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RECEIVED 26 July 2024

ACCEPTED 04 October 2024

PUBLISHED 06 November 2024

CITATION

Stamatakis A, Tsakalides P and Tamiolaki M
(2024) Necessary reforms in the Greek
academic system. *Front. Polit. Sci.* 6:1471002.
doi: 10.3389/fpos.2024.1471002

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Necessary reforms in the Greek academic system

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Motivated by our EU funded ERA chair projects, that require proposing reforms to yield the Greek academic system more competitive with a particular emphasis on fostering brain gain and preventing brain drain, we propose policy changes on a wide range of topics, based on our joint academic management experience inside and outside of Greece in conjunction with our diverse backgrounds in the humanities, computer science, and the life sciences. The proposed reforms can contribute to increase the competitiveness of Greece in research and development (R & D). We classify proposals by their associated costs and include a plethora of zero cost proposals that do have the potential to increase efficiency and net research time as well as to improve current working conditions in Greek academia. However, to yield Greece more competitive at the international level, reverse brain drain, and foster brain gain, substantial investments and increases of R&D expenditure are required which depend on political willingness and require a long term strategic development plan for Greece beyond being a tourist destination in the European periphery.

KEYWORDS

R&D policy, research funding, Greece, brain drain, brain gain, academic system reforms

1 Introduction

As of 2022, Greek research institutes and universities are eligible for the EU widening countries' ERA chair program whose main goals are to: "Increase the country's research capacity by attracting high-level researchers to a widening university or research center. It will establish a research team fully integrated in the coordinator's institution to significantly improve its research performance in the scientific domain of choice"¹.

In this first call, Greece attracted 7 ERA chair projects with a duration of 5 years each. To attain a sustainable impact, a further major goal of ERA chair projects is to propose and support the implementation of necessary reforms with a key focus on reversing brain drain that was further intensified by the Greek economic crisis (see e.g., [Panagiotakopoulos, 2020](#); [Theodossiou et al., 2019](#), or [Labrianidis et al., 2023](#)) and fostering brain gain.

The perspective of Alexandros Stamatakis (AS) is that of a semi-outsider, that is, he has been maintaining an active network of contacts in the Greek research community and regularly participated at Greek faculty search committees for over 20 years. Since the start of his ERA chair project at FORTH (Foundation for Research and Technology Hellas) in

1 https://rea.ec.europa.eu/funding-and-grants/horizon-europe-widening-participation-and-spreading-excellence/era-chairs_en

early 2023, he has attained more profound insights by means of dedicated interviews, regular meetings, teaching activities, research group management, and informal interactions with a plethora of actors across the academic hierarchy (university professors, state-appointed permanent researchers, academic and technical staff representatives, graduate students, PostDocs, directors of research institutes and centers).

Melina Tamiolaki (MT) and Panagiotis Tsakalides (PT) are coordinators of two additional, distinct ERA chair projects at the University of Crete and at FORTH, and have been part of the Greek academic system for 15 and 20 years, respectively.

AS, MT, and PT have extensive academic management experience as department heads, research institute vice-director, head of IT, vice dean, etc.

In the following, we make policy proposals that have emerged from the aforementioned interactions and experience, aimed at yielding academic research in Greece more competitive on both, the European, and international level.

The remainder of this paper is structured as follows: we first briefly review related work on educational/academic reforms and reform management in Section 1.1. Thereafter, we initially discuss the substantial issue of non-competitive academic salaries for tenure track and tenured positions in Greek higher education institutions and research centers and the closely related issue of insufficient national research funding. Then, we analyze issues pertaining to gender equality, sexual and cultural diversity, address the absence of appropriate intellectual property right regulations, and propose an efficient reorganization of the academic research landscape administration. We conclude by listing miscellaneous issues that are not solely research-specific, but hinder Greece's competitiveness (e.g., excessive bureaucracy and an intransparent pension system). In each section we initially outline the status quo and subsequently propose one or several solutions sorted by order of decreasing implementation cost.

1.1 Related work on educational reforms and change management

An ample bibliography on regional educational system reforms and general approaches to assessing educational systems, managing change, as well as implementing reforms already exists, yet with a predominant focus on primary and secondary schools rather than on academia. Nonetheless, these insights also partially apply to academic reforms.

