Resource endowments and responses to regulatory pressure: Publications of economics, management, and political science departments of Turkish universities in indexed journals, 2000–2008

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Abstract   This paper investigates how differences in resource endowments of universities shape variation in their response to regulatory pressures. Earlier research on higher education institutions tends to conceive regulatory rules as the primary basis of action and does not attend to differences in the salient characteristics of universities. This paper is based on the premise that satisfying regulatory demands requires resources that are compatible with these demands, making resource endowments of universities a potentially significant source of variation in their responses to regulatory pressures. We empirically investigate the relationship between human resource characteristics of economics, management, and political science departments of Turkish universities and how these departments responded to the intensifying regulatory pressure to publish more in indexed journals. Findings reveal that departments which predominantly employ researchers trained in North American universities published significantly more in indexed journals between 2000 and 2008. These departments are better endowed with respect to resources that are necessary for publishing in indexed journals, most importantly knowledge of theory, methodology, and style sought by indexed journals. The paper shows that attending to differences in resource endowments of universities as well as regulatory goals and tools facilitates understanding of how regulation-driven processes unfold.

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Introduction

An increasing number of governments are instituting elaborate research evaluation policies in order to boost research productivity of universities (Benner and Sandström 2000; Etzkowitz and Leydesdorff 2000; Hicks 2009; Nowotny et al. 2001; Weingart 2005). Some form of governmental surveillance over research activity characterizes many national higher-education systems, most notably those in Western Europe (Filippakou et al. 2010; Luukkonen 2002; Moed 2008) and a number of other developed countries, such as Australia (Butler 2003; Mahony 1994). Policy initiatives in developed countries are also emulated by regulatory and administrative authorities in developing countries such as Taiwan (Lo 2009) and Turkey (Önder et al. 2008). There is now a sizeable literature which scrutinizes national research evaluation policies and their impact on various aspects of research (Benner and Sandström 2000; Bourke and Butler 1999; Butler 2003; Geuna and Martin 2003; Jimenez-Contreras.2003; Moed 2008; Reidpath and Allotey 2010). This literature describes in detail how characteristics of national research evaluation policies differ with respect of breadth of policy, favored policy tools, stated goals, units of evaluation, or the timing of evaluation and the outcomes of policy regarding research productivity, quality of research or commercialization of scientific knowledge.

Extant literature on research evaluation policy tends to conceive national higher education systems as undifferentiated organizational contexts where universities are uniformly influenced by the workings of research evaluation policy. Therefore, this literature focuses on the overall responses of higher education systems (or particular disciplines within these systems which cut across university boundaries) to research evaluation. However, national higher education systems are highly differentiated, hosting universities which differ from one another in terms of salient organizational characteristics. Because organizational characteristics of universities may shape the way they respond to policy initiatives, research should scrutinize the sources of variation in responses to policy. An important organizational characteristic that may shape responses to policy relates to resource endowments. Organizational resources evolve historically, as organizations invest in particular competences or secure commitments of particular resource providers (Levinthal and March 1993; Teece et al. 1997). These arrangements are inert, that is hard to replace with new arrangements (Hannan and Freeman 1984). Therefore, organizations that differ with respect to resource endowments respond differently to alterations in their institutional environment as they cannot rapidly develop new kinds of resources or flexibly redeploy their resources for new purposes (Kraatz and Zajac 2001; Misangyi et al. 2009). Thus, despite coercive nature of research evaluation policy in many national contexts, responses of universities to research evaluation may vary depending on compatibility of their resources with regulatory demands and the amount of these resources. This study investigates how differences in resource endowments of universities shape their responses to research evaluation policy geared towards increasing research productivity. Our contention is that by doing so the workings and the outcomes of research evaluation policy can be further exposed. For instance, an apparent indicator of success at the national (or discipline) level, such as increase in the overall amount of research published in international journals, may hide actual failure, such as oligopolistic supply of published research by a very small number of universities, as well as the circumstances that bring about the failure, such as unequal distribution of critical resources among universities that face the regulatory pressure to publish more in international outlets.

Our empirical context involves indexed publications by economics, management, and political science departments of Turkish universities between 2000 and 2008. Indexed

publication refers to an article published in journals indexed by the Institute for Scientific Information (ISI) under the Social Sciences Citation Index (SSCI). We focus on indexed publications because indexed publication is the major regulatory tool used in Turkey in order to evaluate and thereby increase research productivity of universities and individual researchers. In our empirical analyses we use data about human resource characteristics of these departments as well as indexed publications by these departments. Human resource characteristics connote the degree to which economics, management, and political science departments employ researchers with the requisite human and social capital to publish in indexed journals. We empirically investigate the relationship between human resource characteristics of these departments and their indexed publication performance during the observation period.

The next section conceptually frames the paper with reference to resource endowments as a driver of variation in responses to regulatory pressures. Then, we describe what it takes to publish in indexed journals, especially in contexts such as Turkey. This section is followed by a brief description of the Turkish higher education system with particular emphasis on the recent regulatory initiatives concerning research evaluation and the human resource characteristics of universities. Then, we describe the data and methods of analysis, followed by a presentation of the findings. We conclude by discussing the implications of this study for assessing policy impact on research activities of universities.

