Research Barriers and Academic Productivity

Megi Çali, University of Tirana, Albania
Blendi Gërdoçi, University of Tirana, Albania
Fiorina Jaso, Albanian American Development Foundation, Albania

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Abstract
This study explores the hindering effect of various research barriers on research productivity. Using a sample of 403 University lecturers, we employed ordinal regression to assess the effect of access to research funds, teaching load, personal capabilities for carrying out research, personal interest in research, and access to scientific articles databases as significant barriers to research productivity. The results of the three models created by using different measures of research productivity show that access to research funds is the only significant barrier that affects the quantity of research, whether it is Scopus ranked or not. In contrast, when accounting for quality of research, we found that access to scientific databases is the main barrier to the volume of research published in the first and second quartiles of the Journal Citation Reports. Last, lack of research methodology capacity is a crucial barrier and access to funds that negatively affect the number of articles published in the third and fourth quartiles of the Journal Citation Reports. Our results provide additional empirical evidence to the research stream focused on research barriers and some indications for policy-making.

Keywords: Research Barriers, Research Productivity, University

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1. Introduction

Albania continues to perform poorly in many education-related rankings, particularly research. In 2019, Scopus - the internationally prestigious ranking of scientific journals - ranked Albania 119th, below Montenegro for scientific publications (SCIMAGO, 2019). In terms of research output, Albania does not only lag behind OECD countries, but also other Western Balkan countries. The country has the lowest publication density, 48 per one million inhabitants, and the lowest output, with 154 articles in 2014 compared to Montenegro's 191 (UNESCO, 2015). This paper seeks to shed light on the key barriers that hinder the quantity and quality of research production in Albania and to find solutions that address these barriers.

Building on the body of existing literature, this paper focuses on both dimensions of research production, quantity, and quality. Research productivity has been measured as the quantity and/or quality of the artefacts produced by faculty Scholarship (Meho & Spurgin, 2005). More specifically, academic research productivity is measured by the number of publications of journal articles (usually articles published in "peer-reviewed" journals), books, book chapters, papers in conference proceedings, awarded research grants, and patents (Heng et al., 2020) Other scholars (Aksnes et al., 2019) focus on the quality aspect of academic research productivity. Indicators such as citation counts, citation rates, h-index and others are used to determine the scholarly impact of a specific article, author, or publication.

Current literature suggests that there are various factors affecting research productivity. On the one hand, institutional and network-related factors, such as research collaboration (Nguyen, 2016). and participation in academic associations (Valsangkar et al., 2016), can strengthen research productivity. Furthermore, a responsible research environment where heads of departments encourage their staff to develop not only their technical competencies but also to maintain their academic integrity has had a positive impact on research production (Haven et al., 2020). On the other hand, inexperienced research workforce (Tien et al., 2019), the level of university support for scholars to conduct research (Smeltzer et al., 2016), lack of research facilities (Alrahlah, 2016). lack of support, bureaucracy, suboptimal supervision of doctoral students (Haven et al., 2020) are among the factors that hinder research productivity. Furthermore, research policy and practices are vital issues to address for improving productivity (Haven et al., 2020). The authors highlight the importance of a policy framework that addresses talent development, selection, promotion, and a formal evaluation system in research institutions. Such systems should put less emphasis on citation criteria and more on the quality of research.

Many studies indicate that research productivity varies depending on the academic discipline (Jung, 2012; Albert, 2016). Jung (2012) suggests that academics in hard disciplines publish many more articles than those in soft disciplines; however, the opposite is true for books publication. A study on research productivity in the Spanish Academia found that research productivity among young academics is lower in economics compared to social sciences, particularly Humanities (Albert et al., 2016).

