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What and how long does it take to get tenure?

The Case of Economics and Business Administration in Austria, Germany and Switzerland*

July 7, 2008

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Abstract

This paper investigates the determinants of tenure decisions in Germany, Austria and the German-speaking part of Switzerland for professorships in economics, business administration and related fields. Our data set comprises candidates who were awarded tenure as well as those who were eligible but were not tenured. We show that business candidates have a higher probability of being tenured than economists. Youth, marital status, and publications matter; gender and children do not. The market for first appointments in economics relies much more on publication performance than the market for business administration.

Keywords: Habilitation, tenure, academic labor market
JEL Classification: A11, I23

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1 Introduction

Seeking a tenured professorship is a very risky business, at least in Germany, Austria and Switzerland. Candidates come up for tenure at a relatively late stage of their careers – in our sample successful candidates receive tenure at an average age of 38 years – when careers in the business sector are already well established. Attractive alternatives have long ceased to exist and people who do not make it in academia are typically in their forties when they search for other, much less attractive options. To stay in academia at a lower ranked but still tenured position (such as senior lecturer positions in the UK) is not an option since these jobs hardly exist in the German system. Thus, it is an "up-or-out" decision with bleak consequences for those who do not make it. This begs the question as to what it takes to get tenure, and if successful, how long it takes? What is the role of factors such as youth, gender, acquired external funds and publications? How do search committees value different forms of publication (refereed journal articles, books, contributions to collected volumes etc.)? This paper addresses these questions. We analyze how faculties make tenure decisions and assess the relative importance of their determinants using a unique data set covering the academic market in Germany, Austria and the German-speaking part of Switzerland. We also analyze whether the market for business administration exhibits the same pattern as the market for economists.

The labor market for academics has been widely researched in other countries (e.g. Stephan 1996, Siegfried and Stock 1999, Ehrenberg 2004, Coupé et al. 2005, Oyer 2006); particular emphasis has been placed on gender differences in performance and career paths (e.g., Kahn 1993, Levin and Stephan 1998, McDowell et al. 2001, Ginther and Kahn 2004) and on publication performance of individual researchers and departments (e.g., Coupé 2003, Kalaitzidakis et al. 2003, Combes and Linnemer 2003). Other contributions study the search strategies of faculties for new faculty members (Chen and McKinnish 2005) and the role of seniority (Monks and Robinson 2002). Most of the existing literature on academic career paths refers to Anglo-Saxon countries, which have a very specific institutional setup of the academic labor market. As continental Europe does not share this institutional setup, these findings may not apply to the German speaking countries included in our study. Studies of these countries are still relatively scarce. Notable exceptions include Bommer and Ursprung (1998) who study publication performance of German economics departments and Rauber and Ursprung (2008a,b) who focus on publication profiles for German academic economists over time and across cohorts.[1]

Recently a small body of literature on the determinants of tenure decisions in Germany has emerged. In a first study Schlinghoff (2002) investigates 102 candidates for tenure in economics and management who have received their Habilitation between 1990 and 1994. He runs logistic regressions explaining tenure by publications, the reputation of the home university and the prevailing job market situation and finds that publications have a strong impact on the probability of being tenured. He classifies publications as international journals, German top journals, other German journals and contributions to collected volumes, but he does not differentiate within these groups. His study is more a useful snapshot analysis than a representative study, given his small data set and the short time span covered.

[1] Hein (2006) studies research performance of economists in Switzerland, Schulze (2008) portrays overall trends in Habilitations in Germany, among other things. Fiedler et al. (2008) look at correlations between the publication performance of post-docs in business and the publication record of their "Habilitation-supervisors" and other characteristics of the post-docs' research environment in Germany.

Graber et al. (2008) provide information relevant to tenure decisions for a subset of the currently tenured economics professors in Germany, such as the place where they received their PhD, the age at which they completed their PhD, when they were granted tenure, and their publication profile. They aggregate EconLit publications by the weighting scheme suggested by Combes and Linnemer (2003) and show that the amount of accumulated publications (in terms of standard EER pages) has significantly increased since 1990. They provide a forecast of how much one "needs to publish" in order to be tenured in the future. Their study is illustrative in the sense that they describe the publication profile of successful candidates. Unsuccessful candidates for tenure are not included and thus we do not know, for example, whether the publication profile of the successful candidates is significantly different from that of the unsuccessful ones and whether publications matter. Potentially important determinants for tenure such as acquisition of research funds ("Drittmittel"), gender, research experience gained abroad, and publications other than EconLit publications (other journals, books, contributions to collected volumes) are not taken into account, even though the authors show that a significant (but declining) fraction of candidates received tenure without having published in EconLit journals at all.[2]

Heining et al. (2007) analyze the time to tenure in a survival model for economics professors in Germany. Their sample consists of tenured economics professors and currently employed post-docs. They use gender, age at PhD, the kind of degree (diploma in economics or other fields), institution that awarded the PhD, time dummies and a bibliometric score as variables to explain the duration to tenure. They show that publications significantly increase the "hazard", that is they make tenure more likely, and that there are distinct time periods in which duration to tenure was shorter. They do not include unsuccessful candidates in their analysis (of course, some of the current post-docs might eventually fail) and thus identify the determinants for the duration to tenure, conditional on being given tenure. Like Graber et al. they do not include publications other than EconLit publications, which are aggregated according to the Combes–Linnemer weighting scheme.[3]

In our study we use a sample that consists of nearly all researchers who received a Habilitation in economics *or* business administration in the period 1985 to 2006 in Germany, Austria and the German speaking part of Switzerland, including those researchers who received a Habilitation, but did not receive tenure. The Habilitation is a sort of 'Super PhD' which constitutes a quasi-requirement for obtaining tenure and thus allows us to delineate the relevant pool of candidates for tenured positions. However, we do not have data for all relevant variables on every individual, so our effective sample is somewhat reduced. Tenure decisions are made by search committees and faculties, and it is not clear which publications they will take into account and how these publications will be aggregated. Rather than postulating an aggregation scheme as relevant, we use six different weighting schemes for articles in refereed journals in order to identify the weighting scheme that has the highest explanatory power for the tenure decision. This procedure allows us to understand the selection process of search committees better. In order to include nearly all relevant journals in our weighting schemes, we have imputed six different journal lists, covering over 2700 journals[4] on the

[2] Likewise we do not know a priori whether search committees use the particular weighting scheme that they apply to aggregate publications. Indeed, Bräuninger and Haucap (2001) have shown that German economists systematically weight journals differently to international impact-based rankings such as Combes and Linnemer (2003).

[3] Like Graber at al. they find a strong variance in bibliometric scores which include zeros for a number of tenured professors, strongly suggesting that publications other than in EconLit journals may matter as well.

[4] The list used by Graber et al., for example, covers only 798 journals.

basis of six different original lists, each employing different methodologies (based on expert opinions or impact factors). The journals that are missing in the respective base lists are imputed with the help of other lists in such a way that the weighting scheme of the base list is maintained. Moreover we include books and articles in collected volumes, differentiated by language (English, German). This allows us to examine whether these publication types have an additional explanatory power for the tenure decision. Moreover, we include a number of other individual data, such as the size of research funds raised, gender, age at Habilitation, marital status, number of children, research experience abroad, external or cumulative Habilitation and time dummies to capture changing demand for new professors. In our data base we include candidates for tenure from economics as well as business administration, which allows us to study possible differences in these submarkets.

We find that the markets for new business and economics professors function very differently. Publication performance matters a great deal for economists, but much less so for professors in business, and consequently publication performance is much higher for the former than for the latter. Nevertheless, candidates for business professorships stand a significantly higher chance of receiving tenure. Search committees reward international experience and youth; they are not interested in fundraising or whether a Habilitation has been written in the form of a monographe or a collection of articles.

The paper proceeds as follows. First, we briefly outline the institutional setup for tenure decisions in Germany; in section 3, we present our data, which includes individual data and our various approaches to measuring publication performance. In section 4, we describe the academic landscape as encountered by candidates for tenure. In section 5, we first present the results of a probit model to identify the determinants of tenure; subsequently we run a Cox proportional hazard model for tenure decisions. Section 6 summarizes and concludes.