Organizational resources and responses to regulatory pressures

Regulation disseminates institutional logics, that is systems of beliefs and rules that guide organizations in delimited organizational contexts (Friedland and Alford 1991; Lounsbury 2007; Marquis and Lounsbury 2007; Thornton and Ocasio 2008), including higher education systems (Gumport 2000). Institutional logics are schemas that delineate categories of activities or organizations (Thornton and Ocasio 2008). In this respect, institutional logics constitute, in the cognitive sense of the word, activities or organizations. For instance, institutional logics define what it means to do research or the distinctive characteristics of universities, that is in what ways universities are different from other types of organization. Institutional logics also describe evaluative criteria or normative expectations that attend categorical distinctions. These criteria involve what is appropriate and desirable under particular circumstances and therefore, they are sources of behavioral norms. For instance, institutional logics describe what universities should do in return for contributions by key stakeholders.

Institutional logics disseminated or imposed by regulatory bodies form the ideational basis on which organizations act and structure themselves. A long standing idea in organizational research is that organizations which face a common institutional logic tend be isomorphic, that is similar to one another with respect to how they structure themselves or behave under particular circumstances (Meyer and Rowan 1977; Scott 2001). However, although institutional logics considerably shape organizational action by specifying categorical distinctions and behavioral norms, substantive practices of organizations also require resources (Feldman 2004; Kraatz and Zajac 2001; Misangyi et al. 2009; Sewell 1992). Behavioral expectations encoded in institutional logics can be realized by compliant organizations to the extent these organizations possess resources that can be mobilized to satisfy regulatory expectations (Misangyi et al. 2009; Sewell 1992). Organizations that do not possess or fail to obtain such resources are likely to fail in fulfilling the expectations,

even when these expectations are imposed by regulatory bodies with considerable coercive powers.

The significance of organizational resources derives from their qualitative features. First, the particular resources possessed by organizations "invite utilization" which results in further development of these resources and limits experimentation with alternative resources, resulting in competency traps (Levinthal and March 1993). Over time, organizations excel at doing one thing very well but also become ignorant of alternatives, as they do not develop resources compatible with the alternatives, making it harder for them to adapt to new environmental exigencies, such as regulatory changes. Resources are also associated with a second type of trap. Building and maintaining organizational resources requires contributions by resource providers who may be external or internal to the organizations. The contributions of resource providers can be secured only when organizations make binding commitments to the goals, beliefs, or values (in other words, the institutional logics) of resource providers (Selznick 1957). Once these commitments are in place, they are hard to change either because they trigger political conflict or because they put organizational survival at risk (Hannan and Freeman 1984). The common thread in both arguments regarding qualitative features of organizational resources is that arrangements that confer organizations with particular kinds of resources are inert, making it hard for organizations to replace them with new arrangements and develop new kinds of resources to respond to new exigencies. In short, resources possessed by organizations are likely to be "sticky," that is hard to replace with other kinds of resources or unsuitable for use for alternative purposes (Teece et al. 1997: 514).

Therefore, changes in regulatory policy and dissemination of new institutional logics do not smoothly translate into compliant behavior by all organizations targeted by regulation. The degree to which substantive practices of organizations fit regulatory demands is likely to be a function of compatibility of organizational resources with the regulatory demands and the amount of these resources (Leblebici et al. 1991; Misangyi et al. 2009). Organizations that happen to possess larger stocks of compatible resources will be more able to satisfy regulatory demands. Organizations which lack compatible resources will probably find it harder to engage in substantive practices that satisfy regulatory demands, at least in the short run, because developing new kinds of resources may require overcoming the competence and normative traps that render existing stocks of resources sticky (Leblebici et al. 1991; Teece et al. 1997).

Resources of universities and responses of universities to regulatory pressures to increase research productivity

In an increasing number of higher education systems where governments have to oversee activities of many public universities regulatory mechanisms have been erected to undertake systematic and large-scale evaluation of research productivity of universities, departments or individual researchers, which forms the basis on which research funds are allocated (Butler 2003; Geuna and Martin 2003; Gonzalez-Brambila and Veloso 2007; Hicks 2009; Jimenez-Contreras et al. 2003; Luukkonen 2002; Lynch and Baines 2004). Evaluation of research productivity involves for the most part measuring the number of publications in particular outlets by a university (Butler 2003; Geuna and Martin 2003; Jimenez-Contreras et al. 2003). In many countries, university administrators currently endorse, rather than objecting to, subjecting universities and individual researchers to external evaluation of research productivity (Weingart 2005). Reports of system-wide

resistance to the institutional logic of holding universities more accountable to external parties (most notably the regulatory bodies) and instituting inter-university competition are rare (Geuna and Martin 2003), although individual researchers articulate their concerns regarding implications of regulatory evaluation of research for the meaning and role of university and research (Gumport 2000; Weingart 2005). Consequently, regulatory pressure translated into changes in organizational structures of universities, especially with regards to the way they reward, hire or promote researchers. In contexts where universities are rewarded based on research productivity, universities devise mechanisms through which they hire or reward their employees based on research productivity (Butler 2003; Önder et al. 2008; Youn and Price 2009).

The relatively scant literature which specifically addresses the implications of using publication counts as a measure of research productivity tends to conceive higher education systems as undifferentiated organizational contexts. However, higher education systems are heterogeneous with respect to resource endowments of universities. Diverse aspects of resources controlled by universities, but most notably human resources related to research ability or capacity of research teams of universities, have been shown to relate strongly to various types of activity such as patenting or transforming scientific knowledge into marketable products (Allen et al. 2007; Lynch and Baines 2004; Powers 2003). Therefore, it may well be argued that research ability or capacities of research teams of universities also shape their responses to the regulatory demand for increased publications in scientific journals.

