Drivers of Occupational Human Capital: Identifying and Developing Research Productivity in the Globalized Business School Industry

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Table of contents

Table of tables

Table of figures

Table of appendices

ABSTRACT

This thesis looks at the antecedents of research productivity in business schools as part of a wider conversation on the development of occupational human capital in knowledge-intensive industries. Building upon the social capital and sociology of science literatures, the present study seeks to advance this conversation in two ways. First, it focuses on the consequences of academic researchers' early-career and mid-career choices by exploring the interplay between organizational scripts and individual proactive behaviors, such as collaboration and mobility. Second, it introduces globalization-related factors into the conversation by exploring the roles of stratification and language in a multi-country context. The multi-level consensus between the drivers of individual performance which are explored in this thesis contributes to research on human capital-based competitive advantage in knowledge-intensive contexts.

Chapter 1 provides an introduction to this thesis. Then Chapter 2 builds a multi-level model of research productivity as part of the micro-foundations of the human capital research stream. Three empirical chapters (Chapters 3, 4, and 5) then test this model using three distinct faculty samples. The first sample consists of 500 academics employed in 25 top research-intensive business schools in the US. The second consists of 360 academics employed in 20 top research-intensive business schools in Europe. Finally, the third sample consists of 348 academics employed in 20 European business schools which come top in the *Financial Times* Global MBA and Masters in Management rankings. The archival data for these academics were collected from ISI Web of Science, individual resumes, and relevant databases.

The findings of this thesis indicate that mid-career proactive behavior can mitigate the negative consequences of early-career choices and support the development of individual research productivity. The findings also offer insights into the development of occupational human capital in an increasingly heterogeneous cohort of academics. They demonstrate that the absence of a fine-grained global stratification of the business school industry undermines the ability of academics with non-elite PhDs to engage in international mobility and reinforces social closure. Linguistic capital has a direct impact on productivity and also influences the value extracted from collaboration. The findings have practical implications for the development, selection, motivation, and retention of researchers. They may also inform the career decisions of individual researchers.

I hereby certify that the submitted work is my own work, was completed while registered as a candidate for the degree of Doctor of Philosophy, and I have not obtained a degree elsewhere on the basis of the research presented in this submitted work

Signed _____

Date _____

CHAPTER 1. INTRODUCTION

In the knowledge economy, employees' professional expertise is a valuable and unique strategic human capital resource (SHCR). SHCR is defined here as an individual's capability to produce outcomes relevant for securing an organization's competitive advantage (Wright, Coff & Moliterno, 2014; Ployhart, Nyberg, Reilly & Maltarich, 2014). The ability to accumulate, develop, and manage this resource is, however, dependent on an understanding of the mechanisms behind its emergence. This thesis focuses on the mechanisms behind the development of employees' occupational human capital, which is a non-firm-specific component of SHCR, in a knowledge-intensive industry. In particular, it looks at the capability of faculty to publish papers in peer-reviewed scholarly journals as a key SHCR in business schools where research output is an important dimension of organizational performance (Trieschmann, Dennis, Northcraft & Niemi, 2000).

Two salient trends have recently been influencing the way individuals and organizations behave in the business school industry. First, individuals have responded to increased competitive pressures and the deterioration of a stable career model by proactively managing their careers across organizations and countries. Second, globalization has led to an increase in the heterogeneity of employees' backgrounds in the new cohort of research-active faculty. The need to account for these new trends motivated me to revisit the existing consensus in the academic careers and academic research productivity literatures. Drawing upon research in sociology of science and social capital, my aim is to answer the question: how is a given employee's individual performance developed through the interplay between an individual's initial conditions, socialization pressures, and proactive behavior?

The theoretical development of the thesis draws on insights from the micro-foundations of the human capital literature (Coff & Kryscynski, 2011; Felin, Zenger & Tomsik, 2009; Ployhart & Moliterno, 2011) to build a multi-level model that brings together research on academic socialization and research on collaboration and mobility as proactive drivers of research productivity. The thesis is structured in an introductory conceptual chapter and three empirical chapters that complement each other in answering two interrelated sub-questions: a) how does proactive investment in the development of individual human capital (i.e. collaboration and mobility) complement the impact of career-long socialization on research volume and impact? b) how does a higher degree of heterogeneity in employees' backgrounds in a globalized industry influence the development of SHCR and the value extracted from collaboration and mobility?

The first empirical chapter explores the antecedents of individual research productivity in a sample of tenured academics from US schools which feature in the

University of Texas at Dallas North American research-based ranking (2007-2011). Twenty-five schools were randomly selected from the top 50 US schools in the ranking, and 20 associate and full professors were randomly sampled from each school. This chapter makes several conceptual contributions. First, it brings together research on the role of organizational socialization in research performance and the literature that discusses the role of proactive strategies (collaboration and mobility) in supporting knowledge creation. By doing this, the study looks into knowledge, skills, abilities, and other characteristics (KSAOs) which are part of the multi-level model of human capital emergence (Ployhart & Moliterno, 2011) and assesses how social structure-driven factors and agency-driven factors contribute, in comparative terms, to the creation of the idiosyncratic stock of SHCR. Second, the study contributes to the structuration stream of the academic careers literature (Barley & Tolbert, 1997; Duberley, Cohen, & Mallon, 2006) by looking at career-long exposure to organizational scripts as an antecedent of research performance. Third, the study is one of the first to explore the impact of mobility on research productivity in the field of organizational science.

The findings of the first empirical chapter have implications for multiple academic audiences. For individual academics, the study highlights the role of proactive investment in human capital development in supporting research performance. For academic supervisors, the study highlights the role of symbolic and intellectual capital in the mid-career performance of students who aspire to continue their careers as research-active faculty members. For business school managers, the study reduces ambiguity in the hiring process by highlighting the relative importance of socialization, collaboration, and mobility as antecedents of research productivity.

The second empirical chapter lays a foundation for extending the investigation of the antecedents of individual research performance beyond the boundaries of the North American educational setting used in Chapter 3. The growing global business education market has been stratified to a certain extent by the means of mass-media rankings (e.g. the *Financial Times* rankings) but the need for a comprehensive research-based ranking of non-North American business schools has yet to be satisfied. The current state of global stratification in the business school industry might be characterized as underdeveloped stratification. Such stratification gives global visibility to a small number of elite business schools and does not offer any hierarchical ordering of the thousands of business schools that did not make it into top strata. Building upon Mangematin & Baden-Fuller's (2008) ranking methodology, this chapter uses Thomson Reuters (ISI) data on publications in 150 journals in 2007-2012 to build a broad global research-based ranking that can be used to stratify business schools in a more fine-grained manner. One hundred and fifty journals

used in the ranking accumulate more than 80% of all citations in the fields of business, finance, management, and public administration and hence capture the majority of impactful research in organizational sciences. The second empirical chapter further explores the role of stratification in the careers of internationally mobile academics, using the sample of European academics selected from the top 20 European business schools in the research-based ranking (developed earlier in this chapter).

This chapter makes several contributions to the literature. First, it advances the academic mobility literature (Cruz-Castro & Sanz-Menendez, 2010; Richardson and Zikic, 2007) by exploring different patterns of international mobility and linking them to faculty research productivity. Second, it contributes to the sociology of science and academic stratification literature (Burris, 2004) by exploring the influence of underdeveloped stratification on the hiring of international faculty and showing how this influence leads to social closure on a global labor market. Third, it contributes to the conversation on the role of top journals and journal lists in the field of organizational science (e.g. Adler & Harzing, 2009; Day, 2011; Nkomo, 2009; Ozbilgin, 2009) by comparing business school rankings based on a narrow list of top journals (e.g. UTD rankings) with a ranking based on a significantly broader set of journals.

The ranking developed in this chapter informs the decision-making of individual academics who are in pursuit of research-active careers by guiding their search for research-intensive environments. The results of the study may also help academics in assessing the research-intensiveness of their potential co-authors' environments and thus partially guide collaboration choices. At the organizational level, business school hiring committees will benefit from the research-based stratification of candidates' academic origin and prior affiliation. This is particularly relevant for increasingly frequent situations where an international faculty is hired from non-North American schools.

The third empirical chapter looks at the impact that linguistic socialization during the higher education stage of employees' careers has on the emergence of researchers' occupational human capital. I use a sample of 20 European business schools which come top in the research-based ranking developed in Chapter 4. Since the European business education market is spread across multiple countries, the sample of European academics is characterized by the heterogeneity of the faculty's linguistic backgrounds. This heterogeneity becomes a challenge where the faculty faces the increasing pressure to produce publications in English-language journals (Sousa, de Nijs, & Hendricks, 2010; Tietze & Dick, 2009, 2013). This chapter adds linguistic capital acquired during third-level education (undergraduate degree, Master's and PhD) as an additional dimension of early-career socialization and explores its direct and interactive effect on individual research

productivity. In order to understand the role of linguistic capital in various segments of the business education industry, the third empirical chapter explores its effects in two additional samples of business school academics. The first sample is taken from Chapter 2 and represents research-intensive US schools. The second is taken from the top 20 European schools in the *Financial Times* Global MBA and Master's in Management ranking. This sample has the highest proportion of faculty educated in non-English speaking environments, and represents business schools with a different competitive strategy, i.e. a focus on visibility in mass-media rankings as a driver of performance.

The third empirical chapter contributes to the literature in several ways. First, it adds a linguistic dimension to the KSAO part of Ployhart & Moliterno's (2011) model of human capital emergence and introduces the language of professional socialization as a meaningful source of human capital heterogeneity. Second, it contributes to research on collaboration networks by looking into the "black box" of nodal attributes (Phelps, Heidl & Wadhwa, 2012) and exploring the influence of linguistic socialization on the value which individuals extract from co-authorship networks. Third, it highlights the tension between the dimensions of business school performance by indicating that the international diversity of faculty's backgrounds may simultaneously bring positive value to teaching and become a hurdle to research productivity.

The findings of this chapter are relevant to a wide audience of academics working within the growing market of business education beyond the boundaries of North America.

CHAPTER 2: LITERATURE REVIEW

In this chapter I will set the scene for the thesis by introducing the main theoretical framework of the study, and by providing a systematic review of the literature that underlies main theoretical constructs. I will further outline the gaps in existing research that the following empirical chapters aim to fill. The chapter first focuses on the outcome variable and its importance in knowledge-intensive organizations, then introduces the factors that drive the variation in the outcome variable, as suggested by the review of prior research. The chapter is concluded by the brief summary of research gaps.

RESOURCE-BASED VIEW OF KNOWLEDGE ORGANIZATIONS: NON-FIRM SPECIFIC HUMAN CAPITAL AND RELATED MANAGEMENT DILEMMAS

The resource-based view of organizations (RBV) argues that in order to achieve competitive advantage a firm has to possess resources that are valuable, rare, inimitable and unique (Barney, 1991; Groysberg, Lee & Nanda, 2008; Hatch & Dyer, 2004). The RBV further argues that the sustainability of an organization's competitive advantage is dependent upon 'isolating mechanisms' that protect firm's resources from being replicated or reacquired by competitors (Hatch & Dyer, 2004; Peteraf, 1993). This research stream outlines physical, organizational and human capital as three types of firm's resources (Barney & Wright, 1998). Among these three types of resources, strategic human capital (SHCR)[1] has a particularly high importance in knowledge-intensive industries (Coff & Kryscynski, 2011; Felin et al, 2009). The logic of RBV thus suggests that firm-specific skills[2] of knowledge workers are most valuable for the organization because they limit the portability of their performance to other workplaces (Barney & Wright, 1998; Hatch & Dyer, 2004).

This thesis explores a knowledge-intensive context where this logic does not fully guide the behavior of organizations. The research-intensive segment of business school industry is a representative knowledge-intensive setting, where human capital plays a key part in achieving competitive advantage. Employees of such organizations (i.e. faculty) develop their skills along three dimensions – research, teaching and administration, of which the first is the least firm-specific. While other industries may treat early-career employees "as the clay that, through investments in firm-specific knowledge, is shaped

[1] Strategic human capital resource is defined here as an individual's capability to produce outcomes relevant for achieving competitive advantage of an organization (Wright, Coff & Moliterno, 2014).
[2] Firm specificity of employees' knowledge and skills is defined as "the degree to which the human capital they acquired at a particular firm is idiosyncratic and therefore useless at other firms" (Groysberg et al, 2008: 1214)

into productive resource in the firm's particular environment" (Hatch & Dyer, 2004: 1158), academics are hired on the basis of an existing (albeit not yet published) research portfolio or research pipeline. Organizational environment may later suppress or amplify individual research performance, but academics are expected to have an already developed research skill at the moment of entering faculty ranks. Further in their careers academics "draw validation – and marketability – from outside the present employer" (Richardson & McKenna, 2002: 776) by presenting their research to the wider professional community. Moreover, unlike other knowledge workers, for example, management consultants or financial analysts, academic scientists often work in teams that are not located within one organization. That increases external social complexity of their human capital (Coff, 1997), and makes their research performance even less firm-specific (Groysberg et al, 2008). And yet the research dimension of faculty performance is valued by organizations higher than the other two, more firm-specific, dimensions (e.g. Callie & Cheslock, 2008).

The ability of faculty to produce research represents an occupational human capital (Kambourov & Manovskii, 2009; Mayer, Somaya & Williamson, 2012), which is a type of general (non firm-specific) human capital. Mayer et al (2012: 1313) define occupational HC as a human capital that "consists of the knowledge and skills required to perform work within a professional or functional area" and argue that it is particularly prominent in the knowledge-intensive settings with "well-defined occupations or professions". On organizational level of analysis, firm's stock of occupational HC has been linked to the outsourcing of knowledge work (Mayer et al, 2012). On individual level, economists explored the relationship between occupational HC and wages (Kambourov & Manovskii, 2009; Nawakitphaitoon, 2014; Sullivan, 2010) and the relationship between occupational HC and teachers' productivity (Ost, 2014).

This stream of human capital research does not explore the drivers of occupational HC, but implicitly assumes that it is developed through education and experience within a given profession. It therefore relies upon organizational influences and ignores individual-level behavior that might facilitate or inhibit the acquisition of occupation-specific skills. Given that professionals in knowledge-intensive settings are able to demonstrate a significant level of individual agency[3], as shown by studies on microprocesses of change in organizations (e.g. Reay, Golden-Biddle & Germann, 2006), this approach to HC development does not seem entirely plausible.

[3] Agency is defined as "an actor's ability to have some effect on the social world, altering the rules, relational ties, or distribution of resources" (Scott, 2008: 77)

Three empirical studies in this thesis focus on the drivers of occupational human capital in order to address two management dilemmas (Coff, 1997; Coff & Kryscynski, 2011) which are common to knowledge-intensive organizations (Groysberg et al, 2008). First, prior research provided evidence that hiring highly productive knowledge workers with a proven track record may be value destroying for an organization due to the disproportionally high price of their human capital, which does not account for potential adjustment costs (Groysberg, Nanda & Nohria, 2004; Groysberg et al, 2008). While it is relatively easy to select among candidates who already have an impressive portfolio of publications, there no guarantee that research productivity after relocation will be as high as it was at the previous workplace(s). Meanwhile, a hiring organization is likely to pay a premium on existing publications because academic career mobility almost always involves the increase in salary relative to the previous workplace (Caplow & McGee, 2001). Therefore, organizations need "the ability to identify talent in the absence of information" (Coff, 1997: 392) by interpreting early-career organizational- and individual-level signals. This would allow them to acquire talent that has more years of potentially productive career ahead and is still reasonably priced by the labour market. Second, the main challenge associated with building competitive advantage on the basis of non-firm specific strategic human capital is the potential mobility of employees. As this mobility is driven by the comparison between current workplace and available alternatives, it is important to understand which factors in organizational environment would be supportive of knowledge creation and thus would facilitate retention of human capital (Coff, 1997; Coff & Kryscynski, 2011).

Individual research performance and organizational competitive advantage

Research performance of individual faculty members adds up to the organizational research output, which is a critical functional outcome for an organization. High levels of research productivity among faculty members is a means by which to secure accreditation from leading international bodies, such as the Association to Advance Collegiate Schools of Business (AACSB) or the European Quality Improvement System (EQUIS) (Zammuto, 2008). It also allows the school to achieve higher positions in some of the industry rankings, such as Financial Times Global MBA ranking[4]. Higher rankings in turn act as seals of quality, and these seals have two advantages. Firstly, they enable educational establishments to attract funding from public (government agencies) and private (alumni and corporate

[4]While research performance may directly account for only 10% of the *Financial Times* MBA ranking, this difference can be enough to move a school up the ranks. Research productivity also indirectly influences a school's position in the rankings, as it allows the school's PhD graduates to be recruited by into top schools. This in turn earns the school additional points according to the *FT* ranking methodology.

partners) sources. Secondly, a strong position in mass-media rankings allows a business school to select the best students (D'Aveni, 1996; Trieschmann et al, 2000) and charge higher tuition fees. This situation is perpetuated in a virtuous cycle: better students who pay higher fees have both the ability and motivation to find better-paying jobs upon graduation. These higher salaries see the alma mater place higher in the next ranking.

Doing research is also a way for business school faculty to keep in touch with current management practices, which has a direct impact on the quality of teaching. The study by O'Brien and colleagues found that research conducted by faculty contributes to the economic value of education for graduates in business schools (O'Brien, Drnevich, Crook & Armstrong, 2010). As economic value is directly related to student satisfaction, this makes another contribution to an organizational competitive advantage. Therefore the ability of business school faculty to produce publishable research becomes a strategic human capital resource (Wright et al, 2014; Ployhart et al, 2014) within the research-intensive business schools setting.

Individual research performance and individual competitive advantage

For individual academics, research productivity functions as a job market currency that facilitates their mobility across organizations and countries (Richardson & McKenna, 2002). As a positive psychological side effect, success in academic publishing helps to maintain membership in a professional group of research-active scientists, which "creates a meaningful social identity" within academia (Day, 2011: 704). Within the segment of research-intensive business schools, research productivity also acts as a key driving force behind firm-specific career success; this success being understood either as promotion within a given organization (Callie & Cheslock, 2008; Miller, Taylor, & Bedeian, 2011; Park & Gordon, 1996) or as an increase in salary (Gomez-Mejia & Balkin, 1992; Judge, Cable, Colbert, & Rynes, 2007). Firm-specific career outcomes lie beyond the scope of this thesis, and are extensively explored by sociology of science and academic careers literature. I use this research as a background literature for conceptual development, and provide an overview of the most relevant studies in Appendix 1 at the end of this chapter.

It is worth re-emphasizing here that the individual performance of academics is a multidimensional construct, of which research performance is just one dimension. Another dimension is teaching performance which refers to the efficacy of an individual as an educator within undergraduate, graduate, and executive programs. This dimension may also capture the ability of an academic to nurture a new generation of researchers by supervising PhD students. By teaching Executive MBA classes, providing consulting services for companies, and taking positions on corporate boards (amongst other practice education and action research engagements) faculty members may extend their impact

beyond the boundaries of academia, serving as mentors for top managers (Aguinis, Shapiro, Antonacopoulou, & Cummings, 2014). The need to include this external impact into the assessment of academic performance has recently been advocated for by a number of scholars (e.g. Aguinis, Suarez-Gonzalez, Lannelongue, & Joo, 2012; Aguinis et al, 2014).

Measuring individual performance of faculty requires a set of indicators that are valid, reliable, representative of a wide population of academics and accessible to scholars. This makes measuring teaching and mentoring performance of academics a particularly challenging task. Teaching performance often exists as a perception of its recipients, primarily students. Traditional teaching evaluations, institutionalized by most business schools as a measure of the quality of teaching (or student satisfaction), measure this perception rather than actual difference that attending a particular course makes on careers or educational development of students. As a measure of perception, student teaching evaluation (STE) suffers from several biases. First, STEs tend to reflect a lecturer's likability or other unobservable individual characteristics rather than the amount of knowledge transferred to the students (Clayson & Sheffet, 2006; McPherson, 2006). Second, class size, class composition and the level of course (basic or advanced) also have a significant confounding influence on STEs (McPherson, 2006). Third, STEs, being no more than one type of customer satisfaction surveys, exhibit problems typical for these surveys, such as that the response rates are low, and students with very high opinion and very low opinion on a lecturer are more likely to participate in the survey. The results, consequently, tend to have limited generalizability to a larger population due to underrepresentation of an average student's opinion. While Beleche, Fairris and Marks (2012) found significant positive association between STEs and the objective measure of student learning, the magnitude of this relationship was small. Meanwhile, Langbein (2008) found a significant link between grades and STEs; these results were confirmed by Ewing (2012) who used a different sample of students. Both Langbein (2008) and Ewing (2012) argue that student evaluations of teaching is a faulty measure of teaching quality which creates an incentive to inflate grades in order to "buy" higher evaluation scores.

From the point of view of a researcher, STEs also have a disadvantage of being each business school's proprietary and confidential information. The studies using this measure are usually set within one educational institution (e.g. Beleche et al, 2012; Clayson & Sheffet, 2006) – the one where a researcher's (or her co-authors') insider status gives her access to data. Moreover, being the product of internal business practices, the format of teaching evaluations differs across organizations, making their comparison challenging even if a researcher gets access to this information in multiple business

schools. Overall, teaching evaluations are not a very good proxy for assessing teaching dimension of academic performance across the business school industry.

Another potentially useful measure of teaching performance is the amount of published teaching materials, such as teaching case studies or textbooks. Databases of case clearing houses, such as the Case Centre, the Ivey Publishing House, and the Harvard Business Publishing amongst others are available for researchers to explore. Amazon.com, one of the major players on the online book retail market, provides a searchable database of published books. Some of the case publishers also provide data on the sales of teaching materials, while Amazon has an "Amazon bestsellers rank" measure, both of which could be used as a proxy for the popularity of a teaching material. Three separate concerns should be addressed before a researcher decides to use this measure. First, the sales of teaching materials are strongly affected by the number of students that an academic teaches, which gives an advantage to faculty teaching large (most often undergraduate) classes over their colleagues who teach on smaller masters and executive programs. Second, Amazon statistics do not capture textbook sales through other distribution channels, including direct sales to university bookshops, which may account for a significant share of demand. Third, various academic employers place different weight on case studies as a part of promotion (tenure-track) portfolio. This measure, therefore, should only be used in conjunction with the information on promotion practices within each business school sampled for a study, and with the information on the class sizes and on the textbook sales through multiple distribution channels.

Aguinis et al (2012) introduced yet another proxy for measuring academic impact outside traditional research productivity dimension. The number of times an academic is mentioned in Google.com, while being removed from actual teaching performance, captures the influence of an academic's work for non-academic stakeholders. This external impact predominantly happens through teaching and consulting, as well as through publishing mass market books (textbooks included) and direct communication with the media in the role of experts. Conceptual paper by Aguinis et al (2014: 633) suggests that altmetrics, "the study of scholarly impact measures based on activity in on-line tools and environments" may be useful for quantifying this external impact.

Besides research and teaching, success of academics as administrators also constitutes a prominent dimension of their performance. This administrative role might be located within a business school (e.g. a program director or a dean) or within wider academic community (e.g. journal editor or one of the Academy of Management officers). In both cases academics contribute a significant amount of time and effort into improving organizational performance or into creating a stimulating academic environment for other

researchers (Northcraft & Tenbrunsel, 2012). Northcraft and Tenbrunsel (2012) called for the inclusion of nonresearch (and nonteaching) performance measures into promotion systems in business schools. Responding to their call, the recent study of multiple contributions by journal editors (Aguinis, Gottfredson, Culpepper, Dalton, & De Bruin, 2013) examined such measures of service to the organization and to the profession as the number of administrative positions, the number of years in administrative positions, the number of dissertation committees and the number of editorial boards of which an academic has been part. The scholars who would wish to use these measures in future research should take into account the difference in the nature of deans' appointments. In many universities and business schools a dean's position is a temporary role that senior faculty members take in rotation. In other educational organizations the position of a dean assumes a change in career path that suggests a complete abandonment of the research role to become professional academic administrator (e.g. Read, 2001). These two types of deans have different long-term career scripts and should be treated separately in academic productivity research.

Dimensions of research performance

Sociology of science tradition distinguishes between research productivity (the volume of knowledge created) and research impact (the "footprint" left by the researcher in the scholarly field, measured through the mechanism of peer citation). The priority that a researcher has for volume or impact of research may be a result of external pressures, for instance the need to provide a certain number of publications by promotion deadline, or a consequence of internal aspirations set during early-career socialization into profession. Academics educated in the environment, where high threshold for the quality of publications was adopted by the most of faculty, are more likely to follow these role models in targeting highly visible publishing outlets and consequently achieving higher impact. In support of this hypothesis, recent study of management academics (Seibert, Kacmar, Kraimer, Downes & Noble, 2014) found negative relationship between research-intensiveness of PhD-granting institution and the number of publications in second- and third-tier journals.

Table 1 below summarizes the use of various measures of research performance in organizational science field. I limited the scope of the table by studies exploring research productivity at the individual level, as this is consistent with the focus of this thesis.

Table 1: Measures of research performance

Level of analysis	Measure of research productivity	Authors
Individual	Number of publications	Abramo et al (2010), Albrecht et al (2011), Bentley (2012), Bird (2011), Buchmueller et al (1999), Clemente and Sturgis (1974), Cruz-Castro and Sanz-Menendez (2010), Danielson and Heck (2011), Hall et al (2007), Jacob and Lefgren (2011), Long et al (1998), Long and McGinnis (1978), Petersen et al (2012), Williamson and Cable (2003), Ynalvez and Shrum (2011)
	Number of publications in top journals	Buchmueller et al (1999), Dean et al (2011), Hogan (1986), Lahiri and Kumar (2012), Park and Gordon (1996)
	Number of publications per year	Cruz-Castro and Sanz-Menendez (2010), Nag et al (2013), Petersen et al (2012)
	Number of citations	Abramo et al (2010), Jacob and Lefgren (2011), Long et al (1998), Long and McGinnis (1978), Petersen et al (2012)
	H-index	Petersen et al (2012)
	Impact Factor of journals or Number of publications*IF	Abramo et al (2010), Hall et al (2007), Williamson and Cable (2003)
	Others: number of awards, number of AOM presentations, social aspiration performance	Crane (1965), Long and McGinnis (1978), Williamson and Cable (2003)

Following in the footsteps of previous studies (e.g. Podsakoff, MacKenzie, Podsakoff, & Bachrach, 2008) and adhering to the general guidelines for the use of bibliometrics to assess research performance issued by Thomson Reuters ISI Web of Science (Pendlebury, 2008; Thomson Reuters, 2008), I decided to use the most common measures of volume and impact of research: the number of papers published in peer-reviewed journals, restricting them to publications visible on the ISI Web of Science database; and total citation count as a measure of total impact. Highlighting the differences in the effect that each antecedent of knowledge creation has on the volume and impact of research output allows this thesis to explore "the different 'shades' of scholarly contribution" (Simsek, Heavey & Jansen, 2013: 27) within the globalized business school industry.

Micro-foundations debate in the human capital literature

Resource-based view of the firm argues that heterogeneous distribution of resources within industry is one of the main reasons why some firms outperform their rivals (e.g. Lockett & Thompson, 2001). Micro-foundations approach[5] advances this logic

[5] Micro-foundations are defined as "key, compositional and micro, generally individual-level factors that need to be understood and specified in order to explain any collective phenomenon" (Felin et al, 2009: 556).

by encouraging scholars to look beyond inter-firm heterogeneity, into individual-level heterogeneity of resources and capabilities. Traditional human capital stream of RBV treats employees as mostly homogenous resource that has a potential to become heterogeneous by acquiring firm-specific skills and knowledge (Hatch & Dyer, 2004). On the contrary, micro-foundations scholars highlight non firm-related idiosyncratic features of employees as a source of uniqueness and inimitability of human capital that might contribute to organizational competitive advantage (Coff & Kryscynski, 2011; Felin & Foss, 2005; Ployhart & Moliterno, 2011). In their model of human capital emergence, Ployhart and Moliterno (2011:128) argue that human capital "originates in individuals' knowledge, skills, abilities and other characteristics" and emphasize the importance of accounting for employee heterogeneity. The micro-foundations of human capital literature, where this conversation takes place, calls for bringing human agency back into organizational research as a way to explain individual-level processes underlying performance outcomes. The multilevel nature of micro-foundational arguments does not, however, give preference to individual (agency-driven) versus organizational (social structure-driven) mechanisms, but rather aims to bridge the divide between them and explore their interplay in organizational life (Barney & Felin, 2013).

Prior research on individual heterogeneity as an antecedent of research performance has focused on demographical characteristics, such as gender and family variables (Barbezat, 2006; Bentley, 2012; Bird, 2011), and personality traits (Keller, 2011). For the overview of this literature see Table 2 below. The research in this thesis goes further in highlighting individual-level antecedents of knowledge creation, focusing on individual proactive behavior as another source of employee heterogeneity. Building upon theoretical and methodological arguments of micro-foundations of human capital research stream, I argue that individual research performance is defined by the interplay between organizational influences (also called career scripts) and individual actions (agency-driven investments in accumulation of human capital). The thesis develops a multilevel model of research productivity to examine direct and interactive influences of organizational and individual antecedents of research performance. Moreover, it compares contributions of organizational-level and individual-level antecedents, and explores their complementarity. The rest of this chapter will introduce the main theoretical approaches and constructs used in the thesis.

Table 2: Individual heterogeneity as a driver of research performance

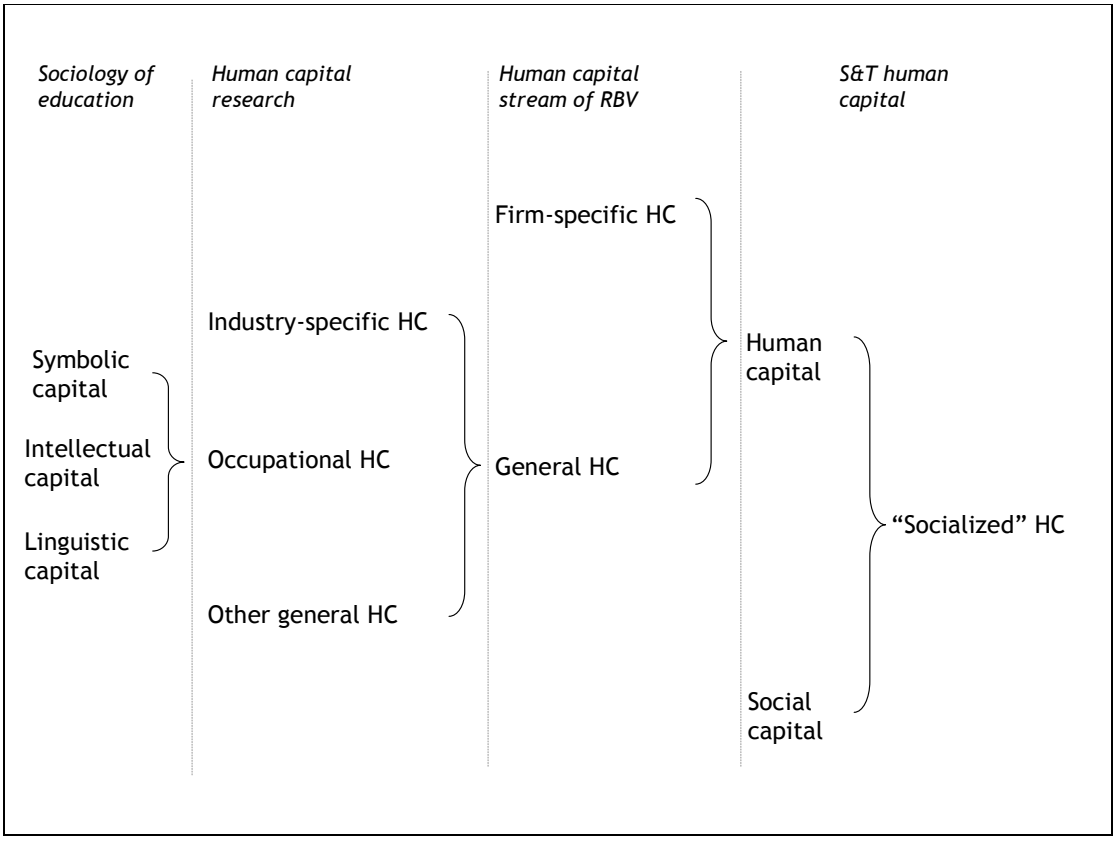
Authors (year)	Predictors	Sample	Theoretical perspective	Main results
Barbezat (2006)	Gender, precocity, family variables, number of conference presentations	291 US PhD economists	Sociology of science: gender perspective	Men publish more papers than women. Having children is positively related to productivity. Publications during PhD and conference presentations positively related to research productivity
Bentley (2012)	Gender, networking (dummy), PhD (dummy), quality of environment, family variables	1473 Australian academics (multidisciplinary)	Sociology of science: gender perspective	Women publish less than men. PhD, collaboration and research time – better predictors of productivity than family variables
Bird (2011)	Gender	202 articles of UK authors	Sociology of science: gender perspective	Women publish less than men (discipline-dependent). Women collaborate more (preference of single-sex collaborations)/
Dever and Morrison (2009)	Exploratory study of factors supporting research productivity of female academics	27 female academics in 1 research-intensive university in Australia	Sociology of science: gender perspective	Internal motivation to do research is more important than organizational incentives. Importance of early publishing, networks and strategic planning of research.
Gonzalez-Brambila and Veloso (2007)	Professional age, prior performance, country of PhD	7,793 Mexican researchers, multidisciplinary	Performance life-cycle	Curvilinear relationship between age and number of papers. Past productivity related to citations, but not to volume.
Grove and Wu (2007)	Three proxies for ability: GRE scores, prestige of undergraduate school, prominence of reference letter writer	344 applicants to one top economics PhD program in US	Signalling theory	Higher GRE score and prominent recommender associated with higher probability of publishing. Rank of undergraduate school is not related to productivity but related to probability of having prominent recommender.
Keller (2011)	Personality traits (self-esteem, locus of control, innovative orientation)	644 scientists and engineers in 5 corporate R&D departments	Interactionism	Innovative orientation and internal locus of control are positively related to publication performance
White et al (2012)	Personality traits, motivation, organizational scripts	236 US management faculty from AACSB-accredited schools	Personnel psychology /HRM	Motivation, time management skills and research time are positively associated with high performance

MAIN THEORETICAL PERSPECTIVES AND CONSTRUCTS OF THE THESIS

Occupational human capital emerges as a result of employee's education and general training. While earlier conceptualizations of this construct focused on knowledge and skills that enable employees to be productive at their jobs, recent studies put social networks forward as an additional type of resources supporting performance of knowledge workers (Coff, 1997). For example, the recent study of baseball stars found that having a diverse boundary-spanning developmental network is positively related to individual performance of sportsmen (Cotton, Shen & Livne-Tarandach, 2011).

Figure 1 below provides a hierarchical typology of human capital, based on the review of interconnected streams of literature (mentioned in the upper section of the chart), and links it to the types of capital outlined by studies in sociology of education (Bourdieu, 1977; Vaara & Fay, 2011). In his works on sociology of education Pierre Bourdieu distinguishes between economic capital (monetary rewards), symbolic capital (prestige) and cultural capital (e.g. Bourdieu, 1991). The latter includes all useful knowledge and skills an individual possesses, with language/communication skills among them. This broad conceptualization of cultural capital, while enlightening from sociological point of view, does not lend itself to detailed operationalization. Following other scholars who use intellectual and linguistic capital as stand-alone constructs (e.g. Hewings & Tagg, 2012; Vaara & Fay, 2011), in this thesis I measure these dimensions of cultural capital separately. I use the interpretation of Bourdieu's types of capital provided by Vaara & Fay (2011), who applied Bourdiesian perspective to the analysis of MBA education. In this thesis similar perspective is applied to doctoral education.

Figure 1: Hierarchy of HC types



Two comments have to be made at this point. First, social capital development is a lengthy process that starts during the education stage (and sometimes earlier) and continues throughout entire career of a professional. Second, looking at the typology through multilevel lens, we can say that *other general HC* is firmly rooted in individual heterogeneity discussed above (e.g. demographical characteristics, individual cognitive abilities). As for the *occupational HC*, which is the main focus of this thesis, it emerges as a result of interaction between organizational-level inputs (symbolic, intellectual and linguistic capital[6]) and individual-level behavior, such as social capital development and mobility. Mobility construct, while absent in the typology, in fact captures the diversity of occupational experience in researchers' career paths.

This thesis brings together the research that emphasises the overarching role of education in the creation of occupational human capital and the research that focuses in the importance of proactive accumulation of resources by employees through networking

[6] Bourdieu (1991) treats linguisitic capital as an individual or group-level construct, where the size of a group may vary from a small community to entire country. As this thesis explores the development of occupational HC in knowledge-intensive organizations, I treat linguistic capital as the ability to speak the language of profession. The teaching of this language is a part of professional socialization which starts at third level programs.

and mobility. Bridging these two perspectives, hereafter called "path dependence perspective" and "proactiveness perspective", I aim to follow prior attempts to present a more "socialized" view of human capital (e.g. Dietz & Bozeman, 2005; Grigoriou & Rothaermel, 2014; Lamb & Sutherland, 2010; Vaara & Fay, 2010) and to enhance the understanding of the multilevel nature of human capital as argued by micro-foundations perspective above (Ployhart & Moliterno, 2011). The literature review below will introduce the main drivers of individual research performance, which is a type of occupational HC in business schools.

Organizational-level drivers of individual research performance: path dependence perspective

Studies in sociology of science and academic productivity argue that the quality of academic origin (primarily, doctoral education) has a lasting effect on individual research productivity by transferring relevant knowledge, socializing future researchers into profession and by setting them on path dependent career trajectory. The role of socialization in scientific careers is well captured by Blaise Cronin (1984: 65-66):

> "Entrants to the world of career science and research have to learn to accept that there are certain ways of doing things (such as citing the works of others), and that certain rules, traditions, etiquettes and codes of conduct determine the limits of acceptability for individual actions. The newcomer is a little like the traveller in a strange land who has to adjust to different cultural sets and expectations. 'Doing science' is not just a matter of having an enquiring mind or high academic ability: it also has to do with playing the 'Game' according to the written and unwritten rules. Training and preparation for a career in science goes beyond the acquisition of technical skills and competences; it requires that a student be socialized to the mores and behaviours of the discipline he is preparing to enter."

As eloquently suggested by Cronin, the tacit knowledge of the rules of research and publishing game is as important as the knowledge of theories and methodologies. This tacit knowledge is acquired through experience and it is therefore more likely to be found in educational organizations with high research output. The rest of this section considers three antecedents of research performance rooted in an academic's education: *intellectual capital* (knowledge and skills), *symbolic capital* (status of academic origin as a research-intensive school) and *linguistic capital* (language-related knowledge and skills).

Intellectual capital

Intellectual capital construct captures knowledge and skills acquired by an employee as a result of education and training. In academic environment, various measures of this construct consistently appear to be good predictors of post-PhD research outcomes. First group of these measures focuses on early research activities and their outcomes. Involvement into research during PhD (Buchmueller, Dominitz & Hansen, 1999; Park & Gordon, 1996), publishing during PhD (Barbezat, 2006; Cruz-Castro & Sanz-

Menendez, 2010; Hadani, Coombes, Das & Jalajas, 2012), and precocity (early publishing) all demonstrate positive relation to post-PhD research performance. Second group of intellectual capital measures focuses on mentorship during PhD. Having a productive mentor (Brewer, Douglas, Facer & O'Toole, 1999; Reskin, 1979; Williamson & Cable, 2003) and co-authoring papers with the mentor brings results in terms of research productivity.

First group of measures captures the influence of professional socialization during doctoral education and the productive transfer of knowledge from organizational environment to individual academic. This cross-level influence is central to the study undertaken in this thesis. Specifically, I use precocity (time before an academic's first paper was published in an international peer-reviewed journal), and the quality of first journal where an academic published her work as proxies for the amount of intellectual capital acquired during doctoral education.

The second group of measures captures individual-level influences of mentors upon their students. This influence is better explained through the lens of imprinting theory (for a review see Marquis & Tilcsik, 2013), and therefore is beyond the scope of this thesis. Besides, several confounding effects are potentially associated with the second group of measures. First, the influence of mentor on research performance of students was shown to be different for graduates of high-ranked and low-ranked schools (Reskin, 1977). Second, the study by Green and Bauer (1995) demonstrated that student-advisor fit was more important than the amount of mentorship, which in itself does not influence the research outcomes of students. As research performance of advisor is not conceptually related to her ability to choose PhD students that are a good fit, the impact of mentorship may be inhibited by misalignment between an advisor and her students. Third, the influence of a mentor on a student's performance may result from mentor's symbolic capital and social capital, rather than from the transfer of intellectual capital. The eminence of advisor and her network may ensure sponsored mobility (Cable & Murray, 1999; Long et al, 1979) of students to research-intensive workplaces post-graduation, therefore contributing to the accumulated advantage mechanism as discussed below.

Symbolic capital of academic origin

Symbolic capital construct captures the status of an individual's organizational affiliation within industry hierarchy (Vaara & Fay, 2010). The relationship between prestige and research performance has to be considered separately for the *volume* of produced publications and for the *impact* of these publications. It has to be said that prestige per se is rarely a driver of publication *volume*. Most of the time prestige serves as a proxy for unobservable "quality of socialization" construct, measuring indirectly the knowledge and motivation of researchers (Reskin, 1977). In this role prestige might influence editorial decisions in some cases (Boyd, Finkelstein & Gove, 2005; Crane, 1967),

because the perception of expertise and ethical standard of faculty affiliated with prominent institutions may motivate editors to give the benefit of the doubt to manuscripts that received mixed reviews. The influence of symbolic capital on the volume of research may also manifest itself in cases where a paper is not peer-reviewed, such as invited papers or editorials. In the latter case the symbolic capital is derived from individual's own prestige, gained from the quality of prior publications, rather than the prestige of their institutional affiliation.

The studies in the reward structures of science demonstrated that, in comparison with the volume of publications, the *recognition (impact)* of research is more dependent on symbolic capital of authors. Merton's (1968) study on "Matthew effect"[7] in science indicates that prestige attracts the attention of scientific community and that leads to disproportional allocation of recognition to already prominent scholars. Empirical studies confirm the existence of this effect in hard sciences (Allison & Long, 1990; Crane, 1965; Reskin, 1977). The evidence in management academia is mixed: while Judge et al (2007) found positive relationship between particularistic (prestige-related) attributes of the paper and its impact, and Bedeian et al (2010) found that the prestige of academic origin led to more positive perception of academics' research output, Boyd et al (2005) have reported an absence of significant relationship between prestige and impact.

The reason why symbolic capital of PhD origin has a central part in studies of academic productivity is its importance at the early-career stage. Other dimensions of human capital, such as intellectual capital and social capital (professional network) are only partially observable at the moment of post-PhD hiring, because a new graduate has (at best) a very limited publication portfolio. Therefore, symbolic capital becomes the best proxy for the quality of socialization and guides the decision-making of employers. Multiple academic career studies show the importance of doctoral origin reputation for career success (e.g. Bedeian, Cavazos, Hunt & Jauch, 2010; Gaughan & Robin, 2004; Hadani et al, 2012; Laudel & Glaser, 2008; Smith-Doerr, 2006). Using the language of path dependence theory[8] (Sydow, Schreyogg & Koch, 2009), the choice of PhD school becomes a "critical juncture" (Collier & Collier, 1991, cited in Sydow et al, 2009), which triggers a self-reinforcing process in research performance development and results in low flexibility of career patterns at the advanced stages of academic careers.

Path dependence concept is prominent in the RBV literature where it is used to emphasize that history matters and that "today's opportunities depend upon yesterday's

[7] "To those who have, more shall be given" Matthew 13:12

[8] Sydow et al (2009) have developed their theory on an organizational level, but the recent paper by Vergne and Durand (2010) argues that path dependence perspective can be applied to other levels of analysis.

decisions" (Lockett & Thompson, 2001: 724). Recently, Vergne and Durand (2010) argued against such broad definition and suggested that true path dependence is only present where self-reinforcing mechanisms were triggered by a random event, a streak of luck (or misfortune) independent on the initial conditions. This is clearly not the case in academic careers, because the choice of PhD school can be partially predicted from demographic characteristics of applicants, their geographical location and language (Azoulay, Liu & Stuart, 2009; Grove & Wu, 2007). This thesis therefore will use path dependence concept to acknowledge the historical rigidification of career paths, in the same vain as the concept is generally used in the RBV studies, but will not claim that true path dependence is present in academic context.

Path dependence approach suggests that the graduates of top PhD schools continue their careers in high-status schools and their performance is supported by accumulated advantage mechanism (Allison & Long, 1987; Miller, Glick & Cardinal, 2005). There is, however, empirical evidence that downward mobility is a predominant career trend in the US organizational science field (Debackere & Rappa, 1995; Miller et al, 2005). This questions the assumption that symbolic capital of academic origin determines long-term research performance, as the symbolic capital of PhD origin is replaced by the symbolic capital of current workplace later in academic career.

Symbolic capital of post-PhD workplaces

Studies that examine PhD origin prestige in isolation from other organizational factors usually find a weak positive relationship with volume of publications (e.g. Clemente & Sturgis, 1974; Flagg, Gilley & Park, 2011; Reskin, 1977, 1979). The early study by Crane (1965) even found PhD prestige to be more impactful than current workplace prestige, but only for graduates of top PhD schools working in lower-rank schools. Other studies, however, found either that impact of doctoral school prestige on productivity faded after several years (Debackere & Rappa, 1995; Long & McGinnis, 1981; Su, 2011), being replaced by current job prestige, or that doctoral origin prestige and productivity were not directly related to post-PhD performance (Long, Allison & McGinnis, 1979; Long, Bowers, Barnett & White, 1998; Williamson & Cable, 2003).

Notwithstanding the importance of early-career influences, professional socialization literature argues that each organization imposes pressures on a new employee to conform to norms and rules set within organizational scripts (Cable, Gino & Staats, 2013; Chao et al, 1994). To capture these norms and rules, career literature uses organizational scripts construct, which is defined as mental schema created by organizations to serve as a guide for employee behavior (Dany, Louvel and Valette, 2011). Organizational scripts were found to influence performance (Long, 1978; Long & McGinnis, 1981) and career choices (Dany, 2003; Dany et al, 2011; Duberley et al, 2006), even in the

organizations where these scripts are weakly institutionalized. Longitudinal studies of academic performance consistently show that the impact of early-career socialization is weaker than the influence of organizational scripts of a current workplace (Long, 1978; Long & McGinnis, 1981; Reskin, 1977). Thus, while research performance is a type of non-firm specific human capital, its emergence is still dependent on the organizational environment, which is consistent with Ployhart and Moliterno's model (2011). According to this model, employees' initial stock of individual knowledge and skills is influenced by emergence enabling processes within organization before it transforms into a strategic human capital resource.

Some studies of academic productivity include the research rank of current job[9] as a predictor of research performance (Albrecht, Thompson & Hoopes, 2011; Allison & Long, 1990; Long et al, 1998; Seibert et al, 2014), but overall the literature on mid-career socialization in academic industry is surprisingly scarce. Reskin (1977) cites one such study in medical sciences area (Aran & Ben-David, 1968), but that research stream has not got much traction. There might be two reasons behind this. First, researchers might follow the tradition of imprinting literature (Marquis & Tilcsik, 2013) and consider doctoral education to be the most important sensitive period[10] for professional socialization. Recent developments in imprinting research, however, acknowledge possible existence of multiple sensitive periods over lifecycle of individuals and organizations (Marquis & Tilcsik, 2013). Moreover, empirical evidence discussed above indicates that the influence of organizational scripts in immediate research environment on performance of knowledge workers is pronounced throughout the entire academic career. Second, careers of academic researchers in 1950s and 60s were stable and often single organization-bounded. This empirical context might have presented insufficient evidence of difference in organizational scripts to career scholars. Since then academic careers have become more mobile, with researchers increasingly moving between organizations and countries (Baruch & Hall, 2004; Dowd & Kaplan, 2005; Welch, 1997). This growing evidence of "boundaryless" careers suggests that researchers might have to adjust to multiple and diverse organizational scripts. Therefore in understanding the organizational-level pressures that shape non-firm specific human capital of business school researchers it is necessary to account for the influence of all workplaces throughout academic career.

Linguistic capital

Linguistic capital (Bourdieu, 1977, 1991), defined as an ability to communicate clearly and appropriately using the dominant language of a relevant professional

[9] which is a proxy for organizational norms and values, as discussed above

[10] Sensitive period is defined as "a limited period of time, when an organism exhibits heightened susceptibility to environmental influences" (Marquis & Tilcsik, 2013: 196).

community, has become an important antecedent of research performance for the new cohort of business school academics. In case of organizational sciences an individual's linguistic capital is equal to her fluency in academic English. Bourdieu (1991) emphasises the "a propos" aspect of linguistic capital, so it is important to understand that this fluency entails much more than the ability to produce grammatically correct phrases. High level of linguistic capital assumes that an academic's style of writing and presenting scientific ideas is consistent with dominant practices in the field, and that a researcher has a confident voice in written and oral professional communication. This thesis deliberately focuses on linguistic capital as an organizational-level factor, a dimension of educational environment. While individuals might have different aptitude to languages and invest unequal amount of effort into studying foreign languages, organizations can only observe and control higher-level linguistic influences on the development of human capital. It is therefore important to understand the extent to which early-career variability of linguistic environment on organizational level leads to long-term individual-level outcomes.

Linguistic dimension of capital is more prominent on the nationally heterogeneous market of business education outside US; therefore it is only tested in chapter 5 which looks at the European sample of researchers. European market of business education operates across multiple countries, each with its own language and culture, which distinguishes it from more homogenous segment of North American business schools. For example, among 65 business schools in Financial Times 2011 Masters in Management[11] ranking 46 schools are located in non-English speaking countries. Given traditional preference for local hiring in academic labor markets (Bonnal & Giret, 2009), it is reasonable to assume that a significant proportion of faculty in these schools have been educated in language other than English.

English has long been established as *lingua franca* of management science, which was natural while the research field was largely dominated by English-speaking peoples (Tietze & Dick, 2009). The recent expansion of the business education field together with the increased pressures to publish in English-language journals has created linguistic challenges for large population of scholars who has received their education in non-English speaking countries (Tietze & Dick, 2013). Using again the path dependence framework (Sydow et al, 2009: 691), we can argue that even before the "critical juncture" of the PhD school choice, during the "preformation phase", language of individuals' undergraduate education lays a foundation for path dependence process. Additional hurdles of

[11] Pre-experience Masters is a segment of business education market where European schools play a leading part.

communication in a foreign language drive the local search of PhD programs; therefore, candidates educated in English speaking countries have a preferential access to top-ranked PhD schools, because of business school industry being historically concentrated in the English speaking part of the world.