2 The Road to Tenure

In Austria, Germany and Switzerland, the career path leading to tenured positions differs substantially from academic career paths in the Anglo-Saxon countries. Thus, a brief remark on the typical career in the German university system seems appropriate.[5] Our explanations refer to the situation prior to the advent of the bachelor/master system currently being introduced in German universities. After high school, and possibly military or civilian service (for men), students typically enter the university at the age of 18/19 (women) or 19/20 (men). The median student takes 11.3 semesters to graduate, with considerable variation across fields of study. The average graduate is 28.1 years old, but more typically, graduates who commence their university education after finishing high school or military/civilian service are 24 to 26 years old.[6] Most people opting to write a PhD thesis do so directly after having received their diploma/magister artium/state examination; the lion's share of students seeking an academic career are employed by a university during that period. They complete their PhD when they are 29 to 32 years old. The overwhelming majority leave the university on completion (many PhD students do not have the intention of pursuing an academic career). Those seeking an academic career then proceed to write their *Habilitation* thesis, a kind of „Super-PhD" which is typically a much more comprehensive dissertation than the doctoral dissertation (recently, the cumulative Habilitation, a collection of papers, has become popular).

[5] The institutions in Austria and Switzerland are very similar.

[6] Data refer to 2002. Statistisches Bundesamt, Fachserie 11, Reihe 4.3.1, 1980-2002, S. 349. Note that those seeking an academic career tend to be considerably faster than the average.

During that time, postdocs form part of a research team under the supervision of a tenured professor. After its successful completion and a Habilitation-colloquium, they receive their Habilitation,[7] the qualification for teaching at universities, and are awarded the academic degree of „*Privatdozent*" at which time they are 39 to 40 years on average (with a wide variation between fields). They then seek positions of tenured professorships at universities. As a rule they are not given tenure at the university where they got their Habilitation, but instead move to a different university. Open positions are advertised and candidates send in their résumés including a list of publications and teaching portfolio; from these, the search committee typically selects about half a dozen candidates for a presentation and interview. On the basis of the personal impression, the committee typically forms a ranked shortlist of three candidates. This process is very competitive and occurs at a relatively late age considering that those who fail to obtain tenure must often accept jobs that do not do justice to their qualifications. On average across all fields, those who succeed receive their first tenured position at the age of 42; in our sample of economists and business candidates the average age of tenure is 38 years.

The tertiary education sector in Germany consists of three tiers: (1) The universities, including pedagogical universities,[8] art academies, and technical universities, (2) technical and other colleges („Fachhochschulen" who often refer to themselves as „universities of applied sciences") (3) vocational and technical schools („Fachschulen") and universities of cooperative education („Berufsakademien") and comparable institutions at each level. Habilitation has been a requirement for tenure only for first tier institutions.[9] Second and third tier institutions are much more applied in their academic approach and require a PhD and some practical experience outside academia. They constitute a separate market and are not the subject of this analysis.

While a Habilitation has never been a prerequisite for a tenured professorship at a university in a strict sense and could be substituted with a proof of „equivalent scientific achievements" (typically publications of at least equal quality), the introduction of non-tenured junior professorships (assistant professors) has brought an end to the de facto requirement of a Habilitation. Currently we observe a coexistence of independent junior professors and post-docs seeking a Habilitation. It remains to be seen which will be the road most traveled. The recent developments notwithstanding, the Habilitation has been a de facto requirement for tenure for professors of economics, business administration, and related fields until very recently. Only now are junior professors starting to receive tenured jobs. Thus, for our data set, which covers scientists who have received their Habilitation in the period 1985 to 2006, the award of the Habilitation marks the entry date of the candidates in the market for tenured professors.[10] Unlike the US, the German markets for business professors and economics professors are strictly separated and cross-overs are rare.

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[7] The Habilitation goes together with the award of the *venia legendi*, which is the university lecture qualification and allows its holder independent teaching at the awarding university. This *venia legendi* is typically given either for teaching in economics or in business administration, but can be defined more narrowly. Related areas are subsumed under economics (such as econometrics and statistics) or business administration (such as information management).

[8] *Pädagogische Hochschule*, which existed in Thüringen and Sachsen-Anhalt until 1992, in Schleswig-Holstein until 1993, and still exists in Baden-Württemberg.

[9] Exceptions of the Habilitation requirement are professors in art academies and professors of engineering who often do not have a Habilitation.

[10] In fact, candidates start looking for tenured professorships earlier and some start applying for jobs even before they have been awarded the Habilitation. We account for that in our data set; but still the Habilitation is a formal prerequisite and thus its award marks the entry in the market in a formal sense.

3 Data

3.1 The Sample

The natural population for our analysis of tenure decisions is all scientists who have obtained the Habilitation in economics, business administration, and related fields, since a Habilitation is the quasi-formal requirement. Unlike in the US system, in the systems of German speaking countries, the overwhelming majority of people with a PhD in economics or business administration never intended to pursue a career in academia and thus the group of PhDs would be an inappropriate sample.[11]

Since there is no central registry for Habilitations in Germany, it was extremely difficult and time-consuming to identify all individuals with Habilitations in economics and business administration and to establish whether, and if so when they were tenured. We needed to painstakingly assemble a data set on all Habilitations in these fields. First, we searched two professional journals, *Forschung & Lehre*, published by the Deutscher Hochschulverband, the association for professors in Germany, Austria, and Switzerland, and the *Deutsche Universitätszeitung* which is published by a private publishing house.[12] Both journals have a section in which they report awards of Habilitations by field, including the *venia legendi* and a date, as well as official job offers („Ruf") issued to professors and candidates seeking their first professorship. Unfortunately, we found that both journals reported very erroneously and incompletely, therefore we could not rely on the information given. In a second step, we asked first the deans' offices and then friends and trusted colleagues at all universities in Germany, Austria, and Switzerland to correct and amend our list of alumni that had been awarded Habilitation at their respective university. This procedure resulted in a very high response rate: Only two out of 93 universities did not respond; for those two we had to rely on the information given by *Forschung & Lehre* and the *Deutsche Universitätszeitung*. Given that these were rather small universities, our list of Habilitations should be rather accurate.

3.2 Individual Characteristics

We then searched for the email addresses of all individuals with a Habilitation and sent them an online questionnaire in order to verify the date of Habilitation and the field including their subarea in economics or business administration.[13] We also asked for career and personal information such as date of first tenured job offer, date of birth, marital status and number of children at Habilitation, academic stays abroad, whether they had handed in a cumulative Habilitation (a collection of articles) or a 'traditional' Habilitation thesis (a monograph), whether they had written their Habilitation thesis while employed outside academia, and whether they had raised money for research projects („Drittmittel").[14] The intention was to collect all systematically available

[11] By delineating the sample as the group of individuals with a relevant Habilitation, we do not consider post-docs who stayed in academia for a while seeking an academic career and gave up before obtaining the Habilitation. They did not pursue the academic career with the same diligence and thus are not included; on the practical side, it would be next to impossible to identify those people in any systematic way given the difficulties we faced identifying those with a Habilitation.

[12] For online versions see http://www.forschung-und-lehre.de/cms/ and http://www.duz.de.

[13] Non-response was an issue – we sent up to three reminders to non-responding individuals and obtained a response rate of 53.86 percent; this is relatively high.

[14] We also asked whether they had published under a different name than their current one in order to get a correct publication record. Name changes occurred mostly for women who got married and changed to their husbands' names or got divorced and changed back to their maiden names.

information on career and other personal characteristics that may influence the search committees' decision.[15]

3.3 Publication Record

To establish the candidates' publication records, we used the *WISO* database which is the most comprehensive German data base for literature in economics, business administration and related fields, as it comprises not only international publications, but also most German language publications, including books and contributions to collected volumes.[16] We opted against using the EconLit data base, as its coverage is centered on journals published in English (even though it also covers German journals) and publications in German language journals may also be important for tenure decisions, as may be monographs and articles in collected volumes. Moreover, since we analyze tenure decisions in economics *and* business administration, including sub-fields such as Taxation, Accounting, and Auditing which have a more national focus, some relevant journals may not be indexed in the EconLit data base. Our approach does not contain any normative statement of which journals should be relevant for tenure decisions; we seek to portray what search committees regard as relevant and thus we use the most comprehensive approach possible.