However, there is no systematic research as to how differences in research ability or capacity of research teams of universities translate into variation in responses to regulatory pressures to publish more and specifically to publish more in indexed journals. Publishing in indexed journals requires being knowledgeable about theory, methodology, and style desired by indexed journals. Therefore, publication productivity of universities probably relates strongly to their human resource characteristics regarding knowledge of particular theories, methods, and style. What is notable about indexed journals is that they mostly originate from North America or Great Britain (Bordons et al. 2002; van Leeuwen 2006). These countries dominate social sciences by providing research agendas, research methodologies, and criteria as to what is scientific (Alatas 2003). Relatedly, a very large portion of research output published in indexed journals originates from these countries. Research that originates from other parts of the world (even the economically developed countries such as Japan and Germany) and gets published in these journals addresses ideas and agendas of these countries and uses methodologies considered appropriate in these contexts (Alatas 2003). Thus, the likelihood of publishing in indexed journals is likely to be a function of knowledge of theory, methods, and style (most importantly, proper use of English) valued in North America or Great Britain rather than those valued elsewhere.

Researchers from other parts of the world have had difficulty in penetrating indexed journals, especially the top-tier ones (Bordons et al. 2002; Kirkman and Law 2005). This is probably because on average these researchers are relatively unfamiliar with the American or British conceptions as to what counts as an interesting research question, methods by which these questions should be tackled, and how research should be presented (Alatas 2003; Boyacigiller and Adler 1991; Eden and Rynes 2003). However, higher education systems in countries other than those located in North America or Great Britain are also differentiated with respect to exposure of their researchers to North American or British conceptions or methodologies. Due to prominence of North American or British ideas, issues, methodologies, and research institutions many researchers from elsewhere in the

world receive their doctoral training in these countries and are later employed by their native institutions. Publication productivity has been shown to vary with attributes of the doctoral training process, e.g. the location or quality of the degree granting department or the number of publications by the researchers employed in the department (Gonzalez-Brambila and Veloso 2007; Buchmueller et al. 1999). Therefore, we argue that researchers educated in North American or British universities and employed in other national contexts are better equipped with the requisite theoretical, methodological and style knowledge to publish in indexed journals. Thus, these researchers will find it easier to publish in these outlets compared to those trained in native institutions or in other foreign contexts. In addition, graduates of North American or British universities are probably better net-worked with researchers in these contexts, which further increases their chances of pub-lishing in indexed journals. Studying abroad results in bigger networks (Gonzales-Brambila and Veloso Gonzalez-Brambila and Veloso 2007) and team oriented researchers generally publish more (Nederhof 2006). Thus, teaming up with the more capable is likely to be more remunerative in terms of indexed publications.

To the extent researchers trained in North American or British universities concentrate in particular universities in other national contexts, differences in publication performance of universities may ensue, that is universities where these people concentrate may publish more compared to others. Concentration of these researchers in particular universities may be a historical accident (e.g., the outcome of a long-standing tradition of employing people trained abroad which is not originally related to publishing productivity, but which nonetheless helps the universities to publish more) or the outcome of strategic behavior by universities (i.e., endorsement of the overarching regulatory logic and deliberate institution of human resource practices to recruit and employ these researchers). Conversely, absence of these researchers in other universities may once again be a historical accident (e.g., the outcome of a long-standing tradition of relying on inbreeding which unwittingly gets in the way of recruiting researchers trained abroad). Below, we explore these possibilities within the Turkish higher education system.

Evaluation of research productivity in the Turkish higher education system: regulatory pressures versus human resources of universities

Turkish higher education system has been in double bind for nearly four decades. On the one hand, demand for higher education has been continually increasing. On the other hand, government's ability to fund higher education has been limited. The number of students enrolled in high schools was less than 200.000 in mid-1960s. The figure was above three million in 2005 (YÖK 2007a), implying considerable increase in the demand for higher education. In order to satisfy increasing demand, governments have established public universities in waves. The first wave of founding was experienced between 1973 and 1975. At the beginning of 1973, there were only nine universities in Turkey. Faced with surging demand, which was driven by rapid industrialization and urbanization that began in early 1960s (Erden 2006; Keyder 1987), governments underwrote founding of nine universities between 1973 and 1975. A second spurt of founding took place in 1982 with the estab-lishment of eight universities. A third wave came in 1992 with the establishment of 24 universities. Finally, in 2006 and 2007, 41 public universities were founded. Governments have also relatively recently encouraged founding of private (but not-for-profit) universi-ties in order to increase supply. The first private university was established in 1984 and the second in 1992. Between 1994 and 2003, private university foundings totaled 22. Finally,
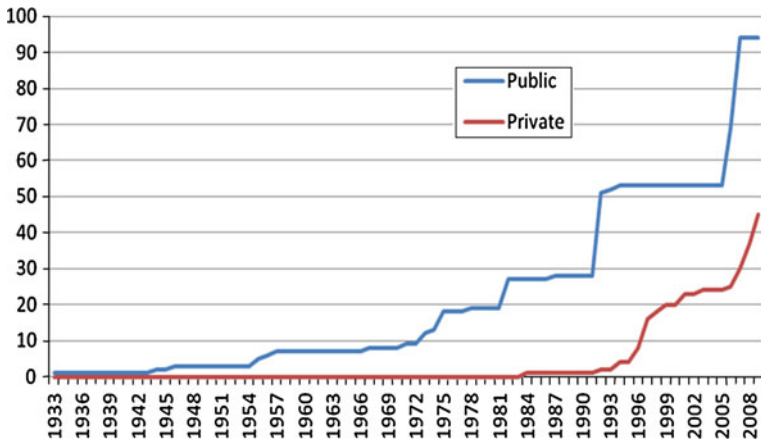
Fig. 1 Total number of public and private universities in Turkey (1933–2009)

21 more were established between 2006 and 2009. Figure 1 depicts the annual counts of public and private universities between 1933 and 2009.