Related work on regional educational system assessments and potential reforms, focuses, for instance, on the development of the geography curriculum in Romanian schools (Jucu, 2012) or the assessment of the impact and curriculum quality of regional geography courses at a Romanian university (Jucu, 2014). Other topical educational research focuses on improving the teaching quality of introductory statistics courses (Garfield et al., 2002) and associated targeted reform efforts.

A comprehensive analysis and review of the primary/secondary school reform in Turkey, also including legislative aspects of the structural changes as well as the major controversies has been compiled by Aksit (2007).

By example of the US school system, Cohen et al. (2018) provide an extensive analysis of inherent challenges and dilemmas pertaining to the management of school reforms as well as to the challenges related to implementing change in inherited (public) organizational structures. Analogous challenges are discussed by Slee (2006), yet with a focus on inclusive education.

Other related work on educational change management focuses (Lieberman and Pointer Mace, 2008; Harris et al., 2017; Berkovich, 2011; Datnow, 2020) on active teacher involvement, in service learning, and resistance to educational reforms

A comprehensive summary covering the majority of the above educational reform challenges is provided in Horn (2002).

2 Salaries

2.1 Status quo

State-appointed permanent researcher and professor salaries—the two salary categories are essentially equivalent—are extremely low and non-competitive. In Greece, a full professor earns approximately EUR 2000 net per month, while the cost of living amounts to 80% of that in Germany², where full professors receive an average net salary of ~EUR 6000. Salaries used to be more competitive (20-40% higher) until 2009, before the onset of the Greek financial crisis. However, they have not witnessed significant increases since the end of the crisis, in contrast to the salaries of other state employees (e.g., judges) which were raised again. An excellent and detailed analysis of Greek academic salary scales can be found at www.esos.gr³ (article in Greek). A recent decision by the Hellenic Council of State determined that academic salaries are indeed too low, but this decision only induced a minor increase⁴. Until 2022, no salary increases were foreseen for assuming key academic management roles, such as directing the Natural History Museum of Crete as a full university professor overseeing ~50 staff members. According to law number 4, 957 of 2022 (art. 288, par. Γ'), an additional remuneration ranging between 210 and 500 EUR per month has now been established for administrative positions (department chairs, deans, vice-rectors, and rectors). Therefore, while some initial steps have been undertaken to reward academic management work, much more still remains to be done. In the following we provide some quotes and examples that characterize the salary situation:

- “Please say something about our ridiculous salaries”— request to AS by a full university professor.
- “There is no reason to work in academic research in Greece except for extremely strong personal reasons”— a state employed permanent researcher—equivalent to full professor rank.

2 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Comparative_price_levels_of_consumer_goods_and_services

3 <https://www.esos.gr/arthra/84020/misthologio-melon-dep-aei-kai-apofaseis-19112022-47412014-tis-olom-toy-ste-parelthon>

4 <https://www.esos.gr/arthra/80188/misthologio-melon-dep-antisntagmatikes-oi-diataxeis-toy-n-44722017>

- An associate professor (about 5,000 citations, h-factor of 25 according to google scholar) is obliged to teach a Lego robotics course to 9 and 10 year old kids in the evening to make a living.

It should be noted that low salaries relative to the high cost of living in Greece constitute a widespread issue beyond Academia. A recently published study^{5,6} by the Organization for Economic Cooperation and Development (OECD) shows that real wages in Greece have decreased by 30% between 2007 and 2022, with Spain ranking second in the EU with a 9% decrease. Italy, the Netherlands, and Ireland experienced decreases below 5% while all remaining countries considered (e.g., Germany, Poland, the U.S., France, Austria, Canada) show increases. The generally low salaries and difficult working conditions are the key contributing factors to brain drain of highly skilled Greeks [see Figure 2 in Labrianidis et al. (2023)].

The consequences are numerous: Greece cannot attract high profile international researchers. For instance, when inspecting the academic staff web-sites of research centers and universities, the vast majority (95% or more) of the staff are of Greek origin, based on name analysis. This also fosters inbreeding, leading to a substantial amount of in-house hires when new positions open, which in turn hinders the influx of novel ideas. Academic work contracts for permanent researchers and professors specify that the salary only covers 50% of their working time, which amounts to 20 h per week. The remaining 20 h can be remunerated via salary supplements obtained from grants. As a consequence, the key motivation for grant acquisition often primarily is to obtain salary supplements to “make a living”, while the research topic assumes a secondary role. This frequently induces a loss of research focus. Additionally, these salary supplements consume a substantial portion of the grant funding sum and thereby reduce the available budget for PhD and PostDoc positions.