We classified the following types of publications:

1. Articles in refereed journals (in English, German, and other languages)
2. Book publications (in English and German)
3. Articles in collected volumes, handbooks, encyclopedias etc. (in English and German)

We did not aggregate over these types of publications, but we aggregated within each type. For the aggregation of journal articles, we constructed six different meta-rankings based on six existing base rankings, each following different methodological approaches. We extended the base lists through an imputation procedure to arrive at a large coverage of journals. Our procedure for the construction of the six meta-rankings and the relative merits of the different methodological approaches are discussed in detail in Schulze, Warning and Wiermann (2008); the paper, the meta-rankings, as well as links to the original rankings are found at www.vwl.uni-freiburg.de/iwipol/rankings.html. In the following we sketch our procedure to the extent necessary for the understanding of our econometric analysis of tenure decisions, and refer the reader to Schulze et al. (2008) for further details.

There are three basic approaches to journal rankings: rankings based on expert judgment, rankings based on impact factors, and hybrid rankings. In expert rankings journals are classified in categories, e.g. A+, A, B, C, D, according to some aggregation of experts' opinions. Impact based rankings calculate the rank of a journal by the number of citations that a journal commands, where the citations are weighted by the impact factor of the citing journal and the number of citations are

[15] Obviously we are missing potentially important information, for which no systematic information is available such as the quality of the job interview presentation, personal traits known to the search committee, personal relations to faculty members, or beauty of the candidates (cf. Hamermesh and Parker 2005).

[16] For online information on WISO cf. http://www.bibliothek.uni-regensburg.de/dbinfo/einzeln.phtml?bib id=ubfre &colors=7&ocolors=40&titel id=2173

standardized by the volume of a journal.[17] The invariant method additionally divides the number of citations of a citing journal by the number of citations per article in that journal to account for different citation intensities.[18] Expert rankings are inherently subjective and they are vulnerable to strategic behavior of the experts who may be inclined to value the journals more highly in which they publish. The subjectivity of this methodology, typically seen as a major shortcoming (cf. Ritzberger 2008), may not be a drawback in our context. *If* search committees' judgments, which are also inherently subjective, coincide with those of the experts, such expert-based rankings *may* have a larger explanatory power than impact-based rankings. Rankings by impact factors are more objective, but they have the severe drawback that they are extremely skewed. For instance in the ranking by Kalaitzidakis et al. (2003) a publication in the *American Economic Review* counts 1.7 times as much as a publication in the *Quarterly Journal of Economics* (no. 5 in the ranking), five times as much as the *Economic Journal* (no.18) and 25 times as much as an article in the respected *Journal of Law, Economics and Organization.* A publication in *Kyklos* counts for less than one percent. It is hardly conceivable that search committees make the same, extremely skewed evaluations. Moreover, impact factors are based on citations of the scientific community as a whole; it may be that the importance of journals for the German-speaking scientific community differs systematically from impact-based rankings.[19] Bräuninger and Haucap (2001) have shown in an online survey of members of the German Economic Association (*Verein für Socialpolitik*) that the respondents regard journals published or edited in the German-speaking countries more highly than the impact factors suggest. The extremely skewed distribution of impact factors has led to hybrid approaches, notably that of Combes and Linnemer (2003), which has been widely used.[20] Combes and Linnemer assign the best five journals the weight 1, the next 16 the weight 8/12, the following 39 the weight 6/12. 68 journals get 4/12 as their weight, 139 get 2/12 and the remaining 1030 journals covered receive the weight 1/12. The ranking of the journal thus depends on the impact factor, but the relative weights are less skewed.[21] We use rankings based on expert opinions, the hybrid Combes-Linnemer ranking, as well as rankings that are based on impact factors. However, due to the unrealistic, strongly skewed distribution of impact factors, we convert those impact factors into classes of journals of a similar quality. More information on this procedure is to be found in Appendix A1.

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[17] There are also rankings that use unweighted impact factors. This however runs counter the logic of impact factors: If journals are differentiated by citations they receive, the citing journals should also be weighted (cf. Ritzberger 2008).

[18] The calculation of impact factor is done by iteration. The impact factor *I* of the journal *i* after the t–th iteration is $I_{i,t} = \frac{\sum_{j=1}^{n} C_{ij} I_{j,t-1}}{V_i}$ with $I_{i,0} = \frac{\sum_{j=1}^{n} C_{ij}}{V_i}$,

with C_{ij} denoting the number of citations of articles in journal *i* by articles of journal *j* in a given period (e.g. two year after publication) and V_i denoting the volume of journal *i* measured by characters, standardized pages, or articles. In the invariant method C_{ij} is divided by the citation intensity (number of citations per article) of journal *j* in order to account for different citation habits of journals (and subfields), cf. Palacios-Huerta und Volij (2004).

[19] Impact based rankings have other drawbacks, the major being that they are sensitive to the population of journals that are used to measure the citations that a journal receives, as has been shown by Kodrzycki and Yu (2006). Another is that impact factors vary over time, especially at the lower end so that ranks are unstable over time. Moreover, new journals will receive appropriate impact factors only with a considerable time lag, cf. Schulze et al. (2008).

[20] For example, Rauber and Ursprung (2008a,b) use the Combes-Linnemer (2003) journal ranking to assess the publication performance of German economists.

[21] They assign the leading field journal a weight of at least 1/2.

We use the following base rankings

1. **[CL]** Combes and Linnemer (2003), hybrid method, focus on economics journals, six categories with weights 1/12 – 12/12, n=1030.

2. **[Vienna]** list, list of the Wirtschaftsuniversität Wien, [22] expert opinion, focus on business administration journals, classification 1 – 5, n=1877.

3. **[VHBR]** (Verband der Hochschullehrer für Betriebswirtschaft, German Academic Association for Business Research), documented in Hennig-Thurau et al. (2004), expert opinion, focus on business administration journals, classification 1-6, n= 681.[23]

4. **[Rb]** Ritzberger (2008), impact factors, calculated according to the invariant method, and categorized into classification 1 – 6, focus on economics journals, n= 261.

5. **[KMS]** Kalaitzidakis et al. (2003), impact factors categorized into classification 1 – 6, focus on economics journals, n=159.

6. **[BH]** Bäuninger and Haucap (2001) expert opinion, based on an online survey of members of Verein für Socialpolitik, includes a relatively large number of German journals, classification 1.02 – 4.83, n= 150.

The coverage of the journal rankings differ widely - while VHBR and Vienna focus more on business journals, CL, Rb and KMS focus on economics journals. All journal rankings are incomplete – no single ranking would have allowed us to adequately assess the scientific output of all researchers on the job market, especially since we cover both economics and business administration. The six base rankings were thus used to create six comprehensive meta-rankings on the basis of each of the base rankings so that the ranking method of the base ranking is conserved. We used the following protocol: Using an ordered probit model we regressed the base list on a randomly selected other list. We imputed into the base list the rankings of those journals that were contained in the other list, but not in the base list on the basis of the highest predicted likelihood. We continued this imputation with all other lists until the resulting imputed list contained all journals that were in at least one of the lists. Since the resulting imputed list depends on the order of the rankings used for the imputation steps, we repeated this procedure 1000 times with the order of journals determined by a random variable that is uniformly distributed. Subsequently we calculated the mean of the 1000 imputed lists and rounded the values to integers, or in the case of CL to the given weights of 1/12, 2/12, 4/12 a.s.f.[24]

Based on these journal weights we are able to aggregate the publications in different ways and thus consider a variety of rankings in our analysis for journal articles. We weighted the journal articles by dividing the journal weight by the number of coauthors. Ursprung and Zimmer (2007) argue that this is the incentive-compatible weighting scheme. Yet, we do not know whether search committees take the number of coauthors into consideration when evaluating publication records of candidates. Therefore, we have also used the journal weights, unweighted by the number of coauthors, to see which one has the larger explanatory power.

[22] Cf. http://bach.wu-wien.ac.at/bachapp/cgi-bin/~des/~des.aspx/~des.aspx?journal=true;lang=DE,
[23] Online at http://pbwi2www.uni-paderborn.de/WWW/VHB/VHB-Online.nsf/id/EB24EF9AF51F72D2C125709600494116. (access 19. May 2008)
[24] Full details can be found in Schulze et al. (2008), as well as some further information in the appendix.