The driving force behind spurts of university founding, both public and private, has been the governmental aspiration for provision of mass education. In this respect, Turkish higher education system is highly undifferentiated. Both public and private universities have typically espoused a teaching orientation (Üsdiken and Wasti 2009). There is no formal distinction between research and teaching oriented universities. Although university is virtually the only form of organization that conducts research in Turkey, a prestige order of universities based on research productivity has been absent. There have of course been relatively well-regarded universities in Turkey. But these distinctions have had to do largely with language of instruction rather than research productivity. Teaching in English (and in very few instances in German or French) has traditionally conferred greater prestige which in turn has influenced student demand. Universities (or departments) offering programs in English have been high in demand and have therefore, been able to recruit the top performing high school graduates in the centralized university entrance examination that has been in place for more than three decades.

Although establishment of public and private universities has been by and large driven by the demand for higher education, governments have also recently taken steps to increase research productivity of universities and began using tools to evaluate research productivity. Governmental interest in research evaluation stems largely from Turkey's aspiration to become a member of the European Union (EU) and Turkey's involvement in EU driven initiatives. Interaction with the EU resulted in emulation of some of the policies and practices prevalent in EU countries, as has been the case for other countries that have aspired to become EU members (Luukkonen 2002; Sarrico et al. 2010). Turkish regulators have found it relatively convenient to use quantitative measures of research productivity. However, a comprehensive and integrated research evaluation and funding system is yet to be instituted in Turkey. Currently, three governmental agencies carry out some form of research evaluation with implications for university- or researcher-level research productivity. The first of these agencies is the Higher Education Council of Turkey (Yükseköğretim Kurulu, henceforth YÖK). For the last few years, YÖK has been using annual counts of articles published in indexed journals in order to rank universities (YÖK

2005, 2006, 2007b, 2008). Sometimes YÖK also published statistics as to indexed publications by departments of universities as well (YÖK 2005, 2006). YÖK's annual reports are not linked to any funding schema. But they nevertheless have important consequences. First, these reports are increasingly grabbing media attention. Ranking of universities is important news because each year approximately about one and a half million high-school graduates take a centralized university entrance examination and about one-fifth of them get the opportunity to select between universities and programs of study (OSYM 2009). Second, because potential students are increasingly provided with information about research productivity of universities, universities are taking steps towards improving their research productivity and publicizing their superior performance in order to attract the better students. Third, research productivity possibly relates to quality of researchers attracted by universities. Well-performing universities are more likely to recruit the potentially more productive researchers. Thus, YÖK's initiative is gradually instituting a new status order, based on research productivity as well as language of instruction.

Another regulatory agency which conducts research evaluation (this time at the researcher level) is the Interuniversity Council of Turkey (Üniversitelerarası Kurul, henceforth ÜAK). ÜAK undertakes a centralized oral examination of researchers willing to progress to associate professorship. Candidates are first required to pass a preliminary evaluation of research activity and only those who pass the evaluation are orally examined. Current evaluation procedures, which were established in 2001, essentially concern scientific publications by candidates. ÜAK differentiates between publications in international and national outlets and assigns international publications more weight. For instance, for the social, human, and administrative sciences field, an article published in an SSCI journal is worth four times an article published in a domestic journal. In other fields, publishing in an indexed journal is the only hurdle. For instance, in the engineering and the health sciences fields, candidates are required to have at least three publications in journals listed under the SCI.

A third governmental agency which undertakes research evaluation is the Scientific and Technological Research Council of Turkey (Türkiye Bilimsel ve Teknolojik Araştırma Kurumu, TÜBİTAK). TÜBİTAK has recently begun rewarding researchers for publishing in indexed journals. TÜBİTAK's rewarding scheme displays more quality awareness. Articles in high impact journals are rewarded more compared to those in low impact journals. Currently, a single article in a journal in the top quartile of the impact factor distribution concerning the pertinent field of study is worth almost as much as an associate professor's salary in a public university. TÜBİTAK also funds research projects. Evaluation of research proposals concerns both the content of the proposal and prior research performance of project leaders. Once again, articles published in indexed journals are considered as a more proper indicator of researcher capability, as has been observed in other contexts (Gonzalez-Brambila and Veloso 2007).

Turkish universities increasingly display signs of endorsement of the regulatory logic and use indexed publication as a major evaluation tool. We scrutinized the formal recruitment and promotion criteria used by forty-nine public and two private universities. A recent regulatory change obliges universities to develop their own recruitment and promotion criteria, subject to approval by YÖK. By September 2009, only 51 universities had obtained YÖK's approval for their criteria. After coding the recruitment criteria used by these universities we first estimated the weight assigned to publications in SSCI journals compared to those in domestic journals in evaluations of researchers engaged in social sciences. The relative weight of indexed journal publications ranges between 1.54 and 6, and its average is 2.85. This means that, on average, the worth of an SSCI article is almost

three times that of a domestic article. We also estimated how much of the recruitment requirements are fulfilled by a single publication in a SSCI journal and a single publication in a domestic journal. On average, researchers are able to fulfill 86% and 31% of the requirements for assistant professorship and associate professorship, respectively, by publishing an SSCI article. The respective rates are 31% and 11% for publications in domestic journals, almost a third of those for SSCI articles. Number of universities requiring at least one publication in a SSCI journal for recruitment or promotion was relatively few (three for assistant professorship and five for associate professorship).