The statement that salaries are *the* major factor hindering brain drain is substantiated by our ERA chair projects, as they do allow to offer competitive salaries. AS, for instance offered PhD and PostDoc salaries corresponding to 80% of those in his home institution in Heidelberg, Germany. Six out of seven members (including AS) of his research team joined from high profile institutions abroad (Germany, Austria, Spain, France—see <https://www.biocomp.gr/people.html>).

2.2 Solutions

2.2.1 Solutions requiring substantial investment

Clearly, salaries need to be substantially increased if Greece intends to become more competitive and desires to address the issue of indiscriminate grant hunting for salary supplements. The practice of salaries only covering 50% of working time must be abandoned, and net salaries need to be doubled. While a small proportion of salary supplements from grants may be permitted,

it should correspond to substantially <50% of the working time (i.e., less than EUR 2,000 net per month). Although doubling the current salaries might appear extreme, such an adjustment merely restores the pre-financial crisis salary levels, corrected for inflation and the substantial rise in the cost of living in Greece. Alternatively, endowed chairs could be established to attract international researchers, offering a guaranteed 50% salary supplement (currently EUR 2,000 net per month) until retirement age. This funding could potentially be provided by major Greek foundations. Clearly, the proposed solutions require a substantial investment. It is a matter of national strategy whether to invest in research and education—areas closely linked to wealth—or to maintain the current status quo as a tourist destination in the European periphery.

2.2.2 Zero cost solutions

To reduce inbreeding and promote brain circulation within Greece, it is advisable to implement a policy similar to Germany’s “Hausberufungsverbot” (in house hiring ban), which prohibits appointing staff members with regular contracts to permanent researcher or faculty positions at the same research center or university. Note that some initial corrections have been applied. According to Greek legislation, one cannot be directly appointed at the University one obtained the PhD from, if a period of at least three years at a different institution has not intervened after completion of the PhD. Another way to enhance the competitiveness of Greek research centers and universities is to permit them to offer fringe benefits, such as accident insurance, private health insurance, or pension plans. Implementing this only requires a legal change, as some research centers already have the funds (from grant overheads) to finance such staff benefits. Finally, the relatively recent income tax reduction law for foreign workforce⁷ could help to attract foreign researchers. However, it is currently under-utilized and not properly advertised by research centers and universities to gain international talent.

3 Insufficient and unpredictable national funding

3.1 Status quo

In analogy to salaries, national research funding through grants as well as institutional base funding is also highly insufficient. The annual fixed state budget for large research centers (e.g., FORTH receives ~EUR 12 million per year) and universities does often not even suffice to cover basic expenses such as electricity costs. Hence, fundamental operating expenses need to be covered via grant overheads. Consequently, grant acquisition performance becomes a central topic in institute-wide meetings and is a key factor contributing to indiscriminate grant hunting. The derogatory term “προτζεκτάδικο” (small time outfit running projects) is often used to describe research centers in Greece that participate in numerous EU projects out of necessity and as an end in itself,

5 <https://www.ft.com/content/ba7e18ea-eaf4-4104-bbe7-bb7f97d182e5>

6 https://www.oecd.org/en/publications/2020/10/regional-policy-for-greece-post-2020_bb991164.html

7 https://www.ey.com/en_gr/tax/tax-alerts/tax-incentives-for-attracting-foreign-professionals-to-greece

often being compelled to “take on the most mundane deliverables in EU consortia” (quote by a permanent researcher) without a clear research focus or strategy. To provide a further example, a colleague of AS in Germany mentioned the surprising response of a Greek candidate at a faculty interview when asked about a research vision and plans for the next ten years. The reply was “I will see what EU funding programs will be announced and decide accordingly”—this reflects a part of the research reality in Greece. Evidently, individual research groups do not receive any sustainable, unconditional annual base funding for staff, material, travel, and infrastructure, which must be exclusively financed via grants. National research funding programs are inadequate in number. Calls and funding decisions are often delayed by months, if not years. National calls are generally irregular and unpredictable, leading to a strong reliance on EU grants. A related and substantial problem is that a plethora of EU calls now require some level of national co-funding (usually 50%). This national co-funding is often not secured, delayed, or unavailable, which can result in delays in starting co-funded projects in the best case, or non-participation of Greece in such projects in the worst case. Thus, compared to faculty appointment committees in other countries, the number and amount of grant acquisitions is typically over-emphasized. The focus is primarily to demonstrate how much overhead funding a candidate can bring to the potential employer, with the actual research assuming a secondary role.