Besides guiding them towards a certain strata of PhD schools, the scientific language received by these academics as a part of their early-career socialization either facilitates or inhibits their writing process, with the lasting impact on research performance. While growing up and being educated in English-speaking environment does not automatically lead to high writing abilities, the opposite is almost always true, as evidenced by studies in linguistics (Slobin, 1996). Even for individuals with advanced writing skills (in native language), creating a text of the same quality in another language is challenging, because the first language adopted by an individual has a life-long imprint upon the way a person structures written and oral communication.

Recent qualitative research has revealed that academics socialized into the profession in non-English speaking countries prefer to publish "figures-based" studies, which are easier to write up, despite the fact that they may have expertise in both qualitative and quantitative methods (Tietze & Dick, 2013). The anxiety and frustration of inability to express their ideas in English may be exacerbated by journal rejections which refer to writing style as the manuscript's flaw. Recent "how to publish" editorials by George (2012) and Linton (2012b) imply that authors located outside of the center of English-speaking management field should pay particular attention to their writing style. At the same time, studies show that the structure of scientific argument and the way academics frame their contribution differ across languages (e.g. Martin & Leon Perez, 2014). It is more difficult therefore for academics socialized in one style of scientific writing to produce a manuscript fully compliant with another style of writing. This might trigger the vicious cycle, as conceptualized by Day (2011), where anxiety avoidance and professional identity threats lead to decreasing research activity among business school faculty.

Linguistic capital may also have an indirect impact on research performance by influencing collaboration within knowledge networks. It is widely recommended to compensate for the lack of linguistic capital by co-authoring with native speakers of English (Delamont, Atkinson & Parry, 1997; Linton, 2012b). Tietze (2008: 382) reports that among multiple coping strategies used by academics with lower linguistic capital, cultivating relationships with "literacy brokers" (editors, friends and colleagues who were able to make research more readable) was considered crucial and worth sharing authorship credit. This collaboration, however, may be undermined by cross-cultural

differences, conflicts over credit, related to the quality of writing, and the expectations that co-authors with lower linguistic capital would shoulder more responsibility for data collection or data analysis. It is therefore necessary to explore both a direct effect of linguistic capital on research outcomes and its interaction with social capital from an individual's knowledge network.

Table 3 provides an overview of research on organizational drivers of individual research performance.

Table 3: Organizational-level drivers of academic research performance

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
Aguinis et al (2010)	Editorship	58 past editors of 6 top org.science journals	Learning theory, job burnout theory	Productivity increases during editorial term, falls after the end of editorship	Symbolic/intellectual capital of affiliation with top journal
Albrecht et al (2011)	Rank of current job, professional age, teaching load, financial support, PhD from North America	320 business ethics scholars worldwide	Sociology of science	Rank of current job, professional age, teaching load, financial support, and PhD from North America are positively related to productivity	Symbolic/intellectual capital of PhD and current job
Allison and Long (1990)	Mobility along the prestige continuum	179 job changes (natural sciences, exact sciences)	Sociology of science	Increase in prestige of current job has positive effect on volume and impact	Symbolic/intellectual capital of current job
Boyd et al (2005)	Prestige (ratings, average GMAT score, number of editors); precocity, 1st authorship, top journal publication.	945 US faculty in strategy	Paradigm development model. Particularism versus universalism	Prestige positively linked to volume, but not to impact	Symbolic/intellectual capital of PhD and current job
Brewer et al (1999)	Faculty research productivity, student research productivity, financial support, institutional research orientation	56 NASPAA-affiliated doctoral programs (single respondent)	Quality of doctoral education	Highly productive faculty develops highly productive students. Pre-PhD productivity – good predictor of post-PhD productivity	Intellectual capital of PhD
Brogaard et al (2014)	Editorship within the same university	Articles from 30 major economics and finance journals	Allocation efficiency of networks	Having an editor in-house increases publication performance of his/her colleagues in the editor's journal. Published papers are of higher quality.	Symbolic/intellectual capital of current job
Buchmueller et al (1999)	PhD research experience, 1st job, PhD rank, individual aptitude	238 US graduates in economics	Educational production function	1st job and early research experience positively related to productivity	Symbolic/intellectual capital of PhD and 1st job
Carayol and Matt (2006)	Age, position, discipline, lab characteristics	1134 researchers in 1 French	Economics of education:	Size of the lab is negatively related to performance.	Intellectual capital of current job

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
	(average productivity, average impact, human capital composition, funding)	university	industrial organization perspective	Performance of colleagues is positively related to individual performance. Number of foreign postdocs is positively related to performance.	
Clemente and Sturgis (1974)	PhD quality, gender, age	2,205 US sociologists	Sociology of science: Prestige	Weak relationship between PhD quality and productivity	Symbolic/intellectual capital of PhD
Crane (1965)	PhD rank, job rank, mentor's prestige	150 interviews with researchers in 3 top US universities (biology, political science and psychology disciplines)	Sociology of science: Prestige/status	PhD prestige has stronger effect on productivity than current job prestige for graduates of top PhD programs. Top rank of current job has beneficial impact on productivity for graduates of lower-ranked PhD programs. Prestige of current job is more important than productivity for getting academic awards.	Symbolic/intellectual capital of PhD and current job
Crane (1967)	Prestige of job, homophily	Authors of American Sociological Review	Matthew effect, homosocial reproduction	Paper acceptance is influenced by job prestige and social similarity	Symbolic capital of current job
Cruz-Castro and Sanz-Menendez (2010)	Mobility, early publishing, current workplace productivity, gender	1583 Spanish scientists, multidisciplinary	Academic careers: inbreeding	Postdoc mobility, early publishing and current workplace productivity positively influence research productivity	Intellectual capital of PhD, symbolic/intellectual capital of current job, mobility
Dietz and Bozeman (2005)	Diversity in careers (intersectoral changes), early research experience, early productivity	1200 US S&T research scientists	S&T human capital (human capital + social capital)	Early productivity and career homogeneity are positively related to publications. Discipline differences exist in publication productivity.	Intellectual capital of PhD, mobility
Green and Bauer (1995)	Student potential, student commitment, mentorship	233 US PhD students in the	Career mentorship	More talented students receive more mentorship.	Intellectual capital of PhD

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
		area of hard sciences (within 1 university)		Greater extent of mentorship does not lead to higher performance. Student experience and student-mentor fit lead to higher performance.	
Flagg et al (2011)	Prestige (rank) of PhD, pre-PhD productivity	360 US finance graduates	Signalling theory	Job market follows PhD rank signal, but early productivity is a better predictor of later productivity than prestige of origin	Symbolic/intellectual capital of PhD
Hall et al (2007)	Gender, age, prestige of PhD, position at current workplace, size of lab, research-intensiveness of lab, international orientation of lab	497 French physicists	Accumulative advantage	Age positively and curvelinearly related to volume of research, negatively related to average quality of journals. Prestige of PhD and research-intensiveness of lab positively related to volume of papers and quality of journals. Gender (male=1) positively related to volume of research and quality of journals.	Symbolic/intellectual capital of PhD and current job
Fox and Milbourne (1999)	Early-career productivity, grade of 1st degree, teaching load, funding	150 academic economists in Australia	Human capital	Teaching load negatively influences productivity. Funding, US-type PhD and undergraduate honours positively influence productivity.	Symbolic/intellectual capital of PhD
Judge et al (2007)	Idea, methods, writing, prestige of author, prestige of author's affiliation, journal quality, position in a journal	614 articles in top 21 management journals (1990-1994)	Particularism versus universalism	Journal characteristics explain the largest proportion of variance in impact, then universalistic factors, then particularistic factors (but all are	Symbolic/intellectual capital of current job

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
				significant)	
Long et al (1979)	Prestige of PhD, prestige of mentor, publications, citations	239 US biochemists	Sociology of science	Mentor's eminence is positively related to pre-PhD productivity (volume and impact). PhD rank is not related to pre-PhD productivity.	Intellectual capital of PhD
Long and McGinnis (1981)	Organizational environment	557 US scientists (biochemistry)	Sociology of science	Within 3-6 years of employment a scientist's productivity conforms with the characteristics of the context, independent of prior productivity	Symbolic/intellectual capital of current job
Long et al (1998)	PhD rank, job rank	270 US management academics	Human capital	PhD rank not associated with productivity, Job rank strongly associated with productivity	Symbolic/intellectual capital of current job
Mein (2002)	Divergence between productivity and promotion (HR practices)	Scientists in 1 German economics research institute	Marginal productivity theory of wages	Weak link between performance and promotion leads to performance decrease	Intellectual capital of current job
Park and Gordon (1996)	1st job, precocity, gender	96 US graduates in strategic management	Academic careers, behavioral consistency theory	Pre-PhD publications and 1st job in research-intensive school are positively related to post-PhD productivity	Symbolic/intellectual capital of PhD and 1st job
Podsakoff et al (2008)	PhD research rank, current job research rank, age, gender, discipline area	150 top-cited researchers	Sociology of science: Matthew effect	Rank of PhD positively related to citations, not related to volume of papers. Current job rank positively related to volume, not related to citations.	Symbolic capital of PhD and current job
Reskin (1977)	Pre-PhD productivity, time to PhD completion, mentor productivity, collaboration with mentor, postdoc, PhD	238 US chemists	Sociology of science: reward system	Pre-PhD productivity is positively related to early productivity. Mentor productivity is positively	Symbolic/intellectual capital of PhD and 1st job

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
	school rank, research-intensiveness of 1st job			related to early productivity of high-ranked PhD schools' graduates and negatively – productivity of low-ranked PhD schools' graduates. PhD rank not related to early productivity, but positively related to early recognition and later productivity. Research-intensiveness of the 1st job has a strong positive effect on later productivity.	
Reskin (1979)	Mentor's eminence and productivity. PhD origin prestige.	228 US chemists	Ascription and sponsorship in academic careers	PhD prestige influences the volume of early-career and late-career publications, but not their citations. Mentor's productivity influences pre-PhD productivity.	Symbolic/intellectual capital of PhD
Su (2011)	Postdoc rank, current job rank	277-388 US S&T scientists	Accumulative advantage	Postdoc rank influences early-career research productivity. Current job rank influences later research productivity	Symbolic/intellectual capital of PhD and 1st job
Williamson and Cable (2003)	Mentor productivity, PhD school productivity, current job productivity	152 US academics employed by 95 AACSB-accredited doctoral schools	Human capital	Pre-PhD productivity positively related to early-career productivity (but not to later-career productivity). Advisor productivity positively related to pre-PhD productivity. Doctoral origin productivity not related to post-PhD productivity. 1st job's research-intensiveness is indirectly related to productivity through presentations	Symbolic/intellectual capital of PhD and current job

Individual-level drivers of individual research performance: proactiveness perspective

Recent developments in *social capital* research (McFadyen & Cannella, 2004; McFadyen et al, 2009; Seibert, Kraimer, & Liden, 2001; Seibert et al, 2014) point towards the proactive use of interpersonal networks and resources they contain as a means with which to develop individual performance. Social capital research maintains that knowledge networks are vital antecedents for the creation of knowledge (Nahapiet & Ghoshal, 1998; McFadyen & Cannella, 2004; Phelps et al, 2012) and demonstrates that individuals "actively shape the features of the networks around them" (Carpenter, Li & Jiang, 2012: 1340) in response to changes in their environment. Crucially for academics, the social capital embedded in their relationships with their peers takes the form of greater access to information and funding, higher visibility, trust and friendly support (Gersick, Bartunek & Dutton, 2000; Seibert et al, 2001). As Nahapiet and Ghoshal (1998: 244) write encouragingly in their paper on the antecedents for knowledge creation, "social capital makes possible the achievement of ends that would be impossible without it".

Given the importance of immediate environment for knowledge production discussed above, *mobility* might become another agency-driven mechanism that researchers can use to support their productivity. Within RBV perspective the mobility of human capital is generally perceived as a threat to the sustainability of firm's competitive advantage, as departing employees may transfer the portable part of their knowledge to competitors (Aime, Johnson, Ridge & Hill, 2010). On individual level, however, recent career research increasingly conceptualises mobility as a source of valuable experience that may be transformed into human capital. The focus of this thesis if therefore on mobility of employees which happened prior to entering the ranks of current organization.

Social capital

Among the types of employee's capital discussed above, *social capital* development requires the most proactiveness from an individual. While doctoral origin can provide access to dense professional networks, it takes human agency to use social capital from these networks for knowledge creation. The development of knowledge networks is a lengthy process, which means that most collaboration happens at later stages of academic careers, and therefore is less dependent on the quality of doctoral origin.

Social capital is shown to be positively associated with the volume of research (He, Geng & Campbell-Hunt, 2009; Kelchtermans & Veugelers 2011; McFadyen & Cannella, 2004; McFadyen, Semadeni & Cannella, 2009; Seibert et al, 2014) and its impact (Acedo, Barroso, Casanueva & Galan, 2006; He et al, 2009; Kamalski & Plume, 2013). Looking at relationships with multiple mentors and at broader developmental networks, academic career studies also found positive association between having a wide advice network and

career outcomes, such as knowledge creation and job satisfaction (van Emmerik, 2004; van Eck Peluchette & Jeanquart, 2000). Therefore, the accumulation of social capital becomes one of key proactive mechanisms that researchers might use to compensate for the paucity of symbolic and intellectual capital resulting from lower quality of their doctoral origin.

Broadly speaking, co-authorship network can influence research performance in three main ways. First, it enables the flow of information that might be instrumental for producing, publishing, and disseminating knowledge. Information here can be understood as straightforward as the dataset that a co-author provides, or more complex – as knowledge and skills that a co-author brings into the project. Co-authorship can also deliver the tacit knowledge on publishing process through the sharing of publishing experience between co-authors. Second, co-authorship provides direct writing and research support by sharing workload, collectively refining the ideas, and taking it in turns to move the project towards publication. Third, co-authors can provide psychological support and make it easier for each other to cope with uncertain nature of scientific process. This support may also help to preserve researchers' identity in the face of inevitable rejections and thus facilitate revision and further development of a rejected paper (Day, 2011).

The exploration of the access to information within the network can be done along several dimensions. The size of the network is an important predictor, because larger networks are likely to contain more information and provide more opportunities for the dissemination of knowledge. The diversity of network ties across organizations, countries, disciplines, and industry strata is likely to deliver more heterogeneous information. Networks including elite actors, such as academic stars, industry gatekeepers, or individuals affiliated with top organizations in the field, are likely to contain information of higher quality that other networks. Measuring diversity and quality of network ties requires the information on each co-author's institutional affiliation. Unfortunately, the ISI Web of Science, which is the main source of bibliometric data for this thesis, provides very fragmented information on authors' affiliation. Moreover, this information is systematically biased against older publications. Consequently, I use the size of the network as the only measure of information assess in co-authorship network.

The measurement of research and writing support within the network is based on the assumption that strong ties are associated with increased trust and require mutual investments into the maintenance of a relationship (McFadyen and Cannella, 2004; Seibert et al, 2014). The number of collaborations with the same co-author (i.e. the average strength of ties) therefore becomes a proxy for the extent of research support within the

network. Furthermore, networks with higher proportion of strong ties should provide better research and writing support. I use both of these measures (strength of ties and the proportion of strong ties) in the thesis.

Finally, psychological support from co-authorship network is associated with the number of meaningful peer and mentor relationships within the network (Seibert et al, 2014). Existing literature provides evidence that wider and more diverse mentoring constellations are associated with higher performance and career outcomes of knowledge workers (Cotton et al, 2011). The measure of psychological support, however, can only be self-assessed, and thus was not available through archival data collection undertaken in this thesis. I acknowledge this as a limitation of this study and an avenue for future development of my research program.

Mobility

Studies in the sociology of science established that the move to more research-intensive environment led to increased research performance of academics (Allison & Long, 1990; Long & McGinnis, 1981). Since then, academic career research predominantly treated inter-organizational mobility as an outcome variable, focusing on "mobility along the prestige continuum" (Bedeian et al, 2010; D'Aveni, 1996; Debackere & Rappa, 1995; Miller et al, 2005) and exploring the determinants of the access to the most prestigious positions. The quality of research environment, however, is just one dimension of mobility. Total number of workplaces, the frequency of their change and the spatial dimension of mobility all may have separate effects on individual performance. For example, a recent study of German scientists' short-term international mobility showed that the frequency of visits and the duration of visits had a different impact on knowledge and technology transfer activities of academics (Edler, Fier & Grimpe, 2011).

Most recent studies linking mobility to research performance and career advancement focus on career consequences of postdoctoral mobility (Cruz-Castro & Sanz-Menendez, 2010; Sabatier, Carrere & Mangematin, 2006; Zubieta, 2009). This literature predominantly discusses postdoctoral appointments using data from natural sciences context (e.g. Gaughan & Robin, 2004; Zubieta, 2009). Anecdotal evidence also shows that postdoctoral appointments are less frequent in careers of organizational scholars; therefore the evidence provided by existing research is not sufficient for understanding the impact of mobility on individual performance in social science field. Qualitative studies of international academic careers (Oliver, 2012; Richardson, 2009; Richardson & McKenna, 2003; Richardson & Zikic, 2007; Sang, Al-Dajani & Ozbilgin, 2013) provide insights on positive and negative aspects of mobility. The former include the access to new knowledge and social networks, dissemination of research among a wider audience of scholars (Laudel & Glaser, 2008), new experience (including unique cross-cultural

experience), financial reward, expected career progression and general sense of excitement because of the adventurous nature of mobility (Jepsen et al, 2014; Richardson & McKenna, 2003; Richardson & Zikic, 2007). Among the latter – the loss of connection with friends and family, feeling of exclusion from local community in the host country, difficulties in finding an employment for spouses, visa and language barriers, and general emotional toll from "living out of suitcase" (Richardson & Zikic, 2007; Riusala & Suutari, 2000). These insights, however, do not address directly the relationship between mobility-related factors and research performance. Hence, there is a need for a quantitative exploration of this relationship in business school setting.

Table 4 provides an overview of research on individual-level drivers of individual research performance.

Table 4: Individual-level drivers of academic research performance

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
Gersick et al (2000)	Exploratory study of professional relationships in academia	37 US academics	Academic careers: grounded theory	Men experience more help in relationships, women experience more harm. Men play "game of reputation"; women play "game of skill".	Social capital
Gonzalez-Brambila et al (2013)	Collaboration characteristics: number of ties, strength of ties, network density, structural holes, network centrality, cross-disciplinary links	1704 Mexican researchers in Exact Sciences	Network theory	Centrality and cross-disciplinary links are positively related to volume of publications. No curvilinear effects found. Number of ties and their strength are positively related to impact. Structural holes are positively related to impact. Network density negatively related to impact.	Social capital
Hadani et al, (2012)	Network centrality of PhD school	602 US graduates in management	Social capital	Network centrality of PhD school not related to early publications. Publications during PhD and co-authorship with mentor positively related to early productivity	Social capital
He et al (2009)	Collaboration	65 NZ biomedical scientists	Learning and social capital	At article level, all types of collaboration positively related to quality; at individual level only international collaboration related to research productivity	Social capital
Kamalski and Plume	Collaboration, mobility	Scopus data,	Sociology of	Collaboration positively	Social capital

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
(2013)		multidisciplinary, 2007-2011	science	related to impact	
Social capital					
Kelchtermans and Veugelers (2011)	Seniority, network, gender, other activities	1036 researchers in KU Leuven (Belgium)	Science policy	Gender positively related to performance. Funding, network size positively related to volume. Funding, gender positively related to citations.	Social capital
Liu and Lin (2012)	Number of ties, structural holes	110 (77) management professors in Taiwan	Social capital	Number of ties positively related to knowledge creation. Structural holes mediate the relationship.	Social capital
McFadyen and Cannella (2004)	Number and strength of direct co-authorship ties	173 biomedical scientists in 2 top US research universities	Social capital	Number and strength of ties have inverted U-shaped relationship with knowledge creation	Social capital
McFadyen et al (2009)	Strength of ties and network density	177 biomedical scientists in 2 top US research universities	Network theory (Knowledge networks)	Sparse network combined with strong ties is positively related to knowledge creation. Dense network combined with weak ties is positively related to knowledge creation.	Social capital
Rotolo and Petruzzelli (2013)	Network centrality, research specialization, cross-community ties	203 Italian tenured academics in engineering and management	Social capital	Network centrality has an inverted U-shaped relationship with productivity. Specialization negatively moderates this relationship. Number of cross-community ties positively moderates	Social capital

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
				this relationship.	
Seibert et al (2014)	Number of co-authors, co-authoring heterogeneity, research field heterogeneity, number of strong ties, network density	119 US management professors	Social capital	Number of co-authors positively related to volume of research. Number of strong ties positively related to impact of research. Co-authoring heterogeneity positively related to top-tier publications.	Social capital
van Eck Peluchette and Jeanquart (2000)	Mentor types (within organization, within profession, outside profession)	430 US faculty members in 2 universities, multidisciplinary	Mentoring in professional careers	Multiple sources of mentorship are associated with higher research productivity. Preferable sources of mentorship depend on career stage.	Social capital
Mobility					
Cruz-Castro and Sanz-Menendez (2010)	Mobility, early publishing, current workplace productivity, gender	1583 Spanish scientists, multidisciplinary	Academic careers: inbreeding	Postdoc mobility, early publishing and current workplace productivity positively influence research productivity	Mobility, intellectual capital of PhD, symbolic/intellectual capital of current job
Dietz and Bozeman (2005)	Diversity in careers (intersectoral changes), early research experience, early productivity	1200 US S&T research scientists	S&T human capital (human capital + social capital)	Early productivity and career homogeneity are positively related to publications. Discipline differences exist in publication productivity.	Mobility, intellectual capital of PhD
Edler et al (2011)	Short-term international mobility	950 German S&T academics	S&T human capital	Short-term international mobility is driven by higher productivity and brings subsequent increased propensity to engage in knowledge and technology transfer	Mobility

Authors (year)	Predictors	Sample	Theoretical perspective	Main results	Main conceptual drivers
Horta et al (2010)	Inbreeding (internal hiring of PhD graduates)	414 Mexican faculty members (multidisciplinary)	Academic careers (inbreeding)	Inbreeding is associated with lower productivity through 1) lower information exchange and 2) higher teaching load.	Mobility
Zubieta (2009)	Postdoc mobility	100 UK S&T researchers	Network theory	International postdoc mobility has positive impact on performance	Mobility

MAIN THEORETICAL GAPS AND THE CONTRIBUTIONS OF THE THESIS

Based on the review of the literature provided in this chapter, I identify and address several underexplored areas of research. First, recent developments in human capital research call for the increased attention to the micro-foundations of human-capital based competitive advantage (Coff & Kryscynski, 2011). This requires looking beyond organizational factors to investigate individual characteristics and individual behavior as drivers of human capital heterogeneity. This thesis applies the micro-foundations approach to the exploration of academic research productivity, which is a non firm-specific dimension of human capital in business school industry. By building and testing a multilevel model of individual knowledge creation, I look at the interplay between organizational and human agency-driven antecedents of individual research performance. I further assess their complementarity in explaining long-term research outcomes and their relative contribution to volume and impact of research.

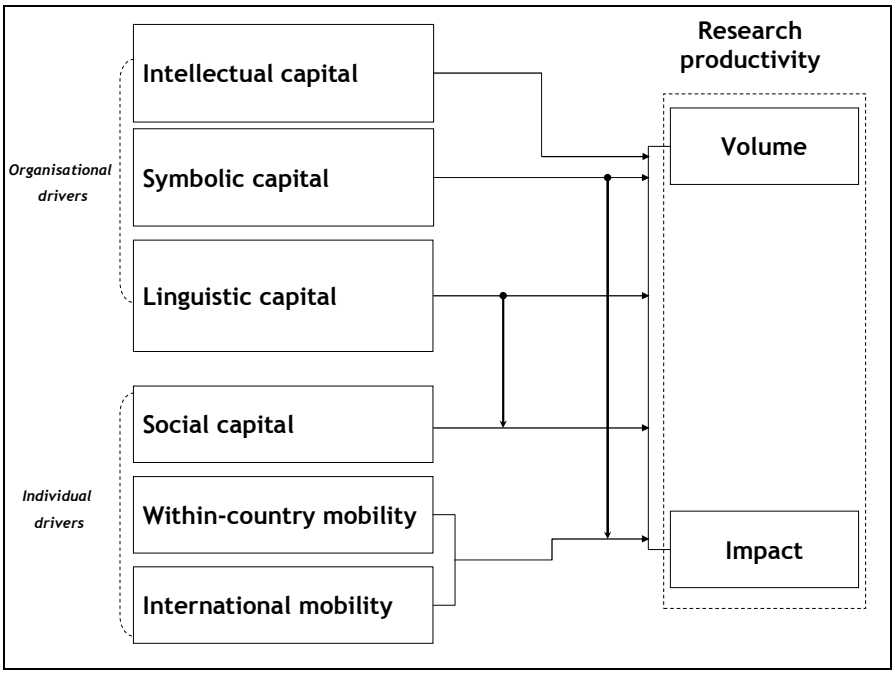
Second, the literature exploring organizational influences on individual research performance predominantly focuses on early-career impact of doctoral education (e.g. Flagg et al, 2011) and ignores mitigating influences of organizational scripts later in academic career. I address this gap by measuring research-intensiveness of all workplaces in academics' career history and weighting it by the time of exposure to each organizational script.

Third, language skill as an important dimension of knowledge workers' human capital often gets just a brief mention in the studies of research productivity (e.g. Baden-Fuller, Ravazzolo & Schweizer, 2000). However, the challenges facing employees educated outside of English speaking environment have been mentioned in the research on international business (Marschan, Welch & Welch, 1997) and cross-cultural management (Molinsky, 2005), as well as the applied linguistic studies (Tietze, 2008). I look at the language of the country where an academic received her undergraduate, masters and doctoral education in order to get a better understanding of the extent to which linguistic dimension of education has a lasting impact on research performance of faculty.

Fourth, RBV traditionally focuses on employee mobility from the focal firm to its competitors and the potential detrimental effect of such mobility on firm's competitive advantage (Aime et al, 2010). What gets overlooked is mobility as a source of industry- and task-related experience which contributes to employees' knowledge and skills. I look at full-time mobility of academics on national and international level to capture the impact of this proactive strategy on individual research performance.

Figure 2 below presents an overall conceptual model of the thesis. The following three empirical chapters will test different parts of the model using the international dataset of business school academics constructed for the purposes of this thesis.

Figure 2: Conceptual model of this thesis



While human capital literature makes a background of all three empirical studies, I will not mention it explicitly in conceptual sections of Chapters 3-5, to maintain the focus on foreground literatures used there for the development of hypotheses. The human capital lens will be used in the discussion chapter, where it will serve as a link between academic context and the wider context of knowledge-intensive industries.

APPENDIX 1: Firm-specific academic career outcomes

Authors (year)	Predictors of career success	Sample	Theoretical perspective	Main results
Allison and Long (1987)	Prestige, publications, citations	274 job changes in natural and exact sciences fields in US	Sociology of science: universalism vs. particularism	Prestige of past workplace has strong influence of the prestige of job change. Volume of publications has a weak positive impact on the prestige of future job.
Bedeian et al (2010)	Prestige of PhD	171 US PhD graduates in management	Prestige, cumulative advantage (Matthew effect)	PhD prestige positively related to job prestige; path dependency
Bonnal and Giret (2009)	Number of publications, research productivity of PhD department, spatial proximity, postdoc	1400 French graduates of 2001	Academic careers	Publications and postdoc influence the access to permanent positions
Cable and Murray (1999)	Conference presentations, R&Rs, author order, PhD prestige, mentor prestige	159 management job applicants	Sociology of science, academic careers	Publication success positively related to prestige of job and to salary. Conference presentations positively related to prestige of job and negatively to – salary. Rank of PhD not significant. Mentor's eminence – positive relationship to job prestige, no relation to salary.
Cruz-Castro and Sanz-Menendez (2010)	Mobility	1583 Spanish scientists, multidisciplinary	Academic careers: inbreeding	Inbred and nonmobile faculty get tenure earlier
Dany et al (2011)	Organizational scripts and individual agency	75 French academics (biology and history)	Boundaryless careers/structuration theory	Career scripts both constrain and empower individuals. Even weakly institutionalized career scripts influence the behavior of academics

Authors (year)	Predictors of career success	Sample	Theoretical perspective	Main results
Debackere and Rappa (1995)	Prestige of PhD, maturity of research field	373 US scientists in the neural networks field	Sociology of science	Rank of PhD is positively associated with the rank of current job. The effect disappears after 5 years post-graduation. Overall downward trend in mobility along the prestige continuum
Dowd and Kaplan (2005)	Type of career	34 US academics	Boundaryless careers	Typology of academic careers: both boundaried and boundaryless
Duberley et al (2006)	Structure and agency	77 academics from UK and NZ (earth sciences and agriculture)	Structuration theory	Dynamic interplay between scripts and individual action in academic career
Gaughan and Robin (2004)	Prestige of PhD, post-doc mobility, funding	407 US scientists and 400 French scientists (life sciences and physics)	Science policy	Prestige of PhD positively related to career success, postdocs negatively related to career success (France) or not related to career success (US)
Gomez-Mejia and Balkin (1992)	Productivity, impact, mobility	353 US professors	Agency theory	Top-tier publications, gender and mobility positively related to salary
Hadani et al (2012)	Network centrality of PhD school	602 US graduates in management	Social capital	Network centrality of PhD school positively related to career success
Laudel and Glaser (2008)	Quality of PhD, early research experience, teaching/service load	16 Australian early career researchers, multidisciplinary	Sociology of science, organizational sociology: careers perspective	Three interconnected types of careers: cognitive, community, organizational. Clear alignment of types is rare. Research supports are necessary for role transition from apprentice to colleague.
Long et al (1979)	Prestige of PhD, prestige of mentor, publications,	239 US biochemists	Sociology of science	Productivity is not related to the rank of 1st job. PhD

Authors (year)	Predictors of career success	Sample	Theoretical perspective	Main results
	citations			rank and mentor's eminence are positively related to the rank of 1st job.
Miller et al (2005)	PhD prestige, mentor prestige, research success, rank of current job	298 US academics (graduates of 1977-1985)	Sociology of science, academic careers	PhD prestige and pre-PhD publications are positively related to prestige of 1st job, Mentor's eminence not related to prestige of 1st job. Prestige of 1st job and research success are positively related to prestige of subsequent job.
Oliver (2012)	International mobility	248 science researchers in EU	Academic careers	Challenges of international mobility: Gap of insecurity, dual-careers. Mobility is driven by job search rather than search for excellence.
Park and Gordon (1996)	1st job, early publishing, gender	96 US graduates	Academic careers, behavioral consistency theory	Number of publications is positively related to probability of getting tenure. Gender is negatively related to tenure.
Richardson (2009)	International mobility	30 UK academics abroad and 44 academics who moved to Canada	Boundaryless careers	The relationship between international mobility and career success is dependent upon the legitimacy of international careers model within a hiring organization. International mobility is restricted by national context (employment and educational practices).
Richardson and McKenna (2003)	International mobility	30 UK academics abroad	Boundaryless careers	Drivers of mobility: curiosity, financial rewards, career progression, family

Authors (year)	Predictors of career success	Sample	Theoretical perspective	Main results
				reasons
Richardson and Zikic (2007)	International mobility	30 UK academics abroad	Boundaryless careers	Positive aspects of mobility: exploration, career flexibility, adventure Negative aspects of mobility: emotional weariness, loss of support networks, financial insecurity, dual-career problems, sense of outsiderness.
Roebken (2007)	Departmental network position	504 German business academics in 60 departments	Network theory	Homosocial reproduction – graduate exchange within the same reputational strata is stronger than across strata. Reputation of PhD is a signal for graduate employment.
Sabatier et al (2006)	Gender	583 French life scientists in one national laboratory	Academic careers: gender perspective	Mobility is positively related to promotion. Social capital is particularly important for female academics. Top-ranked PhD positively related to promotion.
Sang et al (2013)	Gender, international mobility	9 female migrant professors in UK	Frayed careers	Female migrant academics as double outsiders. Proactive approach to careers. Compliance with existing career scripts.
Schermerhorn (1999)	International mobility	1 US professor in Malaysia	Careers of expatriates	Challenges of keeping contact with home and host country. Lack of supports for expatriate academics.
Smith-Doerr (2006)	PhD prestige. Gender and age - controls	2062 US life scientists	Prestige, Matthew effect.	Graduates of middle-ranked PhDs are less likely to be promoted than anyone else.

Authors (year)	Predictors of career success	Sample	Theoretical perspective	Main results
				The effect of PhD-driven stratification is the strongest in elite organizations. Two explanations for the mid-rank disadvantage: 1)lower intellectual capital (research-intensiveness) of mid-rank PhD; 2) too high career aspirations – focus on top-level employment
Tietze (2008)	Proficiency in English	33 management academics (non-native speakers of English)	Academic careers	Increased pressures to create knowledge in English. Careers are bounded by the mastery of English language.
Tietze and Dick (2013)	Proficiency in English	33 management academics (non-native speakers of English)	Hegemonic practices	The repertoire of responses of non-native speakers on pressures to publish in English
van Eck Peluchette and Jeanquart (2000)	Mentor types (within organization, within profession, outside profession)	430 US faculty members in 2 universities, multidisciplinary	Mentoring in professional careers	Multiple sources of mentorship are positively associated with career satisfaction
van Emmerik (2004)	Developmental networks	1010 faculty members in 1 university in the Netherlands	Mentoring in professional careers	Having a mentor and a wide developmental network is positively related to career success and job satisfaction
Williamson and Cable (2003)	Mentor productivity, PhD school productivity, current job productivity	152 US academics	Human capital	Pre-PhD productivity positively related to research-intensiveness of 1st job

CHAPTER 3. MULTILEVEL EXPLORATION OF RESEARCH PRODUCTIVITY IN THE US BUSINESS SCHOOLS

The first of three empirical chapters in this thesis explore the joint effect that organizational environment and individual proactive behavior have on the research performance of business-school academics. Drawing upon sociology of science research and the academic careers literature I build a multilevel comparative model of research productivity emergence in the business school industry. The study looks at the interplay between organizational scripts and individual strategies as a part of microfoundations program (Barney & Felin, 2013: 145), which "has a preference for explaining the macro by focusing on the micro".

Research output is an important dimension of business schools' performance (Trieschmann et al, 2000). Consequently, the ability of academics to produce original knowledge can be directly linked to a business school's competitive advantage. Universities in general and business schools in particular create value for our society both through education and the creation of a new knowledge in the field of organizational science (Trieschmann et al, 2000). The ability of business school employees to advance research in this field is therefore an important resource that enables organizations to attract funding and human capital. Research productivity of academics also has a positive impact on their students. Research active faculty provides higher economic value from education for MBA students (O'Brien et al, 2010), while for doctoral students research performance of their alma mater is a major driver of early-career employment (Miller et al, 2005). It is important therefore to understand what organizational factors and individual behaviors are associated with the ability of academics to produce publications in peer-reviewed journals and to accumulate citations that signal the impact of these publications in a scientific field.

The current state of research on the antecedents of research performance is characterized by a divide between scholars who believe in the dominance of organizational factors and scholars who argue for the importance of proactive individual-level strategies. The former speak about a "handicap of initial identification with a less prestigious department" (Bedeian et al, 2010: 13), which in their opinion has a permanent detrimental effect on academic productivity (Bedeian et al, 2010; Crane, 1965) due to the path dependent nature of academic careers. The latter put forward networking and mobility as the means to influence research productivity through proactive behavior at the later stages of individual career development (Baruch & Hall, 2004). Those scholars who see early-career organizational affiliation as being the main driver of research performance draw their arguments from the sociological studies of 1950s-1980s (Caplow &

McGee, 2001; Clemente & Sturgis, 1974). The human agency-driven view of individual performance supports their arguments by the evidence from the "new careers" literature and from social capital research (McFadyen & Cannella, 2004; Seibert et al, 2001).

None of these perspectives alone can explain individual research performance in a newly globalized business school industry. A path dependence-based view does not account for the increased diversity of human capital and the increased competitive pressures (Certo, Sirmon & Brymer, 2010). The 'new careers' literature so far relied predominantly on conceptual and qualitative research (e.g. Baruch & Hall, 2004; Richardson & McKenna, 2003), which makes it difficult to understand the scope and the significance of theorized effects upon individual performance. The extensive social capital research literature (see e.g. Payne, Moore, Griffis & Autry, 2011) focuses on the role of networks in knowledge creation, without considering the embeddedness of individuals into social structures. One recent exception would be the paper by Seibert et al (2014) which includes reputation of PhD and current workplace in their analysis. Seibert et al, however, include reputation as a control variable, maintaining the focus on the link between social networks and research.

In this study I seek a consensus between a path dependence perspective, which builds upon professional socialization as a key mechanism in researchers' careers, and a proactiveness perspective, which builds upon social capital-related mechanisms of performance development. The 'glue' that creates this consensus is a multilevel framework of research performance that brings together organizational- and individual-level drivers of success in knowledge creation. This framework is grounded in the 'new careers' literature (Dany et al, 2011; Duberley et al, 2006) and the microfoundations literature (Barney & Felin, 2013; Coff & Kryscynski, 2011; Ployhart & Moliterno, 2011). New career scholars explore the interplay between individual and organizational factors in predicting individual-level career outcomes, while microfoundations research, in a more general way, focuses on an interaction between micro- and macro-level antecedents of organizational outcomes.

Theoretically, this study responds to the call from Barney and Felin (2013: 146), who argue that "we need comparative theories and associated empirical analysis that prioritizes different levels of analysis in terms of their respective contribution to overall performance". Such comparative analysis is at the core of this chapter, and I look at the emergence of research productivity in knowledge-intensive organizations (Coff & Kryscynski, 2011; Ployhart & Moliterno, 2011) as a consequence of interplay between organizational scripts and individual choices. Methodologically, I respond to the call for the wider use of multilevel designs in organizational studies (Hitt, Beamish, Jackson &

Mathieu, 2007; Payne et al, 2011) by examining cross-level direct and interactive effects of individual and organizational factors on individual research performance. Contextually, the study contributes to the literature on research productivity in business schools (e.g. Seibert et al, 2014) and extends this literature in two ways. First, it goes beyond early-career organizational influences, exploring the role of career-long exposure to organizational scripts in knowledge creation process. Second, the study measures relative importance of organizational and individual factors in the careers of academic researchers.

CONCEPTUAL BACKGROUND

Socialization as a Driver of Research Productivity: Path Dependence Perspective

Research productivity emergence starts with professional socialization, which is defined as "the process by which an individual acquires the values, expected behaviors, and social knowledge needed to assume an active role" in a given profession (Cable et al, 2013: 2). A socialization process is a part of professional education, and leads to the acquisition of symbolic, intellectual, and, to a certain extent, social capital, which are instrumental in future professional career of an individual (Vaara & Fay, 2011). In an academic context, professional socialization predominantly occurs as a part of doctoral education (Li & Seale, 2008; Stuart & Ding, 2006) and includes the transmission and the acquisition of discipline-specific skills (i.e. intellectual capital) and the awareness of professional norms (the 'rules of the game')[12]. "Like the elders of any tribe, academic elders pass on the wisdom and "tricks" of the culture to the next generation" (Adler & Harzing, 2009: 87).

Whilst in science at least, socialization during a doctoral program is considered to be the most common practice in honing the skills of would-be researchers (Baker & Lattuca, 2010; Stuart & Ding, 2006), the wider academic community can also play an active role in shaping a future researcher's understanding of the profession. "It is through participation in the intellectual community in the field and the home institution that doctoral students build the knowledge and skills required for scholarship in their field of study" (Baker & Lattuca, 2010: 809). Interaction between a young academic, a journal editor and multiple reviewers which leads to the first publication of an academic's work in a peer-reviewed journal is a formative experience where the development of a future publishing career is concerned. To sum up, both the environment of the doctoral program and the first publishing experience provide *intellectual capital* that lays the foundation for an academic's ability to create knowledge in the form of journal publications.

[12] This "internalized system of schemes for perceiving, thinking, feeling, and acting within a given field and its structures" was called *habitus* by French sociologist of education Pierre Bourdieu (Vaara & Fay, 2011: 30).

As evidenced by multiple studies conducted into the role of academic origin in the development of scientific productivity, research-intensiveness of a starting point in a scientist's career has a long-term impact on an academic's ability to produce original knowledge (for a review of these works, see, for example, Clemente & Sturgis, 1974). First, highly productive faculty members possess a large stock of discipline-specific knowledge, which they can transfer to doctoral students thus establishing a foundation of their students' research productivity. Second, career research argues that the research-intensiveness of academic origin facilitates the access to productive workplaces by providing *symbolic capital*, which serves as a proxy for the potential quality of a future researcher (Bedeian et al, 2010; Miller et al, 2005). Where an academic has succeeded in publishing before graduation, this reduces uncertainty in the hiring process and provides some proof that this graduate has the skills required to produce original knowledge (Mangematin & Baden-Fuller, 2008). In such cases, potential research productivity is assessed through an evaluation of the PhD institution's research output and of the quality of the outlet in which the work was published — the strength of the latter compensates for the weakness of the former (Bonnal & Giret, 2009).

A favorable assessment of an academic's symbolic and intellectual capital allows access to research-intensive institutions that provide the resources and the motivation necessary for knowledge creation. A research-friendly environment, characterized by lower teaching loads and abundant research funding, is propitious to knowledge creation (Crane, 1965; Long & McGinnis, 1981; Long et al, 1998) and motivates faculty to prioritize activities leading to publications over other activities. Consequently, research productivity is developing through a self-reinforcing mechanism of accumulative advantage, which leads to the increasing rigidity of academic career paths. These path dependent mechanisms indicate the overarching importance of the early-career stock of intellectual and symbolic capital as an antecedent of research productivity. Thus,

Hypothesis 1a: Research-intensiveness of academic origin is positively associated with long-term research productivity.

While arguments of path dependence perspective seem plausible, recent academic careers research provides evidence of a less linear trajectory of mobility across the academic workplaces. Both the lack of tenure-track positions in research-intensive universities (Huisman, de Weert and Bartelse, 2002) and the factors rooted in individual characteristics of academics, such as family commitments and the pursuit of new experience (Richardson & McKenna, 2003) lead to higher diversity of workplaces. Studies in the sociology of science demonstrated that the research-intensiveness of an immediate organizational environment (measured by a school's standing in research-based rankings)

has a strong impact upon research performance of individual academics. This impact results from the exposure to organizational scripts and to the organizational stock of intellectual capital. It is important therefore to explore the influence of post-PhD professional socialization rather than to assume the similarity of these scripts to the script provided by the PhD school. A combination of resource munificence, quality of academic peers and organizational incentives is likely to lead to positive association between the employment in more productive organizations and higher individual research performance of faculty.

Hypothesis 1b: Research-intensiveness of post-PhD workplaces is positively associated with long-term research productivity.

Social Capital as a Driver of Research Productivity: Proactive Behavior Perspective

Since the start of business school industry globalization in 1990s, several new trends influenced individual performance of academics. First, the expansion of AACSB across the borders of the US and the emergence of EQUIS as another international accreditation body (Durand & McGuire, 2005) has brought new "publish or perish" pressures to a wide range of organizations outside North America. The pressure from global accreditation bodies was reinforced by the pressures from government stakeholders (e.g. through the Research Assessment Exercise in the UK), which made university funding dependent on research output. The calls for increased efficiency and accountability in higher education have directed researchers towards highly visible international journals (Sousa et al, 2010). The resulting dramatic increase in competition for space in the top journals has made it more difficult to publish research in these outlets (Certo et al, 2010) and led to more stringent requirements for scientific rigor (Ashkanasy, 2010) and may also have knock on impact upon both space and standards in mid and lower tier journals. Despite the emergence of some new journals, the limited time that business school academics have for research increases reliance on journal Impact Factors to navigate the field (Judge et al, 2007). The resulting disproportionate importance of publishing in the top journals leads to rejection rates up to 97% of all submitted manuscripts (Day, 2011).

Second, academia mirrored other industries in the deterioration of a secure and stable career model. The proportion of part-time faculty and faculty outside tenure tracks has increased as a result of accreditation pressures and efficiency pressures discussed above (Callie & Cheslock, 2008; Huisman et al, 2002). Academic career scholars disagree in their reaction to this emergent trend. Some scholars met the 'boundaryless careers' model (Dowd & Kaplan, 2005; Sullivan & Arthur, 2006) with enthusiasm and suggested that proactively driven careers are the future of empowered human capital (Baruch & Hall, 2004). Others were more cautious and emphasized the increased power of an organization

over employees in the age of a scarce job security (Dany, 2003). While the more optimistic fraction of the 'new careers' field presents an individual as a proactive creator of her own career across multiple organizations, the pessimistic fraction argues that proactiveness is used by individuals to manage the increased difficulty in meeting organizational performance standards and does not challenge the dominant role of organizational scripts.

New career scholars generally agree that networking and mobility serve as proactive mechanisms supporting individual performance. Prior research has demonstrated that social capital embedded in collaboration networks may be used to improve individual performance in general and knowledge creation in particular (McFadyen & Cannella, 2004; Seibert et al, 2001; Seibert et al, 2014). Collaboration allows researchers to take part in several projects simultaneously, sharing the work between multiple members of each research team. Co-authorship provides access to a more diverse stock of knowledge and allows researchers to examine the same phenomenon from different angles. Co-authorship network[13] may perform the function of a sounding board at the early stage of idea development, of a friendly reviewer at the manuscript drafting stage and of a source of tacit journal-related knowledge at the submission stage. After the publication of a study, a co-authorship network plays a role in knowledge dissemination, as more researchers advocate for the value of a particular project.

Following prior research on knowledge creation in academia (McFadyen & Cannella, 2004; McFadyen et al, 2009) I expect that collaboration will begin to generate diminishing returns as the number of co-authors grows. Thus,

Hypothesis 2a: There is a curvilinear (inverted U-shaped) relationship between the size of co-authorship network and research productivity.

The size of the co-authorship network gives an idea of the potential stock of information available to an academic, and of the number of individuals that are likely to contribute to knowledge dissemination. The extent of actual research support within a co-authorship network is better measured by the strength of co-authorship ties, or the frequency with which an individual collaborates with the same co-author (Seibert et al, 2014). Repeated collaboration increases the trust between co-authors and makes creative process smoother, which may lead to higher research productivity. Repeated collaboration may also be a signal of a good fit between co-authors, complementarity of their knowledge, skills and personal characteristics, all of which would be beneficial for research productivity. Following prior research on the link between the strength of ties

[13] Co-authorship network explored in this thesis is understood as an ego-network of an academic, which includes all her co-authors.

and knowledge creation (e.g. Gonzalez-Brambila, Veloso & Krackhardt, 2013; McFadyen et al, 2009), I assume that:

Hypothesis 2b: There is a positive relationship between the strength of co-authorship ties and research productivity.

Network size and the strength of ties represent different dimensions of social capital; therefore I expect that they might reinforce each other. For instance, a large co-authorship network will lead to higher research productivity where it contains stronger relationships between co-authors. Such a network, I expect, ought to combine broad access to information with trust and support between co-authors. Thus,

Hypothesis 2c: There is a positive interaction between the size of co-authorship network and the strength of co-authorship ties.

Mobility as a Driver of Research Productivity: 'New careers' Addition to Proactive Behavior Toolbox

Academic mobility is often considered to be instrumental in academic career development (Sabatier et al, 2006; Zubieta, 2009). Mobility between workplaces increases the diversity of experience, facilitating the development of professional skills and the broadening of researchers' perspective. The exact nature of the relationship between prior experience and performance is, however, still underexplored. Dokko and co-authors (2009) demonstrate that while prior task-related experience contributes to the development of knowledge and skills, it also negatively influences performance, because employees experience difficulties in adjustment to the culture of a new workplace. In an academic setting, Dietz & Bozeman (2005) found that academics' mobility between universities and industry R&D centers had a negative effect on research productivity.

International mobility may become a driver of cross-cultural knowledge acquisition, bring financial rewards and facilitate the development of professional networks (Laudel & Glaser, 2008; Jepsen et al, 2014; Richardson & McKenna, 2003; Richardson & Zikic, 2007). Mobility may also be stressful due to the loss of connection with friends and family, difficulties in finding an employment for spouses, visa and language barriers, and general emotional toll from "living out of suitcase" (Richardson & Zikic, 2007; Riusala & Suutari, 2000). These qualitative insights are useful for understanding the consequences of mobility decisions, but the existing research on mobility does not address directly the relationship between mobility-related factors and research performance. Hence, there is a need for quantitative exploration of this relationship in a business school setting.

All academics in the sample explored in this chapter are located in the US. Consequently, I am interested in distinguishing between the impact of mobility within the US system, which allows developing professional relationships and disseminating

knowledge without facing the hurdles of international relocation, and the impact of mobility outside of the US. While mobility outside of the US has a substantial cost associated with the change of cultural environment, educational and legal regulations and practices, it may also be more rewarding due to higher exposure to different research perspectives.

Hypothesis 3a: Prior academic experience within the US is positively related to research productivity.

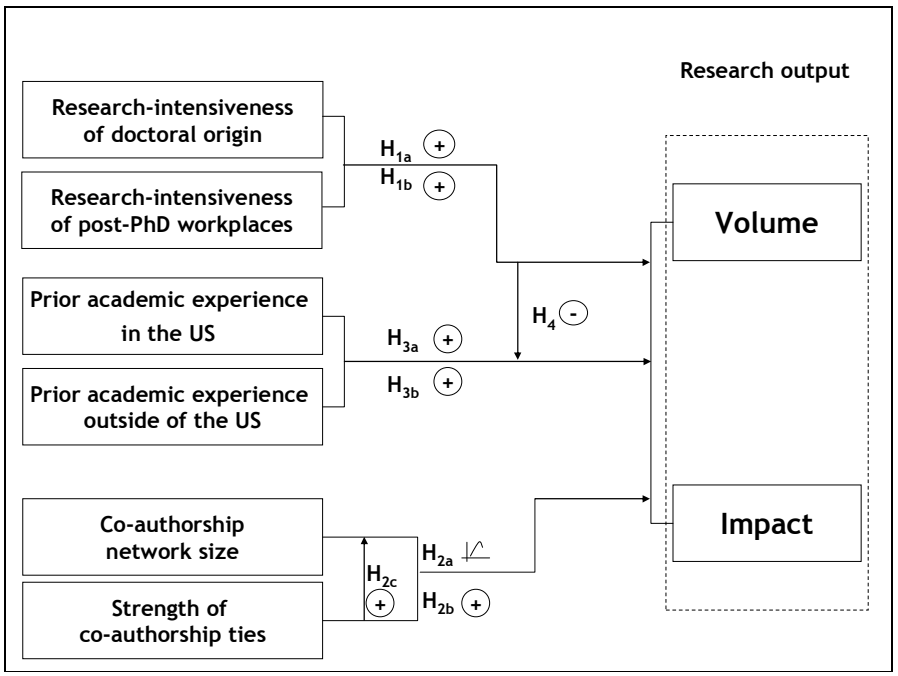
Hypothesis 3b: Prior academic experience outside the US is positively related to research productivity.

