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"Striving for status: the influence of tenure on productivity within the Top 20 Business Schools in the U.S."

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1 Abstract

This thesis explores the influence of tenure on productivity in the American tenure-track system within the Top 20 Business Schools in the U.S. with respect to the status-positions of the universities. Numerous researchers have analysed the advantages and disadvantages of the tenure track system but a study measuring the direct impact on researchers' productivity, additionally identifying status as important motivational factor, has not been done within existing literature so far. This thesis therefore suggests that the strive for tenure is also a strive for status, being furthermore influenced by the status-position of the university. To this individual aim comes the drive for prestige of the universities themselves, being reinforced by the yearly renewed University- and Business school-rankings. As the latter serve as important guidelines for prospect students, deciding upon a university, as well as international researchers, looking for suitable collaborators, prestige has a lot influence on universities' successes and development. Status can therefore be identified as an essential motivational factor with it's influence on professors' productivity that furthermore also impacts the universities' status-positions. In order to trace back the point in time in which tenure was granted, a database was created, containing professors that hold positions of the tenure-track system in the areas of Strategy-, Management- and Organizational Behaviour-departments within the Top 20 Business Schools in the U.S.. Productivity is measured by the number of publications whereas a distinction is made to quality-adjusted productivity, only concerning highly qualitative articles that have been published in the Top 50 Business Journals. The analysis showed an increase in productivity, as well as quality-adjusted productivity after tenure was granted with the effect being stronger for productivity. The assumption that a lower status position of the university would have negative effects on output could partly be proven as productivity and quality-adjusted productivity still increased, but did so less, as it did for professors of higher-prestige universities. The data-collection resulted in a comprehensive database that can serve scholars, universities and professors as tool for further research due to it containing information about numerous career steps and professors' publications. The current structure of the observed departments can be understood up to the year of 2017 and therefore provides a basis for continual extension.

2 Introduction

The American tenure-track system constitutes a special one of it's kind. A system, highly discussed within literature. Competition arises between professors for one of the highly desired tenure-track positions due to the existence of tenure and the yearly renewed Business school rankings furthermore encourage rivalry between the universities. Therefore status in both cases can be identified as an important motivator for better productivity in academia.

Within the American tenure-track system the gain of tenure embodies the ultimate reward one can achieve. While advocates claim the importance of freedom of speech and in succession enhanced creativity and innovation, opponents argue that due to the unterminated contracts following the grant of tenure, rigidity is motivated as professors no longer have to prove themselves. This thesis therefore argues that status of professors in American Business Schools is dependent on two important drivers:

1) The grant of tenure,

2) The status of the university tenure was granted at;

The nomination and granting process of tenure is a long and hard one. It is only granted to exceptional scientists, showing an outstanding publication record, having gained awards and proven their teaching skills. At some point in academic careers, the decision has to be taken by university authorities whether tenure is granted or not. If it turns out negative it can be interpreted as the end of the tenure-applicants' academic career. Due to the high pressure lasting on Assistant and Associate professors, the grant of tenure can be identified to be an influencing factor for productivity and quality-adjusted productivity.

Regarding the status of the university, Business school rankings can be understood as officially depicting their value. Multiple factors are taken into account regarding the decision what positions the schools should get in the ranking, i.e. the quality of research, faculty and alumni. These rankings can be identified as rather powerful due to their publicity and prospect students, as well as researchers or collaborating companies taking them into account when choosing their university. This leads to increased competition between American universities and furthermore affects their researchers and work. Taking all these considerations into account, this thesis explores the resulting effect of the

universities' status and the professors' strive for tenure on productivity. It is therefore divided into three parts which will now be outlined in more detail.

The first part of this thesis therefore reviews existing literature, underlining the topic. The typical academic career path in the American tenure track system is explored and an overview is given of it's advantages and disadvantages. Furthermore two theories will be presented, explaining differing views on reasons and influencing features on the tenure decision-making process. Human Capital theory on one hand argues that individuals and their knowledge and abilities constitute the source of organizations' success and competitive advantage. Therefore priority shall be given to the knowledge and abilities of researchers when deciding upon tenure which is furthermore measurable through their publication record. Opposing is Symbolic Capital theory, arguing that individuals and organizations can economically benefit from their reputation. The latter can only be built up through social networks that undermine and confirm one's symbolic capital. Within academia recognition plays an important role in order to be able to find suitable partners for research. Awards for example might facilitate this search as they are symbols of high qualitative research skills and findings. Membership in prestigious institutions may also help to increase one's symbolic capital which shows why professor's tenure-granting university's prestige is important to them.