Book publishers were ranked only in the Bräuninger and Haucap study, yet the coverage of publishers was very limited. On the basis of their valuations we established similarities and ranked the missing publishing houses accordingly.[25] Again we weighted by the number of coauthors and also constructed an unweighted index. Lastly, we counted the number of books, distinguishing books published in German and in English.

We counted the number of contributions to collected volumes, handbooks etc, separately for German and English volumes and we used the simple number as well as the number of contributions weighted by the number of coauthors.

3.4 Job Market Situation

In addition to relative individual performance, the probability of receiving tenure depends also on the overall demand for new professors. To account for different market situations, we use time dummies for five year periods. In particular, controlling for time allows us to analyze whether spells from Habilitation to tenure were shorter and the likelihood of getting tenure higher in the aftermath of German reunification, when the economics and business departments were re-established in the new German federal states.

A list of all variables used in the regressions is given in Table 1.[26]

Table 1: List of variables used in the empirical analysis

Variable name	***description***
Female	Dummy variable, =1 if individual is female
Age at Habilitation	In years
External Habilitation	Dummy variable = 1 if Habil. thesis was written while employed outside academia
Cumulative Habilitation	Dummy variable = 1 if Habil. thesis is a collection of articles
Fundraising	Dummy variable = 1 if individual raised more than 1000 Euros prior to Habilitation
Married	Dummy variable =1 if married at time of Habil.
Children	Dummy variable =1 if individual has children at time of Habil.
Research abroad	Dummy variable =1 if individual had stayed at least 12 months abroad in a non-German speaking country
Business-dummy	=1 if venia legendi is in business
Journals CL	Journal publications weighted by Combes Linnemer (2003) ranking, weighted by number of coauthors
Journals VHB	Journal publications weighted by VHB ranking, weighted by number of coauthors
Journals RB	Journal publications weighted by Ritzberger (2008) ranking, weighted by number of coauthors
Engl. Books	Number of books in English, weighted by number of coauthors
German books	Number of books in German, weighted by number of coauthors

[25] For example, Bräuninger and Haucap (2001) included *Oxford University Press*, but not *Cambridge University Press* and we assigned the latter the same value as the former.

[26] We calculated a host of other related variables and used other thresholds for certain variables such as variable “abroad”, but report only those that we used in the final regressions.

Collected vol. English	Number of articles in collected volumes etc. in English, weighted by number of coauthors
Collected vol. German	Number of articles in collected volumes etc. in German, weighted by number of coauthors
Time 1991-95/ Time 1996-2000/ Time 2001 -	Time dummies = 1, if the year is in the respective time period (reference time period: 1985-1990)

4 Habilitations in Economics and Business Administration

4.1 Individual Characteristics and Areas of Expertise

1734 post-docs received a Habilitation in economics, business administration, and related fields during the period from 1985 to 2006. The online questionnaire was answered by 934 individuals, which is 53.86 percent of the entire population.

We provide some summary statistics on the Habilitations: 1,545 (89.1 percent) people were men, 189 (10.1 percent) women. The average age at Habilitation was 38 years (with a standard deviation of 4.6 years). The age at tenure was 38 years as well. 733 (or 45 percent) of 1615 received their Habilitation in the field of business and 629 (39 percent) in economics. [27] Of the respondents of the online questionnaire 57.7 percent were married, 48 percent had at least one child at the time of their Habilitation. 154 respondents wrote their Habilitation thesis while working outside academia (external Habilitation), 201 wrote a collection of papers instead of a thesis (cumulative Habilitation). Table A3 in the Appendix provides further details on the descriptive statistics on individual characteristics.

4.2 Publication Performance

In Table 2 we report the candidates' published oeuvre at the time of the Habilitation, and for those who were successful, also at the time when they received their first offer of a tenured job.

Table 2: Publication Performance at Habilitation and at Tenure

Variable	***Mean***	***Std. dev.***	***Max***	***Mean***	***Std. dev.***	***Max***	***Diff_M***
At Habilitation	*Economics (545)*			*Business (626)*			
Journals CL	0.93	0.99	4.97	0.37	0.39	4.17	0.00
Journals VHB	19.23	19.00	158.75	11.19	10.69	112.33	0.00
Journals RB	7.32	7.27	42.50	4.36	4.41	50.00	0.00
Engl. books	0.09	0.34	3.50	0.03	0.18	2.00	0.00
German books	0.75	1.07	10.75	0.88	0.95	6.75	0.03
Collected vol. English	0.52	1.10	11.83	0.15	0.48	4.50	0.00
Collected vol. German	1.53	2.89	25.75	1.15	2.13	16.83	0.01
At Tenure	*Economics (239)*			*Business (276)*			
Journals CL	1.52	1.26	8.08	0.42	0.31	1.66	0.00
Journals VHB	29.50	23.52	174.00	13.01	9.44	54.92	0.00
Journals RB	11.79	9.10	53.50	4.95	3.64	19.75	0.00
Engl. books	0.24	1.06	15.00	0.03	0.17	2.00	0.00
German books	0.97	1.23	7.00	1.12	1.13	7.50	0.17
Collected vol. English	0.86	1.48	8.00	0.17	0.54	5.50	0.00
Collected vol. German	2.29	4.13	36.83	1.45	2.25	15.83	0.01

[27] Unfortunately we do not have information on 119 individuals on the field of Habilitation, which leaves us with 1615 post-docs with a Habilitation.

Counts of observations are in parentheses. Minimum value for all variables is zero. Diff_M reports the level of significance (p-value) of a test for equality of the mean values of economics and business. Variances were significantly different (at the 1 percent level) for all publication categories except German books.

We observe three major differences between the economics and business candidates. First, by the time they get the Habilitation, economists have published more than business candidates. At Habilitation the difference for journal publications is on average 0.56 on the Combes Linnemer scale and 8 on the VHB list.[28] The difference at Habilitation is significant: On the CL scale it is, for example, one additional publication in a leading field journal such as the *Journal of International Economics* or two in the *German Economic Review*; on the VHB scale it is two articles more in the *ZfB* or the *GER*. [29] Economists also publish more English books (but not German books) and they have more contributions to collected volumes.

Second, as expected, there is a significant difference in the publication record between the pool of people awarded Habilitation and those who are actually awarded tenure. For the total sample (not reported) the difference in journal publications amounts to 0.40 on CL and 5.8 on the VHB list.[30] The score of all other publication categories increases as well. This is due to a favorable selection bias, as it should be, but potentially also to the time that has elapsed from Habilitation to the offer of a tenured professorship.

More striking is the third observation: The difference between publication records of economists and business administration candidates is even more pronounced if one considers successful candidates. While for business candidates the publication record improves only very mildly by 0.05 for CL and 1.8 on the VHB scale, the change is quite large for economists from 0.93 to 1.52 (CL) or 19.2 to 29.5 (VHB). *A*t the time of the tenure decision, economists have published in journals between 2.3 and 3.6 times as much as newly appointed professors of business administration (depending on the scale). That is a very substantial difference. In part, this may be due to a stronger selection; in part it may be a result of a longer duration between Habilitation and tenure in economics.[31]

[28] To give an impression of what this means, we provide some examples. The *American Economic Review* has the value 1 on the Combes Linnemer list and 6 on the VHB list. *Journal of Labor Economics* is 0.67 at CL and 6 on VHB, the *German Economic Review* has the values 0.17 and 4, respectively; *Zeitschrift für Betriebswirtschaft* has 0.08 and 4, *Kyklos* 0.33 and 5, *Kredit und Kapital* 0.08 and 4.

[29] The VHB list does not differentiate between good, very good and excellent journals as much as Combes-Linnemer do. For instance the *Journal of Institutional and Theoretical Economics* has 83 percent of the value of the *Quarterly Journal of Economics* on VHB, but only 33 percent on CL. That is a drawback of the VHB list.

[30] For instance, this is almost one publication in the *Journal of Human Resource*s or one in the *Journal of Institutional and Theoretical Economics,* plus one in the *Zeitschrift für Nationalökonomie* (CL) or one publication in the *Journal of Econometrics* or *Management Science* (VHB) (see also fn. 29).