Academic mobility may bring more value to the academics with a lower quality of professional socialization, as they lacked early-career access to skills, knowledge and role models. At the same time, international mobility makes it hard for the graduates of top-ranked schools to maintain contact with top-quality co-authorship networks established at an early stage of their academic careers. Social networks research emphasizes spatial proximity as a key driver of networking (Brass, Galaskiewicz, Greve and Tsai, 2004). Thus, I expect the positive effect of mobility on knowledge creation to be more pronounced for academics with a lower quality of professional socialization.

Hypothesis 4: Research-intensiveness of academic origin negatively interacts with prior academic experience to weaken its impact on research productivity.

The conceptual model is summarized in Figure 3 below.

Figure 3: Conceptual model of chapter 3

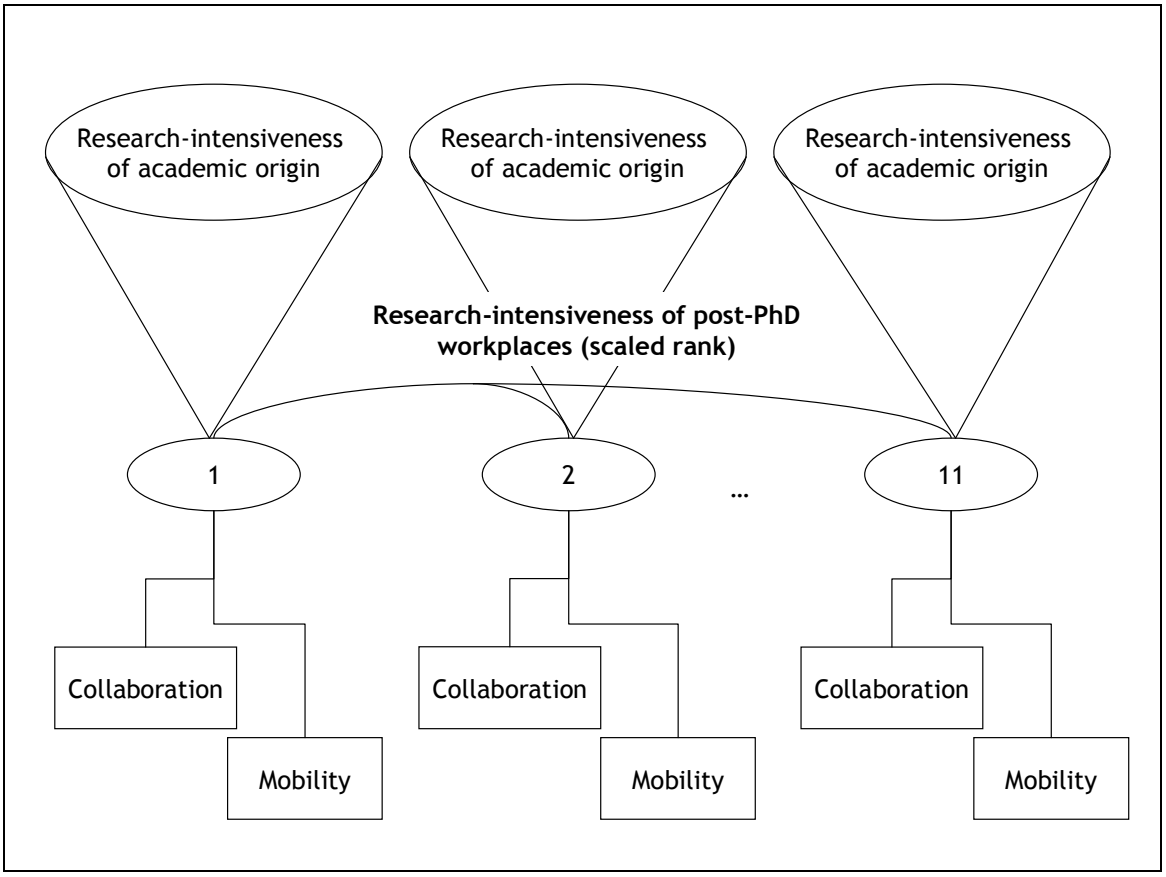


METHOD

Following the previous work on academic productivity (e.g. Long et al, 1998; Park & Gordon, 1996), I construct an individual-level theory using multilevel analysis of individual- and organizational-level data. Recently, a number of scholars have advocated the use of multilevel studies for the analysis of nested data in order to determine boundary conditions in organizational science through the exploration of cross-level effects and cross-level interactions (i.e. interactions between higher- and lower-level variables) (Breugst, Patzelt, Shepherd & Aguinis, 2012; Payne et al, 2011). The same reason points towards multilevel analysis as an appropriate methodological foundation for microfoundations research. "Using a multilevel lens reveals the richness of social behavior" (Hitt et al, 2007: 1385) and helps us understand that individual performance is the outcome of the interplay between the social structure of an industry and individual behavior.

Multilevel modelling rests upon the idea that, in datasets with a nested structure, "level-1 units within the same level-2 unit or cluster tend to be more similar to each other than to units in other clusters" (Rabe-Hesketh & Skrondal, 2012: 1). In the case of this study, the academics socialized into the research profession within the same stratum of business schools are likely to be more similar that their peers socialized in other strata. Consequently, the individual-level data, such as co-authorship network characteristics and mobility, is nested within the socialization structure at a higher level (see Figure 4 below). In this study I examine the cross-level direct and interactive effects of macro- and organizational-level predictors on individual-level outcome, namely the research productivity of individual academics.

Figure 4: Nested structure of the dataset



Academics are selected into each stratum of workplaces based on the quality of their academic origin. Later the prevalent scripts in each stratum influence their behavior, making it more similar within stratum (in comparison with academics from other strata).

Sample

25 US business schools were sampled from the University Texas Dallas (2007-2011) North American ranking of research-intensive business schools, which is based on publications in 24 top journals. As prior studies indicated that top 50 schools contribute to the majority of knowledge production in the field of organizational sciences (Trieschmann et al, 2000), I randomly selected 25 schools from top 50 US schools in the ranking. Only US schools were included to avoid potential bias due to country-level differences in academic career models. I then randomly sampled 20 tenured academics from each school, maintaining the gender distribution inherent to each school. The summary of the sample is presented in Table 5.

Table 5: Sample summary

University	*UTD rank 2011*	*Number of academics sampled*	*Male academics*	*Female academics*
1. City University of New York, Baruch College (Zicklin School of Business)	44	20	15	5
2. Columbia University (Graduate School of Business)	10	20	19	1
3. Emory University (Goizueta Business School)	30	20	17	3
4. Georgia Institute of Technology (College of Management)	34	20	18	2
5. Harvard University (Harvard Business School)	2	20	16	4
6. Massachusetts Institute of Technology (Sloan School of Management)	13	20	17	3
7. Michigan State University (The Eli Broad College of Business)	29	20	15	5
8. New York University (Leonard N. Stern School of Business)	6	20	16	4
9. Pennsylvania State University at University Park (Smeal College of Business)	14	20	18	2
10. Rice University (Jesse H. Jones Graduate School of Management)	40	20	16	4
11. Stanford University (Graduate School of Business)	7	20	17	3
12. Texas A & M University at College Station (Mays Business School)	31	20	17	3
13. University of California at Irvine (Paul Merage School of Business)	43	20	13	7
14. University of California at Los Angeles (Anderson School of Management)	16	20	18	2
15. University of Chicago (Booth School of Business)	5	20	17	3
16. University of Florida (Warrington College of Business)	28	20	18	2
17. University of Houston (C.T. Bauer College of Business)	53[14]	20	17	3
18. University of Illinois at Urbana-Champaign (College of Business)	19	20	17	3
19. University of North Carolina at Chapel Hill (Kenan-Flagler Business School)	25	20	16	4
20. University of Pennsylvania (The Wharton School)	1	20	17	3
21. University of Southern California (Marshall School of Business)	12	20	17	3
22. University of Texas at Austin (McCombs School of Business)	9	20	15	5
23. University of Washington at Seattle (Michael G. Foster School of Business)	33	20	16	4
24. University of Wisconsin at Madison (Wisconsin School of Business)	41	20	17	3
25. Yale University (School of Management)	35	20	17	3
Total		500	416	84

[14] After the elimination of Canadian business schools from the sampling frame the resulting top 50 US business schools are located between the positions 1 to 55 in the UTD ranking.

The information on career history, starting from undergraduate education, was collected from resumes (available on business schools' websites) and from Hasselback's (2014) directory of faculty. Resumes have proved to be a useful source of career data in prior academic career studies (Dietz & Bozeman, 2005) and Hasselback's directories have also been used in the past to get career data for US academics (Boyd et al, 2005). The publication data was retrieved from Thomson Reuters ISI Web of Science, and the co-authorship data was extracted from this bibliometric data. Where the information on doctoral education was unavailable in resumes, I used ProQuest Database of Dissertations to get the date and the school of PhD. I also made occasional use of profiles from the social network LinkedIn to fill in missing categories of data in a resume, but did so only in cases where no other sources of information were available.

Variables

Dependent variable. I was interested in exploring both the volume of research output and the scholarly impact of the published research. Adhering to the general guidelines for the use of bibliometrics to assess research performance (Thomson Reuters, 2008), I decided to perform the analysis using multiple measures of research performance as a dependent variable before comparing the results to see if they were congruent. This is consistent with the approach taken by previous studies in this area (e.g. Podsakoff et al, 2008). In this study I used the most common measures to do so: the number of papers published in peer-reviewed journals/proceedings (including the book chapters), restricting them to publications visible on the ISI Web of Science database; and total citation count as a measure of total scholarly impact.

Arguably the two most popular sources of citation data in the social sciences are the ISI Web of Science and the Google Scholar (from which the data are retrieved via Harzing's Publish or Perish software (2010)). I conducted a pilot study of 650 academics in which I used both of these sources to ensure that the citation data were as complete as possible. In this pilot study, which included less detailed career data and fewer predictor variables, the correlation analysis showed that the citation data from the Google Scholar displays a strong correlation with the same data from the ISI Web of Science ($r=0.821$, significant at $p<0.001$). This meant that I was able to use either of these sources and for the purposes of this thesis I selected the ISI Web of Science, as has been done by the other authors working within this area (Seibert et al, 2014).

The dependent variables displayed a non-normal distribution, as confirmed by the Shapiro-Wilk test ($p<0.001$) and Levene's variance homogeneity test. Consequently, I followed in the footsteps of previous researchers who had found themselves in a similar

situation and log-transformed the numbers of papers and of citations (Cruz-Castro & Sanz-Menendez, 2010; Podsakoff et al, 2008).

Independent variables. I used two measures to assess the research-intensiveness of an organizational environment that provides symbolic & intellectual capital necessary for the development of research productivity. First, I used the research-based rankings by University of Texas at Dallas (UTD) to rank the institutions from which the sampled academics received their PhD degree. UTD North American rankings were used for US and Canadian schools; UTD World rankings were used for all other schools. All the academics in the sample started their careers in different years; in order to address this issue, I have calculated mean UTD rankings based on the data from 2000 (the earliest available) to 2011 (the start of data collection). The use of mean rankings is the best approximation I can achieve, but I admit that the data for 2000-2011 may not capture the earlier fluctuations of the rankings. I acknowledge this as a potential limitation of this study.

Prior literature uses various operationalizations of this measure, e.g. dummy variables (top school or not) (Hall, Mairesse & Turner, 2007), reverse score of ranking (Seibert et al, 2014) and the scaling of ranking (Buchmueller et al, 1999). I have tried three measures – PhD from top 10 schools in UTD ranking (dummy), PhD from top 25 schools in UTD ranking (dummy) and the reverse-coded scaled ranking with 11 scales. In order to get this third measure I split the UTD ranking into 10 groups of 10 schools and added the 11^{th} group which contained the non-ranked institutions. For the ease of interpretation, the scale was reverse-coded, so that schools with UTD rank 1-10 belong to the 11^{th} scale and the schools not ranked by UTD belong to the 1^{st} scale. I further ran the analysis with each of these three measures and picked the one that showed the strongest results in terms of statistical significance – *PhD from top 10 schools* dummy. The results of the analysis for the other two measures of research-intensiveness of PhD are consistent with the results for the chosen measure.

Second, as discussed above, first publishing experience can also become a source of symbolic and intellectual capital. Symbolic capital from the first publication was measured by the quality of the journal where an academic's first paper was published. I chose citation measurement as the tool with which to assess this variable, as doing so allowed consistency to be maintained. Recent research argues that various journal ranking systems based on citation measurement, such as the ISI Impact Factor and Publish or Perish (PoP) h-index, are highly correlated (as seen with the ISI and PoP data collected for business school academics). Based on that research, which also reports that the journal rankings in organizational sciences change very little over time (Cotton & Stewart, 2010), I took the ISI five-year *Impact Factor* (the average number of citations per paper) as the

measure of peer-reviewed journal rank. In order to control for the inflation of the Impact Factor due to the growth of the field of management science (while relative standing of journals is stable, the absolute value of citation rates has experienced dramatic growth in the last decade), I used Thomson Reuters Journal Citation Report 2011 as the sole source of Impact Factors. Where academics in the sample had more than one paper published in the same year at the start of their career, I used the month of publication to determine the first journal in which publication was achieved. Where this information was not available, I selected the higher-ranked journal as the first one, on the basis that a more stringent peer-review process was likely to have a greater impact on a researcher's development.

Intellectual capital from the first publication was measured by looking at the precocity of publishing, or the *time before the first publication* appears in an ISI-visible journal. Early publishing is a signal of high emphasis on research within a PhD program, as well as the sign of a school's ability to motivate and support student in producing publishable research. I measured this variable by calculating the difference between the year of the first publication and the year of PhD completion. As some academics publish earlier than they receive their doctoral degree, this variable can take negative values.

Third, I was interested in the influence of organizational scripts that academics experience in their post-PhD careers. To capture this antecedent of research productivity, I introduced a *weighted rank of all workplaces* variable, which reflects research-intensiveness of post-PhD workplaces. The variable was measured as a sum of UTD research ranks of all post-PhD institutions, weighted by the proportion of time an academic spent working for each institution (see equation 1 below):

$$WeightedRank = \frac{T_1}{\sum T_{1\ldots i}} * UTDRank_1 + \ldots + \frac{T_i}{\sum T_{1\ldots i}} * UTDRank_i \qquad (1)$$

Where $UTDRank = \frac{\sum_{j=2000}^{2011} UTDrank_j}{8}$ and T – is tenure at each workplace *i*[15]

This variable was split into 11-point scale, similar to one of the research-intensiveness of PhD measures explored above.

The stock of social capital that an academic accumulated over her career was measured by several variables. *Co-authorship network size* was measured as the number of unique co-authors with whom a person published her research. This measurement has

[15] UTD ranks are constructed for 5-year periods (i.e. 2000-2005, 2001-2006), this is why the denominator is equal to 8.

previously been used by researchers (McFadyen and Cannella, 2004; McFadyen et al, 2009) in studies that explore the influence of social capital on knowledge creation and provides an accurate picture of the number of direct, non-redundant ties that an academic maintains in collaboration. I used two measures for the strength of ties within the co-authorship network. *Average strength of ties* measures an academic's average frequency of collaboration with her co-authors, similar to the measure used by McFadyen and Cannella (2004)[16]. The *proportion of strong ties* in the co-authorship network measures the percent of co-authors with whom an academic has collaborated more than once[17]. I assume that networks containing higher proportion of strong ties should provide better research support to an academic, and deliver more publications.

Prior academic experience (i.e. mobility in post-PhD careers) was measured by counting workplaces (including PhD school) throughout academic careers, and distinguishing between US and non-US institutions.

Control variables. The control variable *gender* was included in order to capture the possible differences between the career histories of male and female academics. I further introduced the control variable to take the *professional age* of the academics into account[18]. Longer academic careers offer academics more time to make an impact and increase the volume of research (Podsakoff et al, 2008).

Previous studies have also indicated that the degree of competition for the space in high-quality journals differs between discipline areas in organizational science, and that this has a direct impact upon academic productivity (Certo et al, 2010; Podsakoff et al, 2008). In order to capture this phenomenon, I introduced *discipline area* as a control variable. To define the primary discipline area for each academic in the sample I used the Delphi method. Three coders independently assigned a discipline on the basis of resume and publication data (average inter-coder agreement icc_{avg}=0.95), and the differences were discussed between coders, so that the consensus could be reached for each case. Sampled academics were allocated to one of the following discipline area: Accounting,

[16] McFadyen & Cannella have found curvilinear relationship between the strength of ties and research performance in their sample of biomedical scientists. Given the lower extent of collaboration in social sciences, I did not expect this effect to be present in my sample. The supplemental analysis did not find any evidence to the curvilinear relationship between the strength of ties and individual research performance.

[17] I have performed robustness tests, defining strong ties as co-authors with whom an academic collaborated 1) more than 3 times, or 2) more than 4 times. These tests demonstrated that the relationship between this variable and the outcome variables does not depend on the measurement choice.

[18] Following the suggestion of one of the reviewers of a conference submission during my doctoral studies, I have tested the professional age variable for the curvilinear effect (similar to Gonzalez-Brambila & Veloso, 2007), but have not found any significant evidence supporting this hypothesis.

economics, finance, management information systems (MIS), management, marketing, organizational behavior/HR/education, operations research/logistics, and strategy.

Data Analysis

Due to the multilevel nature of the study I used a multilevel mixed modeling (MLM) approach in STATA 13 software to analyze cross-level and same-level effects (Albright & Marinova, 2010; Bliese, 2002; Breugst et al, 2012). Unlike those used in most multilevel studies, the dataset in this chapter was not designed around a specific group structure. The nested structure of the data emerged instead due to the fact that I included both organizational-level and individual-level predictors of individual performance in this research. Given the long-term nature of phenomenon explored in the study, retrospective exploration of faculty's career paths seemed to be a more appropriate research approach than experimental designs used in many multilevel studies (e.g. Breugst et al, 2012). Some of the prior academic productivity studies tracked the career progress of a particular class (e.g. Grimes & Register, 1997). Choosing similar approach would make it possible to design the dataset around the PhD stratification scale. Unfortunately, this approach cannot be replicated outside of North America due to the limited availability of data on PhD graduates of non-North American schools. Given the focus of this thesis on the drivers of research productivity in a new globalized business school industry, I have chosen a research design that allowed comparison between North American and European business school settings (which I will do in later chapters of this dissertation).

Consequently, in order to test the hypotheses, I was forced to group individual data according to the scale of one of organizational-level variables. 500 individuals in the sample were divided into 11 groups, based on the weighed rank of their workplaces, with an unequal number of actors in each. All variables were group-mean centered – a recommended method of centering when the output variable in multilevel research is situated on a lower level of analysis (Dalal & Zickar, 2012). This means that all centered variables represent the extent to which each observation is different from within-cluster mean of this variable, where the cluster is defined as academics with the same average rank of workplaces.

To estimate the relative contribution of organizational-level variables and individual-level variables to the explanation of variance in research performance, I used standardized OLS analysis. Standardized OLS allows a researcher to compare effect sizes independent on the measurement of each variable. Following the conceptual logic of the study, I compare the base model, which includes control variables, with models that include organizational-level covariates only, individual-level covariates only, and both sets of predictors.

RESULTS

Academics in the sample had published an average of 20 papers (median=15) and accumulated 834 citations each over the course of their career (median=367). The descriptive statistics for the other variables is provided in Table 6.

Table 6: Means, standard deviations, and correlations

		Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.	Log(1+Number of Published Papers)	2.80	0.70	1.00													
2.	Log(1+Number of Citations)	5.81	1.55	0.77*	1.00												
3.	Professional age	26.10	11.21	0.35*	0.16*	1.00											
4.	Gender (1= male; 0=female)	0.83	0.37	0.16*	0.06	0.25*	1.00										
5	Discipline area	4.98	2.41	0.08*	0.12*	0.08*	-0.05	1.00									
6.	PhD from top 10 schools (1=yes)	0.43	0.50	0.01	0.09*	-0.02	-0.00	-0.07	1.00								
7.	Impact Factor of 1st Journal	3.18	2.67	-0.02	0.21*	-0.07*	-0.03	0.05	0.02	1.00							
8.	Time before 1st publication	1.74	4.30	-0.15*	-0.19*	0.14*	0.03	-0.07	-0.01	-0.00	1.00						
9.	Weighted research rank of all workplaces (11 items scale)	8.90	1.98	0.10*	0.17*	-0.03	0.02	-0.03	0.24*	0.03	-0.04	1.00					
10.	Co-authorship network size[a]	15.52	12.18	0.72*	0.56*	0.16*	0.07	0.16*	-0.12*	0.03	-0.11*	-0.02	1.00				
11.	Average strength of co-authorship ties[a]	1.62	0.53	0.43*	0.34*	0.05	0.12*	-0.04	-0.04	0.06	0.03	-0.06	0.14*	1.00			
12.	Proportion of strong ties in ego-network	0.30	0.17	0.16*	0.15*	-0.08*	0.07	-0.15*	-0.00	0.05	-0.02	-0.00	-0.02	0.63*	1.00		
13.	Prior experience (number of academic jobs) in the US	2.63	1.01	0.21*	0.17*	0.08*	0.01	0.02	0.01	-0.04	0.05	-0.19*	0.23*	0.05	0.07	1.00	
14.	Prior experience (number of academic jobs) outside the US	0.11	0.36	0.07	0.04	0.02	0.00	-0.00	-0.12*	0.03	0.13*	-0.09*	0.01	0.08*	0.03	-0.12*	1.00

N = 500 Correlations marked with * are significant at least at the 10% level (two-tailed)

[a] - variable winsorised at top 1%

Several features of the dataset are worth particular notice. First, the positive correlation between professional age and gender shows that women in the sample have graduated from PhD more recently than their male colleagues, perhaps because their path to tenured positions in business schools was cleared later than that of male academics. Second, the positive correlation between the rank of PhD and the weighted rank of workplaces confirms the path dependent perspective; graduates of more research-intensive schools on average spend their careers in more research-intensive schools. Third, the negative correlation between the rank of PhD and the size of co-authorship network supports the assumption that academics use collaboration to compensate for lower quality of early-career socialization. Fourth, the positive correlation between prior academic experience in the US and the size of co-authorship network provides tentative support to the idea that mobility is associated with the accumulation of social capital.

The results of the multilevel mixed modeling analysis for *number of papers* are presented in Table 7 below. Model 1 and Model 2 test for the influence of organizational environment on the volume of research. The calculation of ICC from the base model (Model 1) indicates that 2% of variance in volume of research can be attributed to average research-intensiveness of organizational environment where an academic spent her career. This provides support to Hypothesis 1b, which looked at the impact of post-PhD socialization. Hypothesis 1a, which assumed positive association between the research-intensiveness of the doctoral origin and research productivity, received partial support. Early publishing is positively related to the volume of research, but the impact factor of the first journal is negatively related to such volume and the PhD from top-ranked school only shows significant and positive association to the outcome variable when individual-level variables are added to the model (Models 3-4).

Model 3 added the individual-level proactive behaviors of collaboration and mobility as the antecedents complementary to organizational-level predictors of productivity, and tested for the individual-level interactions. Hypothesis 2a is supported, as the size of co-authorship network has a positive curvilinear relationship with the volume of research. Only one measure of tie strength demonstrated significant relationship with the outcome variable; this, however, provides enough support to Hypothesis 2b. The interaction between co-authorship network size and the strength of ties is positive and significant, which provides support to Hypothesis 2c. Hypotheses 3a and 3b also received support; both types of prior experience are positively associated with productivity. Hypothesis 4 received partial support, as only the interaction between the PhD from top-ranked school and the prior experience in the US shows significant and negative coefficient.

Table 7: Results of MLM for log (1+total number of papers)

	Model 1 (base model)	Model 2 (socialization)	Model 3 (two perspectives)	Model 4 (interactions)
Individual-level first-order effects				
Intercept	2.78***	2.74***	2.85***	2.85***
	(0.05)	(0.08)	(0.10)	(0.01)
Professional age		0.02***	0.02***	0.02***
		(0.00)	(0.00)	(0.00)
Gender (1=male)		0.10†	0.04	0.04
		(0.07)	(0.04)	(0.04)
Discipline area		0.02	0.00	0.00
		(0.01)	(0.01)	(0.01)
Co-authorship network size			0.04***	0.04***
			(0.00)	(0.00)
Average strength of co-authorship ties			0.40***	0.40***
			(0.04)	(0.04)
Proportion of strong ties in the co-authorship network			0.03	0.01
			(0.11)	(0.11)
Prior academic experience in the US			0.05***	0.08***
			(0.02)	(0.02)
Prior academic experience outside the US			0.11**	0.15**
			(0.04)	(0.05)
Individual-level interactions				
Co-authorship network size squared			-0.00***	-0.00***
			(0.00)	(0.00)
Co-authorship network size * Average strength of ties			0.01***	0.01***
			(0.00)	(0.00)
Organizational level first-order effects				
PhD from top10 schools		-0.04	0.09**	0.09**
		(0.05)	(0.03)	(0.03)
Time before 1st publication		-0.03***	-0.02***	-0.02***
		(0.01)	(0.00)	(0.00)
Impact Factor of 1st journal		-0.01	-0.01*	-0.01**

	Model 1 (base model)	Model 2 (socialization)	Model 3 (two perspectives)	Model 4 (interactions)
		(0.01)	(0.01)	(0.01)
		Cross-level interactions		
PhD from top10 schools * Prior academic experience in the US				-0.07*
				(0.03)
PhD from top10 schools * Prior academic experience outside the US				-0.11
				(0.10)
Random-effects parameters[19]	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	0.01	0.01	0.09	0.09
	(0.02)	(0.01)	(0.05)	(0.05)
Residual	0.48	0.35	0.10	0.10
	(0.03)	(0.02)	(0.01)	(0.01)
Model fit statistics	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Deviance	1056.565	896.5672	317.6306	311.6734
AIC	1062.565	914.5672	349.6306	347.6734
BIC	1075.214	952.4626	416.9035	423.3555
Pseudo-R^2		0.27	0.61	0.61
N	500	498	495	495

N = 500 individuals (level 1) in 11 groups (level 2). Groups are based on weighted rank of all workplaces scaled as indicated below ([a]).
Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
*** p<0.001 ** p<0.01 * p<0.05 † p<0.1

[19] This part of the table shows the variability of the multilevel model's intercept and slope due to group-level variance.

The results of the multilevel mixed modeling analysis for the *number of citations* (the impact of research) are mostly consistent with the findings for its volume. The key difference between the drivers of research volume and the drivers of research impact consists in the higher importance of organizational environment for producing impactful research. The coefficients for the rank of PhD and for the Impact Factor of the first journal are positive and significant, and 12% of variance in impact of research can be attributed to average research-intensiveness of organizational environment where an academic spent her career. Another difference is related to the interaction between the rank of PhD and prior academic experience: for the impact of research the interaction of top-ranked PhD with experience outside the US is negative and significant, while the interaction with experience in the US is not. The results of the analysis for impact of research are presented in Table 8 below.

Table 8: Results of MLM for log (1+number of citations)

	Model 1 (base model)	Model 2 (socialization)	Model 3 (two perspectives)	Model 4 (interactions)
Individual-level first-order effects				
Intercept	5.71***	5.76***	5.91***	5.89***
	(0.20)	(0.22)	(0.23)	(0.22)
Professional age		0.03***	0.02***	0.02***
		(0.01)	(0.00)	(0.00)
Gender (1=male)		0.02	-0.08	-0.07
		(0.17)	(0.13)	(0.13)
Discipline area		0.06*	0.04*	0.05*
		(0.03)	(0.02)	(0.02)
Co-authorship network size			0.08***	0.08***
			(0.01)	(0.01)
Average strength of co-authorship ties			0.62***	0.61***
			(0.12)	(0.12)
Proportion of strong ties in the co-authorship network			0.26	0.25
			(0.36)	(0.36)
Prior academic experience in the US			0.16**	0.16**
			(0.05)	(0.06)
Prior academic experience outside the US			0.15	0.31*
			(0.14)	(0.17)
Individual-level interactions				
Co-authorship network size squared			-0.00***	-0.00***
			(0.00)	(0.00)
Co-authorship network size * Average strength of ties			0.02*	0.02*
			(0.01)	(0.01)
Organizational level first-order effects				
PhD from top10 schools		0.08	0.32***	0.32***
		(0.13)	(0.10)	(0.10)
Time before 1st publication		-0.07***	-0.05***	-0.05***
		(0.01)	(0.01)	(0.01)
Impact Factor of 1st journal		0.11***	0.09***	0.09***

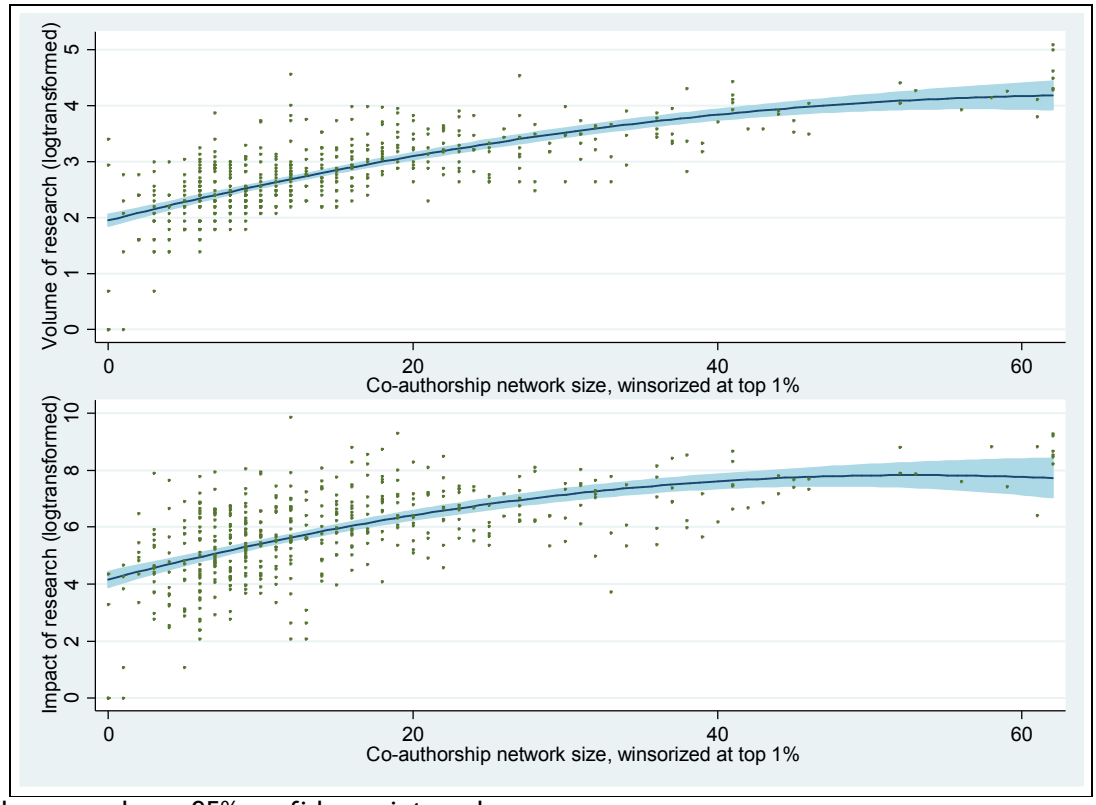
	Model 1 (base model)	Model 2 (socialization)	Model 3 (two perspectives)	Model 4 (interactions)
		(0.02)	(0.02)	(0.02)
Cross-level interactions				
PhD from top10 schools * Prior academic experience in the US				0.01 (0.10)
PhD from top10 schools * Prior academic experience outside the US				-0.50* (0.30)
Random-effects parameters[20]	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	0.31 (0.27)	0.19 (0.15)	0.31 (0.21)	0.29 (0.19)
Residual	2.23 (0.14)	1.80 (0.12)	1.04 (0.07)	1.04 (0.07)
Model fit statistics	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Deviance	1841.047	1720.13	1446.94	1444.206
AIC	1847.047	1738.13	1478.94	1480.206
BIC	1859.697	1776.026	1546.213	1555.888
Pseudo-R^2		0.22	0.47	0.48
N	500	498	495	495

N = 500 individuals (level 1) in 11 groups (level 2). Groups are based on weighted rank of all workplaces scaled as indicated below ([a]). Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
*** p<0.001 ** p<0.01 * p<0.05 † p<0.1

[20] This part of the table shows the variability of a multilevel model's intercept and slope due to group-level variance.

Following recommendations of researchers studying curvilinear effects in management (Pierce & Aguinis, 2013), I plotted the relationship between the co-authorship network size and both outcome variables (see Figure 5 below).

Figure 5: Relationship between co-authorship network size and research productivity



Blue area shows 95% confidence interval

I also calculated the inflection points, which are equal to 67 co-authors in case of the volume and 53 co-authors in case of the impact of research. I concluded the analysis by looking at the relative strength of organizational- and individual-level drivers of individual research performance and the amount of explained variation in outcome variables each of the levels of analysis provides. The comparison of the effect sizes (see results presented below in Tables 9 and 10) shows that collaboration has the strongest effect on productivity, followed by organizational environment and mobility. Proactive strategies show strong complementarity, to the extent that collaboration fully captures any variance explained by mobility (see the R^2 in Models 3-5). A certain degree of complementarity is also present between the organizational-level and the individual-level drivers of research productivity. Taken separately, the organizational-level factors explain 7% of variance in volume of publications and 11% - in impact of publications (difference in R^2 between Models 1 and 2), while the individual-level factors explain 57% variance in

volume and 33% variance in impact (difference in R^2 between Models 1 and 3). Together the organizational and the individual factors explain 60% of variance in volume and 42% of variance in impact of research (difference in R^2 between Models 1 and 6).

Table 9: Results of standardized OLS multiple regression analysis of log number of papers

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control Variables						
Gender (1= male)	0.06*	0.04†	0.01	0.06*	0.01	0.01
	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)
Professional age	0.22***	0.26***	0.16***	0.21***	0.16***	0.17***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)
Discipline area	0.04	0.05†	-0.01	0.04	-0.01	-0.01
	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)
Symbolic & intellectual capital (driven by organizational environment)						
PhD from top 10 schools		-0.01				0.04*
		(0.03)				(0.02)
Weighted research rank of all workplaces (scaled)		0.04*				0.08***
		(0.03)				(0.02)
Time before 1st publication		-0.13***				-0.08***
		(0.03)				(0.02)
Impact Factor of 1st journal		-0.02				-0.04*
		(0.03)				(0.02)
Social capital (driven by proactive behavior)						
Co-authorship network size			0.44***		0.44***	0.42***
			(0.02)		(0.02)	(0.02)
Average strength of ties			0.20***		0.20***	0.21***
			(0.02)		(0.02)	(0.02)
Proportion of strong ties			0.00		0.00	-0.01
			(0.02)		(0.02)	(0.02)
Mobility (driven by proactive behavior)						
Prior academic experience in the US				0.13***	0.03*	0.06***
				(0.03)	(0.02)	(0.02)
Prior academic experience outside the US				0.06*	0.03†	0.05**
				(0.03)	(0.02)	(0.02)
N	500	498	496	500	496	495
Constant	2.80***	2.82***	2.80***	2.80***	2.80***	2.81***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)
F-statistic	24.78***	17.46***	180.95***	20.23***	137.18***	110.30***
Adjusted R-Squared	0.12	0.19	0.69	0.16	0.69	0.73

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
All variables are standardized

Table 10: Results of standardized OLS multiple regression analysis of log number of citations

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control Variables						
Gender (1= male)	0.04	0.00	-0.05	0.04	-0.05	-0.06
	(0.07)	(0.06)	(0.06)	(0.07)	(0.06)	(0.05)
Professional age	0.23***	0.33***	0.14**	0.20**	0.14**	0.19***
	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)	(0.05)
Discipline area	0.17*	0.17**	0.10†	0.17*	0.11†	0.08
	(0.07)	(0.06)	(0.05)	(0.07)	(0.02)	(0.05)
Symbolic & intellectual capital (driven by organizational environment)						
PhD from top 10 schools		0.07				0.18***
		(0.06)				(0.05)
Weighted research rank of all workplaces (scaled)		0.18**				0.25***
		(0.06)				(0.05)
Time before 1st publication		-0.31***				-0.24***
		(0.06)				(0.05)
Impact Factor of 1st journal		0.28***				0.24***
		(0.06)				(0.05)
Social capital (driven by proactive behavior)						
Co-authorship network size			0.75***		0.74***	0.70***
			(0.06)		(0.06)	(0.05)
Average strength of ties			0.29***		0.29***	0.33***
			(0.07)		(0.07)	(0.07)
Proportion of strong ties			0.09		0.09	0.04
			(0.07)		(0.07)	(0.07)
Mobility (driven by proactive behavior)						
Prior academic experience in the US				0.25***	0.07	0.14**
				(0.07)	(0.06)	(0.05)
Prior academic experience outside the US				0.09†	0.03	0.12*
				(0.07)	(0.05)	(0.05)
N	500	498	496	500	496	495
Constant	5.81***	5.84***	5.84***	5.81***	5.84***	5.84***
	(0.09)	(0.06)	(0.05)	(0.07)	(0.05)	(0.05)
F-statistic	6.56***	12.74***	47.78***	6.88***	35.99***	35.94***
Adjusted R-Squared	0.03	0.14	0.36	0.06	0.36	0.46

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
All variables are standardized

DISCUSSION

In this chapter I embarked upon a journey in search of a middle ground between two streams of research on individual performance of academic researchers. The findings of the study, which is set within US research-intensive business schools, provide support to both perspectives and show their complementarity.

The first perspective emphasized the path dependent nature of academic careers and the overarching importance of organizational scripts in supporting research productivity (Bedeian et al, 2010; Buchmueller et al, 1999; Williamson & Cable, 2003; Zubieta, 2009), starting from the early-career socialization in PhD schools. I found that the research-intensiveness of workplaces indeed has a strong positive connection to the volume and the scholarly impact of research. I also found that the graduates of top research-intensive PhD schools are more likely to spend their careers in research-intensive schools; however, the correlation between the research rank of PhD and the average research rank of post-PhD workplaces is not as high as to suggest fully deterministic career paths.

Looking at the quality of the first journal where an academic publishes her work as another consequence of early-career socialization, I see that it is not related to the research-intensiveness of PhD school. I suggest that this might be due to the overarching role of PhD advisor in early publishing choices of doctoral students (Long et al, 1979; Reskin, 1979; Williamson & Cable, 2003). It has to be said, however, that while the Impact Factor of the first journal is positively related to the long-term impact of research, it is negatively associated with the long-term volume of research. This indicates a possible trade-off between the volume and the impact of research. The academics who started publishing in higher-ranked journals might prefer visibility to the number of publications throughout their careers, either because of high level of aspirations acquired at the PhD school, or because early visibility gives them access to research-intensive schools where the bar for the quality of journals in faculty publication portfolio is set particularly high. The recent study by Seibert et al (2014) provides evidence confirming this assumption. In the sample of 119 US management professors they found the research rank of PhD to be positively associated with publications in top journals and negatively associated with publications in lower-ranked journals.

The second perspective suggested that social capital, acquired through collaboration and mobility, is a major driver of research productivity in academia (e.g. Defazio, Lockett, & Wright, 2009; He et al, 2009; McFadyen & Cannella, 2004). The study provides evidence for this assumption and estimates the social capital to be a relatively stronger driver of productivity than socialization. Therefore, proactive behavior may be

instrumental in the careers of those academics who lack socialization in research-intensive environment. At the same time, the curvilinear relationship between the size of co-authorship network and the research productivity demonstrates that the marginal return of working with additional co-authors is likely to diminish when the number of collaborators goes beyond the inflection point (between 53 and 70 co-authors, depending on the type of research outcome). Therefore, the number of collaborative relationships should be balanced with the actual ability of an academic to maintain productive relationships with all collaborators. This is particularly true in relation to the impact of research. The analysis of the relationship between the network size and the volume of research (see top graph in Figure 5) reveals that, despite statistically significant quadratic term in the regression analysis, the scatterplot indicates an almost linear relationship, with the inflection point located beyond the scope of most co-authorship networks in social sciences.

Research-active faculty has another reason to strive for the balance in the structure of their co-authorship ego-networks. While starting a new project, academics have to consider the importance of tie strength before making a decision whether to work with one of their prior co-authors or to engage a new collaborator. One potential consequence might be an increase in the size of co-authorship teams as researchers struggle to expand the network without losing the support provided by the established research relationships. At the same time, given the complex nature of research activities and the traditionally autonomous structure of knowledge creation in the social sciences field (as contrasted with lab-based research in life sciences, for example), the task of managing larger teams of creative people may become a challenge. Findings from the research conducted into other creative industries indicate that collaboration on a larger scale is likely to produce extreme (either very good or very poor) outcomes (Taylor & Greve, 2006). I suggest that studying this potential conundrum and the trade-off between the scope and the depth of collaboration in social sciences may become an interesting avenue for further research.

Academic mobility increasingly becomes a focus of discussion among academic career researchers as another proactive strategy supporting research productivity (e.g. Cruz-Castro & Sanz-Menendez, 2010; Richardson & Zikic, 2007). This study offers controversial evidence in this regard. Although inter-organizational mobility seems to be a driver of research productivity, which is congruent with Mangematin and Robin's (2003) approach to academic mobility as a way of disseminating knowledge, the strength of this driver is rather low relative to the other antecedents. This, however, might be specific to the US environment, which exhibits lower mobility (in particular, lower international

mobility) than other geographical segments of global business school industry. I encourage other scholars to test the assumptions of this study in non-US settings in order to determine the boundary conditions of suggested theory.

Moreover, mobility has a weaker effect on performance for the graduates of top-ranked PhD schools. Specifically, for these graduates mobility within the US has a weaker link to the volume of research, and mobility outside the US has a weaker link to the impact of research. In order to interpret these findings we have to reflect upon the consequences of two distinct career strategies. The graduates of top-ranked US schools who engage in mobility with US are likely to experience downward prestige trend, moving to lower-ranked schools, as this is the most common career trajectory at this market (Miller et al, 2005). In these lower ranked schools they are likely to have higher teaching load, which will leave them less time to produce publications. At the same time, staying in the country will allow these academics to maintain relationships with their co-authors and to keep up with research conversations, which is crucial for producing impactful work. The graduates of top-ranked US schools, who decide to move abroad, are usually hired for their research potential, as a part of non-US schools' strategy of increasing research output. As star assets, these academics are able to negotiate lower teaching loads and other research supports. This leads to the volume of research comparable to their peers who did not expatriate. Relocation, however, brings them to the periphery, and makes it more difficult to communicate with their US-based co-authors. The flow of information from the industry center also becomes less abundant and is somewhat replaced by local information from the country of employment. Studies based on non-US data, while being highly relevant to local market, are sometimes met with suspicion in the reviewing process (Meyer & Boxenbaum, 2010), which may impede their access to the most visible research outlets.

Bringing two perspectives together through micro-foundations lens, I see the development of research productivity in business schools in a familiar but more positive light. Although the initial choice of a high- or low-ranked school does have a strong influence on research productivity by facilitating access to research-intensive environment, the proactive accumulation of resources after graduation is also an important tool that can potentially balance the situation out for those who do not enjoy the advantages of initial anchoring in the top academic stratum. The data shows that the graduates of lower-ranked PhD schools have larger co-authorship networks and are more active in accumulating experience through mobility. As all academics in the sample are tenured in research-intensive US business schools, where research performance is highly valued, there obviously is more than one way to achieve success in academic publishing. The

findings of this study advance the 'new careers' literature, which emphasizes the duality of structure and agency in organizations (Dany et al, 2011; Duberley et al, 2006), by offering quantitative evidence to this predominantly qualitative stream of research.

Key to finding the consensus between path dependence perspective and proactiveness perspectives is the understanding how the organizational and individual-level drivers of research performance together influence the outcome variables. The findings of this chapter deliver several insights of such kind. First, previous studies investigated the link between networks and productivity in the natural sciences (Defazio et al, 2009; He et al, 2009; McFadyen & Cannella, 2004) and among industry inventors (Fleming, Mingo, & Chen, 2007; Rost, 2011) in isolation from the influence of the structure-driven predictors. In the business school industry, initial anchoring in a high- or low-ranking institution becomes an important antecedent of scientific productivity; thus, it was crucial for this particular setting to test the curvilinear relationship in conjunction with reputational predictors. Seibert et al (2014) included both the research rank of PhD and the rank of current workplace in their study of management professors, but decided not to test for curvilinearity. The fact that the ∩-shaped relationship is supported in this chapter points to the significant effect that the size of co-authorship network has on research productivity, even in the socially stratified industries, and even in the presence of other social capital measures. Wider sampling frame used in the chapter also allows generalizing this finding for a range of sub-disciplines with organizational science field, thus addressing one of the limitations of Seibert et al's study.

Second, the value extracted from mobility depends on the starting point of academic career. Interestingly, while the graduates of top-ranked PhD schools in general should have better mobility options, as their early productivity is higher, for them the experience gained through mobility is not as beneficial as it is for their peers from lower-ranked PhD schools.

Another point worth discussing relates to the patterns that I have not found in this dataset. Numerous studies demonstrate that women face greater difficulties in moving up the academic career ladder compared to their male counterparts. As a result, women are forced to adapt their career strategies to contend with the lower mobility and the higher social pressure (Gersick et al, 2000; Sabatier et al, 2006; Smith-Doerr, 2006). Research conducted in other industries also reveals that men and women follow different career patterns as a result of the differences between the perceptions of men and women among colleagues and mentors (Groysberg, 2008). Moreover, recent studies of male and female networks report differences in collaborator choice strategies (Bozeman & Gaughan, 2011) and a lower level of trust within female networks. These two factors both impact

negatively upon social capital creation and this hamper the development of women's careers (Bevelander & Page, 2011). Despite these predictions, the only significant gender-related difference revealed by the data was in the average strength of co-authorship ties, which is significantly higher for male academics. As the strength of ties measures research support, while the number of co-authors measures the access to information, and there is a trade-off between these dimensions of an ego-network, I suggest that female academics in the sample prioritize data, skills and knowledge acquisition through collaboration. I have not found differences in mobility, and all the difference in research performance was captured by the social capital variables. I cannot be sure whether this is the result of self-selection of a particular type of female academics into the cohort of tenured professors, or the consequence of other factors counterbalancing the detrimental influence of gender highlighted in the literature. Further exploration of this matter is necessary to test for possible alternative explanations of the phenomenon.

Implications for the business-school industry

This study demonstrates the significant role that human agency plays in achieving superior performance in the knowledge-intensive industries. This is an important insight for both aspiring and established academics. While the research on academic industry characteristics reveals increasing competition for the space in top-tier journals (Certo et al, 2010) and an overwhelming pressure to publish in these scholarly outlets (Day, 2011; Miller et al, 2011), the traditional view of scientific productivity provides limited opportunities to those who embark upon academic careers from lower strata. The findings of this study offer some encouragement to business schools that are currently placed outside the top stratum, demonstrating the long-term consequences of alternative strategies of resource accumulation and thus facilitating everyday decision-making on the part of research-active faculty.

The findings also inform the decision-making of business-school hiring committees and contribute to a lower information asymmetry in the candidate screening process. Firstly, the configuration of co-authorship network, both in terms of its scope and in terms of the strength of collaboration between co-authors, should be considered a key factor when assessing the potential productivity of applicants. Secondly, separate exploration of factors associated with the volume and the impact of research reveals the nuances of micro-foundations behind research performance in business schools. The volume of research is largely driven by proactive behaviors; organizational factors mainly influence this dimension of performance by enabling early publishing at the beginning of a researcher's career. The impact of research is more dependent on organizational factors; placement in top strata of research-intensive business schools facilitates access to most

visible journals (Crane, 1967) and disseminates knowledge among broader academic audience. Therefore, hiring committees of business schools should consider different dimensions of an applicant's career history, dependent on the strategic goals of an organization. Thirdly, the nuances of relationship between mobility and research productivity, especially pronounced for graduates of top-ranked PhD programs, should be considered when assessing the potential productivity of international applicants whose initial collaboration network is derived from a high-status institution located abroad.

Implications for management education

In the highly competitive environment of today's knowledge-intensive industries it is important to teach our students the value of proactive behavior in knowledge workers' careers. This study provides some empirical evidence that can be applied to the practice of preparing business-school PhD graduates for their future careers. By exploring US academics' careers, I can clearly see that the achievements of these faculty members did not arise predominantly because they were in the right place in the industry at the right time. Proactive strategies of networking and mobility between organizations provided these actors with the access to social capital and made them more productive scholars.

In this respect, my recommendations for business-school curricula would firstly echo those of Bevelander and Page (2011: 638), who argued for "introducing networking theory and practice at the beginning of the educational experience" in order to allow students to reflect upon the implications that networking has in a variety of situations. Secondly, I believe that students would benefit from explicit discussion of the role that the proactive behavior can play in increasing their chances of competing with peers who have more "blue chips" in their resume. Thirdly, given the curvilinear nature of the relationship between network size and productivity, it is important to teach our students how to identify the best collaborators and to manage partnership relations efficiently.

Given the important role that the characteristics of the first scholarly publication play in academic productivity development and the challenges of finding a compromise between publishing early and publishing in a high-quality journal, I believe that doctoral programs should put an emphasis on publishing support systems that would help inexperienced researchers to tailor their first publications for scholarly outlets that would fit their future career and research strategies.

APPENDIX 2: Addressing unobserved heterogeneity issues in the US sample

In organizational science, the relationship between decisions made by actors and the consequences of these decisions can often be explained by variables that influence initial decisions but which are not included in the analysis of outcomes (Bascle, 2008; Hamilton & Nickerson, 2003; Shaver, 1998). Where these variables indeed prove to affect this relationship, there is a possibility that the interpretation of the causal relationship might be biased as the variable that was believed to have caused the result is in fact endogenous or dependent on the omitted variable that triggers self-selection in the sample.

There was a possibility that the retrospective exploration of business-school faculty performance might also be affected by self-selection among academics in the early stages of their careers. Indeed, in their study examining the pairing of PhD applicants and their supervisors, Azoulay et al (2009) found this to be the case. As far as this study is concerned, the choice of top-ranked PhD programs might be influenced by the superior abilities of students, which will eventually manifest themselves as superior scholarly ability and higher research productivity. Empirical evidence supports the theory that a positive relationship exists between high GMAT scores and student performance in graduate programs (Oh, Schmidt, Shaffer & Le, 2008). It is for this reason that this test is used to guide the admission process in many business schools, especially within the North American system of education. However, despite the fact that this test is highly valid, and that this validity prompts the assumption that the most capable students would be self-selected into top programs, there are several reasons which explain why some highly-able future academics would choose (and be chosen for) PhD programs with an inferior status. These include learning disabilities such as dyslexia that prevent some applicants with great research potential from achieving high scores in standardized tests (Miller, 2011), geographical distance from top-ranked institutions (Azoulay et al, 2009), and linguistic and cultural barriers. As a weak paradigm field, organizational science is characterized by high dispersion of talent across organizations (Glick, Miller and Cardinal, 2007). The dispersion is reinforced by cross-national differences in educational systems, which until recently led to the exclusion of most of the non-US schools from mass-media rankings underlying industry stratification systems.