Concerted efforts of regulatory authorities and the acquiescence of university administrators resulted in substantial increase in the number of indexed publications by Turkish researchers. A keyword search in the ISI databases shows that total number of indexed publications was above 23,000 in 2008. The figure was below 8,000 in 2001, the year which marks the intensification of the pressures to publish in indexed journals through a change in the procedures for evaluation of associate professor candidates. The increase in the number of researchers employed in universities partially accounts for the surge in indexed publications. The number of professors, associate professors, and assistant professors in Turkish universities increased from 24,460 in 2000–2001 to 38,435 in 2007–2008 (OSYM 2001, 2008). However, the growth rate of indexed publications was about five times the growth rate of researchers.

Although regulatory pressures increased the overall publication productivity of the Turkish higher education system, university contributions were unequal. Unequal diffusion of indexed publications within the Turkish higher education system is all the more evident in social sciences, as a small number of universities have published considerably more in SSCI-indexed journals compared to other universities. A similar distribution of indexed articles across universities was observed even before the regulatory pressure to publish in indexed journals intensified. Uzun (1998), for instance, reports that almost half of all Turkish-origin SSCI-indexed publications between 1987 and 1996 were produced by researchers affiliated to three Turkish universities only. Thus, there probably is a systematic factor which explains variance in publication productivity of Turkish universities.

In this paper we scrutinize why responses of universities to regulatory pressures varied with respect to social scientific research productivity by focusing on publications by researchers employed in management, economics, and political science departments of universities. As argued above, one likely antecedent of variation in university responses is differences in human resource endowments of universities. The extent to which universities employ researchers with the capacity to publish in indexed journals, that is, researchers trained in North American or British universities, may account for differences in publication productivity of economics, management, and political science departments of universities.

There is virtually no systematic empirical evidence on variance in human resource characteristics of Turkish universities regarding the capacity to publish in indexed journals. Two public universities (Boğaziçi and Middle East Technical) are well-known for having continued links to the US. These universities were staffed by visiting researchers from the US and US-trained Turkish researchers in their early years of founding (Üsdiken and Wasti 2009). Boğaziçi was in fact a former American college. Unlike some other universities which were also established under strong US influence (for instance, Atatürk University), these universities continued to hire researchers trained in the US. The success of these universities in recruiting the best students in university entrance exams (partly because they instruct in English) made them a model to be imitated by the emergent private

universities in 1980s and 1990s (Erden 2006; Üsdiken and Wasti 2009). However, because most private universities focused on teaching what was copied was largely educational content and processes rather than human resource policies. Nonetheless, a small number of newly established private universities (Bilkent, Koç, and Sabancı) emulated their practice of hiring, almost exclusively, US-trained researchers. These private universities were even more Americanized in that they not only recruited US-trained researchers, but they also adopted the American way of doing research and evaluating research performance, which is counting the number of publications in particular outlets (Üsdiken and Wasti 2009).

Other sources of foreign trained researchers for public universities were the programs administered by YÖK and the Turkish Ministry of Education (MEB). Between 1987 and 2004 YÖK sponsored doctoral training of 3,776 Turkish graduates in overseas universities. In 2007, 1,777 of them had successfully completed their training. Between 1994 and 2005 MEB sponsored 1,755 graduates but only 357 of them had successfully completed their doctoral training as of 2006 (YÖK 2007a). Beneficiaries of these programs were supposed to help staff especially the newly established public universities with qualified researchers most of whom were trained in North American or British universities. However, the number of Turkish researchers sponsored by YÖK and MEB for doctoral training abroad remained relatively limited (for comparison, in 2005, Turkish universities employed a total of 31.298 assistant, associate, or full professors). What is more, those who successfully completed their doctoral training abroad with YÖK or MEB sponsorship were appointed to a multitude of universities which probably prevented these universities from developing a critical mass of foreign trained, high quality researchers.

Thus, current distribution of foreign trained (mostly in North American or British universities) researchers across universities, which probably relates to publication productivity of these universities, seems to be driven by three processes. The first one is a historical accident, considering current pressures to do more indexed publications. This process concerns two public universities, namely Boğaziçi and Middle East Technical. These universities have had continued links with the US, recruited researchers trained in American universities and now probably enjoy high levels of publication productivity although the original reason for instituting the human resource practice of recruiting US trained researchers was not doing more publications in international journals. The second process involves three of the recently established private universities (Bilkent, Koç, and Sabancı) which were modeled on Boğaziçi and Middle East Technical but nonetheless were more Americanized as they intentionally incorporated contemporaneous performance evaluation practices of American universities to guide and evaluate research activities of their academic staff. These universities genuinely endorse the regulatory logic of considering publications in international outlets as the proper measure of research productivity. We expect their indexed publication performance to be high relative to other universities as well. The third process involves the larger set of public universities. Regarding recruitment of foreign trained researchers these universities have had to use the limited pool of foreign trained researchers sponsored by YÖK and MEB. These universities probably rely predominantly on their own doctoral graduates or graduates of other Turkish universities and thus produce a limited number of indexed publications. We expect that bulk of private universities recruit their researchers from among graduates of other (public) Turkish universities and perform lower compared to the three private universities mentioned above. Below, we empirically investigate the researcher profiles of our select departments and their publication performance.