It is worth noting that the establishment of the Hellenic Foundation for Research and Innovation (HFRI) has at least provided a long needed national research funding institution. In addition, private foundations such as the Niarchos, Latsis, and Onassis foundations also provide some support for research in Greece.

Finally, research groups in Greece that could potentially lead projects due to the country’s rich sample availability (e.g., ancient archaeological DNA samples or biodiversity samples in the context of Greece’s status as a European biodiversity hotspot) often only serve as sample collectors and junior partners. They send these samples to leading labs in more developed countries because Greece lacks the necessary funding and infrastructure to conduct these analyses independently. In analogy to brain drain, this phenomenon was recently termed specimen drain by the director of the Natural History Museum of Crete.

3.2 Solutions

3.2.1 Solutions requiring substantial investment

State-funded researcher and professor positions should come with sustainable annual base funding for 1-2 PhD or PostDoc positions, depending on the seniority of the position. Additionally, there should be a basic annual budget for expenses such as lab equipment and travel. Annual research center budgets need to be substantially increased to at least cover their actual fundamental operating costs. A dedicated national funding program should be established for research areas that handle national sample resources (e.g., archaeology and biodiversity) to prevent specimen drain. Additionally, funding for co-funded EU programs needs to be substantially increased. Finally, competitive national funding should be raised such that the funding rate increases from currently

below 10% where chances to obtain funding are close to random to ~20%.

3.2.2 Zero cost solutions

National grant calls by HFRI, as well as occasional calls by the Hellenic Recovery Fund, should become more regular and predictable, with fixed, reliable, and known call deadlines for the next 4-5 years. Currently, pre-calls are announced, but occasionally the actual calls are delayed by as much as two years. Exporting national sample resources (specimen drain) for analysis should be prohibited or only permitted if national labs take the lead, ensuring a first or last author position on the resulting research paper. Additionally, the co-funding process of EU programs should be substantially streamlined at the organizational level to avoid delays.

4 Gender equality, sexual, and cultural diversity

4.1 Status quo

Greece has the lowest gender equality index⁸ among all EU member states. This is mirrored in academia to some extent, yet particularly so within academic management bodies, which are male dominated and where women are substantially under-represented.

For example, an evaluation of the rectorate gender composition at the top 10 Greek universities, based on the Times Higher Education index (websites accessed on June 15, 2023), reveals that ~30% of rectors are female and only 17% of the rectorate members are female. While the proportion of female rectors in Greece is analogous to that in Germany (28.6%), female rectorate members in Germany account for 37% overall. An assessment of the board of directors gender composition of the 11 Greek research centers that are directly affiliated with the General Secretariat for Research and Innovation (websites accessed in September 2023), shows that women only make up 24% of rectorate boards. Finally, all current 7 Greek ERA chairs are male.

Sexual and cultural diversity issues beyond traditional gender are currently not a priority and are generally absent from the agenda. With respect to cultural diversity, numerous aspects such as employment contracts, intranet pages, vacation application portals, and emails to research institute members (e.g., regarding staff protection measures from heat waves or the availability of new books in the library) are often available only in Greek, which impedes internationalization and excludes foreign staff members.

Sexual diversity beyond gender is generally not addressed at all on the web pages of the respective Gender Equality Committees.

4.2 Solutions

4.2.1 Solutions requiring substantial investment

There is an urgent need to establish a dedicated program for female researcher/professor positions, especially at higher

⁸ <https://eige.europa.eu/gender-equality-index/2021/compare-countries>

academic ranks equivalent to associate and full professor levels, to enhance female representation in academic management. A dedicated proposal (available at <https://www.biocomp.gr/assets/downloads/femaleProfessors.pdf>) for such a program that will also automatically increase female representation in MINT (Mathematics, Informatics, Natural science and Technology) areas which was initiated by AS and is supported by the gender equality committees of all Greek research centers and universities has been completed and submitted by AS, Maria Klapa (president of the FORTH gender equality committee), and Nektarios Tavernarakis (director of FORTH) to respective policy makers on July 10, 2024.

The exemplary quote by a senior female colleague emphasizes this necessity: “I am glad that you brought up this idea” (as a male), “when I had proposed something analogous, it was not well-received by the male colleagues at my institute.”