In order to take account of endogeneity in this study I used Heckman's two-step procedure (Heckman, 1979) as recommended in previous studies (Bascle, 2008; Hamilton & Nickerson, 2003; Shaver, 1998). The first step comprises a probit model that predicts the likelihood of an academic choosing a top-ranked PhD program (see Table 11 below). From this model a researcher can obtain a correction factor λ, known as the "inverse Mills

ratio" (Bascle, 2008). In the second step of the procedure, the correction factor is added to the initial OLS regression equation in place of the endogenous variable, and the significance of λ indicates the presence of endogeneity in the sample. I used the program code recommended in the Hamilton and Nickerson study (2003) to perform the procedure in STATA.

Table 11: Heckman's procedure step 1: Probit estimates of top-ranked PhD choice model

	Model 1
Intercept	-0.45*
Rank of first degree institution (11-scaled)	0.05**
Inter-country/inter-state mobility before PhD	0.28*
First degree in business-related discipline area (1=yes)	-0.22†
N	425
x^2 (df)	11.91(3)**

I collected additional data regarding the pre-PhD educational history of academics in the sample to introduce several instrumental variables. The first instrument termed *rank of the first school* is the rank of the institution from which an academic received their undergraduate degree as assessed by the UTD research-based ranking (similarly to the weighted rank of workplaces variable). Higher rank of the first degree might be associated with higher abilities of a potential PhD student, because higher-ranked schools are usually more selective in their admission process (D'Aveni, 1996). The second instrument *pre-PhD mobility* can be interpreted as one of the possible proxies for the degree of motivation harbored by a future academic. Given that it is typical for PhD applicants to search for PhD programs locally (Azoulay et al, 2009), a willingness to become geographically mobile with all the risks that might entail could be an indication of a proactive attitude and the determination to pursue a high-quality education on the part of a young academic. This mobility was measured at state level within the US and at country level beyond US borders. The third instrument was the *first degree in business discipline*, which included a broad range of disciplines related to management and commerce. I assumed that academic competence in a similar subject area would facilitate access to top-ranked PhD programs. Other instruments considered (but not selected) were *a previous undergraduate (or graduate) degree from the same institution, level of education before entering the PhD program*, and *gender*.

The results of my analysis show that self-selection into top 10 PhD programs is not present in the sample, as λ is not significant in any of the models (see Models 3 and 4 in Tables 12 and 13), and its inclusion in the corrected model (Model 2 in Tables 12 and 13) does not change either the sign or the significance of the rank of PhD.

Table 12: Heckman's procedure step 2: Results of OLS multiple regression analysis of log total number of papers, corrected for endogeneity

	Model 1 (base)	Model 2 (corrected)	Model 3 (PhD from top-10 school)	Model 4 (PhD from non-top-10 school)
Control variables Included	Yes	Yes	Yes	yes
PhD from 10 top-ranked schools (1=yes)	0.10** (0.03)	0.09** (0.04)		
Impact Factor of first journal	-0.01* (0.01)	-0.01* (0.01)	-0.01 (0.01)	-0.01† (0.01)
Time before 1st publication	-0.02*** (0.01)	-0.02*** (0.00)	-0.03** (0.01)	-0.02*** (0.00)
Weighted rank of all workplaces	0.04*** (0.01)	0.04*** (0.01)	0.06*** (0.02)	0.03** (0.01)
Co-authorship network size	0.06*** (0.00)	0.06*** (0.00)	0.06*** (0.01)	0.06*** (0.01)
Average strength of ties	0.38*** (0.04)	0.40*** (0.05)	0.35*** (0.07)	0.44*** (0.04)
Proportion of strong ties	0.01 (0.13)	-0.07 (0.15)	-0.17 (0.20)	0.02 (0.19)
Number of unique co-authors squared	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Prior experience in the US	0.05** (0.02)	0.05** (0.02)	-0.02 (0.03)	0.09*** (0.02)
Prior experience outside the US	0.14** (0.05)	0.13** (0.05)	0.11 (0.15)	0.15*** (0.04)
Inverse Mills ratio (λ)		-0.10 (0.12)	-0.35 (0.22)	0.03 (0.14)
Intercept	0.55*** (0.13)	0.45* (0.18)	0.38 (0.33)	0.39* (0.20)
N	495	421	183	238
F-statistic	133.68***	105.84***	34.24***	83.86***
R-Squared	0.76	0.76	0.71	0.83

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 13: Heckman's procedure step 2: Results of OLS multiple regression analysis of log total number of citations, corrected for endogeneity

	Model 1 (base)	Model 2 (corrected)	Model 3 (PhD from top-10 school)	Model 4 (PhD from non-top-10 school)
Control variables				
Included	Yes	Yes	Yes	Yes
PhD from 10 top-ranked schools (1=yes)	0.39***	0.33**		
	(0.10)	(0.11)		
Impact Factor of first journal	0.09***	0.08***	0.07*	0.09***
	(0.02)	(0.02)	(0.03)	(0.03)
Time before 1st publication	-0.05***	-0.05***	-0.03	-0.06***
	(0.01)	(0.01)	(0.03)	(0.01)
Weighted rank of all workplaces	0.12***	0.13***	0.21***	0.09**
	(0.03)	(0.03)	(0.06)	(0.03)
Co-authorship network size	0.11***	0.12***	0.12***	0.11***
	(0.01)	(0.01)	(0.02)	(0.02)
Average strength of ties	0.58***	0.60***	0.36*	0.82***
	(0.14)	(0.15)	(0.20)	(0.20)
Proportion of strong ties	0.29	0.23	0.67	-0.33
	(0.41)	(0.45)	(0.54)	(0.69)
Number of unique co-authors squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Prior experience in the US	0.13**	0.13**	0.11	0.16*
	(0.05)	(0.06)	(0.09)	(0.07)
Prior experience outside the US	0.29*	0.19†	-0.12	0.34*
	(0.14)	(0.15)	(0.32)	(0.17)
Inverse Mills ratio (λ)		-0.23	-0.67	-0.09
		(0.40)	(0.63)	(0.55)
Intercept	1.02**	0.82	0.30	1.03
	(0.40)	(0.55)	(1.03)	(0.64)
N	495	421	183	238
F-statistic	46.12***	37.42***	15.05***	32.21***
R-Squared	0.50	0.50	0.47	0.55

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

CHAPTER 4. STRATIFICATION AND MOBILITY AS THE DRIVERS OF RESEARCH: COMPARING EUROPEAN AND US BUSINESS SCHOOLS

The previous chapter looked at the drivers of research productivity in a single-country context, i.e. in the US. Thirty years ago, the results of that chapter would have been sufficient to understand the main mechanisms underlying the researchers' careers and the development of their professional expertise. Since then, however, the academic profession has become increasingly "peripatetic" (Welch, 1997: 323). Globalization has brought a number of challenges to knowledge-intensive organizations, and one of the foremost of these is increased complexity in hiring. Where a candidate offers credentials from an overseas university or has worked in companies that do not have a global reputation, US-centric heuristics may be ineffective for decision-making. How does one make sense of a resume which has no recognizable markers, no status cues for a recruiter who is not familiar with the stratification system in the country where a candidate has spent her career?

In the case of multinational companies (MNCs), which were the first to face this challenge, a widely used solution was to delegate the task of hiring to local employees or recruiters who were familiar with the hierarchy of educational organizations and could assess the quality of a local track record. This is a viable solution for situations where an employee is hired for a position in a local branch and has no intention to move countries until a later career stage. In such cases, the company could be reasonably expected already to have the internal performance data to support its decision-making in cross-border hiring. In other words, this works where there is no global labor market for entry positions. The situation becomes more complex where employees look for jobs in multiple countries and employers also consider hiring international employees without first "trying them out" in a local branch. This is precisely the situation facing the increasingly globalized business school industry.

International faculty bring new perspectives to both research and teaching, and this helps business schools better serve the needs of a globalized economy (De Meyer, 2012; Welch, 1997). The assessment of international candidates may, however, become subject to unconscious categorization biases, which result in overlooking capable candidates who lack globally visible credentials. As only a relatively narrow stratum of elite organizations (e.g. large MNCs or top business schools) achieve global recognition, these elite organizations are involuntarily assigned the additional role of gatekeepers of international mobility. For obvious reasons, the ability of these top schools to train international students and to employ international faculty is limited by their size and the number of resources available. As a result, a large stratum of international academics

becomes "closed out" of the global labor market, with a potentially detrimental effect on individual careers and on faculty composition in non-top business schools.

Social closure[21] in the academic context results in the worst graduate of an elite school having a larger stock symbolic capital on a labor market than the best graduate of a non-elite school. This limited resource of elite reputation allows top strata to engage in "input creaming" and to deny access to anyone but the very best human resources (students and faculty) (D'Aveni, 1996). In the case of international faculty, the difference between top graduates and everyone else becomes even more pronounced, as only top organizations have global visibility. Non-elite schools, however, would not normally hire most of their faculty from elite business schools. Therefore, if the value brought by international faculty is to be captured by non-elite schools, these schools need to learn how to recognize capable non-elite candidates on the global market.

This chapter explores the European multi-country business school environment and compares it to the single-country US context examined in Chapter 3. The existing literature in academic research productivity is still predominantly focused on US academics (e.g. Buchmueller et al, 1999; Park & Gordon, 1996; Williamson & Cable, 2003), which is understandable given the dominance of US scholars within the field of business studies. The majority of the studies exploring research productivity in the European context are set within one national environment. For instance, Cruz-Castro and Sanz-Menendez (2010) study Spanish researchers, Rotolo and Petruzzelli (2013) explore the productivity of Italian scientists, and Kelchtermans and Veugelers (2011) examine productivity trends in one university in Belgium. Similar studies have also been carried out in the UK (Zubieta, 2009) and France (Carayol & Matt, 2006). A few studies using multi-country samples focus on a particular distinct population of researchers, such as past editors of top journals (Aguinis et al, 2010) or business ethics scholars (Albrecht et al, 2011). As a result, the issue of stratification in the multi-country context has not yet been salient in the academic productivity literature. In this chapter, I focus on international mobility and industry stratification as two distinct features influencing the careers and research productivity of faculty in the globalized business school industry.

This chapter seeks to make several contributions. First, I contribute to studies of academic stratification (e.g. Azoulay, Stuart & Wang, 2014; Burris, 2004; Miller et al, 2005) by exploring the impact of underdeveloped stratification on the relationship between the symbolic capital of educational origin and the individual performance of knowledge workers. Second, I advance the literature on self-initiated expatriates (e.g.

[21] Social closure is defined as "the process by which social collectivities seek to maximize rewards by restricting access to resources and opportunities to a limited circle of eligibles" (Parkin, 1994: 143).

Horta et al, 2010; Jepsen et al, 2014; Richardson & Zikic, 2007) by exploring different patterns of international mobility within the European business school environment and linking these patterns to the role of stratification in academic careers and to individual research productivity. Third, as a practical contribution to the development of global stratification in the field of organizational science, I construct a research-based ranking of educational institutions using publications that appeared in the 150 top ISI-listed business and management journals between 2007 and 2012. In doing this, I address a measurement issue present in the research productivity literature by offering a means to assess the research-intensiveness of a broad range of business schools worldwide. This measure is relevant for academic career researchers and other studies set in a non-North American context (e.g. Cruz-Castro & Sanz-Menendez, 2010; Gonzalez-Brambila et al, 2013, He et al, 2009, Rotolo & Petruzzelli, 2013).

Adler and Harzing (2009) call for changes in business school ranking systems to allow them to better reflect the growing multifaceted nature of global management research. Given the increasing competition for the limited amount of space in top journals (Certo et al, 2010), it is unlikely that the majority of business school academics would be able to limit their publishing portfolio to A-list publications. Most business schools (except perhaps a few elite institutions) would produce research in a wide variety of peer-reviewed journals, which might allow them to disseminate knowledge among a broader audience of scholars and practitioners. Thomas and Wilson (2011) report that only 15 UK schools (out of 90 that took part in RAE 2008 within the business and management studies unit of assessment) managed to publish a paper in one of 24 top journals used by the University of Texas at Dallas (UTD) ranking. Rankings that reflect the research-intensiveness of such non-elite schools should therefore be based on a more representative sample of research outlets than the usual 24 journals used by the University of Texas at Dallas or the 45 journals used by the *Financial Times* ranking. As the first, and necessary, step towards the analysis of research productivity of European academics in this chapter, I construct a research-based ranking of educational institutions based on a broad range of journals and compare it to other rankings in the field.

CONCEPTUAL BACKGROUND

Stratification and research productivity

Stratification is defined by sociologists as "a system of institutionalized inequality" (Grusky, 1994: 12) whose main purpose is to motivate individuals to fill positions in a social structure and to perform their duties as required by society. Stratification achieves this motivation by allocating an unequal proportion of rewards to different strata, depending on the nature of the tasks which the strata have to perform (Davis & Moore,

1994). On an organizational and an individual level, stratification (or, in the language of social psychologists, social categorization) is used as a sensemaking mechanism that provides cognitive shortcuts in decision-making processes (Bodenhausen, Kang & Peery, 2012). In many ways, stratification is similar to the formation of strategic groups, which also serves as a sensemaking schema imposed upon industry by its participants (Reger & Huff, 1993). The difference between stratification and strategic grouping is similar to the difference between categorical and ordinal variables. Strategic groups are more categorical in nature, as their formation is based on the similarity of strategies within a group (McGee & Thomas, 1986). Members of strategic groups are mostly concerned with binary classification, i.e. defining whether another organization belongs to the same strategic group (and therefore may be considered a competitor or a role model) or not. Stratification usually assumes ordered grouping according to some measurement scale (e.g. income, education or, as in this thesis, the research output of a business school). Actors within a stratum often have similar strategies that allow them to stay in this stratum, which may lead to overlaps between mapping based on stratification and mapping based on strategic groups. For example, on an individual level, parents with a particular level of education[22] tend to aspire to a similar or higher level of education for their children (Erikson & Jonsson, 1996, cited in Arum, Gamoran & Shavit, 2007). On an organizational level, high-performing companies are under pressure to show consistently high financial results (Mishina, Dykes, Block and Pollock, 2010), which may lead to the increasing isomorphism of structures and strategies in search of legitimacy-related rewards (Heugens & Lander, 2009).

Once stratification is established, ingroup identity emerges within strata, created through mechanisms of social identification (Billig & Tajfel, 1973). This ingroup identity leads to ingroup bias, which leads to a more favorable perception of actors sharing the same identity (Brewer & Brown, 1998; Ellemers, Spears & Doosje, 2002). Several studies provide evidence of this bias for the expert assessments within the field of organizational science (e.g. Peters, Daniels, Hodgkinson & Haslam, 2014; Serenko & Bontis, 2011). In the context of academic hiring, ingroup bias may result in less favorable perceptions of the members of other strata (especially those belonging to lower-ranking strata) where they attempt to join the focal strata. An unconscious preference for similar others, known as homophily, is directly related to social closure in hiring processes in academia (Burris, 2004). As a result, resources required to support research productivity are allocated

[22] This is particularly true for the graduates of elite universities (e.g. Ivy League universities in the US, Oxbridge universities in the UK, and Grandes Écoles in France), who consider socialization in these schools to be a source of important social and cultural capital and a proven path towards successful career in politics and business (e.g. Dacin, Munir & Tracey, 2010).

proportionally to the research rank of academic origin, in a way that those coming from higher strata (according to the research-intensiveness of a given school) have preferential access to workplaces in higher strata. As this provides them with superior research support relative to other strata, the mechanism of accumulative advantage is triggered, which leads to the increased rigidity of career paths and creates barriers to upward mobility between strata. Therefore, the nature of industry-level stratification is directly related to academics' individual-level research productivity in that access to research-intensive workplaces, where the research dimension of performance is supported by lower teaching loads and higher financial incentives, is regulated.

Research on social cognition argues that in "situations characterized by low motivation or opportunity for thoughtful individuation … a single category will often come to dominate social impressions" (Bodenhausen et al, 2012: 327). While the choice of a future colleague is supposed to be driven by a thorough assessment of her credentials, the selection of candidates for academic jobs is often carried out by busy faculty members who do this alongside their other research, teaching, and administration duties (Adler & Harzing, 2009). Therefore, it is reasonable to assume that when hiring a researcher, the decision-making of busy committee members mostly relies upon research-related categorization. Personal interviews may add depth to the assessment, but the initial shortlisting process is based on the processing of resumes which are searched for cues that point towards a certain stratum or category.

To understand how stratification influences everyday decision-making in the academic hiring process, it is useful to look at the categories that stratification introduces into the cognitive schema of hiring committees. Through social categorization, hiring committees distinguish candidates as belonging to the same stratum (ingroup candidates) or otherwise (outgroup candidates) (Billig & Tajfel, 1973; Brewer & Brown, 1998). Ingroup candidates (Category 1) are perceived as having similar values and experiences, and thus represent low-uncertainty cases. Hiring committees have clear expectations as to the future research performance of such candidates, based on committee members' own experience. Among outgroup candidates, existing industry stratification makes it possible to distinguish between those from higher strata (Category 2) and those from lower strata (Category 3). In their experimental study, Kane et al (2005) found that groups were more likely to adopt external knowledge from outgroup members if this knowledge was superior to their own, which means that outgroup members are stratified on the basis of observable characteristics. The candidates from higher strata (Category 2) are perceived as desirable; hiring committee members have high expectations of their future productivity. These expectations may in fact be exaggerated, as the members of higher

strata are judged by outsiders (members of lower strata) on the basis of the performance of the most visible members of the strata (rather than the actual average performance within higher strata). This is particularly true where contact between strata is limited and the hiring committee is relatively unfamiliar with the population of higher strata members (Bodenhausen et al, 2012). Candidates from lower strata (Category 3) are usually perceived as undesirable due to low expectations as to the quality of their training and, consequently, their future research productivity. Where existing stratification fails to provide cues for categorizing candidates, they are allocated into unknown strata (Category 4) and are perceived as high-uncertainty cases. Hiring committee members do not have any reference points to form their expectations, and generally find these candidates hard to assess. In the best-case scenario, a candidate's background may be assessed on the basis of the performance of several visible individuals from the same background who published in top journals or participated in international conferences. This assessment is far from objective.

In a single-country context, most schools usually fit within Categories 1-3, as the information on the relative standing of research-active organizations is exchanged through mass media and formal and informal networks. In the case of large educational markets, such as the US, Category 4 schools may appear among lower strata, because no research-based ranking has as yet assessed the relative research-intensiveness of schools that cannot make it into the top 100. These schools are still stratified using the Carnegie classification, accreditations (e.g. AACSB), and mass-media rankings, but this stratification is not aligned with the need of organizations to assess researchers or with the need of researchers to assess potential workplaces. This chapter seeks to address this gap by creating a broad ranking that stratifies educational institutions on the basis of publication in the top 150 journals in the area of business, finance, management, and public administration; for example, more than 700 US institutions are stratified by this ranking.

Within the global business school industry, the increasing trend towards the international mobility of faculty means that the need to assess candidates coming from unknown strata becomes more prominent. Similarly, the increasing number of researchers has to consider potential workplaces from Category 4. Meanwhile, most of the existing global rankings lack "depth" within each country, usually making only a handful of elite schools visible on an international labor market. Moreover, while the North American branch of management academe has a tradition of frequent interaction through multiple conferences, meetings, and research events, European countries have only recently started to engage in international communication. Exchange programs such as Erasmus Mundus have supported student mobility across borders, but research-driven faculty

communication has not reached the same scope. For example, the European Group for Organisational Studies (EGOS), one of the largest and most respected networks of primarily European researchers, had 2,100 members in 2014,[23] compared to the 17,500 members of the Academy of Management, of which 10,000 come from North America.[24] To reinforce this comparison, it is worth noting that the total population of Europe is almost 40% larger than that of North America.[25] The lack of communication prevents contact between strata and places more organizations in Category 4 on a global labor market.

Underdeveloped stratification in multi-country context: the case of the EU

The findings of the previous chapter supported the assumption that the symbolic capital of academic origin plays an important role in supporting research productivity. Underlying this assumption is the idea of an established hierarchy or industry stratification, which helps to distinguish between institutions that are able to provide high-quality professional socialization for future researchers and those institutions that are less able to do so (Bedeian et al, 2010; Miller et al, 2005; Smith-Doerr, 2006). Such an established hierarchy is less likely to exist in multi-country contexts, as the globalization of business education is still a relatively recent phenomenon. While accreditation bodies and mass media were the first to stratify the global field, their stratification systems do not reflect solely a research dimension. Stratification on the basis of research is relevant at an organizational level for the selection of international faculty and, at an individual level, for making international mobility-related decisions. The existing global rankings of business schools usually provide information on the relative standing of the top 100, or, at best, the top 200 elite institutions worldwide, rendering all the others invisible to recruiters and potential candidates abroad. In this thesis, the type of stratification that provides only a binary distinction between the top stratum of globally visible organizations and the non-top stratum of the remainder is termed “underdeveloped stratification”.

The European business school environment differs from the North American business education sector in several significant ways (Antunes & Thomas, 2007). Among the most prominent differences are the multinational nature of European students and faculty, the higher diversity of educational practices across European nation states, and the weaker brand identity of business schools resulting from their scarce presence in the existing industry rankings. This makes the European market of business education one of the most representative examples of multi-country contexts with underdeveloped stratification. Since the early 1990s, the European business school industry has been under

[23] http://www.egosnet.org/egos/about_egos
[24] http://aom.org/Member-Services/Member-Statistics.aspx
[25] http://www.worldpopulationstatistics.com/

increasing pressure to globalize. The globalization trend in business education was predominantly driven by standards set in the North American system. As a result, the growing number of European researchers began to play a "publish or perish" game in order to maintain the marketability of their resumes (Ozbilgin, 2009; Sousa et al, 2010). European business schools, in their turn, were interested in hiring employees that could produce internationally visible publications and meet the accreditation and funding thresholds set by their owners (be they public or private schools) (Adler & Harzing, 2009; Engwall & Danell, 2011). Accreditation and funding serve as sources of legitimacy for European business schools, and are directly related to the number of resources that the school can attract on the "hyper-competitive" market of business education (Thomas & Wilson, 2011). It is important, therefore, to understand the factors driving academics' research performance in European business schools and the influence that the underdeveloped global research stratification system may have on this performance.

On an individual level, the careers of faculty in European business schools have several characteristics that distinguish them from the careers of their North American colleagues. First, the US context is characterized by the low international mobility of faculty due to the large size of the domestic labor market and its central position in the global business school industry. On the basis of his survey of academic mobility, Welch (1997) reports that US academics lack international vision and place a lower value on contact with foreign scholars. Europe, meanwhile, is more prone to international mobility, as some European countries have a small domestic market that cannot accommodate the demand for permanent positions. Moreover, EU policies facilitate mobility between countries by lowering immigration, legal, and some other infrastructural barriers. As a result, European business schools have focused on cultivating an international outlook as a distinct competitive advantage of their programs (Antunes & Thomas, 2007). The pattern of mobility in researchers' careers may therefore be different for US and EU academic researchers.

Hypothesis 1a. Mobility within the country of PhD is more prominent in the career patterns of US academics than in those of EU academics

Hypothesis 1b. Mobility outside the country of PhD is less prominent in the career patterns of US academics than in those of EU academics

Second, in the US and Canada, most candidates for faculty positions come from a clearly stratified academic background, i.e. from schools that have a stable position in the established research-based hierarchy. There is a certain inflow in international faculty to whom this does not apply, but as the sample of 500 US academics examined in Chapter 3 included only 2% with a non-US PhD, on the basis on those data I can only conclude that

applicants with non-US PhDs have not yet been successful in entering the top strata of research-intensive schools in the US. In Europe, faculty mobility across country borders is more frequent, but no means to assess applicants from other countries has as yet been perfected. Due to its multi-country nature, the European business education market has not yet developed a widely recognized hierarchy that would enable hiring committees in, say, a German business school to have a clear idea of the quality of research socialization for candidates from Italy, Sweden or Belgium. As discussed earlier in the thesis (see Chapter 2), the research-intensiveness of doctoral origin is a source of symbolic and intellectual capital that facilitates access to research-intensive post-PhD workplaces and eventually supports research productivity. Miller et al (2005) study different models of mobility in academics' careers and find the accumulative advantage model to be the best explanation in a sample of US academics. According to this model, the symbolic capital of the academic origin sets the foundation for researchers' careers in North America (Azoulay et al, 2014; Bedeian et al, 2010). This symbolic capital might not manifest itself equally strongly in Europe due to the higher proportion of what I termed Category 4 candidates (candidates from unknown strata) above. It is, therefore, necessary while studying European academics to take into account the ability of their potential employers to recognize the symbolic capital that these academics acquired during their PhDs.

As stratification is closely interrelated with mobility patterns in academic careers, the rest of this section will examine its role for each of three main groups within European faculty, which have different experiences of international mobility. First, academics who received their PhD in North America are likely to be perceived as belonging to higher strata due to the dominant role of North American scholars and their practices in the organizational field. These scholars would be hired with an expectation to produce high research outcomes and to share the tacit knowledge received during socialization in the US or Canada with their European colleagues.

Hypothesis 2a. Having a PhD from North America facilitates access to more research-intensive workplaces.

Being hired as highly valuable research-focused human capital, academics educated in North America are more likely to receive resources for research (both in terms of teaching load and financial support). Together with the benefits extracted from socialization, this should lead to higher research outcomes in comparison with their colleagues educated outside of North America.

Hypothesis 2b. Having a PhD from North America is positively related to research productivity among European academics.

The second group consists of academics who chose nationally bounded careers within the country where they received their PhDs. In general, they should not experience any additional challenges in communicating the value of their doctoral origin. National-level stratification guides hiring decisions and career choices within this category, at least where the hiring committees consist of academics with experience within the same country, although the increased internationalization of faculty might eventually make the fit between a candidate's background and that of hiring committee members more difficult to predict. For example, Saunders et al (2011: 401) report that "the UK's leading business and management researchers tend to be non-locals trained outside the UK".

Given the small number of European schools in the top strata of research-intensive workplaces, and the even smaller number of top-ranking schools in any given European country,[26] for most European academics educated in these schools the only direction of mobility within the same country is downwards. As Europe has a less stringent policy on hiring "home" students, academic inbreeding should be more frequent for the graduates of top European schools choosing not to move abroad.

Hypothesis 3a. Among European academics with nationally bounded careers, the graduates of European top research intensive schools are more likely to be employed by the school of PhD origin straight after their PhD as compared with the graduates of non-top research-intensive schools.

Where the graduates of top European research-intensive schools decide to move to another workplace with lower research-intensiveness, professional socialization within the PhD institution remains the main source of intellectual and symbolic capital driving research outcomes. Assuming that Hypothesis 3a is true, for the graduates of non-top European schools places in top schools are scarce, as there are not many of these schools and they intensively hire their own graduates. Overall, a degree from a top-ranking European school gives an advantage to researchers which is not likely to be counterbalanced by the research-intensiveness of post-PhD workplaces.

Hypothesis 3b. Among the graduates of European top research schools with nationally bounded careers, the research-intensiveness of PhD origin has a more important influence on research productivity than the research-intensiveness of post-PhD workplaces.

Third, the most intriguing group of European academics includes researchers educated outside of North America who experienced international mobility in their careers. These academics could be categorized as belonging to unknown strata by their potential

[26] Research ranking in this chapter includes 19 European schools in the top 100 of research-intensive schools: 10 in the UK, 6 in the Netherlands, 1 in France, 1 in Denmark and 1 in Italy.

employers. One way to avoid the negative consequences of this categorization is to ensure that the institution of doctoral origin belongs to the most visible strata of non-North American schools. Europe now has a significant number of research champions that share top positions with the best US and Canadian schools.

Hypothesis 4. In the careers of internationally mobile European researchers, a PhD from a highly visible non-North American school is a strong positive driver of research productivity.

Another way to communicate the value of a doctoral degree and to gain access to a research-supportive environment is to demonstrate sufficient intellectual capital in the form of an early-career portfolio (Bonnal & Giret, 2009). The lack of information on the research environment in the institution of one's doctoral degree is compensated by the assessment of intellectual capital transferred by the institution, and measured by the speed and quality of publications.

Hypothesis 5. In careers of internationally mobile European researchers, early-career intellectual capital is a strong positive driver of research productivity.

Stratification of the global business school industry

There have been multiple attempts to create rankings that would position schools according to their research performance within the field of organizational science, both at the national and at the global levels. Table 14 below provides a brief overview of these rankings. These rankings are not constructed on a disciplinary basis (e.g. Albrecht et al, 2011); they include an output of a broad range of sub-disciplines to which a diverse business school faculty might make a contribution. Some of the rankings have been created once (e.g. Linton, 2012a; Trieschmann et al, 2000), while others are updated annually (e.g. the Leiden ranking, UTD rankings).

While all of these rankings have proven their value, most of them do not serve the purpose of being a basis for the stratification of the business education industry on a global level. In developing this thesis I realized that it was not possible to sample European research-intensive schools in the same manner I have sampled US business schools in the previous chapter. Where in North America the University of Texas at Dallas provides an annual ranking of research-active schools, the only ranking that included any significant representation of European business schools was based on publication data from 1992-2005 (Mangematin & Baden-Fuller, 2008). Given the rapid growth of the field of organizational science, I could not be sure that the standing of non-North American schools has remained constant since that time. For the ranking to serve as a guide for decision-making by organizational researchers globally, it has to satisfy several conditions. First, it has to focus on organizational science research, because business schools and

management departments are most often separate entities and even within the university system they are assessed separately from other social science departments. Second, it has to be based on recent publication data, because organizational science is a highly dynamic field, and a ranking based on publications from 10 years ago might not reflect the current standing of a given organization. Third, it has to have global scope, with significant representation of more than a couple of countries, because the business school industry is no longer limited to the North American or even English-speaking countries. Fourth, it has to provide information that allows the creation of meaningful hierarchies at the global and national levels. While there may be different opinions on this matter, I would also echo Adler and Harzing (2009) in assuming that the ranking has to be based on a broad list of journals; otherwise, its results are instrumental solely for an elite group of schools that may focus on publishing in top journals.

All of the rankings in Table 14 fail to some extent to address at least one of the conditions listed above. The most obvious flaws include the use of narrow lists of top journals and the resulting underrepresentation of non-North American institutions in the ranking. Thomas and Wilson (2011) argue that as the ranking developed by the University of Texas at Dallas on the basis of 24 journals includes only one UK business school, it does not say much about the national hierarchy of research-intensive schools within the UK. Another major empirical challenge associated with existing rankings is the overall number of institutions included in them. In the current globalized business school industry, there are thousands of educational institutions contributing to the field of organizational science. While it is true that a small number of top schools produce the majority of all research published in the most visible journals (Trieschmann et al, 2000), it is also true that new research champions are emerging in Europe and Asia/Australia (Mangematin & Baden-Fuller, 2008; Thomas & Wilson, 2011). Existing rankings do not offer much help when it comes to assessing the quality of professional socialization of anyone who has been educated or employed by an organization that did not make it into the top 100 (or the top 215 in case of Mangematin and Baden-Fuller's ranking). Meanwhile, it is unlikely that there is no significant difference between an institution with a research output just below the threshold of the top 100 and an institution producing no ISI-visible research. For example, as seen from the ranking developed in this chapter, Peking University (rank 128, output 161.6[27]), University Complutense Madrid (rank 344, output 49.9) and University Addis Ababa (rank 1293, output 3.4) all fall below the threshold of the top 100, but produce a significantly different amount of research.

[27] The output is calculated as the number of papers published weighted by the average impact factor of a corresponding journal.

In some business school markets, for example in Europe, the majority of applicants for faculty positions have been educated at or worked for universities not covered by any of existing rankings of research-intensiveness. While some local rankings might exist (e.g. RAE in the UK and VSNU in the Netherlands), it is still challenging for hiring committees to compare local applicants with applicants from other countries. Two of the rankings listed below, the QS World University ranking and the CWTS Leiden ranking, include more than 500 institutions, and might fill the gap in stratification. The QS Ranking, however, is only partially based on publication data, and measures scientific prestige rather than research-intensiveness. In its turn, the Leiden ranking provides data on the social sciences in general, without narrowing it down to the organizational sciences. Baden-Fuller & Ang (2001) demonstrated in their study that these two classifications are distinct, and that business schools rely upon the hierarchy within organizational sciences, ignoring organizational status within the field of social sciences.

The ranking developed in this chapter follows the methodology developed by Mangematin and Baden-Fuller (2008) and might be considered an improved update on their ranking. While the primary purpose of the ranking was to serve as a guide in the selection of European research-intensive schools for this chapter and for Chapter 5, the ranking has a standalone value as a tool for the stratification of educational organizations contributing to organizational research worldwide. It is based on publications in 150 top ISI journals in organizational sciences for the period between 2007 and 2012 inclusive, thus satisfying the first two conditions listed above. The top 100 organizations are presented further in this chapter and are compared to other existing rankings. The full ranking[28] includes 2590 universities and business schools in 105 countries, providing an in-depth insight into the research performance of a large number of schools which are "invisible" in other rankings, and satisfying the third and fourth conditions mentioned earlier in the chapter.

[28] The full ranking table will be made available to the examiners.

Table 14: Overview of existing research-based rankings of business schools (in alphabetical order)

Ranking	Year/data	Number of institutions	National/global scope	Basis (number of journals, where applicable)	Comments
ARWU Shanghai Jiao Tong	Annual, latest 2013	200	Global	Papers in ISI (Economics/business) – 25% score; Nobel prize for economics (faculty and alumni) – 25% score; papers in top 20% journals - 25% score; highly cited researchers – 25% score	Biased towards prominent institutions and top journals
Baden-Fuller et al (2000)	Based on data from 1995-1998	244	Global (19 countries/regions in Europe)	32 top journals	Narrow scope of journals
Baden-Fuller and Ang (2001)	Based on data from 1995-2000	40	European	32 top journals	Narrow scope of journals
CWTS Leiden Ranking	Annual, latest 2013/14	750	Global	ISI journal publications	Does not rank organizational sciences per se, ranks social sciences
Linton (2012a)	Based on data from 2010	100	Global	45 high-impact journals and 45 FT journals	Narrow scope of journals, low representation of non-North American schools
Mangematin and Baden-Fuller (2008)	Based on data from 1992-2005	214	Global	149 journals	Broad range of journals, not up to date
Podsakoff et al (2008)	Based on data from 1981-2004	100	Global	30 journals	Narrow scope of journals
QS World University rankings	Annual, latest 2013/14	642	Global (61 countries)	Survey of faculty, Scopus five-year citations per faculty - 20% of score	Only 20% of score is based on research output, mostly measures reputation/status
RAE	2008	90	National (UK)	Expert panel assessment	Local scope
Ryazanova (2014)	**Based on data from 2007-2012**	**2590**	**Global**	**150 journals**	**Broad range of journals, recent data**
Trieschmann et al (2000)	Based on data from 1986-1998	50	National (USA)	20 top journals	Local scope, only top journals
University Texas Dallas North American	Annual, latest 2013	100	US and Canada	24 top journals	Narrow scope of top journals
University Texas Dallas World	Annual, latest 2013	100	Global (12 countries)	24 top journals	Narrow scope of top journals

METHODS

Step 1: Ranking methodology

The ranking that I constructed in this chapter seeks to fulfill several criteria discussed in earlier sections, such as: a) focus on the field of organizational science; b) global scope; c) depth of stratification in terms of a number of visible organizations, and d) recent data. As a basis, I took the ranking methodology developed by Mangematin and Baden-Fuller (2008). This ranking was lauded for representing the global profile of the business school industry (Adler & Harzing, 2009) and also happens to be the broadest of the business and management-focused rankings.

In order to choose the journals for this business school ranking I downloaded Thomson Reuters Journal Citation Reports (JCR) for 2006-2012, 2006 being the first year not covered by Mangematin and Baden-Fuller's ranking and 2012 being the last year available. Mangematin and Baden-Fuller (2008) used the categories Business, Business Finance, Management, and Public Administration. I used the same categories to produce a ranking which can be consistently compared to theirs. The data from the JCRs was aggregated and the mean impact factor (IF) was calculated for each journal. The top 150 journals by average $IF_{2006\text{-}2012}$ were then chosen for the ranking. Where publication data were not available from the ISI web of Science, the journal was excluded and replaced with the next journal on the list.[29] Three of the journals (*Journal of Accounting Research*, *Corporate Governance*, and *Human Resource Management*) appeared twice due to changes having been made to their titles, so these were merged and three new journals were added: *Entrepreneurship & Regional Development*, *Mathematical Finance*, and *MIT Sloan Management Review*.

The number of journals chosen for the ranking is the result of a compromise between my aim to cover at least the same number of journals as Mangematin and Baden-Fuller (their ranking was based on publications in 149 journals) and the time limitations associated with the processing of a large amount of bibliometric data.[30] The resulting list of 150 journals (see Appendix 3) contributes to more than 80% of all citations accumulated by JCR-listed journals in 2006-2012, and includes all journals with an average IF of 1.12 or higher.

For each of the journals on the final list I collected publication data from the ISI Web of Science (using the *Analyze Results* function). Only research papers and reviews

[29] For example, *IMF Economic Review* was replaced by *Transformation in Business & Economics Journal*.

[30] For example, the raw dataset of publication data for 150 journals (grouped by organizations) included 5517 records that had to be manually cleaned up.

were included in the publication output. The data were grouped by organization and collected for two consecutive three-year periods: 2007-2009 and 2010-2012. The number of papers published by each organization was weighted by the average IF of a relevant journal in each of these three-year periods. Multiplying the number of papers on the IF of a respective journal makes it possible to account for the visibility of publications to the scientific community. It also means that the strategy of publishing fewer papers in highly visible journals, as pursued by elite schools, can be balanced with the strategy of publishing more papers in lower-ranking outlets, as pursued by everyone else (Seibert et al, 2014). The formula for weighted research output in a given three-year period for the number of journals *j* is provided below:

$$WeightedOutput_{2007-2009} = \sum_{j=1}^{150} NumberOfPapers_{j\,2007-2009} * \frac{(IF_{j\,2007} + IF_{j\,2008} + IF_{j\,2009})}{3}$$

The data were then aggregated into two datasets. The first included the count of papers published in 2007-2009 and the same count weighted by the average IF of each journal in 2007-2009, grouped by organization. The second dataset included the count and the weighted count data for 2010-2012. Following the example of prior studies, I use the whole count measure of papers for allocating publications to organizations (rather than a fractional count to account for co-authorship) (Mangematin & Baden-Fuller, 2007; Trieschmann et al, 2000). The whole count method assumes equal recognition of all institutions that appear on the paper; this method is almost always used by Thomson Reuters (Pendlebury, 2008). Using a fractional count, which, for example, would allocate half of a publication to a school if a paper were co-authored by two academics from different institutions, might allow me to account for knowledge input better than whole counts, but such fine-grained data are not available in ISI Web of Science. Meanwhile, given the size of the dataset, it was not feasible to open each paper and account for the proportion of co-authorship. Moreover, the fractional count method assumes an equal contribution from all authors, which allows the use of a simple average in assigning an equal proportion of a paper to each co-author (Pendlebury, 2008). In practice, co-authors may have different input into the project, which makes the weighting of credit a tricky and potentially divisive task (Floyd, Schroeder, & Finn, 1994). Despite this, I acknowledge the choice of a whole count method as a potential limitation of this ranking methodology.

The main ranking is based on weighted output, and is calculated as an average rank for two periods.

$$AverageRank_{2007-2012} = \frac{Rank_{2007-2009} + Rank_{2010-2012}}{2} \quad (2)$$

I also provide the average weighted output for 2007-2012 to give an estimate of the absolute number of publications (adjusted for the impact of journals) for each organization.

$$AverageWeightedOutput_{2007-2012} = \frac{WeightedOutput_{2007-2009} + WeightedOutput_{2010-2012}}{2} \quad (3)$$

Following on from the approach of prior researchers (Podsakoff et al, 2008), in the next step I eliminated all non-educational organizations from the datasets. These included corporate entities, government agencies, and pure research-oriented centers and think tanks. While the employees in research-only organizations do contribute to knowledge creation in the management field, their career model does not offer a balance between the roles of educator, researcher, and administrator, and thus lies beyond the focus of this thesis. While business schools have a mission to create knowledge and disseminate it through teaching, the central mission of research institutes is knowledge creation, which leads to different business models in terms of resource allocation and human capital composition.

Several features of the institutional and industrial landscape which are reflected in the data should be noted at this point.[31] First, there have been a number of mergers between business schools.[32] The publication data for these schools were grouped together in the ranking. Second, some business schools were established through an alliance between several universities,[33] and the faculty of this business school moved between all affiliated entities. The allocation of publications may vary in such cases depending on authors' choice to give the business school or one of the universities as their affiliation for that particular paper. Third, some issues arise from the English translation of the organizational affiliations.[34] Fourth, similar university names may present a challenge where authors do not provide complete information about institutional affiliation.[35] Fifth, multi-campus universities have different levels of autonomy for their campuses. In some public university systems, multiple campuses have developed distinct identities which

[31] Catherine Glee, of IEA Lyon, was immensely helpful in giving me an insider's account of the structure of the French system of tertiary education. Her advice helped me navigate the complexity of the dual system of public universities and *Grandes Écoles*.
[32] For example, KEDGE Business School is the result of a merger between Euromed and BEM Bordeaux Management School.
[33] For example, TIASNIMBAS business school is affiliated with Tilburg University and Technical University Eindhoven.
[34] For example, University of Brussels split into Flemish-speaking Vrij University Brussel and French-speaking Université Libre de Bruxelle long before 2007. However, some academics state their affiliation as University of Brussels, which makes it impossible to associate these publications with either of the universities.
[35] For example, the data do not reveal whether publications affiliated with the University of Clermont-Ferrand are produced by the University d'Auvergne-Clermont-Ferrand 1 or the University Blaise Pascal Clermont-Ferrand.

preclude researchers from grouping them under a general umbrella.[36] Typically, authors from these branches provide an exact affiliation in their papers. In other multi-campus universities most authors do not provide their affiliation at the level of a branch.[37] The data in the ranking were presented according to the information available, with some publications allocated to the University of California, US (unspecified), the University of London, UK (unspecified), and other similar cases. This may introduce a slight degree of error into ranking estimates. I acknowledge this as a limitation of the study, albeit one resulting from authors' self-selected affiliations or university strategies.

Step 2: Methodology of data collection for European academics

To understand the consequences of stratification in a multi-country environment and the impact which this stratification has on research productivity, I needed to create a European dataset of academics that would be broadly comparable with the US dataset used in Chapter 3. The US sampling was based on data from the top 50 business schools in the UTD North American ranking. Following a similar procedure, when constructing the research-based ranking I identified the top 50 EU schools. From these 50 schools I randomly selected 20 schools. Following prior studies (e.g. Baden-Fuller et al, 2000) I included Israel as a member of the European business school market. Israel, together with Turkey, has the status of associated country under the European Commission Framework program for Research and Innovation, which distinguishes it from other Middle Eastern countries. The same status is assigned to Switzerland, Norway, Iceland, and a range of Eastern European countries (EU Framework program Horizon 2020[38]). All schools located in the associated countries were included in the sampling frame. For each of the 20 sampled schools I collected full lists of tenured faculty from the schools' websites. These lists included associate professors, professors, senior lecturers, and readers. Adjunct, visiting, emeritus faculty, and faculty without PhDs were not included. From the population of tenured faculty within each school I randomly selected 20 academics. Sometimes, the number of tenured academics for whom the necessary career information (e.g. the school of PhD) was available was lower than 20; in such cases I included all academics for whom the data were available. I sought to maintain the proportion of male and female faculty which was characteristic of each school, as calculated by counting the number of male

[36] A good example of this case would be the University of California, with the University of California, Irvine, the University of California, Los Angeles, the University of California, Berkeley and other branches all having separate identities and competing with each other.
[37] For example, most publications produced within the University of Colorado do not have campus-level information, with only a few authors clarifying whether it was the University of Colorado Boulder, the University of Colorado Colorado Springs or the University of Colorado Denver.
[38] http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-list-ac_en.pdf

and female academics in the full list of tenured faculty. The summary of the sample is presented in Table 15 below.[39]

Table 15: Summary of European research-intensive schools sample

University	*Global research rank*	*Number of academics sampled*	*Male academics*	*Female academics*
1. AALTO UNIVERSITY, FINLAND	128.5	20	14	6
2. CATHOLIC UNIVERSITY LOUVAIN, BELGIUM	193	20	18	2
3. CITY UNIVERSITY LONDON, CASS BUSINESS SCHOOL, UK	111	20	18	2
4. ERASMUS UNIVERSITY, THE NETHERLANDS	5	15	13	2
5. ETH ZURICH, SWITZERLAND	178.5	18	17	1
6. HEC SCHOOL OF MANAGEMENT, PARIS, FRANCE	130	20	16	4
7. IESE, UNIVERSITY NAVARRA, SPAIN	183	18	15	3
8. INSEAD, FRANCE	45.5	20	17	3
9. LONDON BUSINESS SCHOOL, UK	29.5	20	18	2
10. SDA BOCCONI UNIVERSITY, ITALY	58.5	20	14	6
11. TEL AVIV UNIVERSITY, ISRAEL	152.5	20	16	4
12. UNIV LONDON, LONDON SCHOOL OF ECONOMICS & POLITICAL SCIENCE, UK	69	15	11	4
13. UNIVERSITY MANNHEIM, GERMANY	134.5	11	11	0
14. UNIVERSITY NOTTINGHAM, UK	78	20	13	7
15. UNIVERSITY OXFORD, UK	82	15	13	2
16. UNIVERSITY READING, UK	190	20	12	8
17. UNIVERSITY ST GALLEN, SWITZERLAND	127	18	16	2
18. UNIVERSITY STRATHCLYDE, UK	161.5	20	14	6
19. UNIVERSITY UTRECHT, THE NETHERLANDS	123.5	20	14	6
20. WHU OTTO BEISHEIM SCHOOL OF MANAGEMENT, GERMANY	181	10	9	1
Total		360	289	71

For each selected academic I collected career data from resumes available on business school websites. I used the ProQuest Database of Dissertations and Theses, the Index to Theses database, and, occasionally, LinkedIn profiles to fill the gaps in career data. Publication data for the full career span of each academic were collected using Thomson Reuters ISI Web of Science.

Variables

Most of the variables and their measures are similar to those used in Chapter 3 (see Table 16 below). The main difference relates to the measurement of symbolic capital

[39] Erasmus University seems to be an outlier, with a much higher research output than other European schools in the sample. I performed the robustness test, eliminating Erasmus academics from the sample, and have not found any significant differences in the results of the analysis.

variables. Research-intensiveness of PhD and research-intensiveness of post-PhD workplaces are measured using the weighted research output of these schools in 2007-2012 (Column 3 in Table 17). The robustness tests explored average rank (Column 6 in Table 17) as a possible alternative to this measure, and experimented with scaling the variables into 11-scale (similar to the technique used in Chapter 3) and 16-scale. The tests did not indicate any significant differences in using these alternatives; therefore, I used the initial raw measure of weighted research output.

Mobility was measured within the country of PhD (national mobility) and outside the country of PhD (international mobility). As 98% of academics in the US sample examined in Chapter 3 received their PhD from a US school, the measure "Experience outside of the US" used in Chapter 3 is equivalent to the international mobility measure used in this chapter. Similarly, "Experience in the US" for the US sample is an equivalent of the mobility within the country of PhD measure used in the European sample.

Table 16: Variables and measures

Variable	Measurement in US sample	Measurement in EU sample
Volume of research	Number of papers/book chapters/proceedings papers in ISI	Number of papers/book chapters/proceedings papers in ISI
Impact of research	Number of citations in ISI	Number of citations in ISI
Gender	Male = 1, female = 0	Male = 1, female = 0
Professional age	Number of years since PhD	Number of years since PhD
Discipline area	Coded from CV: accounting, economics, finance, management information systems, management, marketing, organizational behavior/HR, operations research, and strategy	Coded from CV: accounting, economics, finance, management information systems, management, marketing, organizational behavior/HR, operations research, and strategy
Research-intensiveness of PhD	Weighted research output in Ryazanova (2014) ranking (for this chapter only, UTD ranking used in ch.2)	Weighted research output in Ryazanova (2014) ranking
PhD from top-ranking school	Top 10 schools in UTD ranking = 1, otherwise = 0	Top 100 schools in Ryazanova (2014) ranking = 1, otherwise = 0
PhD from North American school	US and Canada = 1, otherwise = 0	US and Canada = 1, otherwise = 0
Research-intensiveness of post-PhD workplaces	Research-intensiveness of each workplace, weighted by tenure at each workplace. Research-intensiveness measured similar to that of PhD.	Research-intensiveness of each workplace, weighted by tenure at each workplace. Research-intensiveness measured similar to that of PhD.
Time before 1st publication (precocity)	Years between 1st ISI-visible publication and PhD graduation	Years between 1st ISI-visible publication and PhD graduation
Impact factor of 1st journal	JCR 5-years IF (2011)	JCR 5-years IF (2011)
Co-authorship network size	Number of unique co-authors	Number of unique co-authors
Average strength of co-authorship ties	Average frequency of working with each co-author	Average frequency of working with each co-author
Proportion of strong ties in co-authorship network	Proportion of repeated co-authorship in the network	Proportion of repeated co-authorship in the network
Mobility within the country of PhD	Number of post-PhD workplaces in US	Number of post-PhD workplaces in the country of PhD
Mobility outside the country of PhD (international mobility)	Number of post-PhD workplaces outside of US	Number of post-PhD workplaces outside of the country of PhD

Data analysis

I compared the ranking constructed in this chapter with other global rankings, including the global ranking by the University of Texas at Dallas (as an example of an established ranking based on a narrow list of top journals) and Linton's rankings (as an example of a recent ranking based on a broader list of top journals). Comparing across these rankings can serve as a robustness test that would demonstrate the change in schools' position on a scale of research intensiveness as we increase the number of journals considered. I also compared the new ranking with Mangematin and Baden-Fuller's ranking (2008) to see the dynamics of research production over the last six years.