[31] To get an idea of the magnitude of the selection effect we compare the publication record at Habilitation of the entire sample with those who later got tenure. The successful economists had a CL (VHB) publication score of 1.15 (22.2) compared to 0.93 (19.2) for the entire sample and increased it to 1.52 (29.5) at tenure; i.e. they had published almost a quarter more at Habilitation than the average of the entire sample and increased their publication record by almost a third until tenure as measured by the CL scale. Business professors had published at their Habilitation only very slightly more than the average (0.39 compared to 0.37 on the CL scale and 12.0 compared to 11.2 on the VHB scale); they increased their record to 0.42 (CL) or 13.0 (VHB). That is a relative increase of eight percent and an absolute increase of one coauthored article in a D journal.

4.3 Success and Failure

How successful have candidates been? Of 636 candidates in business, 353 (or 56 %) have received a job offer and 283 are still waiting for an offer.[32] 269 (or 49 %) of candidates in economics had been successful with 278 still waiting.[33] In total, 735 candidates were still waiting for a job offer at the end of 2007. Behind this number is a very heterogeneous group of candidates, some of whom have just recently completed their Habilitation and are on their way to tenure and others who have not been successful and left academia a long time ago (some of those may never have sought an academic career). In Table 3 we show the distribution of time that has elapsed after Habilitation for those that have not (yet) received tenure.

Table 3: Time elapsed since Habilitation for those without job offer

Waiting in years	***Freq.***	***Percent***	***Cum.***
1	50	6.80	6.80
2	69	9.39	16.19
3	55	7.48	23.67
4	37	5.03	28.71
5	56	7.62	36.33
6	66	8.98	45.31
7	59	8.03	53.33
8	39	5.31	58.64
9	30	4.08	62.72
> 9	274	37.28	100.00
Total	***735***	***100.00***	

How many of those waiting can still expect to become a professor? How long does it take successful candidates to get tenure? In Table 4, we report the duration until the first (tenured) professorship is offered for those who were eventually tenured.

Table 4: Duration to tenure (for those who were tenured)

Duration in years	***Economics***	***Business***	***Others***	***Total***
< -2	7	7	0	14
-2	4	4	0	8
-1	4	18	0	22
0	54	151	13	218
1	68	87	14	169
2	47	40	11	98
3	25	20	4	49
4	22	11	4	37

[32] We have very reliable and complete information on Habilitations (including the field), as this information was provided by universities who keep records, however information on whether individuals have received a tenured job, and if so when, is less accurate since this information was missing in some of the reports from the universities, not all individuals responded to the online questionnaire, and the data of the *Deutsche Universitätszeitung* and *Forschung und Lehre* was incomplete. This explains the discrepancies in numbers of individuals that have received a Habilitation and the number of individuals for whom we have information on tenure, especially the duration to tenure.

[33] These numbers refer to individuals for whom we have duration data to make the numbers consistent with the following tables. The actual numbers are higher.

5	13	7	0	20
6	13	5	2	20
7	5	1	4	10
8	2	1	1	4
9	2	0	1	3
10	2	1	0	3
12	1	0	1	2
Total	***269***	***353***	***55***	***677***

57 percent of all successful candidates got their first job offer for a tenured professorship in the year of their Habilitation or the following year. After the second (third) year 78 (85) percent of the success stories have already been written. There is a distinct difference in the time to tenure for business and economics candidates. Successful economists have a much longer road to tenure than business candidates. 76 percent of the successful business candidates receive tenure by the end of the year after Habilitation, while the corresponding figure is only 51 percent for economists.

5. Regression Results

5.1 The likelihood of being tenured

First, we analyze the probability of receiving tenure in a simple probit model. As explanatory variables we use personal characteristics and publication performance at Habilitation. As we have seen from Table 4, 97 percent of successful candidates received their tenured position within six years after the Habilitation. Consequently we limit analysis to the subsample of those who had received their Habilitation prior to 2001, so that likelihood that we misclassify individuals as unsuccessful when they will receive tenure in the future is very small. The results of the probit regression are reported in Table 5.

Table 5: Probit model on tenure success (endogenous variable tenure=1 if received tenure)

	(1)	(2)
Female	-0.1831	-0.1950
	(-0.85)	(-0.91)
Age at Habilitation	-0.0877***	-0.0874***
	(-4.50)	(-4.49)
External Habilitation	-0.7871***	-0.8041***
	(-3.20)	(-3.29)
Cumulative Habilitation	0.6359*	0.7439**
	(1.93)	(2.32)
Fundraising	0.0466	0.0409
	(0.26)	(0.23)
Married	0.4400**	0.4705***
	(2.46)	(2.64)
Children	-0.02204	-0.0424
	(-0.26)	(-0.51)
Research abroad	0.2174	0.2437
	(1.30)	(1.48)
Business-dummy	0.7086***	0.6520***
	(4.23)	(3.93)
Journal CL	0.6319***	

	(3.42)	
Journal VHB		0.233***
		(3.26)
Engl. books	0.7139[a]	0.6546
	(1.58)	(1.52)
German books	0.0325	0.0291
	(0.35)	(0.31)
Collected vol. English	0.2003	0.2087[a]
	(1.53)	(1.60)
Collected vol. German	0.0342	0.0263
	(0.79)	(0.61)
Time 1991-95	-0.5579**	-0.5232**
	(-2.24)	(-2.10)
Time 1996-2000	-0.9671***	-0.9542***
	(-4.17)	(-4.11)
constant	3.7875	3.7997
	(4.78)	(4.79)
Log likelihood	-192.0953	-193.6289
$Chi^2(16)$	107.12***	104.05***
Pseudo R^2	0.2180	0.2118

[a] significant at the 11 percent level. Endogenous variable is one if individual who got the Habilitation in 1985 – 2000 got tenure, zero otherwise, sample size: 450.

We find that age at Habilitation negatively influences the probability of being tenured; youth signals traits (possibly such as determination, enthusiasm) that are valued by search committees. An externally written Habilitation reduces the probability of tenure, but this effect is statistically significant only for business administration (regression not reported). Individuals who wrote their Habilitation thesis in the field of business administration outside of academia may have already received offers more attractive than professorships, but still regard a Habilitation to be valuable for their career outside academia (or for their self esteem). Visiting positions in a non-German speaking country increase the likelihood to receive tenure; yet the coefficient is not statistically significant at usual levels. Journal publications significantly increase the likelihood for tenure, independent of the measure of publication success (the CL or the VHB scale, imputed ranking). There is some indication that English books and contributions to collected volumes in English affect the probability favorably, yet coefficients are significant only at 11 to 13 percent levels. There is a clear time pattern, with the likelihood of being awarded tenure being smaller for later "generations" (the omitted time period is 1985-90). Most striking however is the difference between candidates from economics and business. For business candidates, the likelihood of being awarded tenure is significantly higher than for the remainder of the sample, which consists mainly of economists.

In the above analysis we include only those individuals for whom there is a very high probability that the tenure decision (success or failure) has already been made. This restricts our sample, as we exclude those individuals who have recently received their Habilitation and are currently seeking a tenured position. Moreover, important variables – notably publication performance – change over time thereby altering the probability of tenure. If individuals publish after their Habilitation; their chances of being awarded tenure will increase. These changes cannot be captured in a simple probit model, thus a survival analysis is more appropriate, as it allows for time varying variables as well as censored spells.