Method

Sample and data

Empirical analyses involve two sets of data. The first set comprises bibliometric data on SSCI-indexed publications by researchers employed in economics, management, or political science departments of Turkish universities between 2000 and 2008. Our category of economics department contains departments of economics and econometrics. Likewise, the category of management department includes departments of management (or business administration), labor economics and industrial relations, tourism administration, and public finance. Political science department stands for departments of political science, international relations, and public administration. The selection of these departments was guided by both theoretical and empirical concerns. First, we focus on social sciences rather than sciences because conceptual, methodological and style knowledge is probably more universal in sciences (Gonzalez-Brambila and Veloso 2007). Isolating social scientific research is therefore, more convenient for capturing differences in resource endowments of universities based on where researchers employed by universities were trained. Secondly, we analyze publication productivity of management, economics and political science departments because (excluding psychology) highest number of Turkish origin articles in the SSCI indexed journals are in economics, management (including the business category in ISI database), and political science. This is not a recent trend. Gülgöz et al. (2002) report that a third of all SSCI-indexed articles and reviews from Turkey between 1970 and 1999 were in the fields of economics, management or political science. Selecting economics, management, and political science departments makes it possible to conduct meaningful quantitative analysis. Thirdly, these departments exist in most of the Turkish universities, and this facilitates doing comparative analysis. Finally, these departments constitute the faculty of economics and administrative sciences in most of Turkish universities. In only very few universities there are multiple faculties with economics, management or political science departments. Therefore, in most of the universities the activities of these departments are overseen by a common administrative body. This property of the sample makes it possible to control for disciplinary differences without confounding them with differences in the ways in which these departments are managed.

Bibliometric data were retrieved from the ISI Web of Science on September 15, 2009. In order to obtain the data we ran a keyword search in the ISI Web of Science using country and department identifiers as address keywords. Country identifiers were Turkey and Turkiye. We used multiple departmental identifiers in order to capture publications by researchers employed in economics, management, or political science departments in Turkish universities. Then, we subjected the resultant data to cleaning. In many articles the Turkish author(s) was not affiliated to an economics, management or political science department but the non-Turkish author(s) was. We eliminated these records from the dataset. We also eliminated records of publications which included Turkey as the country identifier but were written by researchers affiliated with universities in Northern Cyprus. Records which included some of our departmental identifiers but did not pertain to researchers employed in economics, management or political science departments organized under faculties of economics and administrative sciences (e.g., records pertaining to researchers in departments of agricultural economics organized under faculties of agriculture) were also eliminated. Finally, we removed all records of meeting abstracts, editorial materials, book reviews, and corrections. After cleaning we ended up with a total of 1,044 records of articles or review papers with at least one author affiliated with an

economics, management, or political science department in Turkey. Using the bibliometric information contained in these records we were able to code data about national, organizational, and departmental affiliations of all authors for all publications. We used the whole counting method in order to estimate the total number of publications by each of the economics, management, and political science departments. In whole counting, departments get credit for one publication when at least one researcher from the department appears as an author in a record.

The second data set contains information about location of doctoral training of professors, associate professors and assistant professors who were employed in economics, management, and political science departments of Turkish universities in September 2009. Biographical data were collected for researchers employed in universities that were established prior to the year 2000 which marks the beginning of our observation period. We collected biographical data using the internet. First, we obtained lists of researchers using departmental web sites. We were able to obtain lists of researchers employed in economics departments of 64 universities, management departments of 69 universities, and political science departments of 58 universities. We failed to obtain lists of researchers in the economics department of one university and the political science department of two universities only. Then, largely relying on the departmental websites, we coded information about location of doctoral training of the researchers employed in the department. When departmental websites contained no information about location of doctoral training of a researcher we consulted the dissertation database of YÖK which contains information on many doctoral dissertations submitted to Turkish universities. Complementary data were also collected from personal websites of researchers and in some instances from websites of publishing companies or research organizations. We collected information about location of doctoral training of 3,170 of the 3,398 (more than 93% of the) researchers employed in economics, management, and political science departments of Turkish universities. Our coding scheme differentiated between five types of researchers based on location of doctoral training: researchers trained in (1) the university which currently employs the researchers, (2) another Turkish university, (3) a North American university, (4) a British university, and (5) another foreign university. Then, we estimated the total number of researchers in each category for each of the departments. Thus, the analyses below pertain to human resource characteristics and indexed publications of a total of 191 departments.

Variables and analysis

In our analyses we investigate whether human resource characteristics of departments predict their indexed publication performance. We expect higher number of indexed publications by departments where a critical mass of researchers educated in North American or British universities exist. Therefore, we first identify profiles of departments based on location of doctoral training of their researchers and try to see whether there are departments populated mostly by researchers trained in North America or Britain. To do so, we undertake cluster analysis. Cluster analysis is done using five variables. For each department these variables capture the ratio (in percentage points) of researchers in categories describing location of doctoral training. K-means clustering method with SPSS 16 (SPSS Inc. 2007) is used in order to identify clusters. In order to validate the cluster solution, the procedure is repeated three times with approximately 75% of the observations randomly selected by SPSS. We expect to find similar classifications of departments into clusters in all trials.

We use regression analysis in order to investigate the relationship between publication performance and human resource characteristics. In regression analysis clusters are represented by dummy variables which are the independent variables of the study. One of the clusters serves as the baseline and is not included in the regression equation. We also use a number of control variables. First, we use a dummy variable which distinguishes between private and public universities (private universities are coded as 1). This variable is used to account for any systematic differences (e.g., differences as to wages or facilities) between public and private universities. Secondly, by using a set of dummy variables we distinguish between the economics, management, and political science departments. In the regression analysis, the political science department serves as the baseline. These variables are included to account for systematic differences in publication practices of the disciplines hosted by these departments as publication productivity (measured in terms of publication counts) may vary across disciplines due to the nature of the work being performed and the ways of communicating research (Toutkoushian et al. 2003). Thirdly, we include the total number of researchers employed by the department which may be another predictor of publication performance.