To test Hypotheses 1a and 1b, I used an independent t-test to compare the means of the mobility variables across the samples of US and EU academics. I then calculated effect sizes to estimate the practical importance of the differences encountered, as recommended by Field (2009). To test Hypothesis 2a, I used regression analysis with the research-intensiveness of post-PhD workplaces as an outcome variable (see equation below). The outcome variable was transformed using square root transformation (Field, 2009) to deal with positive skew in its distribution.

$$RIJobs = \alpha + \beta_1 gender + \beta_2 DiscArea + \beta_3 PhDNAm + \beta_4 RIPhD + \beta_5 IF1stJournal + \\ + \beta_6 T1stPub + \beta_7 PhDNAm * RIPhD + \varepsilon \quad (4)$$

where RI = research intensiveness; PhDNAm = PhD from a school located in North America; and *T1stPub = time to first ISI-visible publication*

To compare the drivers of research productivity in EU and in the US, I used standardized OLS with volume and impact of research as outcome variables. Standardized OLS allows the direct comparison of effect sizes within each sample, which is helpful for understanding the relative importance of examined drivers of productivity. All analysis was performed using Stata 13.

RESULTS

Research-based ranking

The top 100 producers of organizational research worldwide are presented in Table 17 below. As expected, schools from North America dominate the top of the ranking, with 63 US institutions and seven Canadian schools making it into the top 100. In Europe, the top producers of research are the UK (with 10 schools in the top 100) and the Netherlands (six schools). France, Italy, and Denmark are represented by one school each (INSEAD, SDA Bocconi, and Copenhagen Business School, respectively). The rest of the top 100 included five schools from Hong Kong, three from Singapore, and three from Australia.

Overall, production of research is growing, with the average minimum number of papers published by the top 100 schools increasing from 64 in 2007-2009 to 77 in 2010-2012. The maximum number of papers in the top 100 schools also increased from 358 in 2007-2009 to 409 in 2010-2012.

The full ranking includes 2590 organizations and enables the construction of national rankings as well as regional and global rankings. The examples of national rankings representing the top 10 research-intensive schools in France, Germany, the Netherlands, and the UK are provided in Appendix 4.

Table 17: Top 100 business schools, based on weighted research output in 2007-2012

Organizations	Country	Average weighted output (2007-2012)	Rank (2007-2009)	Rank (2010-2012)	Average rank 2007-2012[40]
UNIV PENNSYLVANIA	USA	890.785	1	1	1
HARVARD UNIV	USA	856.361	2	2	2
UNIV MICHIGAN	USA	777.852	3	4	4
ERASMUS UNIV	Netherlands	733.684	7	3	5
UNIV ILLINOIS	USA	701.207	5	8	7
NYU	USA	698.561	4	10	7
MICHIGAN STATE UNIV	USA	695.403	10	5	8
UNIV MARYLAND	USA	675.792	9	7	8
ARIZONA STATE UNIV	USA	660.487	8	12	10
INDIANA UNIV	USA	646.978	15	6	11
UNIV MINNESOTA	USA	613.203	11	13	12
COLUMBIA UNIV	USA	599.583	6	20	13
STANFORD UNIV	USA	607.959	16	11	14
UNIV NORTH CAROLINA	USA	588.980	18	9	14
TEXAS A M UNIV	USA	590.121	14	14	14
PENN STATE UNIV	USA	566.072	13	17	15
DUKE UNIV	USA	545.755	12	26	19
NORTHWESTERN UNIV	USA	517.207	21	18	20
UNIV WASHINGTON	USA	495.715	22	21	22
TILBURG UNIV	Netherlands	500.498	28	16	22
UNIV CHICAGO	USA	490.403	20	24	22
MIT	USA	475.170	23	23	23
OHIO STATE UNIV	USA	482.345	27	19	23
UNIV TEXAS AUSTIN	USA	486.360	32	15	24
CORNELL UNIV	USA	481.620	17	31	24
UNIV SO CALIF	USA	440.843	24	28	26
UNIV TORONTO	Canada	444.444	29	25	27
UNIV GEORGIA	USA	427.826	36	22	29

[40] Average rank 2007-2012 is a mean between the rank in 2007-2009 and the rank in 2010-2012. This mean was rounded up to a whole number, such as, for instance, rank 3.5 (University of Michigan) became rank 4.

Organizations	Country	Average weighted output (2007-2012)	Rank (2007-2009)	Rank (2010-2012)	Average rank 2007-2012[40]
LONDON BUSINESS SCH	UK	423.721	25	34	30
UNIV WISCONSIN	USA	435.200	19	43	31
NATL UNIV SINGAPORE	Singapore	398.646	34	29	32
UNIV CALIF BERKELEY	USA	387.484	30	36	33
HONG KONG UNIV SCI TECHNOL	Hong Kong (P.R.C.)	398.031	26	42	34
GEORGIA STATE UNIV	USA	359.786	41	35	38
UNIV BRITISH COLUMBIA	Canada	353.434	38	38	38
CARNEGIE MELLON UNIV	USA	357.222	35	46	41
UNIV FLORIDA	USA	347.667	37	45	41
UNIV MELBOURNE	Australia	342.143	44	40	42
GEORGIA INST TECHNOL	USA	338.716	46	39	43
UNIV ARIZONA	USA	338.814	39	47	43
UNIV CALIF LOS ANGELES	USA	329.607	42	48	45
INSEAD	France	340.608	31	60	46
UNIV S CAROLINA	USA	330.575	50	41	46
RUTGERS STATE UNIV	USA	336.154	33	61	47
CITY UNIV HONG KONG	Hong Kong (P.R.C.)	364.802	69	27	48
UNIV MANCHESTER	UK	324.347	43	53	48
BOSTON COLL	USA	318.341	48	51	50
PURDUE UNIV	USA	316.972	45	54	50
COPENHAGEN BUSINESS SCH	Denmark	333.275	72	30	51
HONG KONG POLYTECH UNIV	Hong Kong (P.R.C.)	319.716	73	32	53
UNIV AMSTERDAM	Netherlands	300.242	57	49	53
FLORIDA STATE UNIV	USA	300.327	49	59	54
UNIV HOUSTON	USA	298.947	56	52	54
UNIV VIRGINIA	USA	304.997	64	44	54
UNIV GRONINGEN	Netherlands	303.510	76	37	57
UNIV ALBERTA	Canada	283.521	59	57	58
UNIV MISSOURI	USA	291.187	40	76	58

Organizations	Country	Average weighted output (2007-2012)	Rank (2007-2009)	Rank (2010-2012)	Average rank 2007-2012[40]
UNIV TEXAS DALLAS	USA	309.425	83	33	58
UNIV WARWICK	UK	280.848	54	62	58
CHINESE UNIV HONG KONG	Hong Kong (P.R.C.)	282.150	53	64	59
SDA BOCCONI UNIV	Italy	291.050	67	50	59
UNIV COLORADO	USA	284.050	62	56	59
WASHINGTON UNIV in ST. LOUIS	USA	282.227	65	55	60
RICE UNIV	USA	270.777	51	74	63
UNIV WESTERN ONTARIO	Canada	265.911	60	70	65
YORK UNIV	Canada	265.842	63	68	66
CUNY	USA	263.244	61	72	67
UNIV CONNECTICUT	USA	256.701	52	84	68
UNIV LONDON, LONDON SCH ECON POLIT SCI	UK	260.157	71	67	69
UNIV CAMBRIDGE	UK	260.451	77	63	70
UNIV NEW S WALES	Australia	257.293	75	66	71
SINGAPORE MANAGEMENT UNIV	Singapore	251.349	68	77	73
GEORGE MASON UNIV	USA	247.546	58	89	74
TEMPLE UNIV	USA	247.880	86	65	76
UNIV PITTSBURGH	USA	242.692	55	96	76
EMORY UNIV	USA	239.453	66	90	78
UNIV NOTTINGHAM	UK	240.990	70	86	78
UNIV HONG KONG	Hong Kong (P.R.C.)	234.167	90	69	80
VRIJE UNIV AMSTERDAM	Netherlands	231.194	88	75	82
YALE UNIV	USA	231.542	81	82	82
UNIV OXFORD	UK	230.657	91	73	82
UNIV TENNESSEE	USA	229.115	84	80	82
UNIV ALABAMA	USA	235.960	107	58	83
UNIV IOWA	USA	231.302	79	87	83
UNIV CALIF IRVINE	USA	226.475	89	78	84
UNIV OKLAHOMA	USA	224.112	78	95	87

Organizations	Country	Average weighted output (2007-2012)	Rank (2007-2009)	Rank (2010-2012)	Average rank 2007-2012[40]
UNIV MONTREAL (incl. HEC MONTREAL)	Canada	221.412	103	71	87
MAASTRICHT UNIV	Netherlands	214.476	99	79	89
NANYANG TECHNOL UNIV	Singapore	210.556	96	85	91
UNIV LONDON, IMPERIAL COLLEGE	UK	210.074	102	81	92
UNIV QUEENSLAND	Australia	212.499	92	91	92
UNIV LANCASTER	UK	207.650	85	105	95
UNIV UTAH	USA	208.310	82	111	97
CARDIFF UNIV	UK	202.877	87	110	99
BOSTON UNIV	USA	198.820	106	93	100
MCGILL UNIV	Canada	197.907	93	106	100
UNIV NOTRE DAME	USA	195.983	116	83	100
UNIV ARKANSAS	USA	191.979	104	98	101
UNIV MIAMI	USA	205.686	74	128	101
UNIV CENT FLORIDA	USA	204.840	80	125	103

Comparative analysis of rankings

The new ranking is highly correlated with the other rankings presented in Table 18. The highest correlation is with Linton's *Financial Times* 45 ranking (0.74) and the UTD 2011 ranking (0.72). This provides some face validity to the new ranking and is related to fact that the largest producers of knowledge are also the institutions focused on publishing in institutionalized lists of top-ranking journals (UTD list and *FT* list). It should be noted that the correlations relate only to those schools that are present in both compared rankings. Since the majority of European schools do not feature in the UTD ranking and some of them are also absent from Linton's rankings, especially the *FT*-based ranking, this analysis does not provide much information on the stability of the European schools standing in global rankings.

The correlation between the rank in the new ranking and the rank in that of Mangematin and Baden-Fuller's (2008) is 0.66, which is slightly lower than the correlation to other, more recent, rankings. School-by-school comparison shows that 20 new schools emerged in the top 100 of the new ranking relative to Mangematin and Baden-Fuller. Of these 20 schools, three (University of London Imperial College, University of Alabama, and Cardiff University) were not included in Mangematin and Baden-Fuller's ranking, and the rest were in the ranking, but lower down. In their turn, 17 schools that occupied positions in the top 100 of Mangematin and Baden-Fuller's ranking moved to lower positions in the new ranking.

Table 18: Top 100 producers of organizational research: comparison of rankings

School	Country	Average rank 2007-2012 (Ryazanova, 2014)	World rank 2005 (Mangematin & Baden-Fuller, 2008)	High Impact 45 (Linton, 2012a)	*Financial Times* 45 (Linton, 2012a)	UTD World 2007-2011
UNIV PENNSYLVANIA	USA	1	1	5	2	1
HARVARD UNIV	USA	2	2	6	1	2
UNIV MICHIGAN	USA	4	3	3	4	3
ERASMUS UNIV	Netherlands	5	18	19	18	39
UNIV ILLINOIS	USA	7	28/91[a]	19	27	21
NYU	USA	7	6	14	12	6
MICHIGAN STATE UNIV	USA	8	31	14	35	32
UNIV MARYLAND	USA	8	11	2	9	8
ARIZONA STATE UNIV	USA	10	21	1	30	26
INDIANA UNIV	USA	11	15	9	24	27
UNIV MINNESOTA	USA	12	12	7	15	19
COLUMBIA UNIV	USA	13	16	28	11	10
STANFORD UNIV	USA	14	4	3	3	7
UNIV NORTH CAROLINA	USA	14	54	11	15	28
TEXAS A & M UNIV	USA	14	14	9	15	34
PENN STATE UNIV	USA	15	24	13	22	15
DUKE UNIV	USA	19	5	28	10	4
NORTHWESTERN UNIV	USA	20	10	8	5	12
UNIV WASHINGTON	USA	22	32	19	33	36
TILBURG UNIV	Netherlands	22	27	24	29	38
UNIV CHICAGO	USA	22	9	16	7	5
MIT	USA	23	19	28	5	14
OHIO STATE UNIV	USA	23	26	19	20	30
UNIV TEXAS AUSTIN	USA	24	8	11	13	9
CORNELL UNIV	USA	24	22	65	30	35
UNIV SO CALIF	USA	26	13	17	20	13
UNIV TORONTO	Canada	27	29	43	26	20
UNIV GEORGIA	USA	29	58	24	41	54

School	Country	Average rank 2007-2012 (Ryazanova, 2014)	World rank 2005 (Mangematin & Baden-Fuller, 2008)	High Impact 45 (Linton, 2012a)	*Financial Times* 45 (Linton, 2012a)	UTD World 2007-2011
LONDON BUSINESS SCH	UK	30	17	32	19	25
UNIV WISCONSIN	USA	31	39	32	43	47
NATL UNIV SINGAPORE	Singapore	32	46	39	45	42
UNIV CALIF BERKELEY	USA	33	23	39	8	23
HONG KONG UNIV SCI TECHNOL	Hong Kong (P.R.C.)	34	44	32	42	17
UNIV BRITISH COLUMBIA	Canada	38	33	27	22	24
GEORGIA STATE UNIV	USA	38	38	19	45	63
CARNEGIE MELLON UNIV	USA	41	30	55	33	22
UNIV FLORIDA	USA	41	43	28	28	31
UNIV MELBOURNE	Australia	42	49	94	104	61
GEORGIA INST TECHNOL	USA	43	47	55	51	37
UNIV ARIZONA	USA	43	55	43	54	57
UNIV CALIF LOS ANGELES	USA	45	20	55	24	18
INSEAD	France	46	25	71	37	11
UNIV S CAROLINA	USA	46	40	24	38	45
RUTGERS STATE UNIV	USA	47	35	87	67	71
CITY UNIV HONG KONG	Hong Kong (P.R.C.)	48	80	17	63	69
UNIV MANCHESTER	UK	48	36	Not ranked	Not ranked	Not ranked
BOSTON COLL	USA	50	50	55	50	41
PURDUE UNIV	USA	50	56	36	48	44
COPENHAGEN BUSINESS SCH	Denmark	51	93	76	69	81
HONG KONG POLYTECH UNIV	Hong Kong (P.R.C)	53	156	36	79	60
UNIV AMSTERDAM	Netherlands	53	124	87	104	Not ranked
FLORIDA STATE UNIV	USA	54	81	71	71	Not ranked
UNIV HOUSTON	USA	54	99	39	56	62
UNIV VIRGINIA	USA	54	45	50	36	85/93[b]

School	Country	Average rank 2007-2012 (Ryazanova, 2014)	World rank 2005 (Mangematin & Baden-Fuller, 2008)	High Impact 45 (Linton, 2012a)	*Financial Times* 45 (Linton, 2012a)	UTD World 2007-2011
UNIV GRONINGEN	Netherlands	57	65	55	71	Not ranked
UNIV ALBERTA	Canada	58	77	119	38	55
UNIV WARWICK	UK	58	106	158	56	Not ranked
UNIV MISSOURI	USA	58	139	39	56	91
UNIV TEXAS DALLAS	USA	58	178	36	21	16
CHINESE UNIV HONG KONG	Hong Kong	59	74	43	51	66
SDA BOCCONI UNIV	Italy	59	117	Not ranked	Not ranked	Not ranked
UNIV COLORADO	USA	59	88	65	60	77
WASHINGTON UNIV in ST. LOUIS	USA	60	71	43	45	29
RICE UNIV	USA	63	153	50	56	46
UNIV WESTERN ONTARIO	Canada	65	37	81	71	56
YORK UNIV	Canada	66	122	43	30	65
CUNY	USA	67	41	Not ranked	Not ranked	50
UNIV CONNECTICUT	USA	68	53	43	49	51
UNIV LONDON, LONDON SCH ECON POLIT SCI	UK	69	110	125	71	Not ranked
UNIV CAMBRIDGE	UK	70	105	87	93	94
UNIV NEW S WALES	Australia	71	82	81	93	89
SINGAPORE MANAGEMENT UNIV	Singapore	73	85	81	83	52
GEORGE MASON UNIV	USA	74	145	50	93	Not ranked
TEMPLE UNIV	USA	76	89	32	71	78
UNIV PITTSBURGH	USA	76	59	94	71	43
UNIV NOTTINGHAM	UK	78	42	125	87	Not ranked
EMORY UNIV	USA	78	34	50	43	33
UNIV HONG KONG	Hong Kong (P.R.C.)	80	173	65	71	88
VRIJE UNIV AMSTERDAM	Netherlands	82	200	Not ranked	Not ranked	Not ranked
YALE UNIV	USA	82	48	55	14	40
UNIV OXFORD	UK	82	57	104	60	Not ranked

School	Country	Average rank 2007-2012 (Ryazanova, 2014)	World rank 2005 (Mangematin & Baden-Fuller, 2008)	High Impact 45 (Linton, 2012a)	*Financial Times* 45 (Linton, 2012a)	UTD World 2007-2011
UNIV TENNESSEE	USA	82	100	65	168	Not ranked
UNIV ALABAMA	USA	83	Not ranked	55	104	Not ranked
UNIV IOWA	USA	83	86	Not ranked	Not ranked	70
UNIV CALIF IRVINE	USA	84	60	76	79	49
UNIV OKLAHOMA	USA	87	87	71	115	95
UNIV MONTREAL (incl. HEC MONTREAL)	Canada	87	63	221	89	80
MAASTRICHT UNIV	Netherlands	89	79	Not ranked	Not ranked	Not ranked
NANYANG TECHNOL UNIV	Singapore	91	104	50	51	72
UNIV QUEENSLAND	Australia	92	107	Not ranked	Not ranked	Not ranked
UNIV LONDON IMPERIAL COLL SCI TECHNOL MED	UK	92	Not ranked	Not ranked	Not ranked	Not ranked
UNIV LANCASTER	UK	95	136	Not ranked	Not ranked	Not ranked
UNIV UTAH	USA	97	150	55	63	48
CARDIFF UNIV	UK	99	Not ranked	Not ranked	Not ranked	Not ranked
MCGILL UNIV	Canada	100	109	65	67	59
BOSTON UNIV	USA	100	52	76	63	73
UNIV NOTRE DAME	USA	100	62	94	83	58
UNIV ARKANSAS	USA	101	69	71	169	83
UNIV MIAMI	USA	101	51	55	69	64
UNIV CENT FLORIDA	USA	103	112	104	79	Not ranked

[a] Mangematin and Baden-Fuller distinguish between the University of Illinois (rank 91) and the University of Illinois Urbana-Champaign (rank 28). The data used in the new ranking do not allow for such detailed analysis.

[b] The UTD ranking distinguishes between the University of Virginia Darden (rank 85) and the University of Virginia McIntire (rank 93). The data used in the new ranking do not allow for such detailed analysis.

Research productivity drivers in the US and EU schools

Academics in the European sample published an average of 18 papers (median=15) and accumulated an average of 288 citations over the course of their careers (median=159). In comparison, the academics in the US sample examined in Chapter 3 published an average of 20 papers (median=15) and accumulated an average of 834 citations over the course of their careers (median=367).

Approximately one quarter of academics in the European sample (93 out of 360 academics) received their doctoral degree in the US or Canada. I provide the descriptive statistics for the other variables in Table 19.

Table 19: Descriptive statistics (EU sample, n=360)

		Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	Volume of research (log transformed)	2.67	0.90	1.0														
2.	Impact of research (log transformed)	4.73	1.80	0.81*	1.0													
3.	Professional age	20.53	8.53	0.28*	0.24*	1.0												
4.	Gender (1 = male; 0 = female)	0.80	0.40	0.17*	0.13*	0.17*	1.0											
5.	Discipline area	4.57	1.84	0.07	0.15*	-0.03	-0.09	1.0										
6.	PhD from North America	0.26	0.44	0.09*	0.20*	0.12*	0.11*	-0.06	1.0									
7.	Research-intensiveness of PhD	248.96	227.83	0.05	0.21*	0.12*	0.11*	-0.06	0.67*	1.0								
8.	IF of first journal	1.90	1.98	0.10*	0.30*	-0.05	-0.01	0.06	0.25*	0.25*	1.0							
9.	Time before first publication	2.46	5.74	-0.23*	-0.31*	0.30*	-0.04	-0.04	0.01	0.01	0.02	1.0						
10.	Research-intensiveness of post-PhD jobs	220.15	149.53	0.08	0.22*	-0.02	0.03	0.07	0.25*	0.38*	0.12*	-0.07	1.0					
11.	Co-authorship network size[a]	15.88	13.00	0.73*	0.62*	0.23*	0.10*	0.13*	0.08	0.03	0.09*	-0.16*	0.11*	1.0				
12.	Average strength of co-authorship ties[a]	1.68	1.01	0.36*	0.18*	-0.01	-0.03	0.02	-0.03	-0.08	-0.02	-0.06	0.01	0.08	1.0			
13.	Proportion of strong ties in ego-network	0.31	0.20	0.20*	0.05	0.03	0.08	-0.06	-0.02	-0.06	-0.09	-0.03	-0.04	-0.05	0.59*	1.0		
14.	Mobility within the country of PhD (# of post-PhD jobs in the PhD country)	1.14	1.06	0.16*	0.08	0.10*	0.01	-0.00	-0.25*	-0.21*	-0.06	-0.05	-0.18*	0.12*	0.10*	0.06	1.0	
15.	International mobility (# of post-PhD jobs abroad)	0.83	1.08	0.18	0.19*	0.13*	0.21*	-0.09*	0.42*	0.17*	0.13*	-0.2	0.07	0.12*	-0.03	-0.03	-0.26*	1.0

Correlations marked with * are significant at least at the 10% level (two-tailed)
[a] – variable is winsorized at top 5% to eliminate possible bias from outliers

The results of the first t-test show that on average US academics experience more mobility within the country of PhD[41] (M=1.73, SE=0.05) compared to EU academics (M=1.14, SE=0.06), t(859)=-8.15, p<0.001, r=0.27 (small). This confirms Hypothesis 1a. The results of the second t-test show that on average US academics experience less mobility outside the country of PhD (M=0.13, SE=0.02) compared to EU academics (M=0.83, SE=0.06), t(460)=11.58, p<0.001, r=0.47 (medium). This confirms Hypothesis 1b. I have further compared effect sizes for mobility variables (see Table 20 below) on the basis of negative binomial regressions for US and EU samples (see Appendix 5 for the table of results of this analysis). One additional workplace within the country of PhD is associated with a 5% increase in the volume of research (0.8 additional papers) and a 15% increase in the impact of research (71 additional cites) for US academics. One additional workplace outside the country of PhD is associated with a 10% increase in volume (an additional 1.7 papers) and a 20% increase in impact (130 additional citations). In the European sample, mobility within the country of PhD does not have a statistically significant relation to research outcome. One additional workplace outside the country of PhD is associated with an 8% increase in the volume of research (1.3 papers) and a 10% increase in the impact of research (27 citations).

Table 20: Productivity consequences of mobility among US and European faculty

Effect of one additional workplace change	**US**	**Europe**
Within the country of PhD		
Volume	5% (0.8 papers)	-
Citations	15% (71 citations)	-
Outside of the country of PhD		
Volume	10% (1.7 papers)	8% (1.3 papers)
Citations	20% (130 citations)	10% (27 citations)

Academic career studies widely acknowledge higher barriers to international mobility for female academics (e.g. Richardson & McKenna, 2003; Richardson & Zikic, 2007). The analysis of gender composition within the groups of mobile and non-mobile European academics confirmed that assumption, showing that on average there is a higher proportion of men in the group of internationally mobile academics (M=0.88, SE=0.02) relative to the group without international experience (M=0.72, SE=0.03), t(360)=-3.96, p<0.001, r=0.22 (small).

[41] In 98% of cases, this is the US.

The results of the regression analysis predicting the research-intensiveness of post-PhD workplaces is presented in Table 21 below.

Table 21: Results of OLS multiple regression analysis of research-intensiveness of post-PhD workplaces (square root)

	Model 1
Control variables	
Gender (1= male)	-0.39
	(0.52)
Discipline area	0.15
	(0.12)
Symbolic capital	
PhD from North American school (1 = yes)	4.67***
	(1.06)
Research-intensiveness of PhD school	0.01***
	(0.00)
Intellectual capital	
IF of first journal	0.11
	(0.11)
Time before first publication	-0.06*
	(0.04)
Interactions	
Research-intensiveness of PhD school * PhD from North American school	-0.01***
	(0.00)
N	350
Constant	10.75***
	(0.79)
F-statistic	17.51***
Adjusted R-Squared	0.25

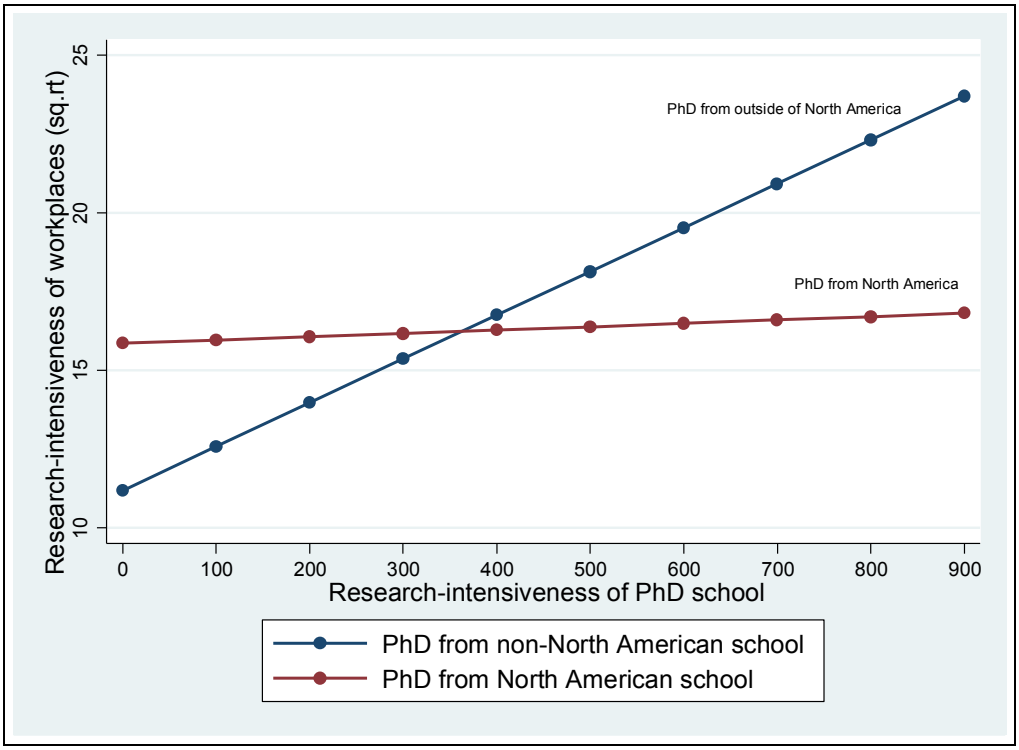
Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Both the research-intensiveness of PhD variable and the PhD from North America dummy have a positive effect on the dependent variable. Their interaction is also statistically significant and indicates that access to research-intensive places is much more dependent on the rank of PhD for academics educated outside of North America (see Figure 6 below). The difference between having a PhD from North America and having a PhD from another geographical region can result in a 62-unit[42] upward movement in research-intensiveness of post-PhD workplaces, given that all other variables are fixed at their means. Sixty-two units is a significant movement, given that the boundary between

[42] Research-intensiveness is measured by the weighted research output of an organization, calculated by multiplying the number of papers produced by the average IF of a journal of publication.

the top 100 research-intensive schools globally and all others passes approximately through the 200-unit mark.

Figure 6: Interaction between the country and the research-intensiveness of PhD in the careers of European academics

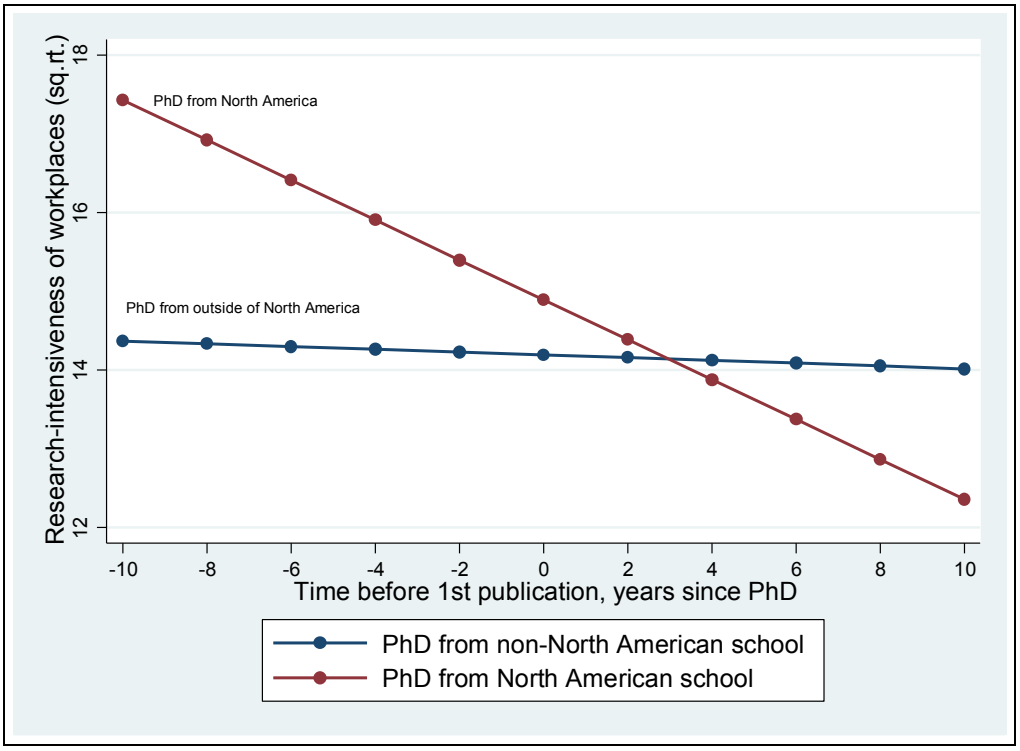


The slope of the curve for graduates of North American PhD schools is explained by looking into the educational background of 93 European academics within this population. Only four out of 93 graduated from US or Canadian PhD schools that are not ranked in the top 100 research-intensive institutions globally. The t-test confirms that academics educated in the US or Canada come from more research-intensive doctoral schools on average ($M=509.07$, $SE=23.45$) than their European colleagues ($M=158.36$, $SE=8.76$), $t(118) = -14.01$, $p<0.001$, $r=0.79$ (large). Graduates of North American schools also spend their post-PhD careers in more research-intensive organizations on average ($M=282.71$, $SE=16.03$) than their peers educated in non-North American schools ($M=198.36$, $SE=8.67$), $t(149) = -4.63$, $p<0.001$, $r= 0.35$ (medium). Overall, this provides support to Hypothesis 2a.

In a supplemental analysis, I explored whether having the symbolic capital of a PhD is sufficient for the graduates of North American schools to keep a job in a research-intensive environment. Figure 7 below shows the interaction between the country of PhD and the time before the first publication. This is truly a "publish or perish" graph.

Graduates of North American business schools, hired on the basis of high research expectations, have nevertheless to produce proof of the their ability to publish. Without this proof, their chances to work in a research-intensive environment decrease more quickly than in the case of their peers educated outside of North America.

Figure 7: Interaction between precocity of publishing and the country of PhD in the careers of European academics



Additional insights into this graph can be gained from looking at the distribution of the sample along two interacting dimensions (see Table 22 below).

Table 22: Time before publishing for academics educated in North America and outside it

Time before first publication/country of PhD	North American PhD	Non-North American PhD
More than six years prior to PhD graduation	1 (1%)	10 (4%)
No more than six years prior to PhD graduation	27 (30%)	92 (35%)
One to six years post-PhD	53 (59%)	110 (42%)
More than six years post-PhD	9 (10%)	48 (18%)

The fact that a larger proportion of academics with non-North American PhDs published before completing their PhDs, relative to their peers with degrees from US or Canada, is better explained by the changing career structures in European institutions

than by the difference in intellectual capital. Until recently, a PhD degree was not compulsory for entering university lecturer positions in some countries. As a result, a number of European academics in the sample started their academic careers with Master's degrees and completed PhDs while employed and research-active (Cruz-Castro & Sanz-Menendez, 2010). Within the North American model of academic careers, 31% of academics with North American PhDs managed to publish before graduation. These researchers were likely to be noticed on the labor market earlier than the majority of their peers, which granted them preferential access to research-intensive workplaces post-PhD.

Research productivity drivers within the US sample, the European sample, and three categories within the European sample are presented in Tables 23 and 24. The findings reported in the second column (EU sample) indicate that having a PhD from North America is negatively related to the number of publications (Table 23) and only indirectly related to the impact of research (Table 24) in that it facilitates access to a research-intensive environment post-PhD. These findings provide partial support to Hypothesis 2b.

Table 23: Results of standardized OLS analysis for volume of research: comparative table

	US sample (n=500)	EU sample, full (n=360)	EU academics with PhD from North America (n=93)	EU academics with non-North American PhD, no international mobility (n=177)	EU academics with non-North American PhD, internationally mobile (n=90)
Control variables					
Gender (1 = male)	0.01	0.06**	0.05	0.04†	0.07†
	(0.02)	(0.02)	(0.05)	(0.03)	(0.05)
Professional age	0.17***	0.16***	0.16**	0.16***	0.18***
	(0.02)	(0.03)	(0.05)	(0.04)	(0.05)
Discipline area	-0.01	-0.02	-0.01	-0.01	-0.05
	(0.02)	(0.02)	(0.05)	(0.03)	(0.05)
Symbolic and intellectual capital					
PhD from North American school	-	-0.19** (0.07)	-	-	-
PhD from top-100 research-intensive school	0.04* (0.02)	0.15** (0.06)	0.16 (0.26)	0.23** (0.08)	0.14 (0.13)
Research-intensiveness of post-PhD jobs	0.08*** (0.02)	-0.01 (0.03)	0.07† (0.05)	-0.05 (0.04)	-0.4 (0.05)
Time before first publication	-0.08*** (0.02)	-0.15*** (0.03)	-0.15* (0.06)	-0.16*** (0.04)	-0.17** (0.06)
IF of first journal	-0.04*	0.05*	0.04	0.05†	0.07†
	(0.02)	(0.02)	(0.05)	(0.03)	(0.05)
Social capital					
Co-authorship network size	0.42*** (0.02)	0.49*** (0.03)	0.49*** (0.05)	0.51*** (0.04)	0.48*** (0.06)
Average strength of ties	0.21*** (0.02)	0.12*** (0.03)	0.06 (0.06)	0.10** (0.04)	0.27*** (0.06)
Proportion of strong ties	-0.01	0.10***	0.16**	0.10**	0.05
	(0.02)	(0.03)	(0.06)	(0.04)	(0.05)
Mobility					
Mobility within the country of PhD	0.06*** (0.02)	0.04* (0.03)	0.05 (0.05)	0.03 (0.04)	0.03 (0.05)
International mobility	0.05**	0.10***	0.08*	-	0.01
	(0.02)	(0.03)	(0.05)		(0.05)
N	495	343	88	167	88
Constant	2.81***	2.71***	2.72***	2.52***	2.81***
	(0.02)	(0.03)	(0.25)	(0.04)	(0.05)
F-statistic	110.30***	62.43***	16.86***	37.29***	16.94***
Adjusted R^2	0.73	0.70	0.69	0.70	0.69

Coefficients of st.OLS can only be compared within columns, not within rows.

Table 24: Results of standardized OLS analysis for impact of research: comparative table

	US sample (n=500)	EU sample, full (n=360)	EU academics with PhD from North America (n=93)	EU academics with non-North American PhD, no international mobility (n=177)	EU academics with non-North American PhD, internationally mobile (n=90)
Control variables					
Gender (1 = male)	-0.06	0.04	0.08	0.01	0.03
	(0.05)	(0.06)	(0.11)	(0.08)	(0.13)
Professional age	0.19***	0.42***	0.36**	0.58***	0.18†
	(0.05)	(0.06)	(0.13)	(0.09)	(0.13)
Discipline area	0.08	0.11†	0.14	0.04	0.20
	(0.05)	(0.06)	(0.13)	(0.08)	(0.13)
Symbolic and intellectual capital					
PhD from North American school	-	-0.04	-	-	-
		(0.17)			
PhD from top-100 research-intensive school	0.18***	0.41**	0.15	0.27†	0.99**
	(0.05)	(0.15)	(0.65)	(0.18)	(0.34)
Research-intensiveness of post-PhD jobs	0.25***	0.14*	0.33**	0.12†	0.05
	(0.05)	(0.06)	(0.12)	(0.09)	(0.14)
Time before first publication	-0.24***	-0.48***	-0.41**	-0.48***	-0.51***
	(0.05)	(0.06)	(0.16)	(0.08)	(0.14)
IF of first journal	0.24***	0.40***	0.29**	0.42***	0.47***
	(0.05)	(0.06)	(0.12)	(0.07)	(0.13)
Social capital					
Co-authorship network size	0.70***	0.68***	0.52***	0.73***	0.67***
	(0.05)	(0.06)	(0.13)	(0.09)	(0.14)
Average strength of ties	0.33***	-0.07	-0.26	0.02	-0.11
	(0.07)	(0.07)	(0.18)	(0.10)	(0.15)
Proportion of strong ties	0.04	0.18**	0.13	0.14†	0.25*
	(0.07)	(0.07)	(0.15)	(0.09)	(0.14)
Mobility					
Mobility within the country of PhD	0.14**	0.06	0.02	-0.00	0.19†
	(0.05)	(0.06)	(0.11)	(0.08)	(0.13)
International mobility	0.12**	0.13*	0.05	-	0.22*
	(0.05)	(0.06)	(0.12)		(0.13)
N	495	343	88	167	88
Constant	5.84***	4.70***	5.41***	4.48***	4.59***
	(0.05)	(0.08)	(0.63)	(0.09)	(0.14)
F-statistic	35.94***	41.72***	6.88***	25.50***	9.66***
Adjusted R^2	0.46	0.57	0.45	0.62	0.54

Coefficients of st.OLS can only be compared within columns, not within rows.

To test Hypothesis 3a, I introduced the inbreed dummy variable, coded 1 where an academic's first post-PhD workplace was in her PhD school and 0 otherwise. The t-test shows that among European academics with nationally bounded careers, graduates of top research-intensive schools on average have a higher propensity to remain in their PhD school post-graduation (M=0.57, SE=0.07) than their colleagues with non-top European PhDs (M=0.41, SE=0.04), t(177)=-1.97, p<0.05, r=0.19 (small). In fact, 24 out of 32 graduates of top-ranking schools who started their careers in PhD schools are still employed there[43]. Thus, Hypothesis 3a is supported.

The comparison of effect sizes in Column 4 of Tables 23 and 24 shows that the research-intensiveness of PhD plays a more important role than the research-intensiveness of post-PhD workplaces for European academics with nationally bounded careers. This evidence provides support to Hypothesis 3b.

The last column presents the results of analysis for the sub-sample of academics who received their PhD outside of North America and have been internationally mobile in their careers. These results provide partial support to Hypothesis 4, which assumed that having a top-ranking PhD would be linked to higher research productivity. Having a top-ranking PhD is the strongest driver of the impact of research, but is not related to the volume of research. It should be mentioned that 81% (73 out of 90) of academics in this sub-sample did not come from top research-intensive schools. Further analysis shows that these academics on average work in slightly more research-intensive places post-PhD than their academic origin (ME for PhD school = 126.16, SE=12.85; ME for post-PhD schools = 198.18, SE=15.32), t (172) =-3.6, p<0.001, r=0.26 (small). In comparison, European academics educated in North America on average work in schools with lower research-intensiveness than their doctoral origin (ME for PhD school = 509.07, SE=23.45; ME for post-PhD schools = 282.71, SE=16.03), t (162) =7.97, p<0.001, r=0.53 (large).

Finally, Hypothesis 5 is supported, as both intellectual capital variables are significantly related to the impact and volume of research, with the relationship being stronger for the impact of research (Table 24).

Overall, comparison of the US and European samples shows that among academics educated outside North America, having a PhD from one of the top research-intensive schools results in a higher impact on research productivity relative to the impact that the research-intensiveness of post-PhD workplaces has on research outcomes. The pattern is reversed in the case of US-educated faculty, both in the US and in the European sample.

[43] These findings are consistent with the results reported by Cruz-Castro and Sanz-Menendez (2010), who found that 45.8% of Spanish academics in their sample spent their entire career, starting from undergraduate degree, within the same university.

DISCUSSION

This chapter explored the link between industry stratification and international academic mobility, seeking to understand how academic origin influences individual research productivity in a multi-country context characterized by an underdeveloped stratification system. The findings of the study delivered several insights into the drivers of research outcomes in a multi-country context and into the differences in the behavior of European and US business school faculty.

First, the results indicate the overarching importance of the visibility of PhD origin for academics educated outside of North America. While in the US the research-intensiveness of the post-PhD environment has a stronger impact on research outcomes, in Europe early-career academics have a very small chance of entering a research-intensive workplace abroad if their academic origin is not visible. In a multi-country environment, however, this visibility is limited by a small number of top schools: even in the ranking developed in this chapter, which is broader than most such rankings, only 30 non-North American schools from eight countries are ranked in the top 100 research-intensive institutions. Thus, social closure (Burris, 2004) is reinforced by the inability to stratify the globalized industry in a more fine-grained manner.

These findings shed new light on the debate between European and North American career researchers (Khapova, Vinkenburg & Arnold, 2009), in which European scholars (e.g. Dany, 2003; Dany et al, 2011) emphasize the strength of organizational scripts while their North American opponents argue for the importance of agency in boundaryless careers (e.g. Dowd & Kaplan, 2005; Sullivan & Arthur, 2006). Indeed, in comparison with the careers of US academics, those of European academics seem to be more bounded by an early-career anchoring in a particular stratum, despite Europeans' higher propensity to move across countries. A deeper understanding of employers' perceptions of doctoral school prestige at the pan-European level may be achieved by controlling for same-country versus cross-border hiring immediately post-PhD. A qualitative analysis of decision-making in the case of early-career international faculty hiring (not unlike that of Karl & Peluchette, 2010) could also bring interesting insights into the development of international research careers.

The discussion of multi-country stratification undertaken in this chapter offers an alternative approach to the issue of academic inbreeding in "emerging scientific systems" (Horta et al, 2010). A number of scholars recently studied the consequences of hiring one's own graduates, a widespread practice on the geographical periphery of the current field of organizational science (Cruz-Castro & Sanz-Menendez, 2010; Horta et al, 2010). In particular, Horta and colleagues (2010) found academic inbreeding to be negatively

related to research productivity. Their explanation of the persistence of this phenomenon in Mexico focused on non-research roles performed by inbred faculty. I suggest that another reason behind this might be the combination of a small, local labor market and the inability to assess entry-level international candidates efficiently. In the countries where the business education industry only recently started to outgrow the stage of trade schools, there is usually a very small number of institutions that can be considered to be in the top strata (at the national level) and that can exchange PhD graduates for filling faculty positions.[44] The graduates of same-country universities outside the top strata are not considered for research-active positions due to their insufficient academic socialization. When the demand for faculty exceeds supply within the top strata, this leaves two short-term hiring options: institutions either hire their own students or bring in international faculty. As this chapter demonstrates, in the careers of internationally mobile academics, top-ranking doctoral origin plays a very important part, and I argue that this is so because it facilitates decision-making in cross-border hiring. The graduates of top-ranking research schools, however, are not keen to take a job in peripheral countries, or put a high price tag on their relocation away from the center of industry. Meanwhile, the graduates of lower-ranking international schools, which are considerably better trained than lower-strata graduates within the hiring peripheral country, remain invisible to potential employers. Since they are categorized in unknown strata due to the absence of a global ranking covering more than a limited number of elite institutions, these graduates are seen as risky candidates. By the time these candidates had publications to prove their research abilities, their salary expectations would also increase significantly. Consequently, inbred faculty are hired; conveniently, they also cost less and can perform additional roles, as described by Horta et al (2010). This vicious circle can be broken only by developing a clear and broad stratification that would allow the accurate assessment of the research-intensiveness of international faculty's doctoral origin.

Second, the study distinguished between two directions of international mobility, by comparing the sub-sample of academics educated in North America who subsequently moved to work in Europe and the sub-sample of academics educated outside of North America who moved between countries in their careers. This comparison shows that the overwhelming majority of academics in the first sub-sample came from top research-intensive schools and experienced downward mobility, while the majority of academics in the second sub-sample came from lower-ranking schools and moved upwards to more research-intensive schools. While the first pattern is consistent with the findings by Miller

[44] In my experience, this is certainly the case in Russia, which is a representative example of an emergent scientific system (as mentioned by Horta et al).

et al (2005), the second has mostly been discussed in the negative light of the phenomenon of the international brain drain (e.g. Ciriaci, 2014; Gibson & McKenzie, 2014). The comparison of the geographical location of PhD with current geographical location (see Appendix 6) shows that this pattern may not be as detrimental to the scientific communities of European countries as the literature suggests. While there are some centers of magnetism, such as the UK, the Netherlands, and Switzerland, and some countries play the role of donors (in particular, Germany), there are other countries that demonstrate no significant change in the number of academics, such as Belgium, Italy, and Israel. The small sample size in this study does not allow for country-level generalization, but I argue that an individual-level analysis of international mobility patterns that accounts for the research-intensiveness of workplaces might bring additional insights to the country-level analysis of scientists' mobility. Future studies might consider extending the sample to look at the cross-strata international mobility of researchers at the pan-European level.

International mobility seems to have a different value for the two subgroups of mobile academics discussed above. For those educated in North American schools it brings additional publications, perhaps by placing them in the position of star human capital and enabling them to negotiate significant research support. For graduates of non-North American PhD schools, mobility brings about an increase in the impact of publications. Several mechanisms may underlie this latter relationship. Mobility may bring these academics to those workplaces in Europe that host prominent scholars or editorial board members. Connecting with these gatekeepers may benefit their ability to produce more robust and interesting research. Alternatively, these academics may move to North America at some point in their careers in order to acquire knowledge and the "feel" for current conversations (Huff, 1998) necessary to publish in higher-ranking journals. It is also possible that mobility enables the formation of research communities around certain topics studied by a given academic, with the resulting increase in cross-community citations (e.g. Business Model community).

The relationship between international mobility and research productivity, while being positive and significant in all samples examined in the chapter, calls for further inquiry into the nature of causality in this relationship. Kedia and Englis (2011) report on increasing pressure to internationalize within the US business school industry. AACSB, mass-media rankings, and recruiters for multinational companies all require that business school faculty develop international skills and abilities through experience abroad (Kedia & Englis, 2011). Despite that, academics from top research-intensive US business schools exhibit very low international mobility. One possible explanation for this is that the

faculty might perceive mobility to be detrimental to research productivity, being aware of the "darker side of an international academic career" (Richardson & Zikic, 2007). The linguistic and regulatory fragmentation of the European business school environment may be less appealing than the more homogenous US market. Thus, faculty may prefer a stable research environment, which results in more publications and brings research-related rewards, over more uncertain internationally mobile career choices that bring new experience which is valuable for teaching. If this is the case, the efforts to internationalize US business schools again face a tension between two constituencies (Trieschmann et al, 2000; Siemens, Burton, Jensen & Mendoza, 2005). If a given policy appears to be beneficial for teaching but seems at the same time to be detrimental for research, the rewards system of research-intensive schools will inhibit the implementation of such a policy. This might also result in a division between research-active faculty with low international competencies and teaching faculty with high international skills and knowledge. While this is a viable option for faculty composition, it deepens the divide between research and teaching (and also between research and practice) that business schools strive to eliminate (Burke & Rau, 2010). A similar specialization pattern emerged in the study of academic inbreeding (Horta et al, 2010), where inbred faculty were found to be reluctant to collaborate with international scholars due to their reliance upon internal sources of knowledge, which had a negative effect on their research productivity. As a result, they increasingly focused on teaching and consulting performance, while non-inbred faculty focused on research activities.

Another reason for the low international mobility in the sample of US academics may simply be that the trend towards internationalization has not yet taken hold of academic careers. The cohort of tenured academics, who started their careers more than 10 years ago, might not be aware of the value that "foreign exposure" (Altman & Laguecir, 2012) could bring in terms of producing interesting research. The promotion of this value is not helped by the doubts of some US reviewers on the generalizability of findings from non-US data for the US business context (as reported, for example, by Merilainen, Tienari, Thomas & Davies, 2008).

Similarly, while European business school faculty has more experience of working abroad, it is not clear whether "push" factors, such as the lack of positions in the country of PhD, or "pull" factors, such as the search for new knowledge, contribute to the link between mobility and research productivity. Further research may control for the size of the labor market in the country of PhD and the proportion of potential workplaces with similar or higher research-intensiveness within this market. The data provided by the ranking constructed in this chapter may be used to construct these measures. Within the

European sample, the language of the host and destination countries may also become useful controls, assuming that mobility within the same linguistic area (e.g. between Ireland and the UK) is less costly than mobility between different linguistic areas (e.g. between Germany and France).

Given the importance of research-based stratification for business school faculty, in particular those who move between countries in their careers, this chapter echoes the work of other scholars (Baden-Fuller et al, 2000; Mangematin & Baden-Fuller, 2008; Linton, 2012a) and constructs a ranking based on a broad range of business and management journals. The ranking developed by Mangematin and Baden-Fuller (2008) became a basis for my ranking methodology, as it already offered many benefits in terms of global coverage and the broad list of journals included. Mangematin and Baden-Fuller (2008) used their ranking to measure global knowledge production and to demonstrate the shifting balance of power from the established US elite towards new research champions in Europe and Asia. This chapter had another purpose, and used the new ranking to make a contribution to the conversation on stratification and international mobility in researchers' careers. Nonetheless, the ranking methodologies are very similar, so the new ranking developed in this chapter may be used as an update for the years 2007-2012 to Mangematin and Baden-Fuller's ranking, which was based on data from 1992-2005. Consequently, more than 200 institutions can now be included in this broad ranking based on 20 years' worth of publication data. Furthermore, 2590 educational institutions can be ranked based on their publications in 2007-2012.

The use of a broader list of journals in assessing the research-intensiveness of business schools brought several non-North American universities into the top 100 producers of organizational science research. Those researchers, who do not focus narrowly on publishing in A-list journals, may consider Manchester University and Lancaster University in the UK, Vrij University Amsterdam and Maastricht University in the Netherlands, and the University of Queensland in Australia to be equally vibrant research communities as some of the top US schools. Therefore, PhD graduates of these universities might be expected to have good research training, even if they lack top-ranking publications at the beginning of their career. These universities are also emerging as good candidates for research collaboration within Europe, where local business schools have traditionally been focused on alliances with top US schools (Baden-Fuller & Ang, 2001).