5.2 Time to Tenure

To provide a first impression of the survival process we depict the Kaplan-Meier survival estimates for the whole sample and separately for business and non-business (mostly economists, but also economic historians, economic sociologists, statisticians with a Habilitation from economics or business departments) candidates.[34]

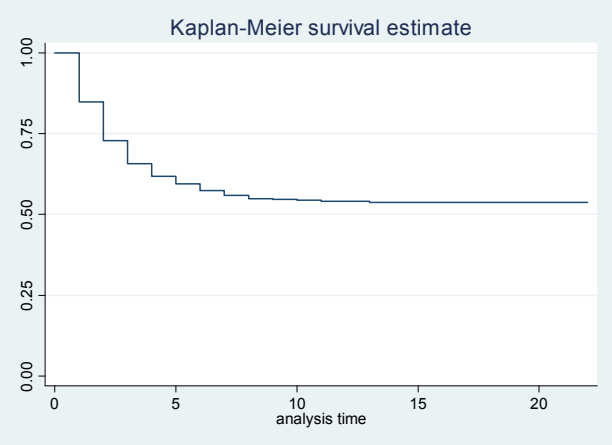

Fig.1 Kaplan-Meier survival estimate, whole sample

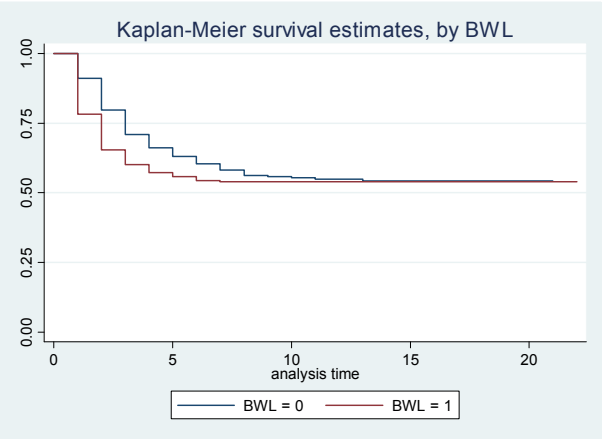

Fig. 2: Kaplan-Meier survival estimate, lower curve: business candidates, upper curve: rest of the sample (mainly economists)

We estimate a Cox proportional hazard model, as this allows for significant flexibility. We use time invariant explanatory variables for hazard, such as gender, marital status and number of children at time of Habilitation, the category of Habilitation (business, economics, others), whether candidates have written a cumulative Habilitation or received their Habilitation while working outside academia, and whether they have raised research funds (at least 1000 Euros) prior to their Habilitation.[35] We have included the time varying publication performance variables as regressors which consist of various indexes for journal articles, books, and articles in collected volumes and the like. The

[34] The Kaplan-Meier is a nonparametric estimator of the survivor function (Kiefer 1988, p. 659). The survivor function indicates the probability of surviving until a certain time (in our context this means *not* receiving tenure up to this point). For a survey on duration models see Kiefer (1988).

[35] These data were taken from the online questionnaire; we did not inquire about changes in these variables since the Habilitation, as this would have been too cumbersome to answer and would have driven down response rates.

publication measures that weighted articles by the number of co-authors consistently outperformed those that did not divide by the number of coauthors, as measured by the Bayesian Information Criterion (BIC). Thus we report only those. For books the weighting by the number of coauthors performed only slightly better and it made hardly any difference whether we counted the number of books or used the weights of the publishing houses, based on Bräuninger and Haucap (2001), after we had distinguished between German and English books.[36] For the sake of brevity we report only the books weighted by coauthors, separately for German and English books, and the number of contributions to collected volumes, again differentiated according to language and weighted by coauthors.

For the sample as a whole, the model with the journal ranking by Combes-Linnemer performed best as measured by the BIC. The VHB, Bräuninger and Haucap, and Ritzberger rankings performed almost equally well and the Vienna list performed worst. We report the results that use CL, VHB, and Rb in Table 6.[37]

Table 6 Cox proportional hazard model, whole sample

Variable	(1)	(2)	(3)
Female	0.8601 (-0.90)	0.8615 (-0.89)	0.8603 (-0.89)
Age at Habilitation	0.9217*** (-5.08)	0.9198*** (-5.21)	0.9199*** (-5.21)
External Habilitation	0.8010 (-1.15)	0.7944 (-1.19)	0.8170 (-1.04)
Cumulative Habilitation	0.8758 (-0.84)	0.9208 (-0.53)	0.9068 (-0.62)
Fundraising	0.9970 (-0.03)	0.9979 (-0.02)	1.0016 (0.01)
Married	1.5046*** (3.31)	1.5639*** (3.65)	1.5364*** (3.50)
Children	0.9791 (-0.38)	0.9741 (-0.47)	0.9771 (-0.42)
Research abroad	1.4135*** (3.14)	1.4492*** (3.38)	1.4333*** (3.28)
Business-dummy	1.7555*** (4.92)	1.6688*** (4.58)	1.6550*** (4.51)
Journals CL	1.2383*** (4.09)		
Journals VHB		1.0095*** (3.50)	
Journals RB			1.0223*** (3.41)
Engl. books	1.1223** (2.15)	1.1274** (2.22)	1.1314** (2.29)

[36] Classification is easy for most publishers, because they publish in a single language; for *Springer* however we had to code the books manually as some are in German, and many are English.

[37] One reason for the superior performance of Combes-Linnemer ranking could be its more discriminating nature that favors better journals more than the linear scales of the other rankings from 1 to 5 (6).

German books	1.0413 (0.94)	1.0283 (0.64)	1.0314 (0.71)
Collected vol. English	1.0640 (1.15)	1.0636 (1.15)	1.0779 (1.41)
Collected vol. German	0.9719 (-1.59)	0.9655 (-1.90)	0.9653* (-1.91)
Time 1991-95	1.3612 (1.42)	1.3675 (1.44)	1.3643 (1.43)
Time 1996-2000	0.8360 (-0.86)	0.8432 (0.414)	0.8487 (-0.79)
Time 2001 -	0.9976 (0.01)	1.0034 (0.02)	1.0052 (0.02)
Log Likelihood	-2407.1159	-2408.9845	-2409.2696
LR chi^2 (17)	122.64***	18.91***	118.34***

Notes: Hazard ratios, z-values in parenthesis, number of subjects: 696, number of failures 405, ***/**/* indicate significance at the 1/5/10 percent level.

It transpires that youth is a big advantage – every additional year of age at Habilitation reduces the likelihood to receive tenure by eight percent. This suggests that the youth of candidates may signal favorable traits to the hiring faculty committees. There seems to be no clear gender pattern in any statistically significant way[38] and it makes no difference whether the Habilitation thesis has been written as a collection of articles or while employed outside academia. Search committees do not reward candidates for raising research money prior to their Habilitation. Being married establishes a highly significant and strong advantage for reasons not entirely clear; yet children do not seem to matter.

Time spent in a research position abroad for a year or more increases the hazard rate for tenure by more than 40 percent; but even more impressive is the dummy for business. Obviously the road to tenure is much shorter for professors of business than for the remainder of the sample, the majority of whom are economists. Publications in journals enter significantly positive in all models. In model (1) one additional *AER* article raises the hazard relative to the baseline hazard by 24 %; one single authored article in the *GER* about 4 percent. The respective values are lower for the VHB list, which is due to the fact that the categories are valued linearly from 1 to 6 with more journals being in the highest two categories (cf. also Schulze et al. 2008). Using the VHB list, the effect of publishing an *AER* article is therefore not so much different from having a *GER* article.[39] The estimate of the hazard ratio gives the effect of a one unit increase in the publication score (which is one *AER* article in CL or the difference of having one article in the *AER* instead of, for example, in the *Journal of Institutional and Theoretical Economics* in VHB). English books increase hazard significantly by around twelve percent, whereas German books do not have much impact. Contributions to collected volumes in English have a positive, but insignificant impact; contributions in German have an insignificant (negative) effect. There is some indication of a time pattern, with an increase in the hazard after reunification and the establishment of economics and business departments in East Germany compared to the omitted category 1985-1990, and a reduction of the hazard thereafter. Yet the effects do not reach usual significance levels.

[38] This refers to the stage of tenure decisions only; obviously there is a clear gender pattern at the stage of the Habilitation – less than 11 percent of post-docs with Habilitation are women.

[39] In CL, an article in the GER counts 17% of an AER article, in the VHB ranking the ratio is 2/3.

Our results for the business dummy seem to suggest that the market for business professors may be qualitatively different from the job market for economists. We investigate this issue by running the Cox proportional hazard model separately for those groups (and excluding the "rest" – economic sociologists, economic historians, business and economics education etc.). The results are presented in Table 7.