Numerous studies have found that the individual attributes of academics have a considerable effect on their research engagement and productivity (Heng et al., 2020; Jung, 2012; Albert, 2016; Mantikayan & Abdulgani, 2018; Carayol & Matt, 2006). Experience is considered an essential factor affecting research productivity (Jung, 2012; Albert, 2016). However, Batool et al., (2021), indicate that young scholars are more interested in conducting research and producing new knowledge than their older colleagues. Productivity decreases with age

(Albert et al., 2016); this could be explained by differences in administrative burden, which tends to be greater for older scholars (Carayol & Matt, 2006). Furthermore, many studies concluded that male scientists publish more than female scientists (Albert, 2016; Batool et al., 2021) and this remains true even after controlling for family-related factors such as child-rearing (Stack, 2004). Finally, high performing scholars may have innate scientific ability or talent, possess a sacred spark of motivation and desire, and have a specific personality or cognitive structure (Mantikayan & Abdulgani, 2018).

An important stream of research has been focused on the barriers to research productivity. One of the main barriers appears to be research funding (Nguyen, 2016), the lack of which weakens academics' research capacity (Tien et al., 2019), affecting the number of publications and citations (Jacob & Lefgren, 2011). Furthermore, Tien et al. (2019) argue that complicated research payment procedures negatively affect productivity. Another barrier affecting productivity is the teaching load, limiting the time a researcher spends on research (Nguyen et al., 2016; Tien et al., 2019; Mantikayan & Abdulgani, 2018; Smeltzer et al., 2016). Albert et al. (2016) make a more accurate prediction by indicating that teaching load over 50% of workload time decreases research productivity. Haven et al. (2020) point out the need for time to learn and improve, especially for early-career researchers. Further, there is a strong correlation between capabilities for conducting research and productivity [Babu & Singh., 1998; Obliopas, 2018]. Also, for not native speakers, proficiency in English might be a barrier (Tariq et al., 2016). Finally, the lack of mentorship within the faculty can be a substantial barrier (Shanmugam et al., 2019). Our purpose is to examine the effect of five significant barriers identified during the exploratory phase of the research, namely, access to research funds, teaching load, personal capabilities for carrying out research, personal interest in research and access to scientific articles databases. To the best of our knowledge, this is one of the few studies investigating the Albanian academic context, with Papadhopulli & Miço (2019) being an exception.

The rest of the paper is structured as follows: Section 2 presents the data and methods. Section 3 presents the results of the ordinal regression analysis. Section 4 includes discussions, implications, and limitations.

2. Materials and Methods

2.1 Participants and data collection

Data were collected using an online survey. Using the official emails of the entire population of academics of 37 public and non-public Higher Education Institutions, we contacted via email around 6500 lecturers working in the private and public sectors. The online questionnaire was accessed by 1038 respondents only. Anecdotic evidence suggests that the new email addresses provided by universities (the database of contacts we used) are not often accessed by academics who prefer to use their private accounts. Thus, we are inclined to classify these cases as unreachable. Of 1038 respondents, only 712 filled out the questionnaire. However, only 403 completed the entire questionnaire.

2.2 Missing data, outliers, response rate and bias examination

We examined the dataset for (i) missing data and (ii) outliers. Three hundred nine cases were deleted due to missing data of more than 20%. Further, Z-score analysis showed that there are no outliers.

The active response rate is reasonable, at around 69%. However, we tested for the non-response bias by using wave analysis. No difference between early and late respondents was found in terms of respondent attributes such as gender ($\chi 2$ test, $p = 0.286$), University (private vs public ($\chi 2$ test, $p = 0.128$), university degree (PhD vs MSc) ($\chi 2$ test, $p = 0.499$), and title (Professor, Associate Professor or without a title) ($\chi 2$ test, $p = 0.648$). Therefore, non-response bias is not a problem in our study.

2.3 Empirical model

Ordinal logistic regression was used since the outcome variable is polychotomous and ordinal in nature.

2.4 Operationalization of variables

The five variables measuring barriers were operationalized using multi-item self-assessed indicators on a four-point scale. One represents the assessment - not a barrier, and 4 (four) indicates the barrier as an extreme one.

The three outcomes, respectively, number of articles published despite being indexed or not in Scopus, the number of articles published in the first and second quartile (respectively Q1 and Q2) of the Journal Citation Reports (JCR) and the number of articles published in the third and fourth quartile (respectively Q3 and Q4) of the Journal Citation Reports (JCR) were measured using a categorical variable (0 articles published was coded with 1, 1 to 3 = 2, 4 to 6 = 3, 7 to 9 =4, and more than 9 = 5).

