



Internationalization of Portuguese Academia: the impact on academic engagement and collaboration with society

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Abstract

Higher Education Institutions are expected to stimulate the innovation system and to contribute to the development of societies in a global perspective. Within this context, there is an increasing focus on internationalization. HEIs are developing institutional mechanisms to support internationalization while academics are expected to carry specific practices that allow them to improve the internationalization of knowledge production. At the same time, they are encouraged to engage with non-academic partners to co-produce and transfer knowledge, contributing, in this way, to economic and social development. Although there is some research on the impact of internationalization on academic entrepreneurship, studies on the effects in other dimensions of academic engagement with society are almost absent. This paper aims to fill this gap by analyzing the relationship between academics' internationalization practices and perceptions and the development of different types of academic engagement. Our analysis draws on quantitative analysis with data provided by an international survey (APIKS) and explores the Portuguese context. Findings show that the different practices and perspectives on internationalization impact differently on the way scientists engage. While there are positive effects of internationalization of research on engagement, the time academics stay abroad and the high focus on publishing in internationally high-rated journals may negatively affect academics' orientation towards the local community. This paper contributes to the debate on the role of the internationalization in the context of a knowledge-based society, considering different dimensions and a broad spectrum of knowledge-based engagement activities.

Keywords Academic engagement · International mobility · Internationalization of research · Institutional policy · Knowledge production

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Introduction

Over the last decades, higher education (HE) systems and institutions (HEIs) are increasingly pressured to adapt to an unprecedented changing, competitive, complex, and global environment, economically, socially, and politically (Bartell, 2003). Moreover, they “have been increasingly expected to become international, by integrating an international, intercultural or global dimension into their purpose, functions and activities” (Seeber et al., 2016: 686).

Within this context, the scientists are encouraged to go abroad since international mobility is considered a “driver of excellence.” Spending time in a foreign country and engaging with an international and multicultural work environment enable scientists to enhance their social capital and establish an international scientific network (Kristensen & Karlsen, 2018). This, in turn, expands opportunities for research projects and international publication (Edler et al., 2011; Kwiek, 2015; Patrício et al., 2018).

In this regard, the literature has highlighted the positive impact of academics’ internationalization on their research productivity (Abramo et al., 2009; Abramo, Horta & Santos, 2016; Patrício et al., 2018). In recent years, these factors have been gaining relevance for the institutions’ recognition and capacity to attract funding, but also to their symbolic capital since international research productivity is a relevant indicator in international rankings. Consequently, academics are pressured to publish internationally in order to secure career opportunities (Abramo et al., 2009; De Wit & Altbach, 2021; Horta & Santos, 2016).

At the same time, the so-called third mission becomes a critical dimension of universities’ institutional strategies. Since knowledge is considered the cornerstone of economic development, and universities have traditionally been the primary producers and disseminators of knowledge, they are expected to play a key role in this society. Therefore, scientists are encouraged to engage with non-academic organizations to accelerate and improve the social impact of knowledge production (Carayannis & Campbell, 2018).

Although internationalization and academic engagement are key priorities of HEIs’ strategies (Bojko et al., 2020), the relationship between the two phenomena remains unclear. Previous literature has primarily focused on the collaboration between HEIs and industry, as well as the commercialization of knowledge and technology. However, we intend to address a gap in the literature concerning other dimensions of academic engagement.

We focus on the Portuguese HE system, which has recognized an increasing relevance of internationalization over the last decades, namely with the publication of a National Strategy (MADR/MEC 2014). The recent policy development has aimed to encourage researchers to increase their international publications and engage in collaborative research endeavors with international partners. Moreover, Portuguese HEIs have dedicated considerable efforts to attract international students (Carvalho et al., 2021). However, Portugal is classified as a semi-peripheral country, facing challenges in keeping up with other Central and Northern member states who are also guided by European priorities. Therefore, it raises the question of whether the recent developments of internationalization practices and strategies observed would stimulate the scientific capacity and the openness among Portuguese academics to engage in collaborations with society, allowing the national system to catch up with other member states in terms of academic engagement and societal impact.

This paper aims to explore the relationship between academics’ internationalization activities and engagement by addressing the following research questions:

1. Do academics' internationalization activities contribute to enhancing academic engagement?
2. Are academics who are internationally oriented in their knowledge production activities more prone or have more opportunities to collaborate?
3. How do internationalization processes affect different forms of academic engagement?
4. Does the promotion of an international-oriented environment by HEIs foster academic engagement?

To provide insight into these topics, we draw on an extended concept of the internationalization of HE, considering it as a transversal process to all the HE missions.

Theoretical framework

Internationalization of higher education: a dynamic and evolving concept

Over the past three decades, the internationalization of HE has undergone notable transformations, evolving into more complex and comprehensive forms (De Wit & Hunter, 2018). Indeed, internationalization is a dynamic concept that has been changing and broadening in scope over time. Knight (2008: 21) defines it as “the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of post-secondary education.” Nowadays, the internationalization of HE is increasingly understood as a diverse phenomenon deeply and transversely embedded within universities. In this regard, De Wit et al., (2015, p. 29) propose an extended definition of internationalization: “the process of integrating an international, intercultural, or global dimension into the purpose, functions or delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society.”

Mobility, or internationalization abroad, is perhaps the component more immediately associated with internationalization. The concept encompasses various forms of education across borders: mobility of individuals, projects, programs, and providers.

However, the so-called internationalization *at home* has been receiving more attention from scholars, especially with the COVID-19 pandemic (De Wit & Altbach, 2021). The concept designates the initiatives and activities conducted within HEIs to develop international and intercultural skills and cultivate a global culture within domestic learning environments (Beelen & Jones, 2015; Phùng & Phan, 2021). The development of activities that enhance internationalization *at home* is crucial in involving the entire academic community in the internationalization process, including those who may not have the opportunity to go abroad (Robson et al., 2018).

The literature highlights the influence of academics' characteristics and past experiences on their involvement in internationalization practices (Calikoglu et al., 2022). However, the rising expectations for academics to enhance scientific production have also influenced their attitudes toward internationalization, motivating them to participate in international networks and engage in activities with an international focus, intending to improve funding sources, recognition, and career opportunities (Yemini, 2021).

Some studies explore the role of international collaborations in facilitating knowledge transfer within and beyond the academic community to improve scientific and social impact. The ability to collaborate extramurally at the international level is especially critical in a

context characterized by financial constraints and increased accountability. In this regard, international collaborations have been found to strengthen international research funding, scientific reputation, knowledge dissemination, and scientific productivity (Abramo et al., 2009, 2014; Yemini, 2021). Therefore, they are often associated with top-performing scientists since it enables them to remain at the forefront of science by developing knowledge capacity and new research platforms (De Wit & Altbach, 2021; Kristensen & Karlsen, 2018; Kwiek, 2015, 2020). By promoting the knowledge circulation, the internationalization of research contributes to bridging technological and innovation gaps, thereby maximizing the benefits derived from such knowledge and generating significant outcomes that drive social progress and change. Furthermore, addressing global societal challenges requires the involvement of academic and non-academic partners at the international level to create the critical mass needed to tackle these challenges effectively.