As an example of another possible application of the ranking data, scholars could revisit the mapping of globally recognized business schools created by Thomas and Li (2009). The strategic groups of business schools identified by these authors are based on a narrow list of 40 *FT* journals, which is consistent with the sampling, as all business schools

are taken from the *FT* MBA ranking. It is, however, unlikely that the faculty of these schools would not publish outside *FT* journals. It would be interesting to test whether the strategic groups defined in Thomas and Li's (2009) study remained stable if the broader measurement of research output were used in cluster analysis. As the movement of research-active faculty between business schools is often guided by the research dimension of institutional performance rather than such things as value for students or student GMAT scores (which form the basis of mass-media rankings), the results might have implications for faculty's individual career decisions.

Implications

The study of rankings in this chapter shows that some research-intensive schools may become "invisible" if the ranking is based on a restrictively narrow list of journals. Meanwhile, a hiring committee's perception of the research reputation of a candidate's background plays an important part in academic careers. It is difficult to avoid the use of rankings in business schools because of their function as sources of legitimacy (Thomas & Wilson, 2011), as cognitive shortcuts in time-constrained decision-making (Adler & Harzing, 2009), and as a source of rewards for the elite (Ozbilgin, 2009). I argue that at least the use of the rankings has to be aligned with a school's policy regarding publications. Given the increasing difficulty of publishing in one of the top journals (Ashkanasy, 2010; Certo et al, 2010) business schools have to be pragmatic about the range of peer-reviewed outlets that are considered acceptable for their faculty. As the range of acceptable journals increases, rankings based on a broader list of journals should be used in hiring and promotion procedures.

Academics supervising doctoral students in European business schools should also be aware of the increased importance of early publications for their students. This is particularly important for graduates seeking academic jobs outside the country of PhD. Given the European tradition of writing doctoral theses in the form of manuscript (e.g. Phillips & Pugh, 2005), this would require an additional effort in helping students to prepare journal submissions as early in a PhD program as possible.

For those academics who decide to move between countries in their career, the findings of this chapter offer some comfort. Despite the risks and challenges associated with international mobility (Richardson & Zikic, 2007; Richardson, 2009), experience of working abroad is positively associated with lifelong productivity on the part of researchers. The effect is too small to recommend mobility as a method for the development of research productivity; however, if other incentives attract an academic to a workplace abroad, a decrease in productivity should not become an overwhelming concern.

The process of constructing a research ranking highlighted the need for business schools to have a clear policy on the format of institutional affiliation when it is mentioned in faculty publications. Failure to implement this policy might result in significant inaccuracies in positioning a school in a research-based ranking. For example, in the ranking constructed in this chapter, I have 16.74 units of research output affiliated with the National University of Ireland. Without opening each of the papers produced I have no means to allocate this considerable (by the standards of Irish universities) output to NUI University College Dublin, NUI University College Cork, NUI Galway, NUI Maynooth or any of the NUI research scholarships.

Limitations and directions for further research

The analysis of mobility patterns undertaken in this chapter has delivered some interesting insights, but I have only scratched the surface of the phenomenon. Due to the fine-grained approach to the analysis of academic careers chosen for this thesis, data collection was a time-consuming process, resulting in a medium-sized sample of European academics. The sub-sample of internationally mobile academics, consequently, was of an even smaller size, which precluded complex statistical analysis and somewhat undermined my ability to generalize from this to a larger population. Further studies focusing on academic mobility across Europe, academic mobility across linguistic areas, and academic mobility between center and periphery could bring valuable contributions to the exploration of business school researchers' productivity.

In order to compare the drivers of research productivity in European business schools with the same drivers in the US business schools, I had to limit the sampling frame of this study to the top 50 European research-intensive schools. This chapter, however, argues that considering only elite schools leads to an excessively narrow view of research production, as almost 3000 schools worldwide actually contribute to research in the organizational sciences. I encourage other scholars to extend this study by looking at the drivers of research productivity in the schools where no faculty has been educated or worked in top-ranking schools. Is this environment more meritocratic? Does it give preference to a contest mobility over accumulative advantage model (Miller, 2005)? Does the stratification system emerge in the same shape at the lower absolute levels of research-intensiveness? These are some of the questions that might be explored using the ranking and the methodology developed in this chapter.

APPENDIX 3: Journal list for the research-based ranking

Journal Title	Average IF 2006-2012	JCR category
Academy of Management Annual	4.866	Management
Academy of Management Learning & Education	3.042	Management
Academy of Management Journal	5.385	Business
Academy of Management Perspectives	1.749	Business
Academy of Management Review	6.238	Business
Accounting Horizons	1.584	Business, Finance
Accounting, Organizations & Society	1.872	Business, Finance
Accounting Review	2.143	Business, Finance
Administrative Science Quarterly	3.449	Business
Asia Pacific Journal of Management	3.505	Management
British Journal of Management	1.528	Business
Business Ethics Quarterly	1.630	Business
Business & Society	1.393	Business
Business Strategy & the Environment	2.598	Business
California Management Review	1.501	Business
Contemporary Accounting Research	1.278	Business, Finance
Corporate Governance	1.680	Business
Corporate Social Responsibility & Environmental Management	1.603	Business
Decision Analysis	2.038	Management
Decision Sciences	1.833	Management
Electronic Commerce Research & Applications	1.278	Business
Entrepreneurship & Regional Development	1.120	Business
Entrepreneurship Theory & Practice	2.059	Business
European Journal of Work & Organizational Psychology	1.470	Management
European Management Review	1.219	Management
Family Business Review	1.927	Business
Financial Management	1.124	Business, Finance
Finance and Stochastics	1.192	Business, Finance
Governance	1.334	Public administration
Group & Organization Management	1.908	Management
Harvard Business Review	1.564	Business
Human Relations	1.450	Management
Human Resource Management Journal	1.473	Management
Human Resource Management Review	2.374	Management
Human Resource Management	1.583	Management
Industrial & Corporate Change	1.288	Business
Industry & Innovation	1.124	Management
Industrial Marketing Management	1.401	Business
Information & Management	2.128	Management
Information Systems Research	2.398	Management
Information Technology & Management	1.278	Management
International Business Review	1.361	Business
International Journal of Advertising	1.521	Business
International Journal of Electronic Commerce	1.344	Business
International Journal of Forecasting	1.480	Management
International Journal of Logistics Management	1.152	Management

Journal Title	Average IF 2006-2012	JCR category
International Journal of Management Reviews	2.307	Business
International Journal of Operations & Production Management	1.288	Management
International Journal of Physical Distribution & Logistics Management	1.827	Management
International Journal of Project Management	1.609	Management
International Journal of Research in Marketing	1.520	Business
International Journal of Shipping & Transport Logistics	1.388	Management
International Journal of Strategic Property Management	1.788	Management
International Public Management Journal	1.257	Public administration
International Small Business Journal	1.289	Business
Internet Research	1.308	Business
Journal of the Academy of Marketing Science	2.003	Business
Journal of Accounting & Economics	3.123	Business, Finance
Journal of Accounting Research	2.411	Business, Finance
Journal of Applied Behavioral Science	1.324	Management
Journal of Applied Psychology	4.533	Management
Journal of Banking & Finance	1.578	Business, Finance
Journal of Business Economics & Management	2.538	Business
Journal of Business Logistics	2.759	Management
Journal of Business Research	1.294	Business
Journal of Business Venturing	2.296	Business
Journal of Consumer Affairs	1.400	Business
Journal of Consumer Psychology	3.080	Business
Journal of Consumer Research	2.518	Business
Journal of Corporate Finance	1.428	Business, Finance
Journal of Environmental Economics & Management	2.053	Business
Journal of European Public Policy	1.323	Public administration
Journal of European Social Policy	1.406	Public administration
Journal of Finance	3.871	Business, Finance
Journal of Financial Economics	3.429	Business, Finance
Journal of Financial Intermediation	1.336	Business, Finance
Journal of Financial & Quantitative Analysis	1.489	Business, Finance
Journal of Information Technology	2.231	Management
Journal of International Business Studies	3.135	Business
Journal of International Management	1.763	Management
Journal of International Marketing	1.872	Business
Journal of Interactive Marketing	1.440	Business
Journal of Knowledge Management	1.361	Management
Journal of Management	3.789	Business
Journal of Management Information Systems	1.927	Management
Journal of Managerial Psychology	1.526	Management
Journal of Management Studies	3.023	Business
Journal of Marketing	4.081	Business
Journal of Marketing Research	2.482	Business
Journal of Monetary Economics	1.605	Business, Finance
Journal of Money, Credit & Banking	1.152	Business, Finance
Journal of Nursing Management	1.362	Management

Journal Title	Average IF 2006-2012	JCR category
Journal of Occupational and Organizational Psychology	1.561	Management
Journal of Operations Management	3.347	Management
Journal of Organizational Behavior	2.600	Business
Journal of Policy Analysis & Management	1.577	Public administration
Journal of Product Innovation Management	1.872	Business
Journal of Public Administration Research & Theory	1.876	Public administration
Journal of Public Policy & Marketing	1.374	Business
Journal of Purchasing & Supply Management	1.260	Management
Journal of Retailing	2.582	Business
Journal of Risk & Uncertainty	1.338	Business, Finance
Journal of Service Management	1.309	Management
Journal of Service Research	1.901	Business
Journal of Supply Chain Management	3.941	Management
Journal of Technology Transfer	1.189	Management
Journal of World Business	1.779	Business
Leadership Quarterly	2.315	Management
Long Range Planning	1.920	Business
Manufacturing & Service Operations Management	1.720	Management
Management Accounting Research	1.208	Business, Finance
Management Decision	1.697	Business
Management Learning	1.152	Management
Management & Organization Review	2.692	Management
Management Science	2.002	Management
Marketing Science	2.818	Business
Mathematical Finance	1.119	Business, Finance
MIS Quarterly Executive	1.483	Management
MIS Quarterly	4.910	Management
MIT Sloan Management Review	1.116	Business
Omega - International journal of management science	2.442	Management
Operations Research	1.757	Management
Organizational Behavior & Human Decision Processes	2.439	Management
Organizational Research Methods	3.024	Management
Organization Science	3.305	Management
Organizational Studies	2.066	Management
Organization	1.486	Management
Personnel Psychology	3.565	Management
Philosophy & Public Affairs	1.647	Public administration
Psychology & Marketing	1.181	Business
Public Administration	1.213	Public administration
Public Administration Review	1.170	Public administration
Quantitative Marketing & Economics	1.202	Business
R&D management	1.383	Business
Regulation & Governance	1.625	Public administration
Research in Organizational Behavior	2.679	Management
Research Policy	2.333	Management
Review of Accounting Studies	1.913	Business, Finance

Journal Title	Average IF 2006-2012	JCR category
Review of Finance	1.661	Business, Finance
Review of Financial Studies	3.237	Business, Finance
Small Business Economics	1.239	Business
Strategic Entrepreneurship Journal	1.761	Business
Strategic Organization	2.550	Business
Strategic Management Journal	3.429	Business
Supply Chain Management	1.615	Business
Technological Forecasting & Social Change	1.582	Business
Technovation	2.202	Management
Tourism Management	1.813	Management
Transformations in Business & Economics	1.131	Business
World Bank Economic Review	1.410	Business, Finance

APPENDIX 4: Example of top-10 rankings by country

	Organizations	Average weighted output (2007-2012)	Rank (2007-2009)	Rank (2010-2012)	Average rank 2007-2012
	France				
1	INSEAD	340.608	31	60	45.5
2	HEC SCH MANAGEMENT PARIS	163.552	157	103	130
3	UNIV PARIS	122.307	184	160	172
4	EM LYON BUSINESS SCH	76.323	229	274	251.5
5	ESSEC BUSINESS SCH	73.223	254	264	259
6	GRENOBLE SCH OF MANAGEMENT	48.427	346	356	351
7	KEDGE BUSINESS SCH /EUROMED/BEM BORDEAUX	47.324	390	332	361
8	UNIV TOULOUSE	38.479	412	406	409
9	TOULOUSE BUSINESS SCH	34.557	382	491	436.5
10	EDHEC BUSINESS SCH	27.556	543	457	500
	Germany				
1	UNIV MANNHEIM	158.488	161	108	134.5
2	UNIV FRANKFURT	137.966	159	149	154
3	WHU OTTO BEISHEIM SCH MANAGEMENT	118.890	216	146	181
4	UNIV MUNICH	90.686	251	199	225
5	UNIV COLOGNE	73.397	307	228	267.5
6	UNIV KONSTANZ	70.237	286	259	272.5
7	TECH UNIV MUNICH	63.990	295	283	289
8	FREE UNIV BERLIN	65.737	329	252	290.5
9	UNIV ERLANGEN NURNBERG	56.953	368	277	322.5
10	TECH UNIV BERLIN	54.838	393	281	337
	The Netherlands				
1	ERASMUS UNIV	733.684	7	3	5
2	TILBURG UNIV	500.498	28	16	22
3	UNIV AMSTERDAM	300.242	57	49	53
4	UNIV GRONINGEN	303.510	76	37	56.5
5	VRIJE UNIV AMSTERDAM	231.194	88	75	81.5
6	MAASTRICHT UNIV	214.476	99	79	89
7	UNIV UTRECHT	166.155	134	113	123.5
8	EINDHOVEN UNIV TECHNOL	145.142	185	114	149.5
9	UNIV TWENTE	121.530	172	167	169.5
10	RADBOUD UNIV NIJMEGEN	92.165	226	211	218.5
	The UK				
1	LONDON BUSINESS SCH	423.721	25	34	29.5
2	UNIV MANCHESTER	324.347	43	53	48
3	UNIV WARWICK	280.848	54	62	58
4	UNIV LONDON, LONDON SCH ECON POLIT SCI	260.157	71	67	69
5	UNIV CAMBRIDGE	260.451	77	63	70
6	UNIV NOTTINGHAM	240.990	70	86	78
7	UNIV OXFORD	230.657	91	73	82
8	UNIV LONDON, IMPERIAL COLL	210.074	102	81	91.5
9	UNIV LANCASTER	207.650	85	105	95
10	CARDIFF UNIV	202.877	87	110	98.5

APPENDIX 5: Results of negative binomial regression analysis

Results of negative binomial regression analysis (EU sample)

	Number of papers	Number of citations
Control Variables		
Gender (1= male)	0.18***	0.07
	(0.05)	(0.12)
Years Since PhD	0.02***	0.05***
	(0.00)	(0.01)
Discipline area	-0.02*	0.06*
	(0.01)	(0.03)
Symbolic and intellectual capital		
Research-intensiveness of PhD school	-0.00	0.00*
	(0.00)	(0.00)
Impact Factor of 1st journal [a]	0.01	0.13***
	(0.01)	(0.03)
Time before 1st publication	-0.01***	-0.07***
	(0.00)	(0.01)
Research-intensiveness of post-PhD jobs	0.00	0.00**
	(0.00)	(0.00)
Social capital		
Co-authorship network size [a]	0.09***	0.13***
	(0.01)	(0.01)
Average strength of co-authorship ties	0.14***	0.01
	(0.02)	(0.07)
Proportion of strong ties	0.37**	0.53*
	(0.13)	(0.32)
Mobility		
Mobility within the country of PhD	0.01	-0.02
	(0.02)	(0.05)
Mobility outside of the country of PhD	0.07***	0.10*
	(0.02)	(0.05)
Interactions		
Co-authorship network size squared	-0.00***	-0.00***
	(0.00)	(0.00)
N	343	343
Constant	0.90***	1.89***
	(0.10)	(0.26)
LR x^2(d.f.)	496.31***	293.95***
Pseudo R^2	0.19	0.06

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

Results of negative binomial regression analysis (US sample)

	Number of papers	Number of citations
Control Variables		
Gender (1= male)	0.06	-0.18
	(0.05)	(0.12)
Years Since PhD	0.02***	0.03***
	(0.00)	(0.00)
Discipline area	-0.01	0.03
	(0.01)	(0.02)
Symbolic and intellectual capital		
Research-intensiveness of PhD school	0.00	0.00
	(0.00)	(0.00)
Impact Factor of 1st journal [a]	-0.01*	0.07***
	(0.01)	(0.02)
Time before 1st publication	-0.02***	-0.04***
	(0.00)	(0.01)
Research-intensiveness of post-PhD jobs	0.04***	0.13***
	(0.01)	(0.02)
Social capital		
Co-authorship network size [a]	0.06***	0.09***
	(0.00)	(0.01)
Average strength of co-authorship ties	0.39***	0.53***
	(0.04)	(0.11)
Proportion of strong ties	0.03	0.49†
	(0.12)	(0.32)
Mobility		
Mobility within the country of PhD	0.05**	0.14**
	(0.02)	(0.05)
Mobility outside of the country of PhD	0.09**	0.19*
	(0.03)	(0.10)
Interactions		
Co-authorship network size squared	-0.00***	-0.00***
	(0.00)	(0.00)
N	495	495
Constant	0.46***	1.70***
	(0.13)	(0.32)
LR x^2(d.f.)	712.21***	362.50***
Pseudo R^2	0.19	0.05

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

APPENDIX 6: Inter-country mobility of European faculty

Sub-sample of internationally mobile European academics educated outside North America

Country	PhD graduates (in the sample)	Currently employed (in the sample)
Australia	1	0
Austria	2	0
Belgium	7	8
Denmark	1	0
Finland	2	4
France	9	6
Germany	22	5
Israel	5	5
Italy	3	3
Netherlands	6	10
New Zealand	1	0
Norway	1	0
Russia	1	0
Spain	3	2
Sweden	2	0
Switzerland	9	26
UK	15	21
Total	**90**	**90**

CHAPTER 5. LANGUAGE AND NETWORKS: INDIVIDUAL RESEARCH PRODUCTIVITY IN EUROPEAN BUSINESS SCHOOLS

Previous chapters developed and tested a multilevel model of research productivity in the business school industry. Chapter 3 brought together organizational-level and individual-level drivers of research productivity and measured their relative importance using the sample of US business school academics. Chapter 4 extended the conversation to a global level and explored stratification and mobility as context-sensitive antecedents of research productivity, using a pan-European sample of academics. This chapter goes one step further in determining the boundary conditions of developed theory in the globalized business school industry, and looks at the consequences of increased heterogeneity of faculty backgrounds on individual research productivity.

The business school industry has experienced rapid growth and internationalization in the last 50 years (Podsakoff et al, 2008; Zammuto, 2008). While the opportunities offered by this internationalization have been welcomed by the academic community (Adler, 2014; Doh, 2010; Mitchell, 2007), challenges associated with it received less attention. So far, a handful of notable works have examined its consequences. Certo et al (2010) report a dramatic increase in competition for space in top management journals and Mitchell (2007) calls for changes to be made to the US PhD curriculum in light of the overwhelming growth in the number of students for whom English is a second language. In his recent article, Paul Adler, Academy of Management President-elect, welcomed the diversity of ideas brought by internationalization, but warned that the spreading of the 'publish or perish' gospel worldwide may have "mixed effects" on the global management community (Adler, 2014). Specifically, he was concerned with the dominance of "US norms of scholarship and publication" (Adler, 2014: 3) that drives highly competitive and increasingly homogenous research ethos globally.

Most importantly from the point of view of this thesis, the impact of internationalization on research performance has been largely overlooked. The debate around the benefits and flaws of using publications in international journals as a measure of academic performance (Adler & Harzing, 2009; Sousa et al, 2010) has not yet fully entered the space where individual-level characteristics of researchers and individual-level performance are considered. Meanwhile, recent qualitative research (Tietze & Dick, 2009, 2013) indicates that a significant tension might exist in this space due to language-related processes.

Maintaining high research productivity becomes an increasingly important strategic goal for many European business schools (Baden-Fuller & Ang, 2001; Baden-Fuller et al,

2000). The rules set by government agencies and international accreditation bodies to assess research outcomes are driven by quantitative bibliometric measures of impact and hence give preference to international peer-reviewed English language journals (Johansson & Sliwa, 2014; Sousa et al, 2010). This creates additional pressures for European research-active faculty because of their national and linguistic heterogeneity. Increased competitive pressures, coupled with the increased diversity of researchers' educational backgrounds, motivate academics to look for additional sources of knowledge and professional support in order to meet the required thresholds of research productivity. Social capital embedded in co-authorship networks is one such resource that can be accumulated throughout an academics' career and utilized to support knowledge creation (Phelps et al, 2012; McFadyen et al, 2009). Meanwhile, linguistic diversity among a new generation of management scholars is likely to have a negative impact upon their ability to extract value from scientific collaboration within co-authorship networks.

This study seeks to make several contributions to the literature in this field. Firstly, it contributes to academic productivity literature (e.g. Buchmueller et al, 1999; Long et al, 1998; Williamson & Cable, 2003) by exploring the impact of linguistic capital on individual research performance of management faculty. In doing so, I extend the stream of research on the behavior of non-native speakers of English in business schools (Tietze, 2008; Tietze & Dick, 2009, 2013). Secondly, it highlights the role of language as a key part of occupational human capital for academic researchers in globalized business schools. This brings "language-sensitive research in international business" (Piekkari & Tietze, 2011: 267) from the traditional context of multinational companies to the increasingly internationalized (and perhaps broader) environment of knowledge-intensive organizations. Thirdly, it contributes to the research on co-authorship networks by investigating the "black box" of nodal attributes (Phelps et al, 2012) and by introducing linguistic capital as a moderating factor which explains the differences in the value extracted by individuals from their social capital.

In order to explore the role of linguistic capital as an antecedent of research productivity in the field of organizational science, I analyzed the career strategies and publishing performance of 360 tenured academics from 20 European research-intensive business schools. The European sample has several distinctive features that might influence the applicability of the theories previously tested in the single-nation, mostly US, settings (e.g. Long et al, 1998; Park & Gordon, 1996; Williamson & Cable, 2003). Academics within European schools come from a great variety of educational backgrounds which do not fit into one stratification system, due to the absence of a common ranking underlying the industry hierarchy in this heterogeneous segment of the business school

market. The European market of business education is composed of multiple countries, which use different languages in everyday social, business and governmental discourse. This discourse permeates regulatory norms and research practices. This introduces linguistic diversity as a factor, which is highly relevant for individual research performance.

In a globalized world, the diversity of academic backgrounds within a faculty is an important source of cross-cultural knowledge that enables business schools to nurture global leaders (Eisenberg, Hartel & Stahl, 2013) and thus bolster the school's competitive advantage. As a result, it is crucial to establish practices that "mitigate specific dilemmas arising from the idiosyncratic attributes of a given firm's pool of human capital" (Coff & Kryscynski, 2011: 1439). I believe that the findings of this chapter will provide academic administrators with an insight into how to create a beneficial environment for researchers, which in turn would facilitate the attraction, retention and motivation of unique human capital in a global market. Moreover, an understanding of the role of a language as a driver of research outcomes is crucial for the education of the new cohort of doctoral students in non-English speaking countries.

More generally, insights into linguistic socialization and its impact on performance may be of help to managers in knowledge intensive industries that rely upon the co-creation and dissemination of knowledge in written form, where talent is international, but the primarily source of knowledge upon which creative insights are developed and disseminated is the English language. One example of such an industry is software development, which is one of the most globalized sectors of the knowledge economy, characterized by high international diversity of human capital. On the surface it seems that programming skills, which are not dependent on an employee's language, are much more important for success in this industry than linguistic capital. Testing this assumption, Perry et al (1994: 45) found that software developers in a large IT organization spent more than half of their time "in interactive activities other than coding". Further examination of the business processes in the industry reveals that technical documentation, which is necessary for customer support and efficient collaboration between developers, is still predominantly produced and disseminated in English. Mastery of technical English is also key to communication within the industry, which often involves working with international customers and outsourcing to international subcontractors. Holmstrom et al (2006), who studied Intel and Hewlett Packard software development teams in Ireland, found that the insufficient knowledge of English among the international workforce was described as a challenge by both companies. Language barriers were found to impede teambuilding and to provoke cross-cultural misunderstandings, with detrimental results for the global software development process which "requires rich communication" (Holmstrom,

Fitzgerald, Agerfalk & O Conchuir, 2006: 7).

CONCEPTUAL BACKGROUND

Linguistic Capital as an Antecedent of Research Productivity

"Whatever else we may be as researchers and scholars, we are at the core a profession of text writers" (Golden-Biddle & Locke, 2007: 9). Scientific ideas rarely have an impact unless they are clearly communicated because, as McCloskey (1985: 188) stated in rather brutal terms, "bad writing does not get read". High-quality writing is a key pre-requisite for publication in top journals (Grant & Pollock, 2011; Judge et al, 2007; Pollock & Bono, 2013) and is one of the reasons why a paper may be deemed interesting by the academic community (Bartunek, Rynes & Ireland, 2006; Judge et al, 2007). Multiple authors agree that writing well is difficult and that mastering this skill takes time and a great deal of effort (Golden-Biddle & Locke, 2007; Ragins, 2012). It is also generally agreed that English is the lingua franca of global management academia (Baden-Fuller & Ang, 2001; Tietze, 2008; Tietze & Dick, 2009).

The model developed within the area of applied linguistics by Kachru (1996) introduces three circles of English. The *inner circle*, which includes the UK, USA, Canada, Australia, and New Zealand, provides the norms for the use of English that are adopted by other countries. The countries of the *outer circle* do not use English as their official language, but the integration of English in the education system and its use as *lingua franca* is high. Among such countries Kachru (1996) lists India, Nigeria, Malaysia, Singapore and some other Asian, African and Central American countries. The rest of the world that uses English belongs to *expanding circle* countries[45]. Within the business school context, the countries of the inner circle, in particular, the USA, Canada and the UK, set the norms for the language of academic writing in organizational sciences. Academics in other countries have to accept these norms if they want to publish in highly visible peer-reviewed journals (Adler & Harzing, 2009). This is both advantageous and problematic. Science benefits from having a common language that allows knowledge to be transferred across national boundaries. At the same time, the existence of a dominant language limits the pool from which potentially influential ideas may be drawn (Meyer & Boxenbaum, 2010), because it is more difficult for scholars educated outside of inner circle countries to share the fruits of their research.

The concept of linguistic capital, introduced by Pierre Bourdieu (1991), is helpful in understanding the link between language and success in research performance in business schools. According to Bourdieu, linguistic capital goes beyond the ability to "generate

[45] I would argue that the Netherlands and Denmark are more likely to belong to the *outer circle* countries due to their emphasis on English in their educational system (e.g. Hewings, 2012).

grammatically well formed sentences" and entails the "capacity to produce expressions which are appropriate for particular situations" (Thompson, in editor's introduction to Bourdieu, 1991: 7). Bourdieu further argues that the elite part of the population that possesses superior linguistic capital due to their favorable initial position is able to convert it into economic capital (monetary rewards) and symbolic capital (prestige, status). Similar processes happen within the business school context.

Early in an academic career, the language of an individuals' undergraduate education lays a foundation for the path dependent process in the development of academic researchers. This happens during the "preformation phase", even before the "critical juncture" of the PhD school choice (Sydow et al, 2009: 691). Language skills may play an important role in one's search for a PhD program. A person lacking a high level of English language proficiency is unlikely to gain entry to an English language PhD program. Furthermore, most of the leading peer reviewed journal sources and texts that a PhD student would use in both their PhD course work and dissertation are written in English. Many of the top ranked PhD programs in the world use English as the primary means of communication. Therefore, candidates educated in inner circle countries, as defined above, have a preferential access to top-ranked PhD schools.

PhD education is a key mechanism for the socialization of researchers, as discussed in Chapter 3. Part of this socialization includes the transfer of linguistic capital that the new cohort of researchers needs to communicate with the scientific community. Such communication can be oral, the email or written (through publications). In the following sections I will discuss the consequences of education outside the inner circle of English for each of these types of communication. Keeping in mind that the distribution of linguistic capital is unequal within each country (Bourdieu, 1991), this chapter takes a more macro-level view on the matter. I focus on the major distinction between countries where an English speaking environment creates a critical mass of everyday linguistic interactions, and the countries where English is used less frequently and competes with other languages for the dominance in everyday communication.

One of the most common occasions when oral communication is particularly important for a researcher is participation in an international conference. Academics with a lower stock of linguistic capital who cannot clearly communicate their ideas to the audience and cannot engage in Q&A are less likely to receive good developmental feedback. This robs the conferences of their purpose to be an intermediate stage between an idea and a publication, a source of friendly reviews. The inability to clearly communicate ideas due to insufficient linguistic capital also undermines knowledge dissemination. Bourdieu (1991) argues that the congruence between the way individuals

were initially taught to speak and the way they are required to speak in a particular situation leads to fluency and confidence in speech. More fluent and confident speakers capture the attention (and possibly the citations footprint) of the audience. Linguistic capital may also influence the formation of collaboration ties. Research in international business (Neeley, 2013; Tenzer, Pudelko & Harzing, 2014) provides evidence that the perception of professional competence is influenced by language skills, such that lower linguistic capital may reduce the attractiveness of a researcher as a potential collaborator.

Email communication with co-authors, reviewers and editors can also be influenced by an academic's stock of linguistic capital. Lower linguistic capital may increase the difficulty of communicating the fit of a manuscript to a particular journal in a letter to an editor. The lack of fit (or an inability to communicate it in a clear and concise way) increases the probability of desk rejections (Linton, 2012b). Research-related communication with peers, such as responses to reviewers or a discussion with co-authors, also has established conventions which define an appropriate style of writing. Bourdieu (1991:80) writes that "[i]n social formalism… there is only one formula in each case which 'works'." While I would not be as restrictive, I would still argue that a lack of linguistic capital may lead to misunderstanding and undermine the publishing process.

Academic writing itself may be influenced by linguistic capital in several ways. First, scholars educated outside the inner circle countries may experience difficulties in communicating the subtle nuances of meaning in their manuscripts. Recent qualitative research has revealed that academics socialized into the profession in non-English speaking countries prefer to publish "figures-based" studies, which are easier to write up, despite the fact that they may have expertise in both qualitative and quantitative methods (Tietze & Dick, 2013). The research by the same authors emphasizes that "despite grammatical competence in the English language, tacit rules of language use remain[ed] a source of continued frustration in terms of exercising "voice" as a competent and recognized researcher" (Tietze, 2008; Tietze & Dick, 2013: 126). Hickson (1996: 204) provides similar insights, writing almost 20 years ago that: "The language in which the research journals are produced imposes considerable obstacles on those whose first language is not English. Knowing the vocabulary and grammar is not enough. There is the idiom, the style, the flow, the very formulation of thought."

Second, the phenomenon of hyper-correction, defined as "tendency to rectify or correct expressions" (Thompson, in editor's introduction to Bourdieu, 1991: 21), is typical for individuals with lower linguistic capital who strive to produce appropriate texts (Bourdieu, 1991). Hyper-correction might result in an overly defensive style of writing, which makes reviewers wonder whether an author makes a valuable contribution based on

robust methodology. An alternative approach for academic writers lacking confidence due to low linguistic capital might be the mimicking of established writing styles to the extent where it becomes hard to distinguish the manuscript from other work on a similar subject. While this seems to be a safe (and even recommended) strategy, it also makes a study less interesting, original and provocative, and thus reduces its chances of capturing the attention of reviewers (Bartunek et al, 2006).

Third, studies in linguistics argue that the first language adopted by an individual has a life-long imprint upon the way a person structures written and oral communication (Slobin, 1996). Slobin (1996) further argues that this imprint manifests itself in foreign language communication and prevents non-native speakers from expressing themselves exactly as native speakers would do. Academics educated outside of inner circle countries may experience difficulties in adjusting to a different structure expected from English-language publications. The differences may include the length of sentences: for instance, while academic English requires short and succinct phrases, other languages, such a Russian or Italian, favor long and complex phrases in scientific texts. The conventions on the structure of an argument may also differ: the triad thèse-antithèse-synthèse is typical for French research tradition (Coleman, 2006, cited in Hewings, 2012), while the use of topic sentences is a prominent feature of American academic writing tradition.

The arguments above do not imply that all academics educated in the countries belonging to the inner circle of English are better at writing than their peers from other countries. Indeed, evidence shows that native speakers of English are willing to attend classes of English for academic purposes designed for non-native speakers (Hewings, 2012). Social class, quality of education and natural abilities all contribute to the quality of produced manuscripts. Ceteris paribus, however, academics educated in inner circle countries do not have to suppress the imprinted style of writing before they shape their research reports according to conventions of the global field of organizational science. “The cost of constant anxiety” associated with lower linguistic capital (Thompson, in editor’s introduction to Bourdieu, 1991: 21) is also likely to be lower for these academics.

This anxiety and frustration, caused by an inability to adequately express ideas in English, is exacerbated by journal rejections which refer to writing style as the manuscript’s flaw. It has been shown previously that the unconscious psychological mechanism of homophily can make reviewers react negatively to a methodological, conceptual or writing style which is different from what they have been using in their work (Adler & Harzing, 2009; Crane, 1967). The insights from international business research also show that professional credibility is often seen through the lens of linguistic competence (Tenzer et al, 2014). This might trigger a vicious cycle, as conceptualized by

Day (2011), where anxiety avoidance and professional identity threats leads to decreasing research activity among business school faculty.

As a result, the cost of publishing a paper (including but not limited to temporal costs) is higher for those who have been introduced to academic language in a non-English speaking environment. Additional investment in copy-editing is also necessary in order to remedy grammatical and stylistic imperfections (Delamont et al, 1997; Tietze, 2008).

Hypothesis 1: Linguistic capital (acquired through education in an English speaking country) is positively related to individual research performance.

Linguistic Capital and Co-authorship Networks

Co-authorship can enrich the foundations of a paper, increasing the likelihood of it being accepted by a journal, and result in more publications (Acedo et al, 2006; Floyd et al, 1994). Research into networks as antecedents of knowledge creation (and scientific research is an example of knowledge created by individuals) suggests that the ability to extract value from a co-authorship network depends on the individual characteristics of the actors concerned (Wei, Chiang & Wu, 2012). Current research, however, provides limited evidence to confirm this theory (Phelps et al, 2012) as the majority of studies focus on structural differences in ego-networks rather than on the internal heterogeneity of individuals who develop and utilize these networks (e.g. McFadyen & Cannella, 2004, McFadyen et al, 2009). A small number of published research studies that investigate individual attributes focus on gender, personality traits, absorptive capacity and political skill (Wang, Tong, Chen & Kim, 2009; Wei et al, 2012). I seek to contribute to such research by analyzing linguistic capital as a factor which influences an academic's ability to transform the social capital embedded in co-authorship networks into tangible research outcomes.

There are multiple reasons why linguistic capital may explain the differences in the outcomes of network utilization. The first of these is that the differences in knowledge structures resulting from linguistic diversity may serve as a barrier impeding communication between collaborators when these hail from different language backgrounds (Marschan et al, 1997; Tenzer et al, 2014; Slobin, 1996). Where these differences exist, it may take longer for co-authors to agree on a writing style. In a recent report on the patterns of collaboration between researchers in the US and the European Union, it was revealed that the collaboration rate in the field of social sciences was lower between European countries in comparison to the collaboration between the various states of the USA (Kamalski & Plume, 2013). Notably, the trend was reversed in the field of natural sciences, with inter-European collaboration exceeding inter-state collaboration in North America. In my view, this data suggests that the diversity of language backgrounds

has a greater impact on collaboration in a social sciences context relative to such collaboration in the field of natural sciences, due to the fact that publishing success in social sciences is greatly influenced by story-telling ability and writing style. There is also evidence in cross-cultural management research that individuals socialized in cultures different to those of their colleagues are more likely to commit cultural faux pas, "producing behavior that does not match expectations of appropriateness" among their peers from other cultures (Molinsky, 2005: 104). Such faux pas can potentially diminish the value extracted from the relationship (Mor, Morris & Joh, 2013).

The second reason is that network maintenance costs are likely to be higher for academics who have been socialized into the profession in a non-English speaking environment and who collaborate with peers socialized in English-speaking countries. Such collaboration is considered beneficial for the quality of the papers produced (Linton, 2012b; Tietze, 2008), as those with higher linguistic capital can assume the dual role of co-researcher and copy-editor of co-authored papers. Network relationships however, are based on the principle of reciprocity (Carpenter et al, 2012). Consequently, in return, academics socialized outside the inner circle of English may be expected to shoulder more of the responsibility for data collection or data analysis. A qualitative study by Tietze (2008: 382) provides empirical evidence that management academics educated in non-English speaking countries "go as far as offering first or second authorship for articles" to their peers who help them to overcome linguistic barriers in publishing.

The arguments above indicate that the costs of network maintenance are higher for academics that have been socialized in a non-English speaking environment. Consequently, I expect the carrying capacity of co-authorship networks (the maximum size of the network that provides increasing returns) to be lower:

> *Hypothesis 2a: Linguistic capital moderates the relationship between the size of co-authorship network and individual research productivity. If an academic has been educated in a non-English speaking environment, the positive impact of network size decreases and their network carrying capacity is reduced.*

As discussed earlier in Chapter 3, ego-networks of academic researchers can have different proportion of strong and weak ties (Kilduff and Brass, 2010). Value delivered by strong and weak ties to an actor is debated by different schools within network research. The proponents of the utility of weak ties argue that these ties deliver more information and have a boundary-spanning function: weak ties help individuals to move across strata, to get impartial advice, to hear multiple opinions, and to receive support from various people (Cotton et al, 2011; Granovetter, 1983; McDonald, Khanna and Westphal, 2008; Seibert et al, 2001). Another stream of research emphasizes trust, information sharing,

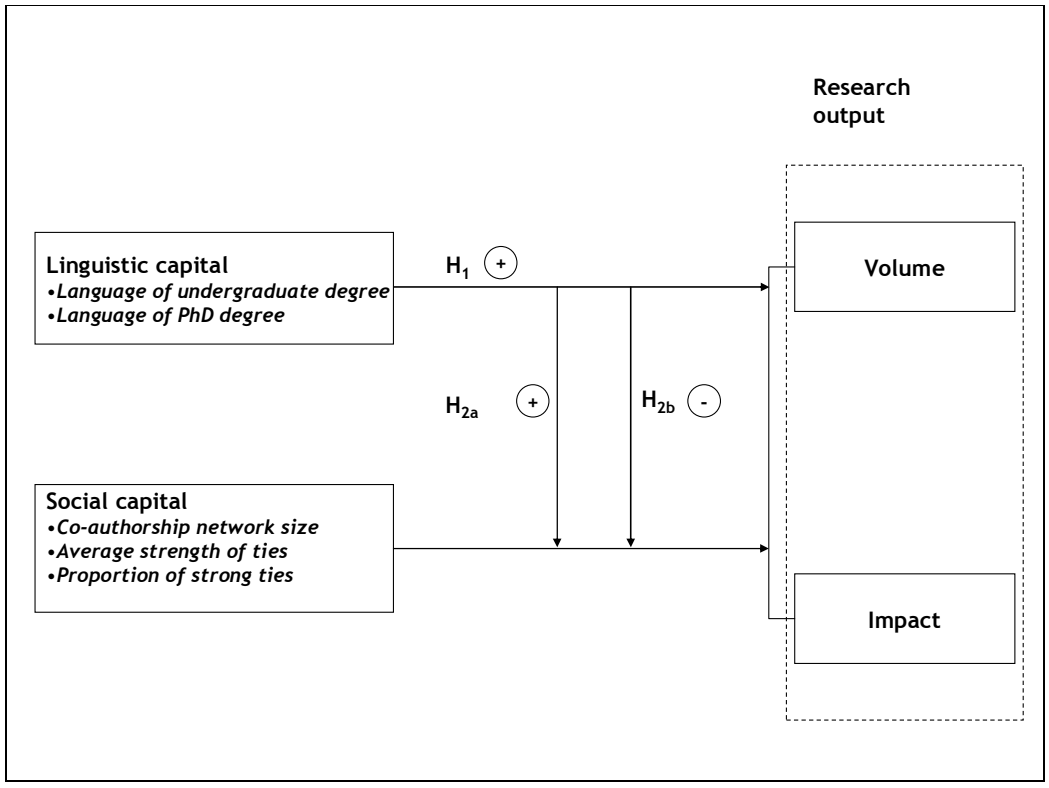
mutual support and a lower chance of unethical behavior associated with strong ties and closed networks (Brass et al, 2004; Kilduff and Brass, 2010; Uzzi, 1996).

Given the importance of writing support for academics with a lower stock of linguistic capital, it is particularly beneficial for them to establish strong relationships with their co-authors, which would foster mutual understanding and result in multiple publishing outcomes. I expect that the strength of co-authorship ties will be a more important predictor of research productivity for academics educated in a non-English speaking environment. Thus,

> *Hypothesis 2b: Linguistic capital moderates the relationship between the average strength of ties within co-authorship networks and individual research productivity. If an academic has been educated in a non-English speaking environment, the positive impact of tie strength increases.*

The conceptual model is summarized in Figure 8.

Figure 8: Conceptual model of chapter 5



METHODS

Sample

This chapter uses the same sample of 360 European academics as Chapter 4. For the description of sampling and data collection procedure, as well as the summary of the sample, see pp. 99-101.

Variables

The variables and their measures were introduced in the methods sections of chapters 3-4 (see pp. 56-60 and pp.100-102), so I revisit most of them briefly in this paragraph. Number of papers is used as a measure of research volume and the number of citations accumulated by these papers is used as a measure of impact of research. I control for professional age, gender, discipline area, research-intensiveness of PhD, research-intensiveness of post-PhD workplaces, time before first ISI-visible publication and the Impact Factor of the first journal where an academic published. Social capital variables include co-authorship network size, average strength of co-authorship ties and the proportion of strong ties in a co-authorship network. The addition in this chapter is a linguistic capital construct which will be introduced below in this section.

Several remarks have to be made. First, research-intensiveness of doctoral origin and research-intensiveness of post-PhD workplaces are measured using weighted research output of these schools in 2007-2012. The data was collected as part of ranking construction in Chapter 4 and is based on publications in top 150 organizational science journals in ISI list (*Business, Business Finance*, *Management,* and *Public Administration* categories). Second, the measure of linguistic capital is based on several components. The first component is the language of the country where an individual has received their undergraduate degree. Information regarding educational history was retrieved from resumes and for 84% of the sample (302 academics) information regarding their undergraduate (bachelor) degree was available. For another 11% (41 academics) educational history was only recorded from master's degree level onwards[46]. However, more than half of these individuals (30 academics) had been educated outside of the North American system (this system also includes that of the UK, as the two are similar in nature). It is common for European educational systems to combine undergraduate and masters degrees into one degree course lasting 5-6 years. Therefore, for the 41 academics mentioned above, their master's degree may also include an undergraduate degree qualification.

[46] For 17 academics (5%) the educational history before PhD was unavailable, these records were counted as missing data.

While some non-English speaking countries (e.g. the Netherlands) have recently begun to introduce primary degree courses taught in English, it is unlikely that the majority of academics in our sample followed such courses, given that 90% of them received their PhD more than 10 years ago. This means they received their first degree more than 15 years ago, and given that the move towards educating in English originated within doctoral programs, it is unlikely that there were a significant number of English language undergraduate programs in place in non-English speaking countries at that time. This variable was coded as 1 for English speaking countries and as 0 for the others. The second component of linguistic capital is the language of the country of a person's doctoral degree[47]. Third, where an individual has completed a master's degree separately from undergraduate degree, it has also been coded 1 for English speaking environment and 0 otherwise.

Finally, all three components were combined into a linguistic capital variable by weighing each measure by the length of exposure to a particular linguistic environment and the academic focus of the program. Thus, undergraduate degree was weighed by 2, as it is usually long (3-5 years), masters degree was weighed by 1 as the shortest of all, and doctoral degree was weighed by 3, as it takes a similar time to complete as undergraduate degree, but is much more focused on the language of science[48]. See equation 3 below for the representation of the variable:

$$LinguisticCapital = 2 * Language_{UndergraduateDegree} + Language_{MastersDegree} + 3 * Language_{PhD}$$

The compound measure is used in the main analysis; however, I perform supplemental analysis with each component separately to gain a better understanding of underlying processes linking linguistic capital accumulation and research outcomes.

Data analysis

The dependent variables displayed a non-normal distribution, as confirmed by the Shapiro-Wilk test ($p<0.001$) and Levene's variance homogeneity test. I followed in the footsteps of previous researchers who had found themselves in a similar situation (e.g. Barbezat, 2006; Cruz-Castro & Sanz-Menendez, 2010) and used negative binomial regression (nbreg command in STATA 13) which is a recommended analytical technique for

[47] While I am certain that undergraduate education is conducted predominantly in the language of the country where a university is located, I am aware that some non-English speaking countries offer PhD programs in English. Two such countries which are present in the sample are the Netherlands and India. To ensure that the findings are robust in these bi-lingual cases, in a supplemental analysis I coded the Netherlands and India as English speaking and re-ran the tests. This revealed no difference with the results of the main analysis.

[48] I have performed robustness tests with non-weighed variable and with the variable where undergraduate degree had higher weight than doctoral degree. The results are consistent but the initial choice of weights gives slightly stronger results and was chosen for final analysis.

over-dispersed count data (Long, 1997; Rabe-Hesketh & Skrondal, 2012). The mean dispersion version of negative binomial regression was chosen, as it delivered larger (least negative) log likelihood. Dependent variables were winsorized at the top 5% to exclude possible bias due to the presence of outliers in the data.

There was a possibility that the retrospective exploration of business-school faculty career choices might also be affected by self-selection among academics in the early stages of their careers. I used Heckman's procedure to account for unobserved heterogeneity in the sample (see Appendix 7 for results).

RESULTS

Academics in the sample had published an average of 18 papers (median=15) and accumulated 288 citations each over the course of their career (median=159). I provide the descriptive statistics for the other variables in Table 25. Linguistic capital is positively correlated with volume and impact of research. Similar correlation between linguistic capital and professional age supports the assumption that the new cohort of business school academics tends to have a higher proportion of individuals with non-English speaking linguistic background.

Table 25: Descriptive Statistics

		Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.	Volume (Number of Published Papers)b	17.96	12.87	1.0												
2.	Impact (Number of Citations)b	287.91	341.40	0.71*	1.0											
3.	Professional age	20.53	8.53	0.35*	0.29*	1.0										
4.	Gender (1= male; 0=female)	0.80	0.40	0.23*	0.16*	0.17*	1.0									
5.	Discipline area	4.57	1.84	0.03	0.14*	-0.03	-0.09	1.0								
6.	Research-intensiveness of PhD	248.96	227.83	0.04	0.17*	0.12*	0.11*	-0.06	1.0							
7.	ISI 5 Year Impact Factor of first journal	1.90	1.98	0.08	0.29*	-0.05	-0.01	0.06	0.25*	1.0						
8.	Time before 1st publication	2.46	5.74	-0.18*	-0.19*	0.30*	-0.04	-0.04	0.01	0.02	1.0					
9.	Research-intensiveness of post-PhD jobs	220.15	149.53	0.04	0.21*	-0.02	0.03	0.07	0.38*	0.12*	-0.07	1.0				
10.	Co-authorship network size[a]	15.88	13.00	0.78*	0.61*	0.23*	0.10*	0.13*	0.03	0.09*	-0.16*	0.11*	1.0			
11.	Average strength of co-authorship ties	1.68	1.01	0.28*	0.13*	-0.01	-0.03	0.02	-0.08	-0.02	-0.06	0.01	0.08	1.0		
12.	Proportion of strong ties	0.31	0.20	0.16*	0.03	0.03	0.08	-0.06	-0.06	-0.09	-0.03	-0.04	-0.05	0.59*	1.0	
13.	Linguistic capital	2.19	2.22	0.16*	0.23*	0.16*	-0.08	0.10*	0.29*	0.07	-0.15*	0.10*	0.09*	0.11*	0.07	1.0

N = 360 Correlations marked with * are significant at least at the 10% level (two-tailed)

[a] – variable is winsorized at top 5% to eliminate the possible bias from extreme outliers

The results of the negative binomial regression analysis for *volume of research* are provided in Table 26. Model 1 tests for direct effects of independent variables on the volume of knowledge. Linguistic capital is significantly and positively associated with research performance, which provides support for Hypothesis 1. Using the method suggested by Long (1997), I calculated that 1-unit increase in linguistic capital leads to the 2% increase in the number of publications, or 0.35 publications, given that all other predictors are at their means. Models 2-4 test the interactions between linguistic capital and various measures of social capital. Non-significant coefficients do not provide support to Hypotheses 2a and 2b.

The results of analysis for the dependent variable *impact of research* are presented in Table 27 below. Direct effect of linguistic capital on the impact of research only becomes significant in Models 3-4, where interactions with the strength of co-authorship ties measures are introduced in the analysis. Interaction with the size of co-authorship network is not significant, but the interactions with both measures of tie strength are highly significant. The interpretation of the relationship between linguistic capital and impact of research from moderated models is the following: the slope coefficient of linguistic capital depends on the value of moderating network variable. Hence,

$-0.61 \le \beta_{LinguisticCapital} \le 0.16$ for the average strength of ties taking the values between 0 and 11 (all possible values in the sample). When average strength of ties is equal to 0 (no co-authors) linguistic capital is positively related to impact, with the slope equal to 0.16.

and

$-0.2 \le \beta_{LinguisticCapital} \le 0.15$ for the proportion of strong ties taking the values between 0 and 1 (all possible values of this variable). When the proportion of strong ties is equal to 0 (an academic has worked with all her co-authors no more than once) linguistic capital is positively related to impact, with the slope equal to 0.15.

The effect this interaction has on the relationship between the network variables and the impact of research is visually represented in Figures 9 and 10. The patterns indicate that for academics with lower linguistic capital the increase in the average strength of co-authorship ties (Figure 9) or in the proportion of strong ties within ego-network (Figure 10) brings more citations relative to their peers with higher linguistic capital.

In absolute terms, 1-unit increase in linguistic capital leads to 16% increase in the impact of research, or additional 8 citations (calculated from Models 3-4 in Table 27).