3. Results

Table 1 shows the results for three models. The first model shows the impact of the independent variables on the overall number of articles, despite their quality and whether they are being published in Scopus indexed journals or not. The second shows the results of the same predictors on the number of articles published in the Q1 and Q2 quartiles of JCR. Finally, the third shows the results of our predictors on the number of articles published in the Q3 and Q4 quartiles of the JCR.

All three models fit the data (significance of model fit < 0.0001). Further, the goodness of fit significance is higher than 0.05 for all three models. The test of parallel lines or the assumption of proportional odds is not significant for the three models; thus, the effects of our predictors are proportional across the different thresholds.

The Nagelkerke Pseudo R-Square indicates that the first model explains 26% of the variance, the second, almost 15% and the third, 20% of the variance of our outcomes.

In the first model, access to research funding is the only predictor among the five barriers that affect output. The coefficient, -0.296 and p-value = 0.003< 0.01 indicates that for a unit increase in the perceived level of the barrier, we expect a decrease in the ordered log-odds of productivity given that all of the other variables in the model are held constant. In the second model, access to scientific databases predicts the number of articles published in Q1 and Q2 journals (Coeff. = -0.220, p-value < 0.05). Finally, in the third model, the barrier related to personal capabilities to carry out research and access to research funds have a negative impact on the number of articles published in Q3 and Q4 journals.

Table 1: Model results

Variables	The overall number of articles published	Number of articles published in Q1 and Q2 Journals	Number of articles published in Q3 and Q4 Journals
	Coeff. (s.e.)	Coeff. (s.e.)	Coeff. (s.e.)
Access to research funds	-0.296*** (0.099)	-0.112 (0.105)	-0.280** (0.111)
Teaching load	-0.060 (0.099)	0.095 (0.106)	0.063 (0.110)
Personal capabilities for carrying out research	-0.136 (0.153)	-0.247 (0.169)	-0.365** (0.185)
Personal interest in research	-0.037 (0.166)	0.114 (0.178)	0.110 (0.189)
Access to scientific articles databases	0.118 (0.100)	-0.220** (0.109)	0.007 (0.114)
Gender (female)	-0.397** (0.197)	0.023 (0.210)	-0.385 (0.218)
Gender (male)	0[a]	0[a]	0[a]
Scientific title (not title)	-0.675* (0.371)	-1.125*** (0.386)	-1.775*** (0.389)
Scientific title (Assoc. Prof.)	-0.305 (0.389)	-0.246 (0.399)	-1.046*** (0.398)
Scientific title (Prof. Dr.)	0[a]	0[a]	0[a]
PhD (Albanian University)	-0.431 (0.266)	-0.283 (0.279)	-0.216 (0.289)
PhD (abroad)	0[a]	0[a]	0[a]
No P.h.D.	-1.569*** (0.253)	-0.718*** (0.268)	-1.013*** (0.297)
P.h.D.	0[a]	0[a]	0[a]
Public University	-0.165 (0.220)	0.327 (0.240)	0.307 (0.256)
Non-public University	0[a]	0[a]	0[a]
Experience (0-5 years)	-1.009*** (0.337)	-0.183 (0.363)	0.075 (0.387)
Experience (6-10 years)	0.172 (0.322)	0.467 (0.345)	0.766** (0.360)
Experience (11-15 years)	0.079 (0.319)	0.037 (0.341)	-0.149 (0.364)
Experience (16-20 years)	-0.351 (0.322)	0.428 (0.340)	0.418 (0.351)
Experience (more than 20 years)	0[a]	0[a]	0[a]

Note: '***' $p < 0.01$; '**' $p < 0.05$; '*' $p < 0.1$; coefficients (Coeff.); standard errors (s.e.).

Our analysis shows that having a scientific title (Prof. Dr) makes the difference. The coefficient for "no scientific title" is negative and significant to various levels across the three models. However, there are no significant differences between the scientific title "Prof. Dr." and "Prof. Assoc." Similarly, individuals with a PhD tend to perform better than those without it; the coefficient for the latter is negative and significant. Further, experience appears to have a specific effect, at least for two of our models, indicating that the entry-level researchers perform worst. However, in the third model, those experienced but still young perform better than the older generation.