Table 7: Cox proportional hazard model, separately for economics and business

Variable	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
	economics			Business		
Female	1.3618 (1.12)	1.3923 (1.20)	1.3788 (1.17)	0.7401 (-1.36)	0.7503 (-1.29)	0.7386 (-1.36)
Age at Habilitation	0.9058*** (-4.08)	0.9037*** (-4.21)	0.9109*** (-3.85)	0.9245*** (3.36)	0.9258*** (3.29)	0.9243*** (-3.37)
External Habilitation	0.9873 (-0.05)	1.0377 (0.13)	1.0521 (0.18)	0.5877* (-1.69)	0.5846* (-1.70)	0.5878 (-1.68)
Cumulative Habilitation	1.2379 (1.02)	1.3030 (1.29)	1.2380 (1.03)	0.6946 (-1.22)	0.6645 (-1.36)	0.6999 (-1.20)
Fundraising	0.8064 (-1.21)	0.7784 (-1.41)	0.7927 (-1.31)	0.9529 (-0.29)	0.9655 (-0.21)	0.9508 (-0.31)
Married	1.2935 (1.37)	1.3852* (1.75)	1.2828 (1.32)	1.5413** (2.53)	1.5431** (2.53)	1.5420*** (2.53)
Children	1.0189 (0.22)	1.0015 (0.02)	1.0126 (0.15)	0.9165 (-1.08)	0.9197 (-1.04)	0.9159 (-1.09)
Research abroad	1.6025*** (2.87)	1.7142*** (3.26)	1.6202*** (2.92)	1.3017[a] (1.62)	1.3089* (1.65)	1.3007[a] (1.61)
Journals CL	1.2594*** (3.90)			1.0217 (0.13)		
Journals VHB		1.0149*** (4.26)			1.0040 (0.72)	
Journals RB			1.0402*** (4.62)			1.0005 (0.04)
Engl. books	1.0919 (1.51)	1.0858 (1.43)	1.0761 (1.26)	1.8244 (1.53)	1.7709 (1.46)	1.8366 (1.55)
German books	1.2073** (2.38)	1.1972** (2.26)	1.1941** (2.24)	1.0401 (0.65)	1.0314 (0.51)	1.0412 (0.67)
Collected vol. English	1.0049 (0.08)	0.9774 (-0.36)	1.0046 (0,07)	1.0857 (0.61)	1.0871 (0.61)	1.0856 (0.61)
Collected vol. German	0.9870 (-0.45)	0.9781 (-0.77)	0.9835 (-0.58)	0.9825 (-0.52)	0.9750 (-0.75)	0.9836 (-0.49)
Time1991-95	2.4161** (2.26)	2.4068** (2.25)	2.3562** (2.19)	1.0467 (0.16)	1.0299 (0.10)	1.0498 (0.17)
Time1996-2000	1.1244 (0.30)	1.0900 (0.22)	1.0692 (0.17)	0.7334 (-1.16)	0.7216 (-1.22)	0.7350 (-1.16)
Time2001-	1.3508 (0.77)	1.2849 (0.64)	1.2771 (0.62)	0.8132 (-0.79)	0.8022 (-0.84)	0.8151 (-0.78)
Log Likelihood	-906.3529	-905.2419	-903.61304	-1108.5348	-1108.2916	-1108.5426
LR chi^2 (16)	83.20***	85.42***	88.68***	35.26***	35.75***	35.25***
No. of subjects/ failures	312/181			338/207		

Notes: see notes below Table 6. [a] significant at the 11 % level,

We focus on the differences in the subsamples. Even though the gender pattern is insignificant in all models (the significance level is around 15%) it is noteworthy that the estimated coefficients have opposite signs – while the point estimate for economics favors women, it disfavors them in business. There is some evidence that external Habilitations are a disadvantage for business, but not so for economics. One explanation could be that those who write a Habilitation thesis in business externally do not intend to go into academia at any rate, but have a good outside option and may seek the title of a *Privatdozent* to further their career in the business sector. Being married is a clear advantage for an academic career in business, but less so in economics. The point estimate is lower and only in one out of three models is the variable significant at usual levels.

Perhaps the most striking difference between the two disciplines is the importance of publications. Surprisingly, none of the publication variables are significant for business. For economics, the journal publications are highly significant, as are German books.[40] Surprisingly, English books have a smaller coefficient and do not quite reach usual significance levels. Visiting positions abroad are rewarded more in economics than in business. Moreover, while we find a strong positive reunification effect for economics, we do not find it for business.[41]

6. Conclusion

This paper analyzes tenure decisions for candidates for professorships in economics, business administration, and related fields. We find that the probability of being tenured and the time to tenure are favorably influenced in a statistically significant way by the publication record for journal articles and books; contributions to collected volumes seem not to matter in any significant way. Youth is a clear plus for getting tenure; fundraising does not affect tenure decisions. The number of children and the gender of the candidate do not play a statistically significant role, but visiting positions abroad of a year or more influence positively the hazard rate for tenure.

Marked differences seem to exist between the market for aspiring economics and business professors: First, marital status matters in business, but is less important in economics. Second, and more importantly, the market for economists is much more competitive – tenure decisions are driven by measurable performance parameters – while it was difficult to find a statistically significant influence of publications (journal articles, books, contributions to collected volumes) for tenure decisions in business. As a consequence of this lack of incentives, publication performance at

[40] Bräuninger and Haucap found that German-language journals are valued more highly by the German speaking community than the international rankings may suggest. We therefore split the journal rankings in subrankings for German and for English journals contained in the rankings to allow for different parameter estimates for these subrankings while leaving the relative ranking within the subranking as suggested by the initial metaranking. Indeed the point estimate for the economists was somewhat higher for German journals (1.322277 in CL) than for English (1.263225), but the coefficient on the German journals was not significant. For business, both coefficients were insignificant.

[41] Since the response rate to the online questionnaire was only 54 %, we tested for sample selection. We compared the mean publication record at Habilitation between respondents and non-respondents. Respondents had higher publication records, but the differences were statistically significant (t-test) only for German books and only for one of the journal rankings. The share of successful candidates was higher in the group of respondents and we tested whether this has resulted in any bias in the estimations. The results of these robustness checks are presented in Appendix A3. We find hardly any bias in the estimates, so that sample selection seems not to be an issue.

Habilitation and at tenure was much lower in business than in economics. Nevertheless, the road to tenure is significantly shorter in business than in economics.

If measurable performance parameters influence tenure decisions relatively little in the aggregate in business administration, what does? Obviously search committees take into account various dimensions of potential candidates – research output, teaching portfolio, didactic abilities, networking etc. – when making their tenure decisions. Tenure decisions may also depend on the strategic choices that departments make to position themselves in a heterogeneous university landscape (cf. Warning 2007). Many important aspects cannot be measured adequately in a systematic way and a possible explanation for our result *could* be that business faculties place a larger weight on abilities other than research performance. If so, what could explain the different weighting in the two subfields and will we see a convergence of relative evaluations over time? Is business becoming more competitive over time? These are interesting issues, which we leave for future research.

Appendix

A1 Journal Rankings

A1.1 Categorization of Rankings by Impact Factors

Since the journal ranking by Ritzberger (2008) results in a highly skewed distribution of impact factors, we use the computed impact factors to form six categories closely related to those proposed by Ritzberger (2008) himself, see Sect 3.3.[42] The procedure is described in detail in Schulze et al. (2008); here we sketch the procedure.

In a first step we distribute the journals of the Ritzberger ordinal ranking into the categories A+, A, B+, B, C+ and C. We use the category sizes proposed by Ritzberger: journals ranking between 1 and 10 fall into category A+, those ranked from 11 to 23 fall into category A, those ranked from 24 to 38 into B+, 39 to 57 into category B, from 58 to 87 into category C+ and from 88 on into category C. In a second step, we sort those journals of the Ritzberger ranking - which were not ordinally ranked before – into these six groups depending on their impact factor. In doing so the number of journals in the groups increases while the boundary group impact factors remain constant. In a third step we attribute numbers 6 to 1 to the categories A+ to C which is in line with the procedure of the Vienna list and the VHB list. This new, categorized list of Ritzberger is labeled as **RbR**.

We also categorized the other continuous lists, i.e. those of Bräuninger and Haucap (2001) and of Kalaitzidakis et al (2003). In contrast to Ritzberger (2008), they do not provide any ordinal ranking. Thus, we simply formed six categories delineated by the percentiles 17, 33, 50, 67 and 83. This gives rise to six groups of similar size.