The internationalization of research also includes developing internationally relevant studies, publishing in a language different from the language of instruction at the home institution (Abramo et al., 2009).

Academics' attitudes towards internationalization may also be influenced by institutional strategies and policies, which can hinder or facilitate the development of international-oriented activities and the creation of a multicultural environment (Woldegiyorgis et al., 2018). In this regard, funding, rewards, and long-term institutional policies are crucial in supporting internationalization practices (Calikoglu et al., 2022). This dimension represents a trend towards "a more coordinate and comprehensive approach" to internationalization (Middlehurst & Woodfield, 2007: 31) since institutional policies are increasingly moving from short-term approaches to more holistic and systematic institutional strategies to promote internationalization that cut across various areas and missions of HEIs, including the third mission. In this context, HEIs seek to create a diverse and multicultural environment that nurtures the development of essential competencies among students and academic staff, allowing them to become socially relevant actors in generating and disseminating knowledge that benefits the economy and contributes to addressing Sustainable Development Goals (SDGs) (De Wit & Altbach, 2021). Due to the diversity of HE systems and institutions, these strategies vary widely and encompass a complex range of internationalization rationales, approaches, and activities (De Wit et al., 2015). Moreover, internationalization has become a strategic priority at the institutional level, driven by the need to generate revenue, secure funding, enhance prestige, and improve global rankings (Woldegiyorgis et al., 2018). As a result, HEIs compete globally to attract foreign scholars and students and encourage the staff to publish in top international journals (De Wit & Altbach, 2021).

Considering the above, this paper aims to explore the dimensions of internationalization discussed in the literature, often in a fragmented manner (Iosava & Roxá, 2019). Alongside international mobility, we examine other dimensions that may occur abroad and/or at home, including international funding, research with an international focus, and publishing in foreign countries. On the other hand, we also consider the institutional perspective by contemplating the mechanisms and strategies implemented by HEIs to support internationalization abroad and foster an international environment on their campuses.

Internationalization of higher education and academic engagement: exploring a controversial and complex relationship

Universities play a significant role in the economic, cultural, and social development. Therefore, the so-called third mission emerged as a critical dimension of the institutional

strategies emphasizing the social responsibility of HEIs in producing impact in the surrounding community (Compagnucci & Spigarelli, 2020). To fulfil this mission, academics are encouraged to engage and collaborate with external stakeholders in (co-)production, dissemination, and exchange of knowledge activities to promote the impact of science in society (Perkmann et al., 2013).

Earlier approaches to the third mission predominantly emphasized the economic perspective related to the role of universities in innovation systems and technology transfer. In this regard, activities like patenting, licensing, or the spin-offs creation are considered mechanisms of commercializing scientific knowledge, enabling the incorporation of innovation in products and processes (Compagnucci & Spigarelli, 2020).

A policy shift toward a focus on tackling complex societal challenges leads to reframing the concept of the third mission, emphasizing the role of universities as agents of social change (Wakkee et al., 2019). As a result, the academic's social engagement with diverse partners beyond industry, including NGOs, media, policymakers, and civil society, has been gaining increasing relevance.

The literature is rich in suggesting different types of interactions between academic and non-academic partners as part of academic engagement, highlighting different aims and rationales (Perkmann et al., 2013, 2021; Schneijderberg & Götze, 2021; Queirós et al., 2022). These interactions encompass various forms, including formal arrangements such as consultancy and research contracts (D'Este & Patel, 2007) and informal interactions facilitated by personal contacts that enable knowledge exchange between organizations (Jacobson et al., 2014). Moreover, academic engagement with society is also evident in teaching-related activities, such as internships or project-based studies.

In this respect, this study considers the following dimensions of academic engagement: *formal research collaboration*, *informal dissemination of knowledge*, *commercialization of knowledge*, and *teaching-related activities* (Queirós et al., 2022).

Previous research suggests that both individual and institutional factors influence various forms of external activities (Perkmann et al., 2021). At the individual level, seniority and age evidence a positive effect on academic engagement (Abreu and Grinevich, 2013), although younger generations demonstrate a willingness to engage in technical and commercially oriented activities (Peksen et al., 2021; Götze et al., 2021). Gender also plays a role in determining the type of academic engagement, with men tending to be more involved in commercially oriented activities (Abreu and Grinevich, 2013, 2017; Tartari and Salter, 2015), while women are more prone to engage in knowledge dissemination activities (Lawson et al., 2016).

The academic engagement is also influenced by disciplinary affiliation and the type of knowledge produced. In this regard, applied disciplines and research are more associated with commercialization of knowledge (Perkmann et al., 2021), while social sciences and humanities prioritize informal dissemination of knowledge activities (Queirós et al., 2022).

Concerning institutional determinants, previous studies addressing the Portuguese HE system suggest a convergence of academic engagement between polytechnics and universities (Götze et al., 2021). However, due to their vocational focus, polytechnics tend to develop more teaching-related activities (Queirós et al., 2022).

When exploring the relationship between internationalization of HEIs and academic engagement, one observes that the literature is limited and lacks consensus. Moreover, it primarily focuses on the commercialization of knowledge, such as patenting and spin-off creation. Drawing on the human capital and social network theories, scholars argue that exposure to more innovative contexts would positively influence academic engagement with industry (Civera et al., 2020; Krabel et al., 2012; Li, 2020), enabling the acquisition

of technical and scientific skills, expand social and cultural capital, and access complementary resources. These factors facilitate the identification of entrepreneurial opportunities by academics and the transformation of knowledge and technology into marketable innovations.

However, empirical studies suggest that the effects of internationalization on academic engagement can be diverse and impact distinctively on the academics' likelihood to engage. International mobility emerges as a driver of academic entrepreneurship (Krabel et al., 2012; Li, 2020; Siekierski et al., 2019; Yasuda, 2016). For instance, when academics pursue part of their education abroad, it increases their chances of creating spin-offs and patenting discoveries. Additionally, participation in international research collaborations can positively influence the involvement in commercialization of knowledge. These effects are enhanced by the establishment of professional networks and access to complementary resources and perspectives (Fabrizi et al., 2016; Goethner, 2017). Along the same line, Edler et al. (2011) suggest that international activities contribute to the formation of human and social capital that increases the likelihood of the academic establishing personal contacts with industry for knowledge transfer purposes. Conversely, Zubieta (2009) evidenced a negative correlation between post-doctoral international mobility and patent filing of the "pure scientists" who primarily focus on their scientific performance.

