC 1026 3rd August 1988) for Catalan universities, followed at the national level by the *Convenio interuniversitario de los estudios de postgrado* (1991)⁹, which led to the differentiation of life-long learning programmes on: *Master, Especialista, Experto* and *Diploma de postgrado*; depending, among other characteristics, on their duration.

In 2001 took place the first meeting of HE managers responsible for postgraduate studies and continuing education. Since then, annual meetings took place that led in 2010 to the creation of the University Network for Postgraduate Studies and Life-long Learning (*Red Universitaria de Estudios de Postgrado y Educación Permanente* - RUEPEP), which in 2017 counts with 49 (public and private) universities (<http://ruepep.org>). RUEPEP is member of the European University Continuing Education Network (EUCEN).

Additionally, within the framework of the EU2015, the Ministry of Education established in 2009 the Commission for Continuing Education (*Comisión de Formación Continua* – CFC) within its University Council (*Consejo de Universidades*). The CFC published in 2010 a report that described the life-long learning performed by the Spanish universities (CFC, 2010a) and included some recommendations for further coordination and homogenisation of the programmes offered. On the basis of this report, the General Conference on University Policy (*Conferencia General de Política Universitaria*) adopted a more comprehensive and modern agreement (CFC, 2010b).

Later on, in 2011, the CRUE created within its Sectoral Commission on Academic Affairs a Sub-commission on Continuing Education. Such Sub-commission has basically supervised the advancements in the verification of life-long learning degrees and their inclusion in the register of the Ministry of Education on university degrees (*Registro de Universidades, Centros y Títulos* – RUCT; see RUEPEP, 2015).

5. Conclusions

The third mission, understood as the objectives of the European Commission for technology transfer, is a relatively recent concept that entailed that relevant socio-economic activities of universities became visible. In the last years, the engagement and third mission of Spanish universities has been further developed and the HE system as a whole has achieved substantial advancements in this area. Such development has not been gradual, but its evolution is the result of the impact of several laws and policies on research, knowledge transfer and HE aiming at boosting particular university outputs: mainly research and third mission results.

In particular, third mission activities are legally recognised as fundamental tasks of universities since the enforcement of the University Reform Law in 1983 and were further reinforced in the Fundamental Law of Universities Act in 2001. An in-depth description of the policy approach to the third mission since then has revealed that the regulatory and funding framework for the third mission of Spanish universities

⁹ Available at: https://www.unex.es/organizacion/servicios-universitarios/secretariados/postgrado/normativas/convenio_interuniversitario?set_language=en&cl=en

is strongly biased towards the traditional knowledge transfer activities, approaching the life-long learning and social engagement dimensions rather residually.

Consequently, knowledge transfer and innovation is the third mission dimension in which Spain has made major progress in the last decades, and has been even regarded as the sole dimension of the third mission (e.g. García-Aracil and Palomares-Montero, 2012). Notwithstanding, nowadays all Spanish universities are engaged in life-long learning and outreach activities, but the extent and forms of such engagement are especially heterogeneous, since government programmes have not aimed specifically at their development. The governmental support provided to these activities has been based on recommendations and coordination and homogenisation initiatives, rather than in full programmes and fund injections.

However, the third mission in practice is not embedded in all university processes yet, not even for the case of knowledge transfer: the scientific community has not provided full understanding of the processes and nature of the activities that make up the third mission so far, and Spanish (and European) HE systems are still coping with its full development and internalisation.

From a governmental perspective, third mission (and basically knowledge transfer) has been supported through regulation reforms and the establishment of institutions dedicated to the management of knowledge transfer and innovation. Still, the current third mission and HE policies may be improved and reinforced, e.g. by diversifying the activities considered in the evaluation of the academics' career: future revisions of the *sexenios* and ANECA's criteria should make sure that performing third mission activities along with traditional research and teaching does not penalise academics nor becomes an additional imperative requirement to them. But governments must also target to prepare society for a stronger interaction with universities, for example by further encouraging donations and patronage, or by catalysing a possible transformation of the Spanish productive fabric that increases the demand and facilitates the absorption of the knowledge generated in the university, either through training or research.

As for universities, a fully mature third mission is to come from its transversal inclusion in their strategies, maybe in the form of their Social Responsibility (understood in a broad sense) and socioeconomic engagement. This approach could appease the reluctance of some university stakeholders worried about the commercialisation of the university resources and outcomes. It is also important that universities include among their strategic objectives the development, coordination or reinforcement of those structures dedicated to provide logistical support to academics.