The dependent variable, number of publications by departments, is a count dependent variable which takes on non-negative integer values. Therefore, we use negative binomial regression. Negative binomial regression is appropriate for count data, especially when there is over-dispersion in data, a usually encountered situation in analyses of count data (Cameron and Trivedi 1998). Regression coefficients are estimated using Stata 9 (Stata Corp. 2005).

The dependent variable captures publications between 2000 and 2008. The independent variable (human resource profiles of departments) concerns characteristics of researchers employed in departments in April 2009. Therefore, the results we present below should be interpreted with caution. We do not intend to predict the exact strength of the relationship between number of researchers trained in particular national contexts and publication productivity of departments. We try to see whether departmental profiles are associated with production productivity and base the analysis on the assumption that departmental profiles as of September 2009 were not any different from those between 2000 and 2008. Our arguments above suggest that human resource characteristics of departments are sticky, that is, they are outcomes of institutionalized human resources policies and practices that resist change. Also, earlier research and anecdotal evidence concerning our empirical context reveals that departments have been consistent in the way they recruit researchers. Therefore, although individual researchers may have been somewhat mobile, currently observed departmental profiles are probably not significantly different from those that would be observed for the period between 2000 and 2008.

Results

In K-means cluster analysis we set multiple numbers of groups (clusters) and requested SPSS to partition the departments into these groups. Initially, we set the number of groups at five. However, there were few observations for three of the groups. We repeated the procedure with four groups. This time, there were very few observations for one of the groups. Finally, the three-cluster solution resulted in groups with enough observations (the minimum number of departments in a cluster was 29). Requesting the three-cluster solution with approximately 75% of the observations randomly selected by SPSS resulted in almost the same partitioning of the departments in samples into groups identified by cluster
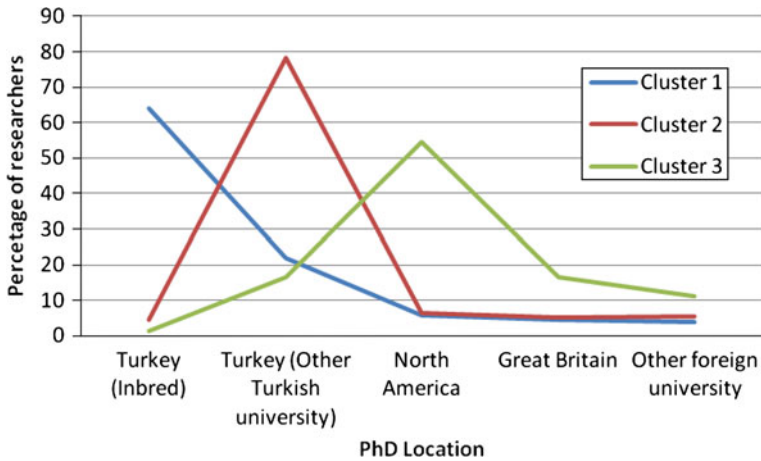
Fig. 2 Profiles of economics, management, and political science departments of Turkish universities based on location of training of their researchers

analysis with all observations. In two of the trials all departments were classified into their original clusters. In one of the trials only three of the departments were classified into other clusters. The initial cluster solution with all observations was therefore validated.

Figure 2 displays the departmental profiles. Cluster 1 contains 41 departments which predominantly use inbreeding, that is, departments that employ its own graduates. On average, approximately 64% of the researchers in these departments obtained doctoral training in the employing department. Approximately 22% of the researchers in these departments were trained in other Turkish universities. In these departments the ratio of researchers trained in North America, Britain or other foreign universities was low (approximately 14%). Cluster 2 contains 121 departments that predominantly employ researchers trained in other Turkish universities. On average, about 78% of the researchers in these departments were trained in other Turkish universities. The ratio of the inbred was very low, at about 4%. Those trained in North America, Britain or other universities were also relatively few. Finally, Cluster 3 contains 29 departments that predominantly employ researchers trained in North America. Almost 55% of the researchers in these departments were trained in North America. Compared to other clusters, the ratio of researchers trained in British or other foreign universities were also higher in this cluster (17% and 11%, respectively). Departments in this cluster employ relatively few researchers trained in Turkish universities.

In the next step we estimated regression coefficients for the association between number of indexed publications and departmental profiles and control variables. The results of the regression analysis are presented in Table 1. Variables were entered in a stepwise fashion in order to assess efficacy of different factors in explaining variation in publication productivity of departments. We first entered the control variables and then the independent variables. Results show that departments in private universities published significantly more compared to those in public universities, pointing to systematic differences between public and private universities underlying production productivity. Results also reveal systematic differences between the three types of departments. Both economics and management departments were more likely to publish in indexed journals compared to

Table 1 Negative binomial regression estimates of the coefficients for the variables associated with indexed publication productivity

Variable	Model 1	Model 2	Model 3	Model4
Constant	1.30*** (.15)	.48 (.25)	−.96** (.30)	−.04 (.39)
Private university	1.08*** (.27)	1.21*** (.27)	1.36*** (.24)	1.06*** (.24)
Economics department[a]		1.12*** (.31)	1.24*** (.28)	1.14*** (.26)
Management department[a]		.86** (.30)	.52 (.28)	.70** (.26)
Department size			.74*** (.12)	.04** (.01)
Cluster 2[b]				−.84** (.30)
Cluster 3[b]				.83* (.34)
Alpha	2.74*** (.33)	2.53*** (.31)	1.91*** (.25)	1.47*** (.21)
Log likelihood	−479.29	−473.29	−451.88	−436.29
Likelihood ratio χ^2	16.70 (1)	29.12 (3)	71.94 (4)	103.12 (6)