Furthermore, the literature highlights other factors that can influence the effects of internationalization on academic engagement, such as the institutional context and academics' research orientation. With regard to the former, Chen and Li (2019) suggest that the institutional strategy can either facilitate or hinder entrepreneurial behavior among scientists. Krabel and colleagues (2012) argue that promoting a diverse and internationally-oriented institutional environment stimulates creativity and the exchange of competencies, which can lead to innovation generation. Regarding academics' research orientation, Bojko et al. (2020) found that while academics focused on the development of national-oriented research activity tend to engage more with the local innovation system, academics with a stronger orientation towards international research tend to engage more in collaborations within the academic community.

Based on the assumptions regarding individual practices and institutional strategies, we propose the following hypotheses:

H1: Academics that have completed their education abroad tend to engage more than their counterparts.

H2: The internationalization of research activities positively influences knowledge transfer to society, leading to increased academic engagement.

In what concerns institutional strategy, the following hypothesis is advanced:

H3: Academics who perceive a supportive institutional strategy towards internationalization tend to collaborate more with external partners.

Internationalization and academic engagement in Portuguese Academia

Portuguese policies have translated supra-national priorities in line with the European strategy towards a knowledge-based society (Carvalho et al. (2021), placing internationalization and academic engagement as strategic priorities in the HE system. In this regard, the internationalization is recognized as a crucial mechanism to enhance knowledge production, foster scientific

excellence, and drive innovation. Academic engagement contributes to practical application of research findings, leading to social impact and solutions to societal problems.

The institutional and legal reforms implemented in the Portuguese HE system over the last decades have strengthened the importance of these two dimensions. A significant change occurred with the introduction of the RJIES (Law 62/2007), the new Legal System of Higher Education Institutions. This framework allowed HEIs to become foundations (public institutions regulated by private law), granting them more autonomy and independence from the state. However, the decrease in public funding intensified by the 2010–2014 economic crisis imposed financial constraints on these institutions, compelling them to find alternative and supplementary funding (Bruckmann & Carvalho, 2018). In this context, academic engagement activities emerge as a mechanism to finance research and support institutions. Indeed, empirical analyses show a high level of engagement among Portuguese academics, namely in activities aiming at disseminating scientific knowledge (Queirós et al., 2022). However, the studies indicate a modest involvement in commercially oriented activities, such as patents or spin-off creation.

Concerning internationalization, the National Strategy for the Internationalization of Higher Education, published in 2014, aimed to establish a coherent policy framework in Portugal (Sin et al., 2019). In fact, HEIs have been promoting several dimensions of internationalization, including them as a core strategic issue. It is evidenced, for instance, by the universities' efforts to attract international students (Sin et al., 2021). One notable development is the implementation of the Decree-Law 36/2014 which established a separate admission regime for non-EU students. This regulation allows institutions to charge higher fees to cover the full costs of tuition. Under this framework, hosting third country emerges as a strategy to address demographic challenges and financial needs faced by universities (Teixeira & Koryakina, 2016).

The reforms introduced in the Portuguese system were inspired by NPM (New Public Management) ideas, emphasizing accountability and results. These reforms required institutions and professionals to undergo performance assessments and justify their activities based on measurable indicators such as patents and licenses, reflecting a focus on public value. Concerning research, Portugal implemented an international peer-review evaluation system of research units that lasts until today (Carvalho et al., 2021). The research funding is strongly tied to the outcomes of these evaluations, driving the international presence of Portuguese research (Patricio, 2010). For instance, data from DGEEC reveals that the number of publications indexed in Web of Science per million inhabitants more than doubled between 2010 and 2020 (DGEEC, 2022). The pressure to publish in high-impact international peer-reviewed journals and the importance of research output for career progression have also accelerated the internationalization of Portuguese research (Horta, 2010). Moreover, national R&D policy strongly encourages collaboration with international colleagues and participation in research projects and networks, further driving academic engagement and strengthening Portugal's scientific capacity (Horta & Santos, 2016).

Methodology

Sampling process

This study draws on data from the APIKS project (Academic Profession in the Knowledge-Based Society) survey delivered to Portuguese academics in 2019. We conduct a stratified

sampling technic to select the academics invited to participate in this research ($n = 16066$), ensuring the representativeness of the following characteristics: types of institutions (university and polytechnic; public and private), academic ranks (Full, Associate and Assistant Professor; Principal Coordinator, Coordinator and Adjunct Professor), and disciplines (Social Sciences and Humanities; Science, Technology, Engineering, and Mathematics—STEM; Medical Sciences; and others).

The overall response rate was about 20%. However, since the questions were not mandatory, we only considered the observations with all the relevant questions completed. The respondents with incomplete answers were excluded from this study. In the final, our sample has 1102 observations (72% from universities and 28% from polytechnics). Regarding disciplines, 42% were from Social Sciences, Education, and Humanities, 34% from STEM, 11% from Medical Sciences, and 13% from other disciplines. Finally, regarding the academic rank, the sample was composed of Full and Principal Coordinator Professors (8%), Associate and Coordinator Professors (23%), Assistant and Adjunct Professors (69%).

Description of variables

Defining the different dimensions of academic engagement as dependent variables, we ask the respondents to point out the activities developed with non-academic organizations in the previous three years from several options. Then, these activities were grouped into the dimensions identified according to their characteristics and objectives (see Table 1). The dimensions of academic engagement were coded as binary variables, assuming the value “1” when the respondent reported involvement in at least one activity included in the list and “0” otherwise.

In what concerns the explanatory variables, and specifically for the purpose of the analytical framework, we distinguish six different components of internationalization, with a particular focus on research and institutional strategies: *international mobility*, *international research collaboration*, *development of international-oriented research*, *receiving international research funding*, *publish in a foreign country*, and *institutional strategy supporting internationalization*. Table 2 describes the proxies used for each variable.

Furthermore, we include some controls based on the aforementioned literature identifying the main determinants of academic engagement (see also Table 2).

Findings

This study examines the impact of internationalization practices and institutional strategies on (different types of) academic engagement. The following section describes the sample considering these practices. We also assess the extent to which respondents perceive that their institutions provide mechanisms and strategies supporting internationalization. Then, we relate the different components of internationalization with the different types of academic engagement. Finally, we conduct a logistic regression analysis to assess the strength of this relationship.

The findings show a heterogeneous picture regarding the internationalization components reported by Portuguese academics.