Table 26: Results of negative binomial regression analysis of number of papers

	Model 1	Model 2	Model 3	Model 4
Control Variables				
Gender (1= male)	0.23***	0.23***	0.23***	0.23***
	(0.05)	(0.05)	(0.05)	(0.05)
Professional age	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.01)
Discipline area	-0.03*	-0.03*	-0.03*	-0.03*
	(0.01)	(0.01)	(0.01)	(0.01)
Research-intensiveness of PhD school	-0.00	-0.00	-0.00	-0.00
	(0.01)	(0.00)	(0.00)	(0.01)
Impact Factor of 1st journal [a]	0.01†	0.01†	0.01†	0.02†
	(0.01)	(0.01)	(0.01)	(0.01)
Time before 1st publication	-0.01**	-0.01**	-0.01**	-0.01**
	(0.00)	(0.00)	(0.00)	(0.00)
Research-intensiveness of post-PhD jobs	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Social capital				
Co-authorship network size [a]	0.09***	0.10***	0.09***	0.09***
	(0.01)	(0.01)	(0.01)	(0.01)
Average strength of co-authorship ties	0.14***	0.14***	0.16***	0.14***
	(0.02)	(0.02)	(0.04)	(0.02)
Proportion of strong ties	0.36**	0.35**	0.34**	0.46**
	(0.13)	(0.13)	(0.13)	(0.16)
Linguistic capital				
Linguistic capital	0.02*	0.03	0.03*	0.03*
	(0.01)	(0.03)	(0.02)	(0.02)
Interactions				
Co-authorship network size squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital * Co-authorship network size squared		0.00		
		(0.00)		
Linguistic capital * Average strength of ties			-0.01	
			(0.01)	
Linguistic capital * Proportion of strong ties				-0.04
				(0.04)
N	343	343	343	343
Constant	0.92***	0.90***	0.89***	0.89***
	(0.11)	(0.12)	(0.11)	(0.11)
LR x^2(d.f.)	484.51***	484.65***	485.67***	485.50***
Pseudo R^2	0.19	0.19	0.19	0.19

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† p < 0.10 * p < 0.05 ** p < 0.01 *** p < 0.001
[a] winsorized at top 1%

Table 27: Results of negative binomial regression analysis of number of citations

	Model 1	Model 2	Model 3	Model 4
Control Variables				
Gender (1= male)	0.16†	0.19†	0.19†	0.19†
	(0.12)	(0.12)	(0.12)	(0.12)
Professional age	0.04***	0.04***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
Discipline area	0.06*	0.06*	0.05*	0.05†
	(0.03)	(0.03)	(0.03)	(0.03)
Research-intensiveness of PhD school	0.00†	0.00†	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Impact Factor of 1st journal [a]	0.14***	0.13***	0.14***	0.14***
	(0.03)	(0.03)	(0.03)	(0.03)
Time before 1st publication	-0.06***	-0.06***	-0.06***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)
Research-intensiveness of post-PhD jobs	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Social capital				
Co-authorship network size [a]	0.12***	0.12***	0.12***	0.12***
	(0.01)	(0.02)	(0.01)	(0.01)
Average strength of co-authorship ties	0.01	0.00	0.24*	0.01
	(0.07)	(0.07)	(0.14)	(0.07)
Proportion of strong ties	0.55*	0.56*	0.45†	1.36***
	(0.32)	(0.32)	(0.32)	(0.40)
Linguistic capital				
Linguistic capital	0.03	0.04	0.16**	0.15***
	(0.02)	(0.06)	(0.06)	(0.04)
Interactions				
Co-authorship network size squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital * Co-authorship network size squared		-0.00		
		(0.00)		
Linguistic capital * Average strength of ties			-0.07**	
			(0.03)	
Linguistic capital * Proportion of strong ties				-0.35***
				(0.10)
N	343	343	343	343
Constant	1.87***	1.81***	1.54***	1.67***
	(0.26)	(0.29)	(0.30)	(0.26)
LR x^2(d.f.)	289.35***	291.79***	297.07***	300.39***
Pseudo R^2	0.06	0.06	0.06	0.07

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

Figure 9: Interaction between linguistic capital and average strength of ties

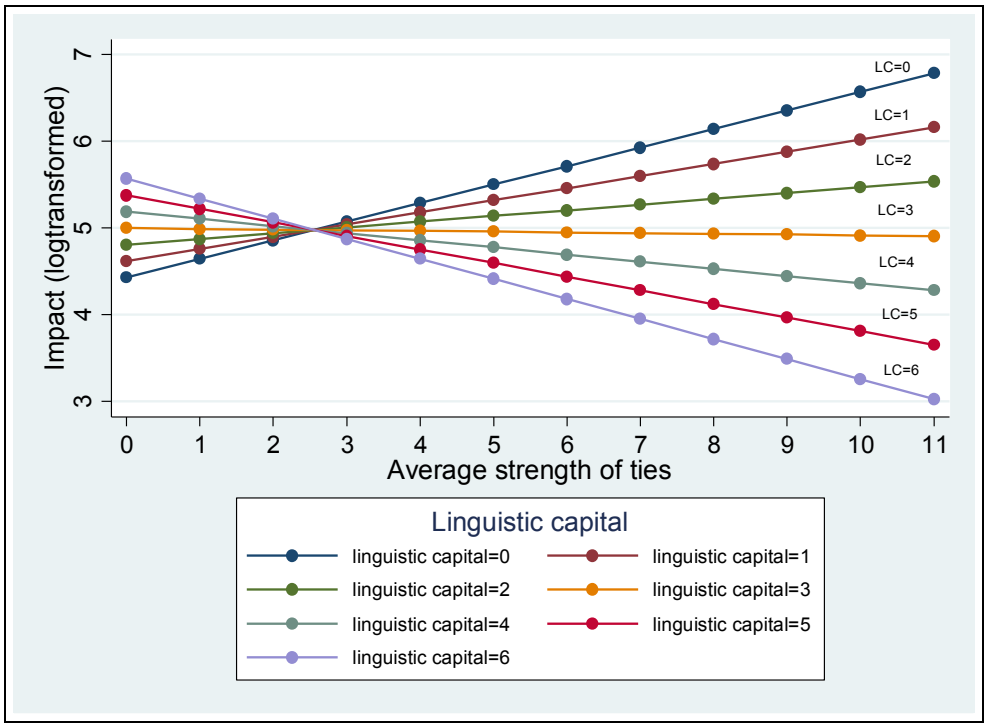
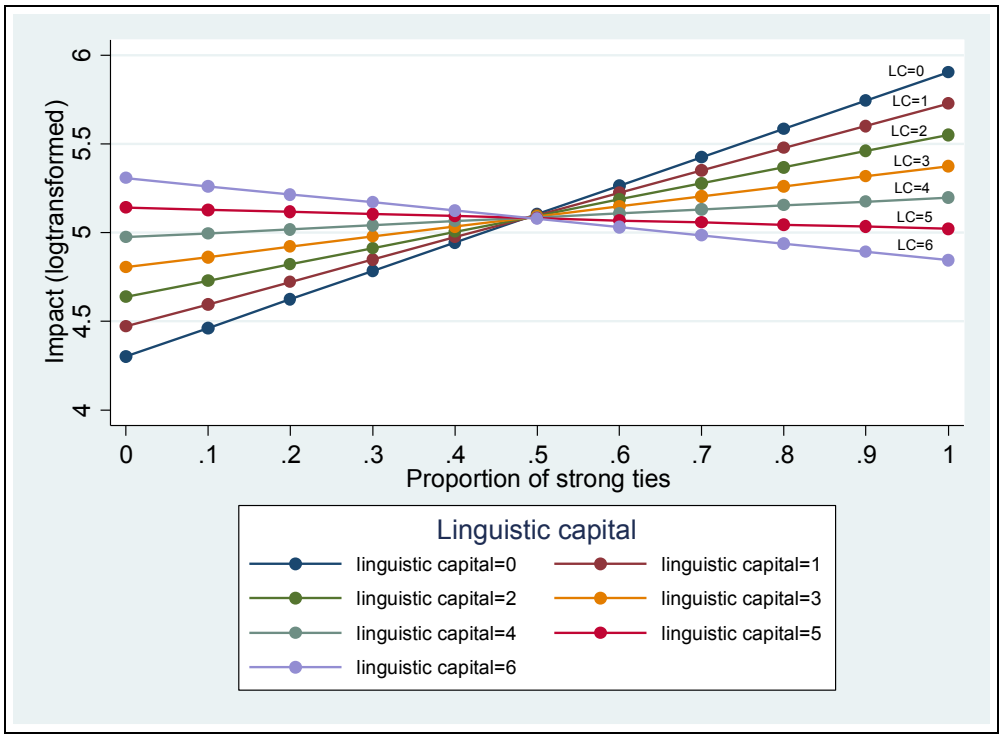


Figure 10: Interaction between linguistic capital and the proportion of strong ties in ego-network



Overall, based on the results of analysis for volume and impact of research, Hypotheses 1, which suggested that linguistic capital is positively related to research outcomes, received partial support. Hypothesis 2a, which suggested negative positive interaction between linguistic capital and the size of co-authorship network is not supported for both dependent variables. As for Hypothesis 2b, which suggested that strong ties bring higher value to academics with lower linguistic capital, it received partial support, as the relationship is only significant for the impact of research outcome variable.

RESULTS OF SUPPLEMENTAL ANALYSIS

I performed supplemental analysis seeking to get a better understanding of the role played by discipline area and by different stages of linguistic socialization in the development of research productivity in business schools.

Discipline area and research productivity

Discipline areas in organizational science differ in preferred methodological toolboxes and accepted styles of reporting research results. While there may be variation within each discipline area, some discipline areas, such as finance are characterized more quantitative approach that puts less emphasis on narrative as a main driving force of a publication. Following this logic, finance programs' preference for mathematical capabilities versus linguistic capabilities in PhD candidates would make it easier for academics with lower linguistic capital to get access to highly research-intensive doctoral programs. The results of probit regression analysis, reported in Table 28 below, support this assumption.

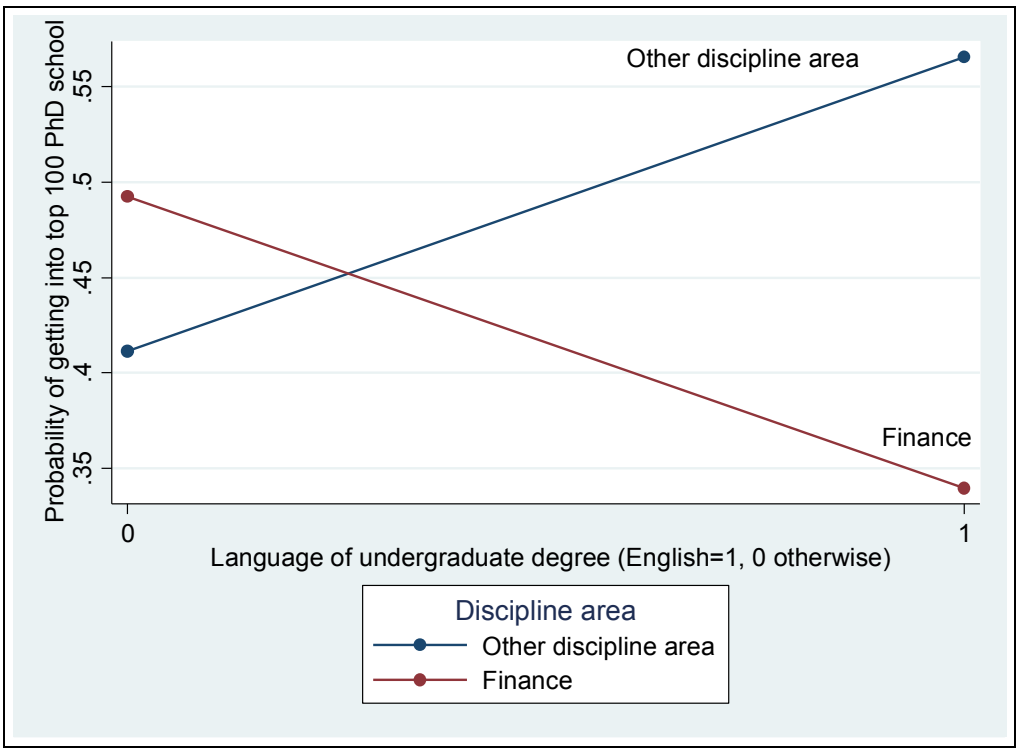
Table 28: Probit estimates of top-ranked PhD choice model

	Model 1
Intercept	-1.10***
Gender	-0.08
Research-intensiveness of undergraduate degree institution	0.00***
Inter-country/inter-state mobility before PhD	1.09***
Language of undergraduate degree (dummy, English=1, not = 0)	0.47**
PhD in finance discipline area (1=yes, 0=not)	0.25
Language of undergraduate degree * PhD in finance	-0.95*
N	329
x^2 (df)	52.38(6)**
Pseudo-R^2	0.19

The coefficient of interaction between the language of undergraduate degree and the discipline of PhD (coded as 1 for finance and 0 otherwise) is negative and significant. For the candidates applying to PhD programs in the area of finance the relationship between the language of undergraduate degree and the chance of getting into a top school is negative, i.e. their lower linguistic capital does not have a detrimental effect on their chances to be accepted. The interaction is visualized in Figure 11 below. As we can see, the probability of getting into a top university for the graduate of a non-English

speaking undergraduate school is approximately 0.49 within the finance area and 0.41 in other discipline areas. For the graduates of English speaking undergraduate programs the probability of getting into top research-intensive schools is 0.34 within the finance area and 0.56 within other discipline areas.

Figure 11: Interaction between the language of undergraduate degree and the discipline area of PhD



As for the direct effect of discipline area on volume and impact of research, the results of negative binomial analysis (see Table 29 below) indicate that economists publish at higher rates than management scholars, while accounting, marketing and organizational behavior scholars publish slightly less. Accounting research also seems to accumulate fewer citations, perhaps due to its more practice-oriented nature.

Table 29: Results of supplemental negative binomial regression analysis

	Number of papers	Number of citations
Control Variables		
Age and gender included	Yes	Yes
Discipline area (base=management)		
MIS	0.05 (0.07)	-0.34† (0.20)
Accounting	-0.18† (0.10)	-0.67** (0.24)
Economics	0.25*** (0.06)	-0.03 (0.15)
Finance	0.08 (0.06)	-0.03 (0.15)
Marketing	-0.16* (0.07)	0.24 (0.17)
Operations research	-0.03 (0.14)	-0.01 (0.38)
OB/HR/Social psychology	-0.13† (0.08)	-0.22 (0.20)
Strategy	0.10 (0.12)	0.42 (0.32)
Research-intensiveness of PhD school	-0.00	0.00
	(0.01)	(0.00)
Impact Factor of 1st journal [a]	0.01†	0.12***
	(0.01)	(0.03)
Time before 1st publication	-0.01***	-0.06***
	(0.00)	(0.01)
Research-intensiveness of post-PhD jobs	0.00	0.00**
	(0.00)	(0.00)
Social capital		
Co-authorship network size [a]	0.09***	0.13***
	(0.01)	(0.01)
Average strength of co-authorship ties	0.11***	0.07
	(0.03)	(0.07)
Proportion of strong ties	0.46***	0.55*
	(0.13)	(0.32)
Linguistic capital		
Language of undergraduate degree (dummy, English=1, not = 0)	-0.10†	-0.20
	(0.05)	(0.13)
Language of masters degree (dummy, English=1, not=0)	0.01	0.04
	(0.05)	(0.12)
Language of PhD (dummy, English=1, not = 0)	0.13**	0.40**
	(0.05)	(0.14)
Interactions		
Co-authorship network size squared	-0.00***	-0.00***
	(0.00)	(0.00)
N	314	314
Constant	0.79***	2.11***
	(0.10)	(0.25)
LR x^2(d.f.)	483.61***	282.64***
Pseudo R^2	0.20	0.07

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

These results, however, have to be taken cautiously, because the sampling of the study was not driven by disciplinary affiliation of faculty. As a result, the distribution of

academics across discipline areas is far from balanced (see Table 30 below). The non-parametric Kruskal-Wallis test (Field, 2009), however, confirms significant differences between discipline areas ($p<0.01$).

Table 30: Distribution of academics across discipline areas

Discipline area	Frequency	Percent
MIS	26	7.22
Accounting	21	5.83
Economics	49	13.61
Finance	44	12.22
Management	143	39.72
Marketing	37	10.28
Operations research (including logistics and supply chain management)	6	1.67
OB (including HR)	25	6.94
Strategy	9	2.50
Total	360	100

Components of linguistic capital and research productivity

Correlations between the components of linguistic capital and other variables are presented in Table 31 below. Starting higher education in an English speaking country is strongly correlated ($r=0.41$) with having a PhD from a more research-intensive school, as already seen from probit model above. High correlation ($r=0.56$) between the language of undergraduate degree country and the language of PhD country points towards the preference for a local search in the choice of doctoral degree program, or at least towards a search within the same linguistic area. While the language of undergraduate degree and the language of PhD have similar correlation with the volume of research, the correlation of undergraduate-level linguistic socialization with the impact of research ($r=0.27$) is almost twice as high as the correlation between the language of PhD and impact ($r=0.15$). The correlation between the language of PhD country and early publishing ($r=0.17$) is higher than the correlation between the language of undergraduate degree and early publishing ($r=0.10$).

The investigation of the main effects in Table 29 shows that the language of the PhD country has a significant and positive relationship with the volume and impact of research. The language of undergraduate degree has a negative relationship with volume of research ($p<0.1$), and does not show significant relationship with the impact of research. The language of master's degree is not related significantly to any of the outcome variables.

Table 31: Correlations (for the supplemental analysis)

		Mean	Std. Dev.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	Volume of research[a]	17.96	12.87	1.0														
2.	Impact of research[a]	287.91	341.40	0.71*	1.0													
3.	Professional age	20.53	8.53	0.35*	0.29*	1.0												
4.	Gender (1= male; 0=female)	0.80	0.40	0.23*	0.16*	0.17*	1.0											
5.	Discipline area	4.57	1.84	0.03	0.14*	-0.03	-0.09	1.0										
6.	Research-intensiveness of PhD	248.96	227.83	0.04	0.17*	0.12*	0.11*	-0.06	1.0									
7.	ISI 5 Year Impact Factor of first journal	1.90	1.98	0.08	0.29*	-0.05	-0.01	0.06	0.25*	1.0								
8.	Time before 1st publication	2.46	5.74	-0.18*	-0.19*	0.30*	-0.04	-0.04	0.01	0.02	1.0							
9.	Research-intensiveness of post-PhD workplaces	220.15	149.53	0.04	0.21*	-0.02	0.03	0.07	0.38*	0.12*	-0.07	1.0						
10.	Co-authorship network size[a]	15.88	13.00	0.78*	0.61*	0.23*	0.10*	0.13*	0.03	0.09*	-0.16*	0.11*	1.0					
11.	Average strength of co-authorship ties	1.68	1.01	0.28*	0.13*	-0.01	-0.03	0.02	-0.08	-0.02	-0.06	0.01	0.08	1.0				
12.	Proportion of strong ties	0.31	0.20	0.16*	0.03	0.03	0.08	-0.06	-0.06	-0.09	-0.03	-0.04	-0.05	0.59*	1.0			
13.	Language of undergraduate degree country (1=English; 0=otherwise)	0.28	0.45	0.16*	0.27*	0.19*	-0.08	0.08	0.41*	0.15*	-0.10*	0.12*	0.08	0.08	0.03	1.0		
14.	Language of master's degree (1=English; 0=otherwise)	0.22	0.41	-0.02	-0.03	-0.14*	-0.13*	0.10*	-0.01	-0.04	-0.10*	0.01	-0.05	0.05	0.08	0.23*	1.0	
15.	Language of PhD country (1=English; 0=otherwise)	0.49	0.50	0.16*	0.15*	0.18*	-0.05	0.11*	0.04	-0.06	-0.17*	0.04	0.11*	0.14*	0.09*	0.56*	0.23*	1.0

N = 360 Correlations marked with * are significant at least at the 10% level (two-tailed)

[a] – variable is winsorized at top 5% to eliminate the possible bias from extreme outliers

TAKING ANOTHER STEP FURTHER: SUPPLEMENTAL ANALYSIS OF LINGUISTIC CAPITAL ACROSS CONTEXTS

Are language-related effects relevant solely for the highly internationalized European business school industry, as I assumed while choosing the sample for the study? Does the underlying sampling logic within a European context influence the strength of effects? To answer these questions I have performed the same regression analysis using the sample of US faculty from Chapter 3. I also replicated the analysis using the sample of faculty from European business schools on top of Financial Times ranking. Business schools on top of mass-media rankings use this position as a driver of competitive strategy, and are therefore focused on performance dimensions that ensure their continued high standing in such rankings. It is worth noticing that Financial Times ranks of business schools are not as highly correlated with business schools' research rank, as US mass-media rankings are correlated with US research rank. Siemens et al (2005) found significant correlations of within the range of 0.55-0.65 between research rank and mass-media rankings of MBA programs. They explained it by the influence of ranking methodology, which was partially based on surveys of deans, who were sensitized by visibility of certain schools within the research community. I have not found any correlations between research rank, MBA rank and Masters in Management (MiM) rank in the sample of 20 top-ranked European schools. This can also be explained by looking at ranking methodology. In case of the Financial Times rankings, research output is included as 10% of MBA ranking, but the list of journals is limited by FT45, where European schools are still underrepresented. MiM ranking methodology does not include research output, and neither of the FT rankings surveys business school representatives on their perception of best business schools.

The focus on FT ranking criteria should promote the hiring of international faculty in top FT-ranked schools. First, the proportion of international faculty is directly included in the assessment. Second, the international focus of European business schools became a source of competitive advantage (Antunes & Thomas, 2007), because it attracts students who aspire to work in global companies. This international focus is supported by international diversity of faculty and students. Therefore, the reasons for hiring in these schools are unlikely to be completely research-driven, which does not preclude the hired faculty to be later assessed on the basis of their research productivity as well as their teaching performance. The sample for this supplemental analysis is taken from the top of Financial Times MBA and Masters in Management ranking (2011). While the Financial Times ranking is not purely research-based, the participation in it requires accreditation by AACSB or EQUIS. Both of these global quality assurance bodies emphasise research

productivity as an important dimension of business school performance. Therefore I can expect some focus on research in these schools, and the results of the sampling support my assumption. There is an overlap of 13 business schools (222 academics) between two European samples: one selected using the research ranking (developed in Chapter 4) and another selected using MBA/MiM ranking. These samples, however, are still distinct, with 138 unique academics in the EU research-based sample (38%) and 126 unique academics in the European FT-based sample (36%). The summary of the sample drawn from the top FT schools is presented in Table 32 below. The data collection process for this sample was the same as for the other two samples in this thesis[49].

Table 32: Summary of European top Financial Times schools sample

University	*Global research rank*	*Number of academics sampled*	*Male academics*	*Female academics*
1. CATHOLIC UNIVERSITY LOUVAIN, BELGIUM	193	20	18	2
2. CITY UNIVERSITY LONDON, CASS BUSINESS SCHOOL, UK	111	20	18	2
3. EDHEC, FRANCE	500	18	8	10
4. ESSEC, FRANCE	259	11	9	2
5. EM LYON, FRANCE	251.5	19	15	4
6. ERASMUS UNIVERSITY, THE NETHERLANDS	5	15	13	2
7. GRENOBLE SCHOOL OF MANAGEMENT, FRANCE	351	19	13	6
8.HEC LAUSANNE, SWITZERLAND	225.5	20	17	3
9. HEC SCHOOL OF MANAGEMENT, PARIS, FRANCE	130	20	16	4
10. IE (INSTITUTO DE EMPRESA), SPAIN	202.5	20	15	5
11. IESE, UNIVERSITY NAVARRA, SPAIN	183	18	15	3
12. INSEAD, FRANCE	45.5	20	17	3
13. LONDON BUSINESS SCHOOL, UK	29.5	20	18	2
14. SDA BOCCONI UNIVERSITY, ITALY	58.5	20	14	6
15. TOULOUSE BUSINESS SCHOOL, FRANCE	436.5	19	15	4
16. UNIV LONDON, LONDON SCHOOL OF ECONOMICS & POLITICAL SCIENCE, UK	69	15	11	4
17. UNIVERSITY MANNHEIM, GERMANY	134.5	11	11	0
18. UNIVERSITY OXFORD, UK	82	15	13	2
19. UNIVERSITY ST GALLEN, SWITZERLAND	127	18	16	2
20. WHU OTTO BEISHEIM SCHOOL OF MANAGEMENT, GERMANY	181	10	9	1
Total		348	281	67

[49] The response from European reviewers on earlier drafts of this study led me to additional robustness tests, where I excluded INSEAD, Erasmus and LBS schools from the sample, as they were considered to belong to "a different league" in terms of research. The results of analysis without these 3 schools were not significantly different from results from the full sample.

The results of this analysis are presented in Tables 34-37 below. The comparison of findings for three samples (see Table 33 below) indicates that the power of effects increases as the proportion of faculty educated outside English-speaking environments becomes higher. In the sample of US faculty, where 98% of academics have PhD from English-speaking schools, linguistic capital is not significantly related to research outcomes. In the sample taken from Financial Times-ranked schools, where only 47% of academics have been educated in English-speaking doctoral schools, the link between linguistic capital and research performance is highly significant. The sample of European research-intensive schools, where 58% of academics have PhDs from English speaking schools, the language-related effects are clearly present, but their significance is slightly lower.

Table 33: Comparison of linguistic capital-related effects across 3 samples

	EU sample (n=360)	FT sample (n=348)	US sample (n=500)
Volume of research			
Linguistic capital	Positive, significant	Positive, significant	Not significant
Linguistic capital * Network size	Not significant	Not significant	Not significant
Linguistic capital * Average strength of ties	Not significant	Negative, significant	Not significant
Linguistic capital * Proportion of strong ties	Not significant	Negative, significant	Not significant
Impact of research			
Linguistic capital	Positive, significant	Positive, significant	Not significant
Linguistic capital * Network size	Not significant	Not significant	Not significant
Linguistic capital * Average strength of ties	Negative, significant	Negative, significant	Not significant
Linguistic capital * Proportion of strong ties	Negative, significant	Negative, significant	Not significant

Table 34: Results of negative binomial regression analysis of volume of research (FT-based sample)

	Model 1	Model 2	Model 3	Model 4
Control Variables				
Gender (1= male)	0.12*	0.12*	0.14*	0.12*
	(0.07)	(0.07)	(0.07)	(0.07)
Professional age	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Discipline area	0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Research-intensiveness of PhD school	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.01)
Impact Factor of 1st journal [a]	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Time before 1st publication	-0.02**	-0.02**	-0.02***	-0.02**
	(0.00)	(0.00)	(0.00)	(0.00)
Research-intensiveness of post-PhD jobs	0.00**	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Social capital				
Co-authorship network size [a]	0.11***	0.12***	0.11***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)
Average strength of co-authorship ties	0.27***	0.27***	0.38***	0.26***
	(0.05)	(0.05)	(0.06)	(0.05)
Proportion of strong ties	0.04***	0.04***	0.04***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)
Linguistic capital				
Linguistic capital	0.04**	0.07*	0.06***	0.06***
	(0.01)	(0.03)	(0.01)	(0.02)
Interactions				
Co-authorship network size squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital * Co-authorship network size squared		0.00		
		(0.00)		
Linguistic capital * Average strength of ties			-0.04**	
			(0.02)	
Linguistic capital * Proportion of strong ties				-0.00†
				(0.00)
N	292	292	292	292
Constant	0.57***	0.50***	0.54***	0.53***
	(0.13)	(0.14)	(0.13)	(0.13)
LR x^2(d.f.)	442.08***	443.31***	448.31***	444.54***
Pseudo R^2	0.22	0.22	0.23	0.22

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

Table 35: Results of negative binomial regression analysis of impact of research (FT-based sample)

	Model 1	Model 2	Model 3	Model 4
Control Variables				
Gender (1= male)	0.13	0.13	0.12	0.12
	(0.15)	(0.15)	(0.15)	(0.15)
Professional age	0.06***	0.06***	0.06***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)
Discipline area	0.13**	0.13**	0.12**	0.13**
	(0.04)	(0.04)	(0.04)	(0.04)
Research-intensiveness of PhD school	0.00†	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Impact Factor of 1st journal [a]	0.09**	0.08**	0.09**	0.09***
	(0.03)	(0.03)	(0.03)	(0.03)
Time before 1st publication	-0.09***	-0.08***	-0.09***	-0.09***
	(0.01)	(0.01)	(0.01)	(0.01)
Research-intensiveness of post-PhD jobs	0.00*	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Social capital				
Co-authorship network size [a]	0.15***	0.17***	0.14***	0.14***
	(0.02)	(0.03)	(0.02)	(0.02)
Average strength of co-authorship ties	0.47***	0.46***	0.80***	0.43***
	(0.12)	(0.12)	(0.15)	(0.12)
Proportion of strong ties	0.04†	0.03	0.05*	0.10**
	(0.03)	(0.03)	(0.03)	(0.04)
Linguistic capital				
Linguistic capital	0.08**	0.20**	0.18***	0.14***
	(0.03)	(0.07)	(0.06)	(0.04)
Interactions				
Co-authorship network size squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital * Co-authorship network size squared		0.00		
		(0.00)		
Linguistic capital * Average strength of ties			-0.17***	
			(0.04)	
Linguistic capital * Proportion of strong ties				-0.02**
				(0.01)
N	292	292	292	292
Constant	1.28***	1.13***	1.27***	1.17***
	(0.29)	(0.29)	(0.28)	(0.29)
LR x^2(d.f.)	281.78***	287.84***	297.20***	287.79***
Pseudo R^2	0.08	0.08	0.09	0.08

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

Table 36: Results of negative binomial regression analysis of volume of research (US sample)

	Model 1	Model 2	Model 3	Model 4
Control Variables				
Gender (1= male)	0.05	0.04	0.04	0.05
	(0.05)	(0.07)	(0.05)	(0.05)
Professional age	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Discipline area	-0.00	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Research-intensiveness of PhD school	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Impact Factor of 1st journal [a]	-0.01**	-0.01*	-0.01*	-0.01*
	(0.01)	(0.01)	(0.01)	(0.01)
Time before 1st publication	-0.02***	-0.02**	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Research-intensiveness of post-PhD jobs	0.03***	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)
Social capital				
Co-authorship network size [a]	0.07***	0.08***	0.07***	0.07***
	(0.00)	(0.02)	(0.00)	(0.00)
Average strength of co-authorship ties	0.36***	0.36***	0.41***	0.37***
	(0.04)	(0.04)	(0.12)	(0.04)
Proportion of strong ties	0.03	0.04	0.03	0.32
	(0.12)	(0.04)	(0.12)	(0.35)
Linguistic capital				
Linguistic capital	-0.02	0.01	-0.01	0.00
	(0.01)	(0.03)	(0.04)	(0.03)
Interactions				
Co-authorship network size squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital * Co-authorship network size squared		0.00		
		(0.00)		
Linguistic capital * Average strength of ties			-0.01	
			(0.02)	
Linguistic capital * Proportion of strong ties				-0.06
				(0.07)
N	495	495	495	495
Constant	0.73***	0.58***	0.66***	0.62***
	(0.13)	(0.20)	(0.24)	(0.18)
LR x^2(d.f.)	659.51***	660.65***	659.63***	660.30***
Pseudo R^2	0.18	0.18	0.18	0.18

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

Table 37: Results of negative binomial regression analysis of number of citations (US sample)

	Model 1	Model 2	Model 3	Model 4
Control Variables				
Gender (1= male)	-0.16	-0.16	-0.16	-0.17
	(0.11)	(0.11)	(0.11)	(0.11)
Professional age	0.03***	0.03***	0.03***	0.03***
	(0.00)	(0.00)	(0.00)	(0.00)
Discipline area	0.02	0.02	0.03	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
Research-intensiveness of PhD school	0.03*	0.03*	0.03*	0.03*
	(0.01)	(0.01)	(0.01)	(0.01)
Impact Factor of 1st journal [a]	0.07***	0.07**	0.07***	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Time before 1st publication	-0.04***	-0.04***	-0.04***	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)
Research-intensiveness of post-PhD jobs	0.10***	0.09**	0.09***	0.09***
	(0.02)	(0.02)	(0.02)	(0.02)
Social capital				
Co-authorship network size [a]	0.10***	0.05	0.10***	0.10***
	(0.01)	(0.05)	(0.01)	(0.01)
Average strength of co-authorship ties	0.50***	0.51***	0.12	0.48***
	(0.11)	(0.11)	(0.31)	(0.11)
Proportion of strong ties	0.46†	0.45†	0.49†	-0.75
	(0.31)	(0.31)	(0.31)	(0.81)
Linguistic capital				
Linguistic capital	-0.04	-0.09	-0.17	-0.13†
	(0.03)	(0.08)	(0.06)	(0.06)
Interactions				
Co-authorship network size squared	-0.00***	-0.00	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital * Co-authorship network size squared		-0.00		
		(0.00)		
Linguistic capital * Average strength of ties			0.07	
			(0.06)	
Linguistic capital * Proportion of strong ties				0.27
				(0.16)
N	495	495	495	495
Constant	2.27***	2.53***	2.89***	2.73***
	(0.32)	(0.48)	(0.58)	(0.44)
LR x^2(d.f.)	311.27***	312.49***	312.92***	313.84***
Pseudo R^2	0.04	0.04	0.04	0.04

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$
[a] winsorized at top 1%

DISCUSSION

This chapter concludes the exploration of antecedents of research productivity undertaken in this thesis. Previous chapters developed and tested the model that included core organizational-level and individual-level drivers of research productivity. The study reported in this chapter added nuances to the model by looking at linguistic socialization as an antecedent of research productivity that emerged relatively recently as a consequence of globalization in the business education industry.

Issues related to the role of language in organizations have recently motivated a stream of research within the international business (IB) area (e.g. Janssens, Lambert & Steyaert, 2004; Neeley, 2013; Steyaert, Ostendorp & Gaibrois, 2011). The majority of IB scholars and cross-cultural management scholars (e.g. Molinsky, 2005) contributing to this emergent stream focus on language as a medium of oral and written (mostly through email) communication within multinational companies. Less attention has been allocated to the situations where language becomes a key resource that enables employees to perform their professional tasks, as it is in the case of academic researchers within the field of social sciences.

Unsurprisingly, most of the language-related studies in management so far have relied upon in-depth qualitative accounts from multinational companies. This data reveals deep frustrations by non-native English speakers trying to find their voice in English speaking environments and maintain their professional credibility despite linguistic imperfections (Neeley, 2013; Tenzer et al, 2014). The data further gives evidence that such imperfections are almost inevitable for those who have not been exposed to the English language from a young age (Belina, 2005; Tietze, 2008; Tietze & Dick, 2013). The study reported in this chapter contributes to the conversation on the role of language in globalized organizational contexts by adding quantitative evidence from a multinational sample of European business school academics whose professional success depends on their ability to produce research in English.

The business school industry has recently been under pressure from its stakeholders on two accounts. Firstly, business schools are required to respond to the needs of internationalized industries and to equip their graduates with the skills necessary to deal with cultural and linguistic diversity within global organizations (Kedia & Englis, 2011; Mendenhall, Arnardottir, Oddou & Burke, 2013). For that reason, any first-hand experience which members of a faculty have of growing up or working in different countries is of great value (Eisenberg et al, 2013). Such experience among faculty members produces international diversity within a new cohort of business school academics. This diversity is even more pronounced in the European business school environment, with its inherent

linguistic diversity and the need to meet the demands of local (often non-English speaking) stakeholders as well as to build relationships with multinational companies where English is the lingua franca. In their recent paper, Saunders and colleagues (2011: 410) report that "the majority of the UK academic community publishing in top B[usiness]&M[anagement] journals were neither born nor trained in the UK." Secondly, the industry is under pressure as the increasing number of schools it contains must meet global quality standards set by international accreditation bodies, such as AACSB and EQUIS. These bodies focus to a larger extent on the research performance of a faculty as a criterion for accreditation (Johansson & Sliwa, 2014). In this chapter I have explored the performance of a diverse sample of business school academics in order to understand the ways in which the diversity of the linguistic backgrounds against which they were socialized into the profession influences individual research performance.

I found linguistic capital to be related to the emergence of path dependence in academic career trajectories, with lasting consequences for individual research outcomes. Linguistic background, in particular, the language of the country where an academic has started her third-level education, has a long-term effect on research productivity by influencing the choices and the access to PhD programs in top research-intensive universities. Admission to a PhD program is a two-sided process, where an applicant has to make a choice to apply to the program, and the admissions procedures have to be satisfied with a candidate's quality. Language influences both sides of this process. Candidates coming from non-English speaking environments may decide against applying to top research-intensive schools, most of which are located in English speaking countries, discouraged by the high costs of international mobility (Nyland, Forbes-Mewett & Hartel, 2013). This is consistent with Azoulay et al's finding that spatial proximity played a part in chemistry PhDs' search for supervisors (Azoulay et al, 2009) and adds a linguistic dimension to their ideas. In their turn, admission offices have to give preference to candidates whose linguistic capital would allow them to cope with coursework and independent research from the very start of a doctoral program. As expected, the importance of linguistic capital is higher for discipline areas that use narrative-based rather than "numbers-based" research methodologies. This is consistent with the findings by Tietze and Dick (2013), who found that non-native English speakers switch to quantitative research as a coping strategy which helps to overcome linguistic hurdles in publishing.

The findings of the study show that the ability to write impactful research has a stronger relationship to the language of an undergraduate degree than to the language of PhD. The main reason for that, in my opinion, is that the language of an undergraduate

degree better captures the linguistic origin of an academic. At a young age people are more likely to choose university in geographical proximity to their families and their native countries, or at least within the same linguistic environment, even if they move later to get a better postgraduate degree in another country. Therefore this relationship indicates that being a non-native speaker of English undermines the ability of a scholar to communicate her ideas in a manner that attracts the attention of the English speaking organizational science community. This is consistent with qualitative insights reported by prior research in the language-centered stream of IB literature (Tietze, 2008; Tietze & Dick, 2013). In turn, doctoral degrees received in English speaking environments provide incentives and training necessary for entering the publishing game early in academic career, which has a positive effect on long-term research productivity.

While most research exploring the role of language implies its direct influence on networking, few studies explicitly examine the link between linguistic and social capital. This chapter demonstrates that while having strong ties with one's co-authors is generally beneficial for research productivity, the strength of this relationship depends on the level of linguistic capital. Academics with lower linguistic capital extract relatively more value from having research support embedded in long-term co-authorship relationships. Linguistic capital therefore becomes a contingency factor, which explains the differences in an individuals' ability to leverage the social capital from co-authorship networks. This glance into the "black box of nodal attributes" (Phelps et al, 2012) might help us understand why some academics give preference to repeated relationships with their co-authors, while others focus on expanding their network by collaborating with a large number of peers only once.

Separate exploration of volume and impact of research in this chapter adds another interesting nuance to the literature linking social capital and individual performance of scientists (e.g. Acedo et al, 2006; McFadyen & Cannella, 2004; McFadyen et al, 2009; Liu & Lin, 2012). In the case of volume of papers, where an academic has to convince reviewers and an editor of the value of a submitted manuscript to get a publication, social capital and linguistic capital operate independently. They help to achieve a threshold level (which can be very high, in the case of top journals) of paper quality and expertise in communication. In the case of impact, where a paper has to attract attention (i.e. citations) of a broad academic audience, social capital and linguistic capital become closely interrelated. Increased levels of trust and support received from strong ties helps researchers with lower levels of linguistic capital to find a confident research voice. Coming from the periphery of the traditional business school industry, these researchers are likely to bring new and different perspectives into organizational sciences (Adler,

2014). When these fresh perspectives are given a confident voice, this increases the probability of producing interesting research that captures the attention of the academic community. In the case of researchers, already possessing high linguistic capital, who are likely to be placed close to the centre of the field, strong ties do not bring them the same value, although they still might be beneficial. At the same time, the preference for working with existing co-authors instead of expanding the network reduces the input of new knowledge and skills. This negative side seems to weigh more heavily than the possible benefits of strong ties, and undermines the ability of academics with high linguistic capital to produce interesting and impactful research.

In their recent review of social capital research Payne et al (2011: 505) called for the "increased understanding of how different types of social capital develop from different social networks" and of the consequences these different types of social capital would have on individual and organizational outcomes. This chapter provides some insights on this matter, using the context of academic science. Specifically, network behavior that focuses on the diversity of information (i.e. characterized by weak ties) delivers better results in ego-networks of individuals socialized in the center of industry, due to their possession of superior linguistic capital. Network behavior focused on social support and mutual understanding (i.e. characterized by strong ties) delivers better results in ego-networks of researchers socialized on the periphery. This is particularly true for situations where individuals have to prove their professional credibility to a wide audience of peers, rather than to a small group of gatekeepers.

Socialization outside of the inner circle of English may lead to difficulties in publishing research in peer-reviewed English-language journals for several interconnected reasons. First, academics from outside of the inner circle (where most targeted journals are located) may suffer from the perception of "otherness" and have to provide additional justification of the external validity of the findings based on data from "the periphery" (Merilainen et al, 2008; Meyer & Boxenbaum, 2010). Second, it is more difficult for such academics to keep up with research conversations happening at the center of the field of organizational science (Huff, 1998). Meanwhile, the "lack of mutual knowledge" (George, 2012: 1025) or, in other words, the use of the literature that reviewers are not familiar with, becomes one of the reasons for reviewers to reject the manuscript (George, 2012; Linton, 2012b). Third, as discussed in this chapter, linguistic structures imbibed during professional socialization outside the inner circle of English may inhibit academic writing in English. Studies comparing academic texts in different languages (e.g. English and Spanish) found significant differences in structure and style of introductions to research papers (Martin & Leon Perez, 2014). While it is possible to switch from one style of writing

to another, it undoubtedly requires some additional effort and takes time to do. Fourth, the importance of spatial proximity in formation and maintenance of network ties (Brass et al, 2004) means that it is more difficult for someone who started their academic career at the periphery to reach out to co-authors located in the center of the field. This further inhibits information flows between the periphery and the center of the field, which is particularly detrimental for knowledge dissemination, and may also restrict the access to journals (Brogaard, Engelberg & Parsons, 2014).

Which of these factors play the most important part in determining the publishing success of academics educated outside of the inner circle countries remains an interesting question for future research. Considering the same question on an organizational level in an IB context, scholars can ask whether the image of a foreigner, the lack of market knowledge, the difference in sociocultural factors, or the absence of network ties with key partners determine a company's ability to expand its operations into a new geographical market.

Unlike multinational companies, which are a traditional focus for research in the International Business area, most business schools are still predominantly local players and generate revenue within one geographical market. Management scholars, however, increasingly become global players whose performance depends on their ability to play the 'publish or perish' game within a nationally and linguistically diverse community. Therefore, the study of processes happening on this individual level of globalization may deliver insights into micro-foundations of globalization on an organizational level (Barney & Felin, 2013).

Implications

The influence of linguistic capital on academic networking strategies, discovered in this study, has implications for the assessment of candidates for faculty positions in research-active environments. The quality and the scope of research networks have now become one of the important criteria used by hiring committees of business schools. Given the findings of this study, it has to be acknowledged that different networking patterns are beneficial for candidates depending on their linguistic background. Networks containing strong ties, even where they lack the scope, are likely to be more productive for applicants with non-English speaking backgrounds. Native English speakers would benefit more from broader networks, even if they contain a lower proportion of strong ties. Adjusting practices to meet the needs of employees with diverse backgrounds is crucial for the attraction, retention and motivation of human capital, which in turn allows business schools operating in a globalized environment to retain a competitive advantage in the long term.

A recent paper by Day (2011) argued that success in publishing is key to supporting professional identities of academic researchers and that frequent manuscript rejections threaten these identities up to the point where potentially productive researchers might decide to abandon publishing. While rejections are inevitable for all scholars, it might be that faculty educated in non-English speaking environments experience these rejections more frequently due to the additional hurdle of expressing ideas in English (Tietze, 2008). Day (2011) further argued for the establishing of support structures that help faculty process rejections in a productive manner. I suggest that business schools with a high proportion of international faculty have an acute need for these support structures, which should address several issues related to research productivity of scholars, whose native language is not English. First, editing and copy-editing services should assist researchers in finding their 'English-speaking voice' and expressing their ideas in a manner that is recognized by English-speaking reviewers as appropriate. Here, it is important to ensure that these services provide "cultural translation", which translates the meanings and the messages, rather than "mechanistic translation" that simply translates phrases into grammatically correct English (Janssens et al, 2004). Second, experienced mentors should assist faculty with less publishing experience in international journals in understanding which part of the reviewers' comments is driven by the content of a manuscript, and where the simple change in writing style would be sufficient to communicate the authors' idea to reviewers. Third, where a paper has been rejected, peer support has to ensure that researchers' identity is maintained and that faculty keeps reviewing and resubmitting research until it finds a home in one of the journals.

The broader academic community also has to acknowledge that the refreshing diversity of ideas and approaches, brought to organizational sciences by academics from outside of the English-speaking world (Adler, 2014), comes with a price to all parties involved in the exchange of knowledge. Communication between people with different levels of linguistic capital involves mutual effort of understanding each other. Refusal to acknowledge that global academic forums, such as international conferences, have to establish linguistic policy that is friendly both to native English speakers and to non-native English speakers, can lead to unnecessary tensions between researchers. Neeley's (2013) study of a French multinational company shows that non-native English speakers experienced resentment towards their colleagues from English-speaking countries who, in their opinion, leveraged their linguistic capital to dominate corporate communication and to advance their professional status. Discussing similar issue in an academic context, Steyaert and Janssens (2013: 139) go as far as to argue that "at some point, virtually all non-native English scholars have experienced confusion when listening to English speakers

who make no distinction between a paper they present in an all-Anglophone context and at an international conference." They, together with Belina (2005), suggest that native English speakers have to "adjust their language use" (Steyaert and Janssens, 2013: 139), in particular to avoid context-specific jargon, to use metaphors sparingly and to speak more slowly than they would to a native English speaking audience. In their turn, it is not always easy for native English speakers to understand their international colleagues presenting their research. It is even more embarrassing for everyone in the room when a presenter cannot engage with the audience because her linguistic capital is not sufficient for understanding the questions. While overall mastery of language comes with practice, something can be done for those scholars who have not quite achieved this mastery yet. First, conference organizers might allocate an additional presentation time to academics from non-English speaking environments, should they require it, which would allow them to adjust the presentation to their less fluent English. Second, where linguistic hurdles seem to undermine Q&A sessions, peer support should be promoted. It should not be embarrassing for a struggling presenter to use an audience member as a translator, and similarly it should not be inappropriate for an audience member to offer such linguistic assistance. If the idea behind the globalization of the business school industry is to understand management practices worldwide, then organizational sciences scholars should be judged by their expertise in organizational research rather than their linguistic capabilities.

Limitations

While I provided several arguments justifying the use of the language of the country where an education was received as a proxy for the language of education, and in some cases as a proxy for the native language of an academic, this measure might have some degree of error. Some academics might come from English speaking families but receive their education in another linguistic environment due to family relocation[50].This error, however, is not likely to be systematic, i.e. I do not expect some countries of the outer and expanding circle of English to exhibit a consistently higher amount of 'hidden' native English speakers. While primary data on linguistic socialization is still preferable to proxies based on archival data, I argue that the robustness testing that I have done (see footnotes to the methods section in this chapter) ensures a reasonable degree of internal validity for the linguistic capital measure.

Other control variables can be included to improve the fit of the model predicting research performance, such as for instance the teaching load, and the amount of

[50] I am grateful to my colleague from Grenoble School of Management who provided himself as an example of an American educated in France since the age of 7.

resources allocated for copy-editing. One, however, has to find a balance between capturing the complexity of the context and maintaining statistical power that allows testing for the main effects. Given the current sample size, I made choices on the number of control variables included in the model based on the current literature in the field of research productivity.

Directions for future research

This chapter suggests that language plays an important role in the development of individual research productivity in business schools. This opens several exciting avenues for future research. First, social network scholars might explore how linguistic capital of a researcher influences the formation of her co-authorship ego-network. The instrumental view on network formation would assume that academics with lower stock of linguistic capital should strive to collaborate with native English speakers who are able to serve as primary copyeditors of jointly written manuscripts. Research in International Business, however, provides evidence that in multilingual teams non-native English speakers gravitate towards other non-native English speakers (Neeley, 2013). This phenomenon is driven by social similarity, which is a well-known predictor of network tie formation (Brass et al, 2004). Second, the scholars studying socialization of doctoral students might look at the role of a supervisor's linguistic capital in the early-career productivity of organizational researchers. This topic is of particular significance to the emerging scientific systems (Horta et al, 2010) in non-English speaking countries, where a new cohort of PhD graduates may have to communicate in a bilingual manner between their local supervisor and a global academic community. Third, while the language of professional socialization is important due to the path dependent nature of academic careers, it is also possible that those scholars who have overcome linguistic barriers to become highly productive, have done so through proactive behavior post-PhD. Taking academic positions in business schools located in the inner circle countries or going to these countries for sabbatical and research visits, may compensate for the lack of linguistic capital. The exploration of academic careers with the focus on mid-career linguistic capital acquisition might become the next step towards the development of language-sensitive research in the business school context.

APPENDIX 7: Addressing unobserved heterogeneity issues in the European sample

In organizational science, the relationship between decisions made by actors and the consequences of these decisions can often be explained by variables that influence initial decisions but which are not included in the analysis of outcomes (Bascle, 2008; Hamilton & Nickerson, 2003; Shaver, 1998). Where these variables indeed prove to affect this relationship, there is a possibility that the interpretation of the causal relationship might be biased as the variable that was believed to have caused the result is in fact endogenous or dependent on the omitted variable that triggers self-selection in the sample.

In order to take account of endogeneity in this study I used Heckman's two-step procedure (Heckman, 1979) as recommended in previous studies (Bascle, 2008; Hamilton & Nickerson, 2003; Shaver, 1998). The first step comprises a probit model that predicts the likelihood of an academic choosing a top-ranked PhD program (see Table 38 below). From this model a researcher can obtain a correction factor λ, known as the "inverse Mills ratio" (Bascle, 2008). In the second step of the procedure, the correction factor is added to the initial OLS regression equation in place of the endogenous variable, and the significance of λ indicates the presence of endogeneity in the sample. I used the program code recommended in the Hamilton and Nickerson study (2003) to perform the procedure in STATA. Overall the procedure was similar to that used earlier in the thesis to account for endogeneity in the sample of US academics (described in detail in Appendix 2).

Several points related to European sample are worth noticing here. First, given linguistic barriers facing those educated in non-English speaking environment, the propensity of PhD applicants to search for PhD programs locally (Azoulay et al, 2009) should be even higher in this sample than it is in the US sample. Therefore, a willingness to become geographically mobile with all the risks that might entail should be a good indicator of a proactive attitude and the determination to pursue a high-quality education on the part of a young academic. Second, I added the language of undergraduate degree variable as an additional instrument predicting the choice of top-ranked PhD school. Lower linguistic capital may restrict the access to top schools, which are predominantly located in English speaking countries. Third, for this sample, top PhD program was defined as one of top 100 schools in research ranking developed in Chapter 4. The same ranking was used to measure research-intensiveness of the undergraduate degree school.

The results of the analysis show that self-selection into top 100 PhD programs is not present in the sample, as λ is not significant in any of the models (see Models 3 and 4 in

Tables 39 and 40), and its inclusion in the corrected model (Model 2 in Tables 39 and 40) does not change either the sign or the significance of the research rank of PhD.