4.2.2 Zero cost solutions

Academic management needs to raise awareness and ensure that all important documents, portals, and information are available in both Greek and English. The proficiency in English among staff members at most research centers and universities is exceptional. Therefore, translating most documents, intranet web forms, and institutional emails comes at a negligible cost (excluding perhaps legal documents), as automatic machine translation from Greek to English typically requires only a few minor subsequent corrections.

Gender equality committees, research centers and universities need to urgently develop measures and formulate appropriate statements to embrace sexual and cultural diversity.

5 Intellectual property rights

5.1 Status quo

At present, intellectual property rights (IPR) concerning inventions at research centers and universities are not clearly defined, communicated, or explained to researchers, which impedes efforts to capitalize on these inventions. Under the current work contracts at FORTH, 100% of the IPRs belong to FORTH. However, decisions regarding IPR exploitation are made on a case-by-case basis. The decision if FORTH will pursue full exploitation or not is at the exclusive discretion of the Board of Directors. Hence, FORTH can partially or fully transfer intellectual property rights to the inventor. Due to this ambiguity and unpredictability—largely resulting from the absence of corresponding national legislation—procedures for exploitation are not well-documented. Furthermore, exploitation attempts or requests often experience substantial delays, and well-developed project ideas may not be exploited at all.

The absence of a legal framework creates a gray area in cases where university faculty members also serve as associated or collaborating researchers at research centers. For instance, at FORTH and the University of Crete, only three out of 23 Computer Science faculty members are *not* affiliated with FORTH. In such situations, it is unclear whether IPRs with exploitation potential were generated at the university or the research center. This uncertainty arises from the lack of collaboration agreements

between research centers and universities, a direct result of the nonexistent legal framework.

5.2 Solutions

5.2.1 Zero cost solutions

IPR management needs to be clearly regulated at the national level. For instance, inventors should receive an unambiguously specified fraction of the generated revenues based on the type of product (e.g., patent, software-licenses, etc.). The remaining revenues should be allocated to the research institute or university, or potentially be transferred to the research group that generated the exploitable product, under the condition that these funds are exclusively used for research.

Additionally, collaboration agreements between research institutes and universities hosting associated researchers need to be established to manage IPRs. There are ample examples of national legislation in other EU countries that could serve as a model for such an IPR law.

6 Academic research landscape (re-)organization

6.1 Status quo

State-funded research centers and universities exhibit substantial similarities in their salary and academic rank structures. Specifically, state-appointed permanent researchers have ranks and salaries that are essentially equivalent to those of university professors (assistant, associate, full). Despite the small size of the country, universities are overseen by the Ministry of Education while the vast majority of research centers is managed by the Ministry of Development. Given the similarities in ranks, payment schemes, and the close collaboration between research centers and universities, separately managing these two major academic research entities in a small country like Greece is inefficient. This separation induces unnecessary administrative overhead and requires redundant legislative adjustments, once for research centers and once for universities. For instance, the regulations governing personal bias in faculty search committees have recently been reformed to become substantially stricter and more aligned with common practice in other EU countries. In contrast, the personal bias regulations for research position search committees, which operate in the same manner have not yet been reformed.

Another issue is that research centers lost a substantial portion of their legal autonomy during the financial crisis and are now constrained by a plethora of—often unnecessary—national laws and regulations. This limits their ability to offer fringe benefits or competitive salaries beyond the current state-imposed limits.

6.2 Solutions

6.2.1 Zero cost solutions

Research centers and universities should be managed by a single ministry and regulations should be further harmonized. Reducing administrative overhead and the workload of legal

departments caused by maintaining this redundant structure will free up resources to address pressing legislative issues, such as the development of a comprehensive IPR law.

Research centers should be granted increased legal autonomy to restore their pre-crisis *modus operandi*.

7 Miscellaneous issues

7.1 Researcher and faculty appointment committees

Status quo

Conflict of interest and personal bias rules for researcher appointment committees are limited to consanguinity, and do not consider other factors such as project partnerships, co-authored publications, or previous supervisory relationships.

Zero cost solutions

Adopt the new conflict of interest regulations for university appointment committees.

Status quo

In-house appointments to permanent positions, especially at research centers, constitute the norm rather than the exception, which hinders brain circulation, at least within Greece.

Zero cost solutions

Prohibit in house appointments.