Table 1 Dimensions of academic engagement (dependent variables)

Formal research collaboration	Informal dissemination of Knowledge	Commercialization of knowledge	Teaching-related activities
<p>Consultancy</p> <p>Contract research</p>	<p>Evaluation (of policies and developments of companies, governments, regions, countries, etc.)</p> <p>Writing publications for a broader range of readers</p> <p>Participation in external board(s) and committee(s)</p> <p>Public lectures and speeches</p> <p>Volunteer-based work/consultancy in an honorary capacity</p>	<p>Patenting and licensing</p> <p>Spin-off/start-up creation</p> <p>Use of infrastructure and (technical) equipment</p> <p>Test and construct prototypes</p> <p>Work in a research laboratory, science incubator organization, and/or a science park</p>	<p>Curriculum development for external agencies</p> <p>Supervision of student internships and/or student</p> <p>Joint supervision with industry</p> <p>Executive, contract tailor-made programs and courses</p>

Table 2 Description of the variables used in the regression analysis

Variable	Description	Range
<i>Dependent variables</i>		
Formal research collaboration	Whether the academic reported at least one of activity of each dimension	1 = yes; 0 = no
Informal dissemination of knowledge		
Commercialization of Knowledge		
Teaching-related activities		
<i>Independent variables</i>		
Internationalization abroad	Whether the academic completed the PhD abroad	1 = yes; 0 = no
International research collaboration	Whether the academic reported co-authorship or collaboration with international colleagues	1 = yes; 0 = no
International-oriented research	The extent to which the research is international in scope or orientation	From 1 (not at all) to 5 (very international-oriented)
International research funding	Whether the academic received international funding for the research development	1 = yes; 0 = no
Publish internationally	Whether more than 75% of the academics' scientific output includes publishing in international peer-review journals	1 = yes; 0 = no
Institutional strategy supporting internationalization	The extent to which the academic considers its HEI: has a clear strategy for internationalization; provides international exchange programs for students; provides opportunities/funding for faculty members to undertake research abroad; provides various opportunities/funding for visiting international students; provides opportunities/funding for visiting international scholars; encourages the recruitment of faculty members from foreign countries; provides opportunities/funding for faculty members to attend international conferences abroad; encourages faculty members to publish internationally	Average of the answers to the questions: From 1 (very low incentives to internationalization) to 5 (very high incentives to internationalization)
<i>Controls</i>		
Institution	Type of institution	1 = university; 0 = polytechnic
Rank	Academic rank of the academic	1 = assistant or equivalent 2 = associate or equivalent 3 = full or equivalent 1 = yes; 0 = no
Discipline	A dummy for each discipline: Education; Humanities; Social sciences; Sciences; Engineering; Medical Sciences; Agriculture	
Basic research	The extent to which the academic characterizes its research as basic	From 1 (not at all) to 5 (very much)
Applied research	The extent to which the academic characterizes its research as applied	From 1 (not at all) to 5 (very much)

First, we found modest results regarding international mobility among the faculty studied, as only a minority of the respondents (18%) have completed their doctoral education abroad. We can attribute this result to the prevalence of inbreeding within Portuguese Academia (Tavares et al., 2017). From the 1970s, the development of PhD programs in the country and the investment in the scientific system (Heitor et al., 2014) allowed Portuguese doctorates to integrate their universities' faculty. More recently, due to the increasing number of PhD holders and financial constraints faced by universities, recruitment often takes place through less transparent "informal recruitment" processes, in which senior academics tend to select internal candidates to maintain research team stability (Tavares et al., 2017).

However, it is worth mentioning that international mobility can take several forms beyond completing a degree abroad. It may include participating in exchange programs, teaching at foreign institutions, engaging in research projects, taking sabbaticals, or attending conferences. These short-term forms of mobility are challenging to measure due to a lack of data. Therefore, we consider completing a PhD abroad as a proxy for international mobility, assuming that a longer stay in the host country or institution would enable academics to become immersed in its culture.

Indeed, the academics' research is strongly marked by internationalization practices, with 80% of respondents collaborating with colleagues from other HE systems. Thus, international research collaboration is the most common form of internationalization among Portuguese academics.

When asked about the scope or orientation of their research, 55% of the academics rated it as internationally oriented (4) or very internationally oriented (5) on a scale of 1 to 5. The same proportion reports that their scientific publications are primarily published internationally, with over 75% of the papers submitted to international peer-reviewed journals. Nevertheless, only 28% of the participants received international funding to conduct research activities.

Concerning the institutional dimension, academics do not tend to recognize their institutions' strategies as strongly supportive of internationalization practices in research and education. We observe that only 25% of the respondents show an average of answers to the questions related to the institutional mechanisms higher than 4. In this regard, although academics tend to perceive the existence of international exchange programs for students (mean = 3.98, median = 4), the same does not apply regarding the recruitment of staff from foreign countries (mean = 2.10; median = 2). On the other hand, the respondents recognize that their institutions encourage faculty members to publish internationally (mean = 3.73; median = 4). However, they do not tend to perceive that their institutions provide opportunities or funding to undertake research abroad (mean = 2.53; median = 2) or to attend conferences abroad (mean = 2.43; median = 2) (Table 3).

As aforementioned, we also defined four types of academic engagement according to the nature of external activities reported. The data reveal that *informal knowledge dissemination* to society is the most popular engagement activities among Portuguese academics, as nearly 80% of the respondents have participated in at least one activity of this dimension. In contrast, *knowledge commercialization* activities such as patenting, licensing, or spin-off creation do not seem to be a widespread practice in Portuguese academia, being the less-reported dimension (about 25%). Additionally, 45% of the surveyed academics report involvement in *formal research collaboration* activities, such as consultancy and/or contract research. Finally, 65% of the academics engage in *teaching-related external activities*, such as supervising internships or developing curricula for external clients.

The cross-table analysis (see Table 5) shows the relationship between the internationalization dimensions and the types of academic engagement. Specifically, we examine the

Table 3 Academics' views on the emphasis provided by the institutional strategy on internationalization practices

	Mean	Median	SD	Min	Max
Your institution has a clear strategy for internationalization	3.22	3	1.17	1	5
Your institution provides various international exchange programs for students	3.98	4	0.93		
Your institution provides various opportunities/funding for faculty members to undertake research abroad	2.53	2	1.19		
Your institution provides various opportunities/funding for visiting international students	2.77	3	1.09		
Your institution provides various opportunities/funding for visiting international scholars	2.44	2	1.09		
Your institution encourages the recruitment of faculty members from foreign countries	2.10	2	1.09		
Your institution provides various opportunities/funding for faculty members to attend international conferences abroad	2.43	2	1.26		
Your institution encourages faculty members to publish internationally	3.73	4	1.24		

proportion of the academics who report each internationalization component that are also involved in each academic engagement type. We compare these results with the sample percentages.

Concerning *international mobility*, the results show that teaching-related activities are less popular among academics that have completed their PhD abroad. Only 57% (against 65% of the sample) of mobile scientist report involvement in at least one teaching-related activity in the previous three years. However, their engagement in other types of external activities appears to be similar to the overall sample.

On the other hand, academics who collaborate with international colleagues evidence a slightly higher engagement in *formal research collaboration* with external partners (3.8 pp higher) and *informal dissemination of knowledge activities* (2.3 pp higher).

The percentage of academics whose research is more international-oriented in scope engaged in the several activities does not seem to vary much from the sample. However, the proportion of respondents reporting receiving international research funding that engages in all types of activities tends to be higher than the overall sample (from 7.2 to 12.6 pp difference). The academics who primarily publish in international journals stand out in commercialization of knowledge (32.2% against 24.9%).