Table 38: Heckman's procedure step 1: Probit estimates of top-ranked PhD choice model

	Model 1
Intercept	-1.07***
Research-intensiveness of undergraduate degree institution	0.00***
Inter-country/inter-state mobility before PhD	0.98***
First degree in business-related discipline area (1=yes)	-0.03
Language of undergraduate degree (English=1, otherwise=0)	0.28†
N	284
x^2 (df)	31.05(4)**

Table 39: Heckman's procedure step 2: Results of OLS multiple regression analysis of log total number of papers, corrected for endogeneity

	Model 1 (base)	Model 2 (corrected)	Model 3 (PhD from top-100 school)	Model 4 (PhD from non-top-100 school)
Control variables				
Age, gender and discipline area included	Yes	Yes	Yes	Yes
PhD from 100 top-ranked schools (1=yes)	0.06 (0.05)	0.05 (0.06)		
Impact Factor of first journal	0.02† (0.01)	0.02 (0.01)	-0.00 (0.01)	0.03† (0.02)
Time before 1st publication	-0.02*** (0.01)	-0.02*** (0.01)	-0.02* (0.01)	-0.02* (0.01)
Research-intensiveness of post-PhD workplaces	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00* (0.00)
Co-authorship network size	0.09*** (0.01)	0.09*** (0.01)	0.10*** (0.01)	0.09*** (0.01)
Average strength of ties	0.15*** (0.04)	0.11** (0.03)	0.12* (0.05)	0.09* (0.04)
Proportion of strong ties	0.44** (0.15)	0.53** (0.17)	0.21 (0.27)	0.81*** (0.23)
Number of unique co-authors squared	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Linguistic capital	0.01 (0.01)	-0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)
Inverse Mills ratio (λ)		-0.04 (0.06)	0.09 (0.09)	-0.06 (0.07)
Intercept	0.89*** (0.11)	0.84*** (0.15)	1.28*** (0.27)	0.65*** (0.15)
N	343	272	120	152
F-statistic	83.91***	61.50***	28.39***	44.82***
R-Squared	0.76	0.77	0.76	0.80

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 40: Heckman's procedure step 2: Results of OLS multiple regression analysis of log total number of citations, corrected for endogeneity

	Model 1 (base)	Model 2 (corrected)	Model 3 (PhD from top-100 school)	Model 4 (PhD from non-top-100 school)
Control variables				
Age, gender and discipline area included	Yes	Yes	Yes	Yes
PhD from 100 top-ranked schools (1=yes)	0.31**	0.23†		
	(0.12)	(0.14)		
Impact Factor of first journal	0.19***	0.16***	0.10***	0.23***
	(0.03)	(0.03)	(0.03)	(0.06)
Time before 1st publication	-0.07***	-0.06***	-0.06**	-0.06**
	(0.01)	(0.02)	(0.02)	(0.02)
Research-intensiveness of post-PhD workplaces	0.00**	0.00**	0.00**	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)
Co-authorship network size	0.14***	0.15***	0.16***	0.13***
	(0.01)	(0.02)	(0.02)	(0.02)
Average strength of ties	-0.03	0.01	0.25**	-0.14
	(0.10)	(0.09)	(0.08)	(0.11)
Proportion of strong ties	0.77*	0.78*	-0.61	1.69**
	(0.38)	(0.40)	(0.52)	(0.52)
Number of unique co-authors squared	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Linguistic capital	0.04†	0.04†	0.09**	0.05
	(0.03)	(0.03)	(0.04)	(0.04)
Inverse Mills ratio (λ)		0.01	0.34	-0.11
		(0.18)	(0.22)	(0.19)
Intercept	1.24***	0.96**	1.47**	0.74†
	(0.27)	(0.35)	(0.52)	(0.39)
N	343	272	120	152
F-statistic	49.96***	37.10***	18.11***	29.28***
R-Squared	0.63	0.64	0.65	0.67

Significance levels are one-tailed for hypothesized effects and two-tailed otherwise.
† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

CHAPTER 6. DISCUSSION AND IMPLICATIONS

This thesis looks at the individual performance of knowledge workers and explores how their occupational human capital (HC) emerges from the interplay between initial conditions, organizational scripts, and proactive behavior. An understanding of this emergence process is instrumental in identifying productive employees at an early stage in their careers and in further developing their professional expertise within organizations (Coff, 1997; Coff & Kryscynski, 2011; Groysberg et al, 2004; Groysberg et al, 2008). The conceptual development and empirical testing within this thesis have two foci. First, I brought together the path dependence perspective, based on the sociology of science literature, and the proactiveness perspective, based on social capital research, to discuss the relative importance of organizational scripts and individual behaviors in the development of individual human capital. Second, I highlighted the structural implications of individuals' initial positioning within a particular geographical and linguistic area, and the influence which these implications have on proactive behaviors (i.e. collaboration and mobility).

I build upon insights from an emergent stream of the literature on the micro-foundations of human capital to develop a model that includes both organizational-level and individual-level factors associated with the individual performance of employees. The model was then tested in multiple employee samples involving 986 academic researchers across 52 business schools in Europe and the US. The results of this analysis are briefly presented in Figure 12 for the *volume of research* outcome variable and in Figure 13 for the *impact of research* outcome variable. The comparison of these two figures shows that the factors related to globalization (international mobility and linguistic capital) have a more nuanced influence on the impact of research relative to the volume of publications. This is consistent with arguments posited in the sociology of science literature according to which scientific recognition is dependent on particularistic factors rooted in social perceptions, and is thus disproportionally allocated to existing leaders. The thesis extends these arguments by highlighting some of the mechanisms that underlie the dominance of centrally located academics as agenda-setters for the field of organizational science. Among these mechanisms are access to top journals, proximity to research conversations, and linguistic barriers.

Figure 12: Confirmed relationships between main constructs and volume of research

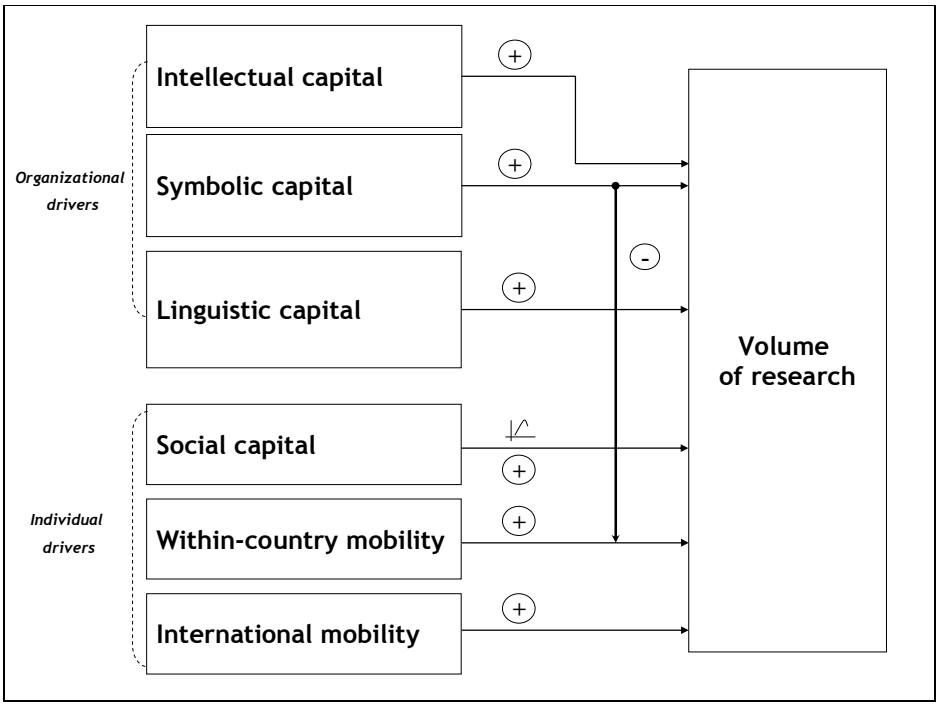


Figure 13: Confirmed relationships between main constructs and impact of research

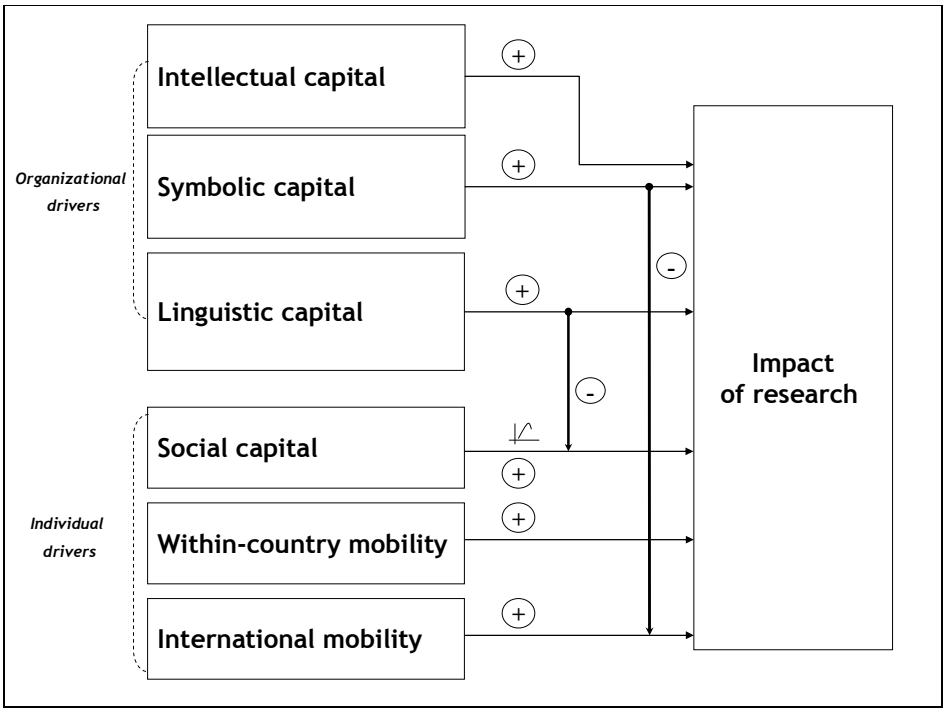


Table 41 below summarizes the individual contributions of empirical Chapters 3-5 to the academic research productivity literature and to other research streams.

Table 41: Contributions of empirical chapters

Chapter: main themes	**Contributions**
Chapter 3: Organizational and individual drivers of research outcomes	***To the academic research productivity literature:*** the study builds a consensus between the path dependence and proactiveness perspectives by developing a multi-level model that includes both organizational factors and proactive behaviors as drivers of individual research outcomes. ***To the micro-foundations of human capital literature:*** 1) the study extends the understanding of individual heterogeneity within employees' knowledge, skills, abilities and other attributes (KSAOs) by adding proactive behaviors as sources of heterogeneity; 2) the study compares the contribution of organizational-level and individual-level factors to the explanation of variance in researchers' occupational human capital
Chapter 4: Global stratification and social closure in researchers' careers	***To the academic research productivity literature:*** the study refines the understanding of the relationship between symbolic capital and productivity by exploring this relationship across multiple career patterns ***To the stratification literature:*** the study introduces the concept of underdeveloped stratification and demonstrates that it exacerbates social closure in academic hiring ***To the academic mobility literature:*** 1) the study demonstrates the co-existence of downward and upward mobility in academic careers within one industrial setting 2) the study highlights the impact of stratification on the international mobility of early-career researchers
Chapter 5: Linguistic capital as a driver of research outcomes	***To the academic research productivity literature:*** the study advances the understanding of antecedents of research performance in a globalized environment by introducing linguistic capital as an additional driver of productivity ***To the social capital literature:*** the study offers an explanation for the variance in actors' ability to extract value from networks by looking at linguistic capital as a nodal attribute within academic ego-networks

Several main themes emerged in the thesis, and this concluding chapter will discuss them in the context of the business school industry and, more broadly, of knowledge-intensive organizations.

MAIN THEMES OF THE THESIS

Structure versus agency: the power of proactive behavior

The choices made by academics early in their careers have lifelong implications for their ability to develop mastery in research, and yet these choices are often made by an individual who is unaware of the rules of the academic game or of the internal research-based stratification of the academic field. An individual choosing a PhD program because of its geographic proximity to her (Azoulay et al, 2009), or because it does not require mastery of a foreign language and is compatible with her budgetary constraints, may not fully realize the consequences of her decision.

The danger of making a wrong early-career choice lies in the emerging path dependence[51] and social closure, especially where an individual attempts upward mobility across multiple strata. This has particularly unpleasant implications for academics striving to move across if their institution of origin does not have international visibility. Once anchored in a lower-ranked stratum, individuals have to face the labor market's perception of the average quality of that stratum's graduates. PhD graduates who aspire to more research-intensive positions have to provide very compelling evidence of their research abilities to convince employers to overlook their pedigree. This task is not made easier by the fact that lower-ranked schools often cannot offer their students the same level of research support as the business schools in higher strata.

The issue of early-career choices may be addressed at the field level before these choices are made, and at the individual level after the choices have been made, to mitigate their consequences. At the field level, there should be more transparency regarding the relative standing of business schools in the field of research. Some rankings have already begun to move in this direction, offering national and global discipline-based hierarchies for PhD programs. For example, the National Research Council provides rankings of PhD programs in the US, while Amir & Knauff (2008) rank top economics PhD programs worldwide; for an overview of other research-based rankings, see Chapter 4 (p. 93). It is not clear, however, to what extent potential entrants to PhD programs are aware of the existence of these rankings and whether they find them useful. An even higher degree of transparency may be achieved by informing PhD applicants of their career prospects after graduation. Mass-media rankings collect data on the economic value of MBA programs by calculating the increase in graduates' salaries which result from MBA-level study (O'Brien et al, 2010). These rankings also account for the proportion of graduates employed three months after graduation. For the purposes of informing PhD students' decision-making, these metrics may be changed for the number of graduates' publications one year, three years, and five years after completion of their PhD and the proportion of graduates employed in academia and industry. Meanwhile, I would not recommend using the research rank of the business schools where graduates are employed as a metric, since focusing on the research-intensiveness of workplaces has two potentially negative implications. First, it drives social closure, because where the graduates of high-ranked schools are actively placed by their mentors into high-ranked workplaces, this

[51] While Vergne & Durand (2010) argue that true path dependence can only be triggered by a random event, and thus academic careers do not exactly fit into this pattern, I suggest that on some occasions true path dependence might be observed in this context. For example, a lucky match with a productive supervisor, the emergence of a "hot group" of researchers (Ford, Duncan, Bedeian & Ginter, 2006) in a PhD school, or early publishing in a special issue might determine the direction of an academic career for many years.

leaves fewer places for the graduates of lower-ranked schools. Second, it discourages international mobility from the center of the industry (i.e. from North America) to the periphery, because the performance of a school suffers if its graduates take positions abroad, where typically the research rank of workplaces is lower.

An anchoring in a low stratum can be the result of individuals' external constraints, even where applicants to a PhD program are aware of that program's ranking in the research-based industry hierarchy. An inability to relocate closer to a high-ranked school due to family commitments, the high cost of tuition, and the absence of scholarships are common reasons leading highly capable researchers to schools with low research-intensiveness. This thesis offers some hope to those who made this early-career choice by arguing that, at an individual level, proactive behaviors at the post-PhD stage can mitigate some of the negative consequences of an unfortunate initial anchoring.

The question of whether it is possible to overcome the influence of path dependence is directly related to one of the oldest debates in the field of organizational science: that of whether structure or agency play a more important role in defining the actions of social actors and their consequences (Pozzebon & Pinsonneault, 2005). This debate received a lot of attention at the organizational level of analysis (Heugens & Lander, 2009), but has been investigated less at the individual level. Existing micro-level contributions are either conceptual (Baruch & Hall, 2004; Battilana, 2006; Sullivan & Arthur, 2006) or qualitative (e.g. Dany, 2003; Dany et al, 2011; Duberley et al, 2006; Reay et al, 2006), and have not yet led to a consensus on the relative importance of organizational scripts and individual behaviors. The thesis moves this conversation forward by measuring quantitatively how organizational and individual factors contribute to the emergence of individuals' occupational human capital.

The organizational factors explored in the thesis include the quality of professional education and the conduciveness of the workplace environment, two main drivers that are assumed to lead to the development of professional expertise in research. Individual factors include both the inherent sources of individual heterogeneity, such as gender, age, and geographical location at the beginning of one's career path, and individual proactive behaviors. Some of these behaviors are more stable than others; the researcher's choice of discipline is usually made early in her academic career, for example, and rarely changes dramatically over the course of it. Elsewhere we find more dynamic processes, such as networking and mobility, which can intensify at any stage in one's career and actively contribute to individual performance.

Comparing the individual-level findings of this thesis with the organizational-level findings of meta-analysis by Heugens & Lander (2009), I see consistent patterns that allow

generalization across levels and may eventually lead to a multi-level consensus on the relationship between structure and agency. Heugens & Lander (2009) found that structural pressures had a statistically significant influence on organizational actions and led to higher performance outcomes. At the same time they found the effect sizes to be small enough to leave plenty of space for actors' agency. Similar findings emerge in this thesis, although in a different context and on a lower level of analysis. Structural factors (e.g. the organizational scripts of PhD schools) have an impact on long-term career paths, restricting access to the top strata for the graduates of lower-strata schools. Through this influence, structural factors have an impact on individual research performance. Academics exposed to more research-intensive organizational scripts (which at the organizational level would be the equivalent of a higher degree of acquiescence to a dominant logic) achieve higher symbolic performance (reputation of workplace) and higher substantive performance (volume and impact of research). Despite this, individual proactive behaviors of networking and mobility make a strong contribution to the development of individual research productivity. My analysis reveals the complementarity of organizational and individual drivers of occupational human capital, and empirical studies in this thesis have uncovered several meaningful interactions between organizational and individual factors. For instance, the language of the educational environment at the beginning of researchers' careers (an organizational-level factor) influences the value extracted from collaboration network structures (an individual-level factor). The value extracted from international mobility (an individual-level factor) also depends upon the research-intensiveness of academic origin (an organizational-level factor).

The heterogeneity of human capital

Scholars within the micro-foundations stream advocate the use of individual-level processes as a starting point for explaining higher-level processes and outcomes (Barney & Felin, 2013). Within the human capital literature, Ployhart and Moliterno (2011) emphasize the importance of accounting for individual-level heterogeneity in employees' KSAOs. This thesis explored multiple sources of human capital heterogeneity in business schools and linked them to the faculty's individual research performance. Conceptually, the sources of human capital heterogeneity can be divided into those which are static and those which are dynamic, the former being stable from the outset of a professional career and the latter developing as that career progresses. Some of the static sources of heterogeneity examined in this thesis have been studied before, such as gender (Bird, 2011; Bentley, 2012; Barbezat, 2006), discipline area (Bird, 2011; Carayol & Matt, 2006), and the quality of education (Buchmueller et al, 1999; Long et al, 1998; Williamson & Cable, 2003).

Chapter 5 of the thesis contributes to this literature by adding linguistic socialization as another static source of heterogeneity. The dynamic sources of heterogeneity are rooted in individuals' proactive behavior and career-related decisions made prior to entering the workplace. Within the business school context, these sources include networking and mobility, both of which contribute to the formation of employees' KSAOs. Micro-foundations research has started to address the link between the networking behavior of knowledge workers and organizational outcomes (Grigoriou & Rothaermel, 2014). The approach taken in this thesis is broader than that of Grigoriou and Rothaermel, who focus on star human resources, i.e. the outliers in their networking ability. Instead, this study looks at networking behavior as a source of heterogeneity which is important for all employees, not only for those who are particularly good at it.

According to Ployhard and Moliterno's conceptual model (2011), all the sources of human capital heterogeneity listed above interact with emergence-enabling processes in the organizational environment to produce unit-level SHCR. The exploration of changes in networking behavior under the influence of different workplace policies could prove a useful means of testing Ployhart and Moliterno's model empirically. It is important to keep in mind that multiple sources of heterogeneity (both static and dynamic), besides having a direct influence on KSAOs, also interact with each other. This increases complexity in the selection of employees, but also has the positive effect of contributing to the uniqueness and inimitability of an organization's stock of human capital. This more nuanced approach to the assessment of human capital has proved to be highly effective in the context of professional sports (Kuper, 2011), where the "Moneyball" phenomenon allowed the Oakland Athletics baseball team to discern productive players better than rival teams and to hire them at a lower cost (Lewis, 2004). A similar approach may be helpful in other knowledge-intensive industries, including in the academic environment (Wolfe, Wright & Smart, 2006; see also the follow-up comments to this paper by other management scholars and practitioners). For example, the assessment of a candidate's resume currently focuses on the reputation of her PhD institution , the reputation of prior workplaces, the candidate's publication record (especially publications in top journals), and the presence of well-known names among a candidate's co-authors. The content of references adds depth to this assessment. I argue that, given the importance of social capital in researchers' careers, new metrics might give a more fine-grained picture of a candidate's potential. Among such metrics we find the size and diversity (geographic, linguistic, and organizational) of the co-authorship network, the dynamics of network maintenance and its link to mobility, and the number and characteristics of strong ties. These metrics could help us to understand whether a candidate is likely to keep in touch with previous co-

authors, where the main sources of support are located in her social network, and how this candidate's collaboration network may complement the networks of the current faculty members.

Globalization in a non-MNC context

This thesis looked at the business education industry as an example of a field that started its journey towards globalization in the 1990s and is currently expanding rapidly worldwide. Unlike many other globalized industries, this process has not been driven by large multinational companies (MNCs). There has been a visible trend among some North American and European schools to establish branches abroad; for example, Nottingham University (UK) has a branch in China, INSEAD (France) has a second campus in Singapore, and many business schools have opened subsidiaries in the Middle East (Alajoutsijarvi, Juusola & Lamberg, 2014; De Meyer, 2012). Mostly, however, globalization has occurred without actual international expansion, through several main mechanisms. First, there has been a global change in the research ethos, which has led to the spread of the "publish or perish" paradigm from North America to the world at large. Not only has the pressure to publish increased in the institutions that historically focused on teaching and consulting, but the pressure to publish in international English-language peer-reviewed journals has also become much stronger. Publishing in these journals has become a measure of the quality of research, which influences national-level assessment (e.g. RAE in the UK) as well as the global stratification of schools in rankings such as those of the *Financial Times*. Second, the mobility of faculty and students across countries has increased. This trend was driven by the growth of the wealthy middle classes in emerging countries (e.g. the BRIC countries), who send their children to study abroad, and by pan-European initiatives, such as the Erasmus Mundus program, which enables student mobility between the countries of the EU. In Europe, since it was decided that all EU students would pay the same fees as local students, students from outside the EU became important sources of income for business schools, as their fees can be twice as high as those of EU students (Currie, 2007). The same business model has been in operation in North American business schools (Mitchell, 2007) and in Australian universities (Nyland et al, 2013). The increase in mobility has created global competition for the best students and employees; mass-media rankings play a central role in influencing students' choices, while global research-based rankings do the same for faculty. Third, business schools have had to prepare students for labor markets characterized by an increasing number of MNCs and to provide consulting for these globalized organizations. This has highlighted the need to build cross-cultural capabilities within faculty and to expand the focus of organizational research beyond the boundaries of the home country.

Looking at this alternative path towards becoming an international organization, in the following sections I discuss some of the consequences of globalization for business schools. Following the main theme of the thesis, I will structure these consequences into three sections that relate to the attraction, motivation, and retention of human capital (i.e. researchers in business schools).

First, business schools' ability to attract human capital from abroad depends on the existence of global stratification, which makes an employer and a potential employee visible to each other. As discussed in Chapter 4, decision-making processes in cross-border hiring rely upon social categorization, which assists in assessing the possible fit between a candidate and an organization. In the absence of such stratification, organizations may systematically overlook capable international candidates with lower-ranking academic pedigrees. Where this happens, candidates' portfolio of publications and personal referrals may be used to fine-tune the selection process. The first method would indicate the prevalence of contest mobility (Miller et al, 2005), which, unfortunately, does not work particularly well for the hiring of early-career faculty. At the organizational level, this might increase the costs of hiring international faculty, because each successful publication increases the market price of research-active employees. This higher price may take the form of a higher salary or additional bonuses (e.g. a lower teaching load). In the case of public universities, whose salary scale is defined by government regulations (Cruz-Castro & Sanz-Menendez, 2010), these international candidates may be completely excluded from their hiring options. At the individual level, this indicates that international mobility may be available to the graduates of non-top schools only as a mid-career strategy. The second method would lead to the importance of sponsored mobility (Cable & Murray, 1999; Miller et al, 2005), and would discriminate against early-career candidates who do not have a mentor or a collaborator with a developed international network. As globalization came to many business schools only recently, a large proportion of senior faculty there has predominantly national-level scientific networks and cannot recommend their students to employers abroad. Business schools, therefore, need faculty with boundary-spanning network ties in order to ensure the international mobility of graduates aiming for research-intensive workplaces.

Second, business school managers responsible for the task of developing employee motivation systems need to be aware that international faculty faces the dilemma between "staying global" and "becoming local". On the one hand, socializing international faculty into the local organizational culture and local business environment may have the positive consequences of increasing the firm-specificity of researchers' human capital and of making the cross-country transition smoother. The increased firm-specificity of human

capital reduces the threat of losing valuable employees and helps create unique bundles of resources that underlie organizations' competitive advantage. Lower transition costs make an employee productive sooner after relocation. On the other hand, in the globalized business school industry, international faculty is often hired to lead a change of culture in an organization. In such cases the newcomers' distinct way of doing things is a benefit rather than a hindrance, as they are supposed to transfer their knowledge and skills to incumbents. Whether these champions of change would be successful in becoming role models or leave the organization, tired of being outsiders, depends largely on the support that cultural change receives from the management of a business school. What needs to be acknowledged here is that the balance between local and global is hard to achieve; the structure of international SHCR motivation should thus be aligned with the purpose of "localization of international employees" or "globalization through international employees".

Third, globalized business schools' retention of researchers depends on their ability to stay research-active within a particular organizational environment. The model developed in this thesis indicates that, besides promotion structures that emphasize the importance of research, an organization also has to implement policies supporting its employees' social and linguistic capital. While decisions to collaborate are ultimately made by individuals, organizations may facilitate collaboration by funding inbound and outbound research visits and by motivating faculty to introduce their collaborators from other schools to their colleagues and to doctoral students. By taking a proactive approach in helping international faculty to maintain their scientific networks and to integrate these networks with the internal community of scholars within the current workplace, business schools may improve the retention of productive researchers.

Establishing a language strategy is an important part of talent management in global organizations (Neeley & Kaplan, 2014). It is even more important in the field of organizational science, where English is firmly established as the *lingua franca* of global scientific communication. Suggestions for building a language strategy were discussed in detail in Chapter 5, so here I want to reiterate why language is key in business schools located both in English-speaking countries and outside the English-speaking world. Firstly, where a business school is located in an English-speaking country, linguistic support has to be put in place for international faculty whose linguistic background is not English. While the location of such business schools provides the benefit of English-language interactions in teaching, administration, and everyday life, evidence from IB research indicates that this might not be enough to develop employees' linguistic capital (Holmstrom et al, 2006). Non-native English speakers tend to gravitate towards one another in multinational teams,

where they successfully communicate in "broken English" (Neeley, 2013: 486) without feeling a need to improve their linguistic skills to match the level of native speakers. While I would not imply that international research-active faculty in business schools speak "broken English", linguistic studies indicate that the English used for communication between non-native speakers is different to that used by native speakers (Hewings & Tagg, 2012). Meanwhile, competition for publication in top peer-reviewed journals is fought out in the global field and requires a confident English-speaking voice from all authors. Second, in business schools located outside of the inner circle of English-speaking countries, the amount of everyday English-language interaction may be insufficient for researchers to truly master it as a dominant language of academic communication. Moreover, communicating in English with other non-native English speakers has limited value for perfecting the appropriate use of linguistic formula in various situations, as it often lacks the 'a propos' component that makes linguistic capital more than the mere ability to produce grammatically correct utterances (Bourdieu, 1977, 1991).

Occupational human capital and multiple roles

This thesis examines the drivers of occupational human capital in business school researchers. Previous studies explored the human capital of knowledge workers in the financial services industry (Groysberg et al, 2008) and law firms (Mayer et al, 2012). Unlike these industries, the academic environment is characterized by the need for employees to fulfill the distinct roles of researcher, educator, and administrator. This poses the question of whether the behavior that leads to the development of researchers' occupational human capital is beneficial for or detrimental to educators' and administrators' human capital. This thesis outlines several tensions between these roles, other than the obvious competition for an individual's time and cognitive resources.

International mobility: the first tension

The first tension is related to international mobility as a driver of individual performance. Such mobility is lauded as a source of cross-cultural expertise and as a developmental experience for academics. Competences acquired through international mobility are of high value for the development of occupational human capital in educators and, to some extent, administrators. The value of this mobility for the development of researchers' occupational human capital seems to be more problematic, however. This is particularly true for the graduates of top research-intensive schools, which are mostly located in North America. For these graduates, international mobility is associated with downward mobility along the prestige continuum, because there are few similar top research-intensive places abroad. For these academics, international mobility also has the weakest positive association with the impact of research. While scholarly journals, the

formal means of scientific communication, are accessible worldwide, the papers that appear in them reflect the state of research in the field of organizational science several years before publication. Meanwhile, informal communication processes underlying cutting-edge research conversations are more dependent on personal, face-to-face interactions (Welch, 1997), and these interactions inevitably become less frequent after relocation to another country (Eisend & Schmidt, 2014).

In order to understand the mechanisms underlying the relationship between researchers' international mobility and occupational human capital, several streams of organizational research may be productively integrated. First, social capital research might look at the dynamics within co-authorship networks and track the transformation of ties as a result of moving to another country (e.g. Jonkers & Cruz-Castro, 2013). This should provide the most visible evidence of whether old ties (relationships formed before mobility) can be maintained despite the geographical distance between collaborators. Second, studies of workplace communication (e.g. Gersick et al, 2000) may be extended to the level of the professional community in order to capture communication at conferences and knowledge exchange during research visits and sabbaticals. These studies could provide insights on the informal exchange of tacit knowledge that leads to better opportunity recognition related to special issues, calls for papers, grant proposals, and emerging hot groups (Ford et al, 2006). Third, studies that address underlying network structures in the academic field, such as "cliques" and "invisible colleges" (e.g. Burgess & Shaw, 2010; Casey & McMillan, 2008; Chabovski, Hult, Kiyak & Mena, 2010), tend to limit their findings by mapping the areas studied. The integration of these studies with the research on gatekeepers of science (Crane, 1967; Brogaard et al, 2014) and on informal power structures in organizations (Selznick, 1943) (applied at the community level) might provide alternative explanations to the performance consequences of moving between organizations, geographical regions, and countries.

Local versus global in non-North American schools: the second tension

The tension related to the multiple roles of employees in business schools is particularly salient for academics outside North America. Researchers' deep immersion into the local business context is beneficial for transferring research into teaching and consulting. An educator who knows the local context well is better at preparing students for the local labor market and more likely to be successful in attracting corporate funding from local businesses (De Meyer, 2012). Therefore, studying local companies and publishing in the local language (where this language is not English) seemingly creates synergy between the development of researchers' and educators' occupational human capital. Unfortunately, in the globalized business school environment the synergy might be

lower than expected. First, publications in a language other than English are not visible to a large global community of researchers and, consequently, have a very small impact on this community. Most global research rankings are based on publication data from ISI Web of Science or similar databases, which are focused on English-language publications. Papers published in other languages do not contribute to the internationally visible research output of business schools and do not advance their schools' standing in global rankings. These non-English language publications, meanwhile, may require a similar amount of time and effort from researchers to English-language publications. Second, publications in a language other than English do not add global marketability to a researcher's resume and consequently do not serve as a currency for international mobility. While not all researchers consider international mobility desirable, for those who do this might be a concern. Third, even where academics produce research in English, they might experience difficulties in publishing this research in top-ranked peer-reviewed journals, which are mostly based in the US, because their studies use local datasets (Meyer & Boxenbaum, 2010). These journals, while being international, still cater to a large audience of North American academics, for whom the data from other geographical regions might raise concerns in its generalizability to the context they are used to.

Day (2011) argues that success in academic publishing helps to maintain membership in a professional group of research-active scientists, which "creates a meaningful social identity" within academia (Day, 2011: 704). Similarly, success in teaching might create a meaningful social identity[52] in business schools, even if promotion structures prioritize research over other roles. The wide variety of career scripts found by scholars within the academic context (Dany et al, 2011; Duberley et al, 2006) indicates that faculty identities are shaped by the interaction between the organizational environment and individual behaviors. These identities further influence behavior as part of the dynamic structuration process. Building on the insights from this research, and keeping in mind the tensions discussed above, I argue that HR management in academic organizations should go beyond encouraging certain behaviors and discouraging others. Managing the portfolio of identities (where each employee may have multiple identities) may be a more appropriate way of aligning faculty's occupational human capital (what employees can do) with faculty motivation (what employees want to achieve) and business school strategy (what an organization needs).

[52] The power of teachers' unions in the US and other countries (e.g. Childress, Elmore & Grossman, 2006) provides evidence that a strong social identity might be created on the basis of the teaching role.

IMPLICATIONS

Implications for organizations

Business schools are both producers of researchers, through their PhD programs and faculty development activities, and consumers of researchers, through their hiring of new faculty. This thesis has implications for the management of both incoming and outgoing flows of human capital resources.

Managing the inflow of researchers

While hiring researchers on a national or global market, hiring committees have to recognize that the business school industry is a dynamic field, with many organizational and cultural changes happening worldwide. Therefore, schools which were not research-intensive as recently as 10 years ago might have built their research capabilities in the subsequent decade. As a result of this, hiring committees should refer to the most recent research rankings when assessing the quality of a candidate's organizational background. Moreover, the quality of a candidate's network should be given at least as significant a weighting as the quality of academic origin and past workplaces. Groysberg et al (2008) found evidence that knowledge workers who moved to a new workplace together with their team achieved higher performance. In the case of researchers, the co-authorship network is the team that will support their productivity throughout their entire career. Where a candidate is likely to lose contact with co-authors, for instance where the entire network is located at their prior workplace or in another country (or even continent), the decision to hire this candidate should take the potential negative effect of this into consideration. Whilst such circumstances do not mean that academics cannot maintain contact with the old network after relocation, the price of keeping these ties active is usually higher than the time spent on email and Skype communication. Personal interaction at conferences, research visits and, occasionally, sabbaticals will be required, with a cost for the researcher and for the organization.

Hiring researchers on a global market involves a number of challenges, most of which could be tackled by the implementation of relatively simple policies that would improve the identification and attraction of scientific talent. First, international candidates are likely to experience the "liability-of-foreignness" (Fang, Samnani, Novicevic & Bing, 2013), which means that they are less likely to possess the tacit knowledge necessary to search for a job on a local labor market. To mitigate the effects of the liability-of-foreignness, business schools should attempt to provide a clear and detailed description of an academic position and all conditions related to it in the job advertisement. Additional explanations of national regulations and practices might be helpful, while the use of local professional jargon should be kept to a minimum.

Second, the inability to assess candidates' credentials in cases where they come from unknown strata of educational institutions can be dealt with in two ways. As a short-term (but not always viable) solution, including international faculty in hiring committees may increase the knowledge base of these committees where it comes to stratification within multiple national contexts. This solution has its shortcomings, however. As mentioned earlier, the number and size of business schools is growing rapidly, and international faculty having left their home country some time ago may have an outdated perception of business schools' relative standing there. Where these faculty members came from the top stratum of national institutions (or have left their home country to pursue a PhD abroad), their attitude towards newcomers from lower strata may be excessively dismissive due to the outgroup bias. Another, more sustainable, solution would be to invest in a deeper understanding of the global stratification of research-intensive educational organizations. The ranking in this thesis may be used as a starting point, but organizations may also collect discipline-specific data for each case (say, when an Italian employer needs to assess a candidate from a particular German school). The important point here is to collect data from a broad range of journals, and to collect data both for the school in question and for the hiring school. In this way the comparison would be based on objective criteria (same journals, same period of time) rather than on self-perception, which tends to be exaggerated. For business schools with a sustained, regular pattern of hiring international faculty, the learning curve in adding this stratification exercise to the candidate selection process may be steep enough to significantly reduce the marginal cost of data collection for each new case. Communication within academic networks may eventually lead to knowledge spillover from these stratification exercises, making a larger number of business schools visible in the global stratification system.

Managing the outflow of researchers

The internationalization of business education, while being initially driven by the inflow of international students, now increasingly leads to international mobility among faculty. Therefore, the next cohort of doctoral students has to be prepared for this option in academic careers and must be able to manage international mobility without undermining research productivity. Several support mechanisms within doctoral programs might facilitate this task. First, international networks are instrumental in ensuring graduates' placement in research-intensive business schools abroad. Business schools should create opportunities for invited researchers and local PhDs to meet and socialize as part of a school's doctoral socialization practices. Second, the visibility of early publications is important for researchers seeking positions abroad; supervisors should therefore guide publication choices towards globally visible outlets. Third, a stratification

exercise such as that carried out in this thesis and described above can help PhD graduates to understand the global labor market and to select workplaces with an appropriate level of research-intensiveness, even if these workplaces are located abroad and do not feature among the top 100 schools globally. Stratification on a disciplinary basis may help to achieve an even better fit in the case of an international job search. Moreover, the results of this stratification can be included directly in resumes (e.g. "Hong Kong Baptist University – research output similar to University of Delaware and Princeton University on the basis of publications in top 150 ISI business and management journals in 2007-2012") to facilitate potential employers' decision-making.

Implications for individual researchers

The discussion of the drivers behind researchers' productivity and the new realities of the business school industry has several implications for individual academics.

First, as the globalization process sweeps across this industry, international mobility is an option that may become more common in academic careers and may eventually change perceptions of its value among a growing number of employers. Moving abroad, even for a few years, might not be a viable option for all researchers. The need to care for small children or elderly parents, the inability of a spouse or a partner to find a position in another country, and the emotional toll of changing an established work routine may all prevent researchers from choosing international mobility (Richardson & Zikic, 2007). For those researchers whose lifestyle is compatible with moving abroad, however, this discussion might be a call to broaden their horizons in the job search process.

Second, globalization, while it appears to be a game played by North American rules, should not lead to the increased homogeneity and Americanization of research cultures worldwide (Adler, 2014). De Meyer (2012:339) argues that the true value of an internationalized field of organizational science lies in "tap[ing] into [the] fuzzy and tacit knowledge" of international markets and in teaching business school graduates how to manage companies in different cultural and institutional contexts. In practice, this requires publishing a lot of research based on "peripheral" datasets (Meyer & Boxenbaum, 2010). The challenge for North American scholars is to focus on a long-term perspective and to take a genuine interest in phenomena occurring outside North America in order to see how knowledge of these phenomena might be instrumental for the development of North American organizations. The challenge for scholars outside North America is to relate the uniqueness of their local datasets to general organizational theories and to communicate meaningful context-specific differences in a compelling way. To achieve this

goal, they have to use the language and style that would allow a global community of scholars to appreciate the contribution made by their research.

Third, it is never too early to be proactive in building professional networks. The ability to use sponsored mobility as a support mechanism in academic careers is particularly important for the graduates of non-elite institutions, who do not possess significant symbolic capital to give them an advantage on the labor market. Early-stage doctoral students might feel too insecure to seek advice from academics other than their main supervisor. Taking risks and approaching seasoned scholars with research conversations is likely to result in an uncomfortable hour while one's underdeveloped ideas are being dissected by an experienced hand, but this risk-taking might bring a pay-off later, when external references become necessary for a job application. Besides the task of academic placement, having external co-authors facilitates the early-career transition from doctoral student to independent researcher by engaging an academic in projects unrelated to her supervisor. Strong relationships with co-authors are an important source of research support, but building relationships takes time. The earlier one starts to work with collaborators, the more time one has to test which of those collaborators presents a good professional and personal match with one's ideas and personality.

Fourth, the proactive development of linguistic capital is another area that deserves increased attention, especially among academics educated within a non-English speaking environment. Writing in a foreign language is an exercise in humility: those who do this are bound to make mistakes that they have not made in their native language since they were of schooling age. They are also bound to receive unpleasant remarks from reviewers who cannot see the content of their papers behind the imperfections of their writing style. Meanwhile, a business school career, with the self-driven, semi-autonomous nature of scientific enquiry and the need to provide competent advice to students and corporate executives, is likely to attract individuals with a strong ego. No wonder that the dominance of English language in the academic field creates bitterness among non-native speakers of English who struggle to find their English-speaking research voice (Belina, 2005; Tietze & Dick, 2009, 2013). Bitterness, however, is not likely to lead to higher research productivity. Unlike many textbooks, I would not advise classes in English as a second language, unless they are focused on advanced academic writing. Increased written and oral communication in English, preferably with native speakers of English (or academics who have spent many years in an English-speaking environment) may be a better mechanism to overcome linguistic hurdles on the way to publishing in English-language journals. While this advice is not new, in practice it often requires stepping out

of one's comfort zone, which is not what people usually do in multilingual organizations (Neeley, 2013; Tenzer et al, 2014).

Academic career paths to higher research productivity

Having studied in-depth the resumes of almost one thousand academics one might ask if I have formed an opinion on the career paths that lead to higher research productivity. In response to such a question, the following section attempts to address such natural curiosity about "the right" and "the wrong" career choices, and shares the results of a sensemaking process that happens when a researcher's mind mulls over empirical data. These results should not be taken as recommendations for action. These reflections should be tempered by the awareness that the cross-sectional nature of research in this thesis, strictly speaking, does not allow conclusions to be made about the causality of explored relationships. Keeping this in mind, if we are to approach the task of discussing academic career paths to higher research productivity from a purely descriptive perspective, several main patterns would emerge. First, for the graduates of elite US business schools, careers characterized by low mobility seem to be associated with higher research performance. Given the importance of post-PhD socialization in supporting research productivity, it is unsurprising that the graduates who manage to stay within a narrow stratum of elite schools, where they had few intra-stratum options for mobility, performed better than those of their peers who chose downward mobility to less research-intensive workplaces. This pattern does not discourage mobility completely, as it is evident from the pairwise correlations that mobility brings value to these academics by helping them to build collaboration networks. These collaboration networks, while being as important to the graduates of elite US schools as they are to the graduates of non-elite US business schools, are relatively smaller with 14 co-authors on average (versus 17 co-authors on average for the academics with PhD from non-elite US schools). As far as I can judge from written and oral reports on the state of the US business school industry, current practices in elite business schools already work to support this career pattern. While academic inbreeding is frowned upon, top research-intensive schools work hard to place their graduates in other top-ranked schools, with traditional mechanism of social closure (Burris, 2004) working to enable this intra-stratum exchange of researchers.

Second, for the graduates of non-elite US business schools, both mobility within the US and international mobility is associated with higher research productivity. Given the structure of tenure-track promotion systems and the findings from the European part of the study in this thesis, it can be assumed that international mobility is more likely a mid-career choice. Tenure in the US research-intensive schools is strongly dependent on the number of publications in top-ranked journals (Adler & Harzing, 2009), and publishing in

these journals is facilitated by proximity to the center of the field of organizational science which is still located in North America. Given the evidence from this thesis, the legitimacy of international experience as a choice made at the mid-stage of academic career should increase relative to the current state of the labor market, as it was reported by studies on international mobility (e.g. Richardson, 2009).

Third, for the graduates of elite European business schools, two career patterns exist: one which prioritizes volume of research and involves staying in the same school where doctoral degree was received, another one targeting scholarly impact and requiring international mobility to more research-intensive business school. This international mobility usually comes with the price of having fewer publications, which is compensated by higher overall number of citations. In case of graduates coming from non-English speaking countries, it may make sense to choose research-intensive business schools located in English-speaking countries, so that the employment there would support the development of a researcher's linguistic capital. While non-mobile pattern of academic careers is wide-spread in Europe, as the evidence in this thesis and in the other studies (e.g. Cruz-Castro & Sanz-Menendez, 2010) demonstrated, academic employers and researchers alike should reflect upon possible downsides of this pattern.

Fourth, for the graduates of non-elite European schools, collaboration seems to be the main factor associated with higher research productivity. For these academics having strong ties in the network is particularly important, as they provide research support that drives both the quantity and the quality of publications. Ultimately, it means that those graduates of non-elite schools who managed to find their place in a productive research team (the "hot group" as Ford et al (2006) called these teams in their study of Nobel laureates careers) would prosper. These graduates may have to create their own hot group if they are not lucky to have one around that they could join post-graduation. At an individual level, this implies that an academic has to pay close attention to her future colleagues while making employment decisions. At the business school level, academic managers should strive to support the emergence of productive research teams within and across organizations.

LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

The research design choices made in this thesis exhibit both benefits and limitations. Archival data collection from ISI Web of Science allowed me to accumulate performance and co-authorship data for a large and diverse sample of business school academics in Europe and in the US. These data were complemented by the analysis of resumes to deliver a broad range of organizational- and individual-level predictors of research productivity. Unfortunately, Web of Science is a less suitable source of data for

the investigation of social capital variables relative to the data obtained from primary sources (through surveys or interviews). Bibliometric data allowed me to measure basic tie-based features of academic ego networks, such as size of network and the average frequency of collaboration. These data, however, do not give any insight into academics' own perceptions of most valuable network ties, the ties that bring a higher amount of information and research support. Web of Science also lacks consistent data on the institutional affiliation of co-authors in the sampled academics' ego networks, especially where collaboration took place more than 20 years ago. Without this information I could not explore geographical and organizational diversity within networks and was unable to delve deeper into the structural features of scientific networks by looking into the co-location of authors. The size of the sample and the tendency of network size to grow exponentially also precluded me from looking at status diversity within networks. Collecting co-authors' status data (whether from ISI or from the resumes), even for the smaller sample of 360 European academics, required information to be processed for 10,658 first-order co-authors, which was not feasible in a given timeframe. Further development of the themes discussed in the thesis might benefit from social network research that compares the influence of ego-network diversity on research outcomes in relatively small sub-samples of European and US academics.

The thesis highlighted the role of linguistic capital in researchers' occupational human capital and provided empirical evidence of its importance in supporting academic publishing. As this study was one of the first to use a quantitative methodology in language-sensitive research, I used a rather coarse measurement of the linguistic capital construct, which distinguished only between English-speaking and non-English-speaking countries of education. Initial sociological studies of linguistic capital, however, argue that linguistic capital is allocated unequally within national boundaries (Bourdieu, 1991). These studies assume that individuals of a high social class possess higher linguistic capital than, for example, the lower middle class. This level of complexity is absent from this study. Therefore, I suggest that further research should consider including both intra- and inter-country variance in the allocation of linguistic capital.

The exploration of the processes of linguistic capital accumulation in the post-PhD period of academic careers may become another avenue for the development of language-sensitive research in the business school context. This accumulation may occur through language training (Tietze, 2008), collaboration with native speakers of English (Eisend & Schmidt, 2014) or international mobility to inner-circle countries. The comparative importance of organizational practices, such as the workplace language training

recommended by Neeley & Kaplan (2014), and of individual proactive knowledge seeking, would also be of interest to scholars studying the micro-foundations of SHCR emergence.

As most scientific studies do, the thesis generated new questions as well as providing answers to those that initially triggered it. Some of these new questions may potentially become a fruitful ground for multidisciplinary studies. For instance, applied linguistics may help to establish whether writing scientific papers in one language facilitates doing so in another. Arguments may be put forward for both a positive and a negative relationship here. Proponents of multilingual writing may argue that the practice of scientific writing is the same, as it is developed independently of the language in which it is taking place. Moreover, producing research in any language makes it possible to hone research methodologies and to collect data. Opponents, meanwhile, may argue that writing in English for the global audience and writing in another language for a local audience compete for the same limited time and attention. Moreover, where the style of argument in English and other languages differ, the costs of switching between languages may be high, as an academic has to invest cognitive resources to achieve mastery in both styles. Moving from human capital research into the realm of social psychology, researchers may explore the mechanisms underlying the identity threats outlined by Day (2011), linking them to the authors' linguistic background. Do authors writing in non-native languages experience more anxiety in relation to manuscript rejection? While rejection is painful for everyone, in the case of these authors it adds to the anxiety stemming from the lack of congruence between linguistic habitus and linguistic market (Bourdieu, 1991). At the same time, individual psychological attributes and one's status in an organization (e.g. tenured or not) may be more reliable predictors of the stress experienced as a result of manuscript rejection.

CONCLUSIONS

The main message of this thesis can be distilled into several concluding remarks. Organizational science and organizational practice are both moving towards a greater degree of complexity. The call for a multi-level approach to organizational phenomena has brought new methods and highlighted new research questions that have redefined the boundaries of existing organizational theories. Globalization has increased the heterogeneity of human capital on a global market, with knowledge-intensive organizations being the first to experience the challenges associated with a multinational, multilingual, and multicultural workforce. The studies in this thesis offer evidence that may facilitate the selection, motivation, and retention of unique human capital and contribute to the competitive advantage of business schools globally. This evidence, however, is only useful if it informs the implementation of practices that seek and nurture

researchers in business schools and at the level of the academic community. These practices should acknowledge human agency as well as organizational influences, and use mechanisms of assessment that at least match the complexity of the work that we undertake as researchers in our scientific field.

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APPENDIX 8: Publications and Conferences

During the period that I have been registered as a doctoral student at the UCD Michael Smurfit Graduate School of Business, I published two papers in the Academy of Management conference proceedings and presented a number of papers at international academic conferences. These papers are listed below. This thesis was informed in part by the process of writing the papers and benefited from the feedback I received from the reviewers.

Publications in peer-reviewed proceedings

Ryazanova, O. & Mc Namara, P. 2014. Language, socialization and networks: Knowledge creation in globalized business schools. In John Humphreys (Ed.), **Proceedings of the Academy of Management,** ISSN 1543-8643.

Ryazanova, O. & McNamara, P. 2012. Between symbolic and social capital: A structuration theory approach to academic productivity. In Leslie A. Toombs (Ed.), **Proceedings of the Academy of Management,** ISSN 1543-8643.

Conference papers

Ryazanova, O. & Mc Namara, P. 2014. Microfoundations of Knowledge Creation in Business Schools: Multilevel Exploration of a 'New Career' Perspective. **SMS Copenhagen Special Conference,** June, Copenhagen, Denmark.

Ryazanova, O. & McNamara, P. 2013. Research productivity of Financial Times top 100 business schools' faculty: Impact of academic origin and pro-active choice. **EURAM Conference,** June, Istanbul, Turkey.

Ryazanova, O. & McNamara, P. 2011. External artefacts production: the right way is no less important than a good start. **Academy of Management Conference,** Management Education and Development Division, August, San Antonio, USA.