A1.2 Information on Meta-Rankings

This table displays the correlation of the imputed lists in the upper half of the table, while the lower part of the table shows the correlation of the imputed and the original lists.

Table A1: Correlations of imputed and original lists

	VHBR_IMP	Vienna_IMP	KMS_IMP	Rb_IMP	BH_IMP	CL_IMP
VHBR_IMP	1.0000					
Vienna_IMP	0.8607	1.0000				
KMS_IMP	0.5987	0.6609	1.0000			
Rb_IMP	0.2232	0.2294	0.4969	1.0000		
BH_IMP	0.6968	0.7864	0.8334	0.4480	1.0000	
CL_IMP	0.2323	0.2345	0.5045	0.7796	0.4661	1.0000
VHBR	1.0000	0.7244	0.8540	0.5831	0.8416	0.4994
Wien	0.8449	1.0000	0.8585	0.3258	0.8276	0.3131
KMS	0.2450	0.3415	1.0000	0.7427	0.5846	0.7728
Rb	0.4365	0.3887	0.7009	1.0000	0.6028	0.7057
BH	0.5069	0.5006	0.7586	0.7034	1.0000	0.6925
CL	0.1659	0.1262	0.7860	0.7558	0.6648	1.0000

[42] The main difference between our approach and that of Ritzberger is that we base our categorization of journals in six groups based on the impact factors calculated by Ritzberger only, whereas Ritzberger uses both his impact factors *and* those of Kalaitzidakis et al. and requires the journals to have appropriate ranks in both lists. We construct separate categorized lists based on impact factors calculated in Ritzberger (2008) and in Kalaitzidakis et al. (2003).

The following table shows the descriptive statistics of the imputed journal ranking lists. Except for the Vienna_IMP, which has five categories, all other lists consist of six ordinal categories. The means and standard deviations vary over the lists systematically; this indicates that the weighting schemes are quite different from each other.

Table A2: Descriptive Statistics of the weights for publication

Variable	Obs	Mean	Std. Dev.	Min	Max
VHBR_IMP	2745	3.9781	1.3959	1.00	6
Vienna_IMP	2745	3.3603	0.8828	1.00	5
KMS_IMP	2745	2.5162	1.1377	1.00	6
Rb_IMP	2745	1.1803	0.6759	1.00	6
BH_IMP	2745	2.8332	1.0068	1.00	6
CL_IMP	2745	0.1077	0.0937	0.08	1

A2 Descriptive Statistics

The following table reports the summary statistics of the variables presented in the descriptive sections.

Table A3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Male	1734	0.8910	0.3117	0	1
Business	1734	0.4204	0.4938	0	1
Economics	1734	0.3610	0.4804	0	1
Other fields	1734	0.2186	0.4134	0	1
Age at Habilitation	1390	38.0748	4.4953	28	63
Cumulative Habilitation	934	0.1638	0.3703	0	1
External Habilitation	934	0.1060	0.3080	0	1
Married at Habilitation	934	0.5771	0.4943	0	1
Children	934	0.4797	0.4999	0	1
Abroad	934	0.1520	0.3592	0	1
Fundraising	934	0.2966	0.4570	0	1
Age at tenure	575	38.2139	4.1857	27	59

A3 Robustness Checks – Sample Selection

In the sample of respondents of the email questionnaire, successful candidates are overrepresented. To check whether this has led to biased estimates in the duration analysis, we estimated the Cox proportional hazard model also for the larger sample of researchers, for whom we have publication data and know their gender and age at Habilitation, but may not have data on individual characteristics asked for in the email questionnaire such as children, marital status etc. This includes individuals who have not responded to our online questionnaire. In the enlarged sample the share of researchers who were awarded tenure is smaller: in economics the sample increases from 312 to 458 individuals, but the number of tenured professors increases only from 181 to 200. In business administration the sample rises from 338 to 511, but the number of successful candidates increases only from 207 to 227. In other words, the online questionnaire produces a sample selection bias that over-represents the successful candidates (58% compared to 44% for the larger sample in economics and 61% compared to 44% in business administration).

Table A4 reports the results of the robustness analysis. Models A1 and A4 repeat the results reported in Table 7 (model 4 and 7) of the sample that responded to the online questionnaire. To analyze how the sample selection affects the results, we first run the proportional hazard model with the same population (respondents of the online questionnaire), but with the restricted set of variables that are also available for the larger sample (models A2 and A5). This allows us to see how the omission of the additional variables compiled through the questionnaire changes the results for the remaining variables. Then, for models A3 and A6, we use the restricted set of variables on the larger sample to analyze the effect of a biased sample on the coefficients.

Table A4: Analysis of Sample Selection

Variable	*(A1)*	*(A2)*	*(A3)*	*(A4)*	*(A5)*	*(A6)*
	economics			Business		
Female	1.3618 (1.12)	1.3271 (1.04)	1.2865 (0.98)	0.7401 (-1.36)	0.8191 (-0.91)	0.7781 (-1.16)
Age at Habilitation	0.9058*** (-4.08)	0.9095*** (-4.17)	0.9152*** (-4.12)	0.9245*** (3.36)	0.9270*** (-3.51)	0.9252*** (-3.87)
External Habilitation	0.9873 (-0.05)			0.5877* (-1.69)		
Cumulative Habilitation	1.2379 (1.02)			0.6946 (-1.22)		
Fundraising	0.8064 (-1.21)			0.9529 (-0.29)		
Married	1.2935 (1.37)			1.5413** (2.53)		
Children	1.0189 (0.22)			0.9165 (-1.08)		
Research abroad	1.6025*** (2.87)			1.3017[a] (1.62)		
Journals CL	1.2594*** (3.90)	1.3275*** (5.24)	1.2037*** (3.84)	1.0217 (0.13)	0.9531 (-0.32)	0.9091 (-0.64)
Engl. books	1.0919 (1.51)	1.0570 (1.01)	1.1009 (1.54)	1.8244 (1.53)	1.8660[a] (1.58)	.7593 (-0.79)
German books	1.2073** (2.38)	1.1199 (1.47)	1.0088 (0.15)	1.0401 (0.65)	1.0612 (1.04)	1.1067* (1.76)
Collected vol. English	1.0049 (0.08)	1.0233 (0.39)	1.0770 (1.55)	1.0857 (0.61)	1.0692 (0.51)	1.1296 (0.88)
Collected vol. German	0.9870 (-0.45)	0.9862 (-0.49)	0.9863 (-0.62)	0.9825 (-0.52)	0.9980 (-0.06)	1.0122 (0.41)
Time1991-95	2.4161** (2.26)	2.5409** (2.39)	2.0244* (1.91)	1.0467 (0.16)	0.9944 (-0.02)	0 .9207 (-0.31)
Time1996-2000	1.1244 (0.30)	1.3035 (0.68)	1.5581 (1.22)	0.7334 (-1.16)	0.7089 (-1.30)	0.7178 (-1.33)
Time2001-	1.3508 (0.77)	1.5256 (1.11)	1.9100* (1.80)	0.8132 (-0.79)	0.7562 (-1.08)	0.8589 (-0.63)
Log Likelihood	-906.3529	-907.8946	-1123.1346	-1108.5348	-1115.3311	-1344.1658
LR	$\chi^2(16)$: 83.20***	$\chi^2(10)$: 69.64***	$\chi^2(10)$: 56.34***	$\chi^2(16)$: 35.26***	$\chi^2(10)$: 21.67**	$\chi^2(10)$: 24.38***
No. of subjects/ failures	*312/181*	*312/181*	*458/200*	*338/207*	*338/207*	*511/227*

Hazard ratios, z values in parentheses, ***/**/*/[a] significant at the 1/5/10/ 11 percent level.

For economists the omitted variable bias is very small (A1 vs. A2), only the German books variable loses significance, and the sample selection bias is likewise very small (A2 vs. A3), it affects only the time dummy for 1991-95 which becomes smaller, and again the impact of German books. The impact of journal publications is somewhat reduced, but still highly significant and positive. For business administration the omitted variable bias is very small, the sample selection bias affects only the variables referring to English and German books, the latter of which now have a positive effect at the ten percent level. Overall our results are only very mildly affected by the bias in the sample.

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