Finally, the data show that the percentages of academics who perceive higher institutional support for internationalization (institutional strategy index higher than 3) tend to be higher in the case of teaching-related activities (Table 4).

To deepen the preliminary results, Table 5 presents the odds ratio and the significant level of binary logistic regression analysis, testing the effects of the internationalization components on academic engagement. For each dependent variable corresponding to the type of academic engagement, we estimated the influence of each internationalization component considered in the study, adding the control variables in line with the main determinants pointed out by the literature as influencing academic engagement. The regression models explain from 8.5 to 22.8 percent of the variance in the dependent variables.

Table 4 Descriptive overview of the dimensions of internationalization by types of engagement

	Formal research collaboration	Informal dissemination of knowledge	Commercialization	Teaching-related activities	Total
Sample	45.1% (497)	80.5% (887)	24.9% (274)	64.7% (713)	1102
International mobility	41.2% (82)	82.4% (164)	22.1% (44)	57.3% (114)	199
International research collaboration	48.9% (429)	82.8% (726)	25.3% (222)	65.0% (570)	877
Research international in scope (> 3)	48.0% (289)	82.9% (499)	26.7% (161)	64.1% (386)	602
International research funding	57.7% (179)	87.7% (272)	32.9% (198)	71.6% (222)	310
Publish in a foreign country (> 75% of total scientific output)	48.2% (296)	76.4% (469)	32.2% (198)	66.0% (405)	614
Institutional strategy (> 3)	46.0% (211)	84.1% (386)	23.7% (109)	69.5% (319)	779

Percentage of academics reporting involvement in at least one activity of the academic engagement dimensions (number of observations in brackets)

Table 5 Logistic regression: estimation of the internalization variables on the academic engagement dimensions (OR: Exp(B))

	Formal research col-laboration	Informal dissemination of knowledge	Commercialization	Teaching-related activities
Internationalization variables				
Constant	0.024	0.070**	0.049*	0.464
International mobility	0.705*	1.024*	0.901	0.703*
International research Collaboration	1.56*	1.591*	0.814	1.031
Research international in scope or orientation	1.043	1.045	1.086	0.983
International research funding	1.533**	1.825**	1.513*	1.488*
Publish in a foreign country	1.027	0.647*	1.651**	1.111
Institutional strategy	1.020	1.199	1.015	1.336***
University	1.716***	1.119	1.020	0.735*
Rank	1.719***	1.198	1.110	0.979
Gender	1.640***	0.981	1.858***	1.003
Age	0.996	1.037**	0.980	1.017
Education	1.543	1.472	0.238**	1.400
Humanities	0.845	2.674*	0.603	0.674
Social sciences	1.161	1.426	0.353**	0.767
Sciences	0.822	0.599	1.370*	0.816
Engineering	1.445	0.555	1.896	0.812
Agriculture	2.639*	1.031	1.480	1.077
Others	1.260	1.403	0.770	0.962
Basic research	1.056	1.036	0.976	0.831***
Applied research	1.434***	1.272**	1.640***	1.159*
Observations	1102			
R2 Nagelkerke	15.8	15.1	22.8	0.085

(a)—Ref Universities. B—Ref Women. d—Ref Medicine and Health sciences; Significance level: * p 0.05; ** p 0.01; *** p 0.001)

Bold values represent significant results regarding internationalisation variables

Overall, the regression analysis suggests a relationship between academics' internationalization and engagement, although considering different and sometimes contrasting effects of each component in the different types of external activities.

When analyzing the potential impact of *international mobility*, our findings show that mobile academics have fewer chances to be involved in *formal research collaboration* and *teaching-related activities*. On the other hand, international mobility positively influences the involvement in informal activities aiming at disseminating knowledge to society.

According to the results, internationalization practices linked to the research mission significantly influence engagement activities, considering that we found some statistically significant effects. First, the findings show that *international research collaboration* is a statistically significant determinant of engagement in *formal research collaboration* and *informal dissemination of knowledge* activities. According to the results, academics who collaborate with international colleagues have 1.56 more chances to develop formal collaboration arrangements with external entities. Additionally, the odds of developing informal interactions with external partners are 1.59 times higher.

Additionally, we observe that international research funding fosters academic engagement with society. For instance, the academics that develop research funded by an international agency are 1.8 times more likely to disseminate knowledge through informal activities in collaboration with non-academic partners. Commercial-oriented activities such as patenting, licensing, or the creation of businesses are also impacted by international funding. With respect to this type of knowledge transfer, the regression findings suggest a strong relationship with international-oriented scientific output. In this regard, academics that publish mainly in a foreign country tend to be 1.6 times more likely to commercialize knowledge. Contrastingly, international publications negatively impact the *informal dissemination of knowledge*. Nevertheless, developing research internationally in scope or orientation does not seem to influence any dimension of academic engagement.

Finally, according to the results, the perception of an *institutional strategy supporting internationalization* seems to favor only the academics' engagement in *teaching-related activities*.

Discussion

This study aims to empirically analyze the relationship between HE internationalization and academic engagement. Previous studies have been highlighting the diversity of activities that faculty members carry out in collaboration with external partners beyond commercial and industry-focused knowledge transfer (Carayannis & Campbell, 2018; Perkmann et al., 2021; Schneiderberg & Götze, 2021; Queirós et al., 2022). Nevertheless, the scarce literature relating the two topics tends to be focused on the latter, emphasizing the creation of entrepreneurial opportunities to translate knowledge into innovative processes and products. Considering different academic engagement dimensions, we found that internationalization practices have some influence on the various engagement activities performed by Portuguese academics.

Our H1 suggests that completing the doctoral education abroad stimulates engagement with society. The data gathered led us to reject this hypothesis for two dimensions under analysis: *formal research collaboration* and *teaching-related activities*. These types of engagement activities require a strong connection with the local market and recognition by the national economic players, including, for instance providing

consultancy, carrying out research under contract, supervising students' internships with industry, and developing executive, tailor-made courses or programs. Some scholars have been discussing some negative effects of international mobility regarding the academics' re-integration into the home institution/system (Groves et al., 2018; Seeber et al., 2022). The stay abroad may hinder the establishment of a relationship with the local community, especially when the returning academics lack resources, facilities, and support from their institutions and colleagues, resulting in a kind of "isolation" from the local reality (Bauder, 2020). Moreover, after being embedded in international research contexts, the academic may struggle to align the research agenda with the local market needs due to the loss of domestic social capital. These findings are in line with the study of Cattaneo et al. (2019), which stresses that research collaborations require time and proximity to be established.

On the other hand, international mobility has a positive impact on developing *informal dissemination of knowledge activities* with non-academic partners. The literature is rich in discussing the role of international and multicultural experiences in broadening researchers' social and cultural capital (Bauder, 2020; Civera et al., 2020; Li, 2020). Mobile academics tend to widen their horizons and seek alternative perspectives in their activities. In this sense, academics may feel more willing to spread scientific knowledge to other sectors of society, nationally or internationally.