Finally, both governments and universities must work together in the production of extensive, comparable and reliable indicators on third mission as field of data development. The current greater development of the knowledge transfer activities is also obvious in the availability of third mission indicators and administrative datasets: the technology transfer and innovation dimension is the one for which there is more availability (and reliability) of indicators, there being incipient experiences on gathering data on employability, life-long learning and sustainability issues. A fully mature third mission framework would need of a complete system of indicators to monitor, analyse, understand and render visible the third mission interactions carried out by (Spanish) universities at national and international level.

In conclusion, although Spanish universities have traditionally performed third mission activities – even when the social demand for them was not explicit yet; there has not been a transformative change from their informal, tacit and secondary provision to the full implementation as fundamental and consolidated university tasks, being one of the challenges of HE systems. This would entail a higher weight of the third mission (in a broad sense) in the universities' production structure and natural and bidirectional relations between universities and the non-academic outside world. To achieve this level of development and stabilisation, there is still arduous work pending to policy makers, HE managers and university leaders. Indeed, they should be aware of the perils of the current situation, since it means that part of the activity of universities is not fully visible and there is not enough data to study and fully understand the processes behind continuing education and outreach activities. Extensive data on third mission is a key factor to put in value the universities' progress in this issue.

The third mission in social sciences, and several other fields, may also play a paramount role in the contribution of universities to the European socio-economic development, employment and quality of life. Until now, such contribution has been made mainly through books and reports, but nowadays it needs financial and institutional support in order to increase its visibility through new technologies (e.g. television, electronic newspapers or social media in academia).

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Annex on line at the journal Website:

¹ *Regional and Sectoral Economic Studies*: <http://www.usc.es/economet/eaat.htm>

Annex 1. Remuneration incentives to researchers (*sexenios*)

Guisan and Aguayo (2005), Cancelo and Bastida(2013) and Guisan (2017) and other researchers have analysed the *sexenios* for the period 1989-2013. Their results show a negative discrimination against fields related with Architecture and Civil Engineering (6.3), Economics and Business (8) and Social Sciences. Although the initial incentives where theoretically addressed to all scientific fields, a great problem arose because the Committees in charge of recognition of research activities to university researchers (*sexenios*) have applied controversial criteria in those fields, as explained in the above-mentioned studies.

Table A1. Accumulated positive evaluation of *sexenios*, until year 2013 by scientific areas (groups of scientific fields) in Spain until 2013.

Scientific areas	N. <i>sexenios</i>	N. teachers	Average per teacher	% <i>sexenios</i>	% teachers
Humanities (including Art)	13,520	7,073	1.91	16.45	14.94
Social Sciences	15,646	13,063	1.20	19.04	27.59
Natural Sciences (excluding Health)	28,785	11,590	2.48	35.03	24.47
Health Sciences	10,175	5,677	1.79	12.38	11.99
Engineering and Architecture	14,038	9,952	1.41	17.09	21.02
<i>Total</i>	<i>82,164</i>	<i>47,355</i>	<i>1.74</i>	<i>100</i>	<i>100</i>

Source: elaborated by Guisan (2017), Table 9; from CRUE (2014), Tables 1.II.2.5 and 1.III.1.7.

We may notice that ~~while~~ Natural Sciences areas (excluding Health) represents a percentage of *sexenios* recognition (35.03%) much higher than their share in the total number of university teachers (24.47%). However, there are areas with the opposite situation, being ~~with~~ the most extreme case the one of ~~in~~ Social Sciences, with only 19.04% of *sexenios* recognition in spite of its high share ~~in the number~~ of university teachers (24.47%).

The evaluation criteria chosen for Natural Sciences has been also imposed to other knowledge areas, in spite of the diverse features of the fields. This policy has received strong criticism. Criteria that may be rather ~~good~~ adequate for Physics, or other Natural Sciences, are not suitable ~~good~~ for evaluation of Social Sciences or Economics and Business Research, nor many other fields.

The negative effects of controversial evaluation criteria have affected more deeply to ~~the fields~~ 8 Economics and Business (field 8) and Architecture and Civil Engineering (field 6.3). Cancelo and Bastida (2013) study ~~present data~~ of positive evaluations of *sexenios* for the period 1989-2007, showing notorious differences: while in several fields of Natural Sciences more than 80% of teachers got two positive evaluations (*sexenios*), in the undervalued fields (6.3 and 8) the percentages were much lower, around 20% and 30%. ~~The~~ Deans, Rectors, Trade Unions of university teachers and the institutional defender of citizens (*Defensor del Pueblo*), have demanded the Minister of Education and Science to correct the negative consequences of this controversial criteria of evaluation in the undervalued fields. Even, the Committee of Science in the

Spanish Senate approved, by unanimity of all the political parties, a requirement to the Ministry of Education in order to solve the *sexenios* problems.