Status quo

Applications for tenure-track or permanent researcher or faculty positions require written proof of proficiency in the Greek language and hinder internationalization.

Zero cost solutions

Require applicants to commit to learn Greek within the first 5 years of their appointment. Even this might not be necessary as the level of English proficiency in Greek academia is generally excellent and a substantial number of graduate programs are taught in English.

Status quo

All announcements and applications for tenure-track or permanent researcher or faculty positions are handled through a web portal called Apella (<https://apella.minedu.gov.gr/>). The portal has two main deficiencies: Firstly, Apella does not automatically check and enforce the completeness of uploaded required documents, which can occasionally cause issues during appointment committee evaluations. Secondly, a substantial number of Principal Investigators (PIs) working abroad, many of whom are part of the Greek academic diaspora, are registered on Apella. When assembling appointment committees, PIs are generally not asked by the respective department dean or institute director (although there are notable exceptions), if they have the time and willingness to participate. Instead, they receive an automatically generated message from Apella

stating that “you have been appointed to this selection committee”, which does not align with standard practices in other countries.

Low cost solution

First, re-design Apella to only accept complete applications by incorporating additional and more specific document upload fields. Second, appoint committee members only if they have checked a box indicating their agreement to serve on the committee, or, ideally, if they have been explicitly and personally been asked and agreed to participate beforehand by the head of the appointment committee.

7.2 Bureaucracy

Status quo

As a result of the financial crisis and some rare instances of corruption in research money spending, extremely austere and overly complex control procedures have been implemented, consuming a large fraction of time at the expense of net research time. These measures can be perceived as reflecting a general mistrust toward researchers and faculty members. For instance, in analogy to members of Greek parliament, every researcher managing a grant as “scientific responsible” needs to submit an annual “*πρόθεν έσχες*” statement listing all assets held both in Greece and abroad. For the vast majority of researchers, the obligation to submit a “*πρόθεν έσχες*” declaration arises solely due to their role in grant management, making it an exclusively work-related obligation that can and should be conducted during regular working hours. While every citizen is supposedly capable of submitting such an application independently without support by a tax accountant (and the associated costs), it is questionable whether this expectation is realistic for foreign researchers whom Greece aims to attract. For instance, AS lost a full working day to merely assemble the necessary data for his initial “*πρόθεν έσχες*” declaration and half a working day in the following year.

Zero cost solutions

Control mechanisms should be scaled back to pre-crisis levels and the state and policy makers should place greater trust in researchers to manage grants. As the president of the board of directors of FORTH has stated, “It can’t be that 99% of researchers have to suffer due to the misconduct of 1%”. Relaxing control mechanisms is urgently needed and has two major benefits: (i) it reduces costs for administrative staff, and (ii) it boosts research productivity by allowing researchers to spend less time on administrative tasks, editing, and reviewing legal documents, etc.

Status quo

Legislation in Greece is often chaotic and unclear, even to experts in the field, with a prime example being the construction laws. Unlike in other countries, where up-to-date legislation can be easily accessed online (e.g., the university law of the federal

state of Baden-Württemberg⁹, relevant for AS in Germany) Greece lacks a well-maintained and centralized resource. As a result of the generally unstable and unpredictable legal environment, standard business processes—such as travel applications, hiring procedures, sub-contracts, and grant management—are often not documented on the intranet of research centers and universities. Consequently, the usual approach is to ask around and find a colleague who has recently navigated the same process, leading to substantial communication overhead.

Zero cost solutions

All fundamental business processes should be systematically documented (in both Greek and English) and regularly updated by central administrations and legal departments. This will substantially reduce administrative workload and, as a result, enhance research productivity and decrease administration costs as well as workload in the long term.

7.3 Internationalization

Status quo

Internationalization and brain circulation within Greece are limited due to factors such as non-competitive salaries, a challenging research funding environment, and Greek language requirements. This lack of internationalization is evident in institute-wide communication, where critical information (e.g., vacation regulations, work contracts, strike announcements) is often provided in Greek only, thereby excluding foreign staff members. Additionally, Greek language courses for foreign staff members to support their integration are generally not available. International offices are often either non-existent or provide minimal support for foreign researchers on issues such as opening a bank account and obtaining tax or social security numbers. A notable exception is the University of Crete, which regularly offers modern Greek courses for foreigners and has recently established a welcome office (welcome.uoc.gr). Nonetheless, due to Greece's bureaucracy, it is extremely difficult for foreigners to manage these seemingly straightforward tasks without the support of a local colleague and an English-speaking tax accountant.