Note: Numbers in parentheses (except those for the Likelihood ratio χ^2) are standard errors. For the Likelihood ratio χ^2 the numbers in parentheses are degrees of freedom

* $p < .05$, ** $p < .01$, *** $p < .001$

[a] Relative to political science department

[b] Relative to Cluster 1

political science departments. This finding indicates systematic differences between publication habits of or opportunities for researchers populating these departments. Larger departments (departments that employ more researchers) published more in indexed journals. Finally, results show that departments that predominantly employ researchers trained in North American universities (and, although to a lesser extent, researchers trained in Britain or other foreign countries) published more compared to other clusters of departments. Apparently, even though departments that rely on inbreeding have established doctoral programs, these programs are not geared towards exigencies of publishing in indexed journals. Findings also reveal that the publication productivity of departments that lack established doctoral programs and have to rely on other Turkish universities for researchers was the lowest.

Discussion and conclusions

Regulatory pressures on Turkish universities to increase their research productivity have intensified during the past decade. Regulatory agencies consider publications in indexed journals as genuine pieces of research and ask universities to produce more indexed publications. The Turkish higher education system as a whole responded positively to regulatory demands. The total number of indexed publications originating from Turkey

increased substantially over time. However, contributions of universities have been unequal, as universities differ with respect to capacity of their research teams to publish in indexed journals. Empirical analysis with data on researcher characteristics of economics, management, and political science departments reveals three clusters of departments, each with a distinct profile of researcher characteristics. A small set of departments predominantly employ researchers trained in North America and to a lesser extent in Britain. There are 29 departments in this cluster. Six of these departments belong to two public universities (Boğaziçi and Middle East Technical) that have had historical links to the US universities and largely relied on US trained researchers. Nine of the departments in this cluster belong to the relatively better endowed three private universities, namely Bilkent, Koç, and Sabancı. These universities were modeled on Boğaziçi and Middle East Technical but have been keener on evaluating as well as selecting their researchers based on conventions that have evolved in the US since 1980s. There are no other universities represented in this cluster with all three types of department. Two other private universities (Bahçeşehir and Işık) not considered financially well-endowed compared to Bilkent, Koç, and Sabancı have two departments in this cluster.

A larger set of departments employs researchers trained by the department. This cluster contains 41 departments, all belonging to public universities. Fourteen universities are represented in this cluster with all of their departments in the sample, accounting for 33 of the departments. Eleven of these universities were established in 1982 or earlier. Thus these universities are the relatively older public universities. Two universities (which are among the oldest public universities in Turkey) were represented in this cluster with two of their departments. The largest cluster of departments contains departments of public and private universities that predominantly employ graduates of other Turkish universities. There are 121 departments in this cluster, mostly belonging to the relatively recently established public and private universities. These departments do not have (productive) doctoral programs and are therefore, least interested in research. Because the universities hosting these departments are amongst the most recently established ones, these departments are probably more geared towards providing mass education and undergraduate degrees.

Cluster analysis supports and adds to scant evidence on the characteristics of researchers employed in Turkish universities and shows that regulatory efforts at infusing universities with researchers trained in North American or British universities did not generate a critical mass of such researchers in public universities. The two public universities which predominantly employ researchers trained in North America or Britain owe this characteristic to historical accident rather than strategic action by their recent administrators or regulatory support. These universities have historically had links to the US, which seemingly resulted in a continued practice of employing researchers trained there. The private universities with all or majority of departments in this cluster reflect current exigencies in their human resource policies and researcher profiles. That is, starting from their inception, these universities were more geared towards researcher evaluation through counts of publications in international (indexed) journals. The other universities, both public and private, display human resource profiles incompatible with regulatory demands. Some of these departments breed their own researchers. Commitment of these departments to their doctoral programs and doctoral graduates seems to get in the way of recruiting researchers trained abroad. Other departments rely on other Turkish universities (which host the inbreeding departments) for researchers. Perhaps, commitment of these departments solely to teaching precludes recruitment of foreign trained researchers.

Controlling for a number of other factors that may help explain research productivity we found that critical mass of researchers with particular characteristics predicts research productivity. Highest performing departments were those that either accidentally or intentionally employ almost exclusively researchers trained in North America or Britain. Departments that employ their own graduates and hence have productive doctoral programs performed significantly lower compared to departments that employ graduates of North American or British universities. However, these universities performed significantly better compared to departments that employ researchers trained in other universities.

This study empirically explicates workings of regulatory policy geared towards increasing research productivity of universities by investigating how resource endowments of universities shape their responses to policy. Research about effectiveness of recent policy initiatives towards increasing research productivity largely overlooks heterogeneity of actors facing regulatory pressures. This body of research implicitly assumes universities can flexibly deploy their existing resources in order to satisfy newly formulated expectations of regulatory bodies. However, based on organizational research that addresses resource endowments of organizations this paper argues that organizational resources develop over time and cannot be flexibly used to respond to changes in external environment. Thus, distribution of resources with particular characteristics may have considerable effect on the way responses of organizations vary.

The study empirically captured variation in resource endowments of universities with reference to characteristics of the empirical context isolated for study, namely three fields of study in social sciences in Turkish universities, and the particular dependent variable that the study tries to explain, that is publications in indexed journals. The study shows that differences in resource endowments explain part of variation in research productivity. The study has implications for effectiveness of regulatory policy aiming at increasing research productivity in similar contexts, which heavily depend on North American or British conceptions of science and research and people trained in North American or British universities. The findings may also generalize to other contexts where success of regulatory policy targeting any form organization requires possession of particular kinds of resources by these organizations.

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