Hypothesis 2 focuses on internationalization practices directly related to research activities. The findings allow us to partly confirm H2 since, in general, the internationalization of research promotes academic engagement in several ways. One of the privileged internationalization practices considered a driver of research productivity and quality is the collaboration with foreign colleagues. Our findings suggest a positive influence of this practice on academic engagement, more specifically on *formal research collaboration* and *informal dissemination of knowledge activities*. Participation in research networks gives access to elite researchers and improves the knowledge capacity at the domestic level (De Wit & Altbach, 2021). The international research collaboration enhances the capacity to extend the collaboration to non-academic partners and increases the opportunities to disseminate knowledge (Abramo et al., 2014; Yemini, 2021). The results are also in line with Kwiek (2020), suggesting that academics who collaborate internationally also collaborate extensively at the domestic level.

In the same vein, participation in internationally funded projects gives access to privileged resources, frontier knowledge, and technology that enhances the capacity to innovate. Integrating international research projects, such as the European programs Horizon 2020 or Horizon Europe, is considered a political priority to strengthen national R&D systems. These programs entail inter- and transdisciplinary research to address complex social problems. In this regard, participation in internationally funded projects normally requires collaborative work between international scientists and other social actors belonging to civil society and industry to increase the applicability of the co-produced knowledge applicable to real-world problems. The literature stresses that the likelihood to secure competitive international funding is strongly related to academic excellence, reputation, and previous experience with research collaborations (Enger & Castellacci, 2016), determinants also associated with academic engagement. Our findings confirm this association by demonstrating the significant positive effects of receiving international research funding in all types of academic engagement studied.

In what concerns publishing research output internationally, our study shows mixed results. On the one hand, publishing in journals with a high impact factor is associated with the commercialization of knowledge. This result corroborates prior studies highlighting

the positive relationship between scientific productivity and academic entrepreneurship (Perkmann et al., 2021). Commercial-oriented academics are often associated with “star” scientists with a higher technological and innovative capacity. Conversely, we evidenced a negative impact of publishing research results mainly internationally on the *informal dissemination of knowledge activities*. We argue that this result emerges considering that these academics privilege the communication channels targeting the international scientific community.

In what concerns the institutional dimension of internationalization, our findings do not confirm H3. In fact, only *teaching-related* activities appear to be influenced by an institutional strategy that supports and promotes internationalization. Although internationalization is considered a strategic pillar of HE strategy, in general, Portuguese academics do not perceive high support to carry out research-related international activities. The focus seems to be mainly placed on attracting international students. These results are in line with previous studies stating that internationalization strategies tend to focus on students rather than on researchers (Woldegiyorgis et al., 2018), which may explain our findings.

In conclusion, the findings allow us to conclude that academics’ internationalization practices have different effects on different types of engagement. *Formal research collaboration*, such as consultancy or research contracts, may benefit from the participation of academics in international research projects. It also implies the development of strong ties with the local market and community and the orientation towards their needs. On the other hand, although the internationalization of research and mobility may promote the dissemination of knowledge to society, a strong focus on publishing results to the international scientific community from “pure scientists” may interfere with their attention to other audiences. This study also suggests a relationship between high scientific production recognized at the international level and the capacity to commercialize knowledge or technological innovations. At last, teaching-related activities seem to be more associated with internationalization developed “at home,” benefiting from the creation of a multicultural and diverse campus capable of attracting foreign students and integrating them into the local community (Krabel et al., 2012).

These findings are especially important for policymakers because they make it clearer which aspects of internationalization should be encouraged to advance the creation of a knowledge society and, consequently, to sustain economic and social development through increased academic engagement.

Conclusions

This study sheds light on the influence of different components of academics’ internationalization on academic engagement. To the best of our knowledge, this is the first empirical study that investigates the effects of internationalization practices in several types of knowledge transfer and co-production activities with external partners beyond academic entrepreneurship related to the commercialization of innovations. Furthermore, this paper highlights the role of the internationalization of research, considering that empirical analysis has been placing a strong focus on learning and education international practices, abroad and at home (Woldegiyorgis et al., 2018).

Our findings confirm the positive effects of embracing internationalization practices on knowledge transfer and engagement with society. In this regard, participation in research collaboration or international-funded projects redirects the research focus towards

addressing complex societal issues that require a multi and transdisciplinary perspective. However, the benefits of internationalization on academic engagement would dry up if linkages with local partners and institutions were not promoted and established. Moreover, high pressure on publishing internationally to improve scientific productivity may deviate the research agenda towards topics less related to regional and local demands.

This study has some policy implications. Policymakers should consider internationalization as a transversal strategy for all universities' missions, acknowledging its capacity to enhance the creation and dissemination of knowledge. In this sense, academics more international-oriented in research activities may contribute to bridging global sources of knowledge with local needs, connecting the local to the global. This is particularly relevant in the Portuguese context, considered a semi-peripheral country, in order to bridge the gap with other European member states. Furthermore, given the positive effects on academic engagement, this study highlights the need to strengthen institutional policies that encourage the internationalization of research. Policymakers should also pay attention to the role of these two dimensions in academic career development. On the one hand, encouraging faculty members to engage in both internationalization practices and academic engagement activities may increase the academic workload, considering the several demands to which the academics are exposed. On the other hand, we recommend balancing the importance placed on international scientific publications with the role of academic engagement for career progression purposes. In this regard, HE policies should encourage diversified career paths and increased knowledge transfer to society to enhance both the economy and the knowledge-based society.

In the future, a qualitative analysis of this relationship would yield valuable insights into how internationalization influences collaboration with external partners. Furthermore, it would be interesting to examine the impact of internationalization on academic engagement in other European higher education contexts, considering the varying levels of development of these practices.

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Declarations

Conflict of interest The authors declare no competing interests.

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References

- Abramo, G., D'Angelo, C. A., & Di Costa, F. (2009). Research collaboration and productivity: Is there correlation? *Higher Education*, 57(2), 155–171. <https://doi.org/10.1007/s10734-008-9139-z>
- Abramo, G., D'Angelo, C. A., & Murgia, G. (2014). Variation in research collaboration patterns across academic ranks. *Scientometrics*, 98, 2275–2294. <https://doi.org/10.1007/s11192-013-1185-3>