Low cost solutions

A shift in mindset is required to ensure that all important information are available in Greek and English. Implementing this change is likely less costly than one might anticipate, as automatic text translations (e.g., through advances in machine learning) are generally effective and typically only require minor adjustments to be comprehensible.

Solutions requiring some investment

International offices to support foreign staff members need to be established at research institutes. In the concrete case of AS, to set up his lab members, he was forced to find an English-speaking tax accountant himself, arrange a bank appointment for opening

an account through some private contacts, and argue with bank directors over opening an account for a US citizen. Establishment of international offices that take over this workload will (i) increase research efficiency and (ii) make foreign researchers feel more welcome in Greece.

7.4 Unattractive public school system

Status quo

Our hypothesis is that academics place major importance on their children's education. Especially with respect to internationalization, we note that high-quality international schools are primarily located in Athens and Thessaloniki. This creates considerable disadvantages for the Greek periphery (e.g., the island of Crete or the Ioannina region) which often hosts competitive academic research communities, when trying to attract international researchers. The Greek public school system, with its well-known deficiencies (see, e.g., [Kelpanides et al., 2016](#)), seems less appealing to international academics who may have access to superior educational systems in other countries. The lack of access to international schools also appears to have been a contributing factor for moving the ENISA (European Union Agency for Cybersecurity) headquarters, the most important EU agency located in Greece, from Crete to Athens.

Solution

Proposing reforms to the Greek public school system or incentives to establish international schools in the Greek periphery is beyond the scope of this paper and far beyond our expertise. Nonetheless, we are convinced that it constitutes a major factor hindering brain gain and internationalization in the Greek periphery.

7.5 Pension plans

Status quo

Private pension plans are generally not a priority for most citizens in Greece, despite the unpredictable and most likely very low pensions from the national social security system, which is also expected to be affected by the country's severe demographic challenges (see e.g., [Lamnisos et al., 2021](#)). This issue also affects researchers and faculty members.

Low cost solution

At the HR level, staff members should be informed about the importance of managing their private pension plans and be made aware of the available options and opportunities in an objective and impartial manner.

Solution requiring some investment

In other countries, companies as well as academic institutions provide pension plans (e.g., the European RESAVER initiative <https://www.resaver.eu/> for a common private pension plan across EU countries is also accessible to academic institutions) where a portion of an employee's salary is deducted for the plan, and

⁹ <https://mwk.baden-wuerttemberg.de/de/hochschulen-studium/hochschulpolitik/landeshochschulgesetz>

this amount is then matched by the employer to incentivize participation. This could be managed through overheads, if offering fringe benefits is reinstated (the council of Greek research center directors that meets once per month has repeatedly requested this from policymakers), or ideally, it should be funded by the state on a broader scale beyond the public research sector.

7.6 Hierarchy

Status quo

Hierarchy remains highly pronounced, both socially, and within the legal structure of research centers. For example, research institute directors hold a significant amount of power, which also contributes to a very high workload. Social hierarchy often manifests itself in conversational asymmetry, such as principal investigators (PIs) addressing students informally with “εσú” (you, singular) while students address them formally with “εσείς” (you, plural).

Low cost solution

A universal code of conduct should be implemented at research centers and universities. Additionally, research institutes should adopt a flatter hierarchy (e.g., assign more tasks and responsibilities to the vice-director, by establishing a vice-director for research, for instance) to alleviate the excessive workload experienced by institute directors.

8 Conclusion

We have presented a plethora of policy proposals that can contribute to yield the Greek academic system more attractive and competitive. A large number of these proposals exhibit zero cost and can even induce an increase in administrative as well as scientific efficiency and available PI net research time. These zero cost solutions will predominantly improve working conditions for researchers already being located in Greece. Yet, for Greece to become attractive and truly competitive at the international level,

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a substantial increase in R&D expenditure is necessary which is a matter of political willingness and requires developing a long-term strategic plan for the development of Greece beyond tourism and shipping.

Author contributions

AS: Conceptualization, Investigation, Validation, Writing – original draft, Writing – review & editing. PT: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. MT: Conceptualization, Investigation, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. This work was financially supported by EU ERA Chair program under Grant Agreements No. 101087081 (Comp-Biodiv-GR, AS), No. 101086741 (Titan, PT), and No. 101087269 (Talos, MT).



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