4. Conclusions, Implications, Extensions and Limitations

This paper examined the main barriers that affect the productivity of Albanian academics. Our findings show that the only barrier affecting the total number of articles published, despite being indexed or not in Scopus, is access to funding. Similarly, this barrier also affects the number of articles published in Q3 and Q4 journals. Such results align with previous research (Nguyen et al., 2016; Tien et al., 2019; Jacob & Lefgren, 2011) especially the findings of Tien et al. (2019) who indicated access to funding as an essential barrier for

research output. However, we did not find any evidence of the effect of this barrier on the number of articles published in Q1 and Q2 journals. We argue that despite the low funding levels, high-performing researchers can overcome the challenges related to funding. Future research needs to address this counter-intuitive finding.

As expected, the lack of capabilities in conducting research is another barrier affecting the number of articles published in Q3 and Q4 journals but not those published in Q1 and Q2 journals. Such results align with previous research (e.g., Babu 1998; Obliopas 2018). Furthermore, our results show that the most critical factor affecting the quantity of high-quality research is access to the research databases. Such finding is consistent with Alrahlah's (2016) results in the middle-Eastern context.

The results of the three models do not show any effect of either personal interest in research or teaching load on the research productivity. While there is some variability in the variable measuring interest in conducting research, our results suggest that such a factor does not impact the quality and quantity of research. Despite the personal interest, other factors such as the obligation to be engaged in research might play a role here. Surprisingly, and in contrast with other studies (Nguyen et al., 2016; Tien et al., 2019), our results show that teaching load is not a barrier to productivity. However, we did not measure the teaching load with objective indicators and did not account for the variability between various Faculties. Further research might shed some light on this relation.

Our results show that the more experienced researchers perform better than the entry-level researchers. Such results align with Albert et al. (2016) and Jung's (2012) findings. However, our results of the third model corroborate the arguments of Batool et al. (2021), indicating that young but somehow experienced scholars produce more research than their older colleagues. Further, females appear to perform worse than their male counterparts supporting previous research (Albert, 2016; Batool et al., 2021). Finally, having a Ph.D. degree or scientific title positively affects productivity, although the results for the latter appear to be mixed across the three models.

Our study has important implications for policy-making at the institutional level and, more generally, at higher-level decision-making (e.g., government). First, more efforts should be made to ensure access to databases of scientific articles. While there have been some efforts in the last four years, the quality of databases accessed by the larger community of researchers is relatively poor, with the AADF's initiative to offer researchers access to JSTOR being an exception. Access to high-quality databases is crucial, especially when it comes to producing high-performing research published in high-quality journals. Second, increasing access to research might support young researchers who have just started their careers. While funding is essential for all researchers, our results suggest that this is more so for researchers who do not have the capabilities or experience to publish in high-quality journals. Hence, university and faculty level policies should support research proposals made by a mixed team of young and more experienced researchers. Third, training and coaching to increase capabilities are crucial, especially for inexperienced and young researchers. Anecdotal evidence suggests that few faculties deliver such training. Furthermore, PhD programs need to be adjusted by integrating a first phase that trains candidates in essential areas such as research methods, econometrics, and academic writing.

Some limitations bind this study. First, while capabilities might include the skills of researchers to use software for qualitative and quantitative analyses, in our study, we have not

measured their access to such software. Some studies consider such barriers significant to research productivity (see; Shanmugam et al., 2019; Teh et al., 2017). Second, we did not account for variations across different academic disciplines (see Jung, 2012; Albert, 2016), research collaboration (Nguyen, 2016), participation in academic associations (Valsangkar et al., 2016), and a responsible research climate (Haven et al., 2020). Third, we measured our outcome as a categorical variable leading to loss of details and variability. Forth, low access to research grants can be caused by various factors, both individual (e.g., low-quality research proposals) and institutional ones (e.g., lack of support). Thus, the variable it lacks the granularity to capture the differentiated impact that various factors related to funding have on research productivity.

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Contact email: megi.cali@unitir.edu.al
blendigerdoci@feut.edu.al
f.jaso@aadf.org