- Abreu, M., Grinevich, V. (2013). The nature of academic entrepreneurship in the UK: Widening the focus on entrepreneurial activities. *Research Policy*, 42(2), 408–422. <https://doi.org/10.1016/j.respol.2012.10.005>
- Abreu, M., Grinevich, V. (2017). Gender patterns in academic entrepreneurship. *The Journal of Technology Transfer*, 42(4), 763–794. <https://doi.org/10.1007/s10961-016-9543-y>
- Bartell, M. (2003). Internationalization of universities: A university culture-based framework. *Higher Education*, 45, 43–70. <https://doi.org/10.1023/A:1021225514599>
- Bauder, H. (2020). International mobility and social capital in the academic field. *Minerva*, 58, 367–387. <https://doi.org/10.1007/s11024-020-09401-w>
- Beelen, J., & Jones, E. (2015). Redefining internationalization at home. In A. Curaj, L. Matei, R. Pricopie, J. Salmi, & P. Scott (Eds.), *The European Higher Education Area*. Springer. https://doi.org/10.1007/978-3-319-20877-0_5
- Bojko, M. M., Knapieńska, A., & Tomczyńska, A. (2020). Academic entrepreneurship and the research productivity in Poland. *Industry and Innovation*, 28(4), 486–506. <https://doi.org/10.1080/13662716.2020.1753020>
- Bruckmann, S., & Carvalho, T. (2018). Understanding change in higher education: An archetypal approach. *Higher Education*, 76, 629–647. <https://doi.org/10.1007/s10734-018-0229-2>
- Calikoglu, A., Lee, J. J., & Arslan, H. (2022). Faculty international engagement: Examining rationales, strategies, and barriers in institutional settings. *Journal of Studies in International Education*, 26(1), 61–79. <https://doi.org/10.1177/1028315320963508>
- Carayannis, E. G., & Campbell, D. F. J. (2018). *Smart quintuple helix innovation systems: How social ecology and environmental protection are driving innovation, sustainable development and economic growth*. Springer.
- Carvalho, T., Cardoso, S., Diogo, S., Sin, C. & Videira, P. (2021). Institutional policies to attract international academics in Portugal in an adverse context. In F. Huang, A. R. Welch (Eds.), *International Faculty in Asia. The Changing Academy – The Changing Academic Profession in International Comparative Perspective*, vol 21. Springer. https://doi.org/10.1007/978-981-33-4980-3_10
- Cattaneo, M., Horta, H., & Meoli, M. (2019). Dual appointments and research collaborations outside academia: Evidence from the European academic population. *Studies in Higher Education*, 44(11), 2066–2080. <https://doi.org/10.1080/03075079.2018.149253>
- Chen, Q., & Li, Y. (2019). Mobility, knowledge transfer, and innovation: An empirical study on returned Chinese academics at two research universities. *Sustainability*, 11, 6454. <https://doi.org/10.3390/su11226454>
- Civera, A., Donina, D., Meoli, M., & Vismara, S. (2020). Fostering the creation of academic spinoffs: Does the international mobility of the academic leader matter? *International Entrepreneurship and Management Journal*, 16(2), 439–465. <https://doi.org/10.1007/s11365-019-00559-8>
- Compagnucci, L., & Spigarelli, F. (2020). The Third Mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change*, 161, 120284. <https://doi.org/10.1016/j.techfore.2020.120284>
- De Wit, H., & Altbach, P. G. (2021). Internationalization in higher education: Global trends and recommendations for its future. *Policy Reviews in Higher Education*, 5(1), 28–46. <https://doi.org/10.1080/23322969.2020.1820898>
- De Wit, H., & Hunter, F. (2018). Internationalization of higher education: Evolving concepts, approaches and definitions. In Teixeira & Shin (Eds.), *Encyclopedia of International Higher Education Systems and Institutions*. Springer.
- De Wit, H., Hunter, F., Howard, L., & Egron-Polak, E. (2015). *Internationalization of higher education*. European Parliament, Directorate-General for Internal Policies.
- D’Este, P., & Patel, P. (2007). University-industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy*, 36(9), 1295–1313. <https://doi.org/10.1016/j.respol.2007.05.002>
- DGEEC. (2022). *Produção Científica Portuguesa, 2011–2021: principais resultados*. Lisboa: DGEEC.
- Edler, J., Fier, H., & Grimpe, C. (2011). International scientist mobility and the locus of knowledge and technology transfer. *Research Policy*, 40(6), 791–805. <https://doi.org/10.1016/j.respol.2011.03.003>
- Enger, S. G., & Castellacci, F. (2016). Who gets Horizon 2020 research grants? Propensity to apply and probability to succeed in a two-step analysis. *Scientometrics*, 109(3), 1611–1638. <https://doi.org/10.1007/s11192-016-2145-5>
- Fabrizi, A., Guarini, G., & Meliciani, V. (2016). Public knowledge partnerships in European research projects and knowledge creation across R&D institutional sectors. *Technology Analysis and Strategic Management*, 28(9), 1056–1072. <https://doi.org/10.1080/09537325.2016.1181741>