Among several important initiatives addressed to revise this controversial treatment criteria the Spanish Senate reached an agreement requesting to the Minister of Education to improve the system in order to guarantee equity in the *sexenios* system in the following terms (see the entries “2010” and “Senado”, in the Spanish University Blog “Foro Unives 2010”):

<https://forounives2010.blogspot.com.es/search/label/2010>

<https://forounives2010.blogspot.com.es/search/label/Senado>

Spanish: *"Con fecha 18 de febrero de 2009 se aprobó en el Senado una moción en la que en el punto 2 se señala que se «establecerán baremos objetivos para la evaluación que garanticen la transparencia y la equidad en su aplicación y que deberán ser conocidos, no sólo antes de la presentación de las solicitudes de evaluación, sino con la suficiente antelación para que los investigadores puedan adaptar su perfil investigador a dichos criterios. En particular se tendrá en cuenta la publicación en las lenguas españolas u otras que resulten adecuadas».*

English translation: *“On February 18, 2009 was passed, by unanimity of all the political groups, in the Senate of Spain a motion in point 2 stated that the Ministry of Education should "establish scales objectives for evaluation to ensure transparency and fairness in its application and should be known, not only before the submission of the evaluation requests, but with sufficient time so that the researchers can adapt their research profile to these criteria. In particular, publication in Spanish or other appropriate languages, to the research objectives, will be taken into account".*

Annex 2. Support to R&D expenditure in Spain: comparison with other countries

Table A2 shows the decrease ~~diminution~~ of financial support from National Plan and Regional Plans to Spanish universities for the period 2010-2013, together with an increase in the support from European Union institutions.

Table A2. Sources of support to R&D expenditure on Spanish universities. Years 2010 and 2013 (million of Euros at current prices).

	2010	2013
National Plan (general Government)	635.8	311.3
European (EU institutions)	176.0	277.1
Regional (regional Government)	286.7	188.1
University Funds	60.6	77.9
Private support	45.3	14.0
Other International	2.8	4.1
Local Administratiobn (cities or provinces)	1.7	2.4
Total expenditure on RD in Higher Education	1,208.9	874.9
Total expenditure on RD in HE per capita	25.7	18.6

Note: R&D: Research and Development. HE: Higher Education.

Source: Guisan (2017), Table 5, based on data from CRUE(2013) and other sources.

Guisan (2017) shows in Graphs 1 and 2 the very low level of R&D expenditure per capita in Spain in comparison with most advanced countries (Germany, France, UK, USA and Italy), for the period 1994-2010.

Regarding the regional disparities of research support on Higher Education, Guisan (2017) shows in Tables 1 and 6 an average support in Spain of only 3.7 Euros per inhabitant and year (based on data by CRUE, 2014) from National Grants to Universities, but with strong differences among regions: from 0.4 (Canary Islands) to more than 6 Euros per capita in a few regions (Aragon, Cantabria and Madrid).

In the case of Humanities and Social Sciences, National support is very low, with an average in Spain of only 0.49 Euros per inhabitant in ~~year~~ 2103. At regional level, this support varies between very low values (around only 0.10 Euros per capita in Canary Islands, Extremadura and Galicia) to values higher than 0.50 in Andalucia, Aragon, Balearic Islands, Castilla y Leon, Madrid, Comunidad Valenciana and Asturias.

Annex 3. The third mission of non-technological research

Accordingly to the influential book published by the Spanish philosopher Ortega y Gasset in 1930, the third mission is the diffusion of the culture. This implies transmission of knowledge not only to the students (through education) and researchers (through research team activities), but also to society at large (government, trade unions, civil associations, firms, experts from different fields and public opinion). At some extent, this mission has been developed through scientific publications and some reports addressed to a more general public.

As anticipated by Aguaded and Macias (2008), -nowadays-it is necessary to foster a greater degree of knowledge transfer. University researchers with good experience should address the improvement of socio-economic development and quality of life, and rely on social communication (e.g. television, electronic newspapers or social media). Financial support in Social Sciences, and other fields, is usually very low and does not allow this type of social transmission. It should be a policy priority the increase of the degree of financial support, from national and European institutions, to interesting initiatives of scientific associations, researchers and universities.