- Goethner, M. (2017). International research collaboration and academic entrepreneurship: Evidence from Germany. In *The World Scientific Reference on Entrepreneurship* (Vol. 4–4). <https://doi.org/10.1142/9874>
- Götze, N., Carvalho, T., Aarvevaara, T. (2021). Academics' societal engagement in diverse European binary higher education systems: A cross-country comparative analysis. *Higher Education Policy*, 34(1), 88–109. <https://doi.org/10.1057/s41307-020-00222-w>
- Groves, T., López, E. M., & Carvalho, T. (2018). The impact of international mobility as experienced by Spanish academics. *European Journal of Higher Education*, 8(1), 83–98. <https://doi.org/10.1080/21568235.2017.1388187>
- Heitor, M., Horta, H. (2014). Democratizing higher education and access to science: The Portuguese reform 2006–2010. *Higher Education Policy*, 27(2), 239–257. <https://doi.org/10.1057/hep.2013.21>
- Horta, H. (2010). The role of the state in the internationalization of universities in catching-up countries: An analysis of the Portuguese higher education system. *Higher Education Policy*, 23, 63–81. <https://doi.org/10.1057/hep.2009.20>
- Horta, H., & Santos, J. M. (2016). The impact of publishing during PhD studies on career research publication, visibility, and collaborations. *Research in Higher Education*, 57(1), 28–50. <https://doi.org/10.1007/s11162-015-9380-0>
- Iosava, L., & Roxå, T. (2019). Internationalisation of universities: local perspectives on a global phenomenon. *Tertiary Education and Management*, 1–14. <https://doi.org/10.1007/s11233-019-09024-1>
- Jacobsson, S., Vico, E. P., & Hellsmark, H. (2014). The many ways of academic researchers: How is science made useful? *Science and Public Policy*, 41(5), 641–657. <https://doi.org/10.1093/scipol/sct088>
- Knight, J. (2008). *Higher education in turmoil*. Sense Publishers.
- Krabel, S., Siegel, D. S., & Slavtchev, V. (2012). The internationalization of science and its influence on academic entrepreneurship. *Journal of Technology Transfer*, 37(2), 192–212. <https://doi.org/10.1007/s10961-010-9182-7>
- Kristensen, K. H., & Karlsen, J. E. (2018). Strategies for internationalisation at technical universities in the Nordic countries. *Tertiary Education and Management*, 24(1), 19–33. <https://doi.org/10.1080/13583883.2017.1323949>
- Kwiek, M. (2015). The internationalization of research in Europe. A quantitative study of 11 national systems from a micro-level perspective. *Journal of Studies in International Education*, 19(4), 341–359. <https://doi.org/10.1177/1028315315572898>
- Kwiek, M. (2020). Internationalists and locals: International research collaboration in a resource-poor system. *Scientometrics*, 124, 57–105. <https://doi.org/10.1007/s11192-020-03460-2>
- Lawson, C., Hughes, A., Salter, A., Kitson, M., Bullock, A., & Hughes, R. (2016). *Knowledge exchange in UK universities: results from a panel of academics 2005–2015*.
- Li, Y. (2020). Do returnee faculty promote the internationalization of higher education? A study based on the “2014 Faculty Survey in China.” *Chinese Education and Society*, 53(3), 115–133. <https://doi.org/10.1080/10611932.2020.1791543>
- Middlehurst, R. & Woodfield, S. (2007). Research project report 05/06: Responding to the internationalisation agenda: implications for institutional strategy, York: The Higher Education Academy.
- Patricio, M. T. (2010). Science policy and the internationalisation of research in Portugal. *Journal of Studies in International Education*, 14(2), 161–182. <https://doi.org/10.1177/1028315309337932>
- Patricio, M. T., Santos, P., Loureiro, P. M., & Horta, H. (2018). Faculty-exchange programs promoting change: Motivations, experiences, and influence of participants in the Carnegie Mellon University-Portugal Faculty Exchange Program. *Tertiary Education and Management*, 24(1), 1–18. <https://doi.org/10.1080/13583883.2017.1305440>
- Peksen, S., Queirós, A., Flander, A., Leišytė, L., Tenhunen, V. (2021). The determinants of external engagement of hard scientists: A study of generational and country differences in Europe. *Higher Education Policy*, 34(1), 18–41. <https://doi.org/10.1057/s41307-020-00214-w>
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., et al. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research Policy*, 42, 423–442. <https://doi.org/10.1016/j.respol.2012.09.007>
- Perkmann, M., Salandra, R., Tartari, V., McKelvey, M., Hughes, A., et al. (2021). Academic engagement: A review of the literature 2011–2019. *Research Policy*, 50, 104–114. <https://doi.org/10.1016/j.respol.2020.104114>
- Phùng, T., Le Ha, P. (2021). Higher Education in Vietnam and a New Vision for Internationalization at Home Post COVID-19. In: Gillen, J., Kelley, L.C., Le Ha, P. (Eds.), *Vietnam at the Vanguard*. Asia in Transition (vol 15). Springer, Singapore. https://doi.org/10.1007/978-981-16-5055-0_13

- Queirós, A., Carvalho, T., Rosa, M. J., Biscaia, R., Manatos, M. J., Videira, P., Teixeira, P., Diogo, S., Melo, A. I., Figueiredo, H., & Mendes, R. M. (2022). Academic engagement in Portugal: The role of institutional diversity, individual characteristics and modes of knowledge production. *Studies in Higher Education*, 47(11), 2239–2252. <https://doi.org/10.1080/03075079.2022.2042241>
- Robson, S., Almeida, J., & Schartner, A. (2018). Internationalization at home: Time for review and development? *European Journal of Higher Education*, 8(1), 19–35. <https://doi.org/10.1080/21568235.2017.1376697>
- Schneijderberg, C., & Götz, N. (2021). Academics' societal engagement in cross-country perspective: Large-n in small-n comparative case studies. *Higher Education Policy*, 34, 1–17. <https://doi.org/10.1057/s41307-021-00227-z>
- Seeber, M., Cattaneo, M., Huisman, J., & Paleari, S. (2016). Why do Higher Education Institutions internationalize? An investigation of the multilevel determinants of internationalization rationales. *Higher Education*, 72, 685–702. <https://doi.org/10.1007/s10734-015-9971-x>
- Seeber, M., Debacker, N., Meoli, M., et al. (2022). Exploring the effects of mobility and foreign nationality on internal career progression in universities. *Higher Education*. <https://doi.org/10.1007/s10734-022-00878-w>
- Siekierski, P., Correia Lima, M., & Mendes Borini, F. (2019). International academic mobility and patent filing in the country of origin. *Revista De Administracao Publica*, 53(3), 560–574. <https://doi.org/10.1590/0034-761220170378x>
- Sin, C., Tavares, O., & Cardoso, S. (2019). Portuguese institutions' strategies and challenges to attract international students: External makeover or internal transformation? *Journal of International Students*, 9(4), 1095–1114. <https://doi.org/10.32674/jis.v9i4.185>
- Sin, C., Antonowicz, D., & Wiers-Jenssen, J. (2021). Attracting international students to semi-peripheral countries: A comparative study of Norway, Poland and Portugal. *Higher Education Policy*, 34(1), 297–320. <https://doi.org/10.1057/s41307-019-00135-3>
- Tartari, V., & Salter, A. (2015). The Engagement Gap: Exploring Gender Differences in University-Industry Collaboration Activities. *Research Policy*, 44(6), 1176–1191.
- Tavares, O., Lança, V., & Amaral, A. (2017). Academic inbreeding in Portugal: Does insularity play a role? *Higher Education Policy*, 30, 381–399. <https://doi.org/10.1057/s41307-016-0029-1>
- Teixeira, P., & Koryakina, T. (2016). Political instability, austerity and wishful thinking: Analysing stakeholders' perceptions of higher education's funding reforms in Portugal. *European Journal of Education*, 51(1), 126–139. <https://doi.org/10.1111/ejed.12126>
- Wakkee, I., van der Sijde, P., Vaupell, C., & Ghuman, K. (2019). The university's role in sustainable development: Activating entrepreneurial scholars as agents of change. *Technological Forecasting and Social Change*, 141, 195–205. <https://doi.org/10.1016/j.techfore.2018.10.013>
- Woldegiyorgis, A. A., Proctor, D., & de Wit, H. (2018). Internationalization of research: Key considerations and concerns. *Journal of Studies in International Education*, 22(2), 161–176. <https://doi.org/10.1177/1028315318762804>
- Yasuda, S. (2016). Mobility and Academic Entrepreneurship: An Empirical Analysis of Japanese Scientists. International Studies in Entrepreneurship. In: D. Audretsch, E. Lehmann, M. Meoli & S. Vismara (Eds.), *University Evolution, Entrepreneurial Activity and Regional Competitiveness* (127 ed., chapter 0, pp. 27–47). Springer.
- Yemini, M. (2021). International research collaborations as perceived by top-performing scholars. *Journal of Studies in International Education*, 25(1), 3–18. <https://doi.org/10.1177/1028315319887392>
- Zubieta, A. F. (2009). Recognition and weak ties: Is there a positive effect of postdoctoral position on academic performance and career development? *Research Evaluation*, 18(2), 105–115. <https://doi.org/10.3152/095820209X443446>