In this thesis it is supposed that the position of universities within Business School rankings and therefore their status-position do have an influence on researchers' productivity. Therefore a high identification of professors with their tenure-granting universities is assumed. Business school rankings and their status-positions are furthermore formed by comparisons between the different universities. The second part of this thesis therefore sheds light on the influence of these phenomena on productivity through social-identity- and –comparison theory. Social identity theory on one hand describes the reasons for the existence of groups and what influence individuals' need of belongingness has on their productivity. Social comparison theory on the other hand gives an overview over the effect the comparison with others has on the motivation of individuals and therefore takes status-positions as comparable feature into account.

Picking up the both presented theories, a link will be built to the role of status in a theoretical way. As already mentioned before, this thesis suggests that professors derive their status from the actual grant of tenure, as well as the status-position of the university tenure was granted at. While the grant of

tenure can therefore be identified to constitute status on the individual level, the university's position in Business school rankings expresses status in group contexts. Therefore two theories will be presented taking a look at individual personality characteristics, as well as social contexts as the defining factors of status. The tendency of individuals to classify others into in- and out-groups will be outlined, leading to status being explained from these two perspectives and at the same time drawing connections to the former presented theories of social identity and –comparison.

Within the last part of this thesis the empirical study will be presented. At first the literature gap will be explained, followed by the development of a research question and the explanation of importance for research. An overview over the used rankings for defining the status positions as well as the descriptive statistics of the dataset will be given. The final results, explaining the effect of tenure and universities' status-positions on productivity will be outlined and the whole thesis is going to be concluded, providing important implications for governing productivity and quality-adjusted productivity in organizations.

3 The tenure-track system in the U.S.

The American tenure-track system is a highly discussed topic within literature. While advocates of the system stress the importance of freedom of speech and economic security of professors (Shulman et al, 2016), opponents claim that the pleasant terms of employment lead to inertia and therefore a decrease in scientific productivity (Batterbury, 2008).

The United States can be identified as the global leader in higher education and one reason might lie within their tenure-track system. It is undoubted that tenure-contracts lead to social and economic benefits of the professors but the career path to becoming a tenured professor is not an easy one (Shulman et al, 2016). Although the criteria for the grant of tenure differ from university to university, some methods are the same in numerous institutions. Usually, the first position one can have as tenure-track faculty is Assistant professor. In most cases the job is given to promising applicants, sometimes with former experience in scientific positions (i.e. research assistants). After approximately six years spent as an Assistant, they might get promoted to Associate professor. It is important to notice that a promotion does not imply the grant of tenure. Some universities already grant tenure with the promotion to Associate, others distinguish between untenured and tenured Associates. In any case with the promotion to full Professor, tenure has to be granted at all American universities. The decision whether tenure is granted or not is taken by senior university officials, based on recommendations from professors of the distinct departments. Although the decision is a highly individual one, special attention is paid to teaching evaluations, the applicants' publication record, as well as received grants and awards (Batterbury, 2008). Publications in *Social Science Citation Index* (SSCI) journals were furthermore identified to have a major impact on whether tenure is granted or not, as they are perceived to be of higher quality due to their double-blind peer review process. Prestige of the postdoctoral institution was also found to affect the tenure-granting process, as it often comes along with a higher number of publications (Lutter and Schröder, 2016).

Sooner or later the decision on the grant of tenure for tenure-track faculty has to be taken. It can be stated that it decides whether applicants can follow an academic career or not. In case of a negative decision, the contract normally goes on for one more year and is then terminated. A positive decision and therefore the grant of tenure leads to an employment till voluntary retirement (Batterbury, 2008).

Although the system is very well established within the U.S., it is often criticised by researchers. The first major argument against tenure contracts lies within the requirements being set too high. Especially American Top universities are well known for letting down many of their Assistant professors when it came to the grant of tenure. The consequences for young professors can be detrimental as the denial of tenure often constitutes the end of an academic career (Batterbury, 2008).

The next big point of criticism concerns the objectivity of the decision-taking authorities. As depicted above, the decision about tenure should be based on specific qualities the applicant brings with him or her and therefore be as objective as possible. Although critics claim that in reality the decision is often based on sympathy due to faculty professors, working with tenure applicants day-by-day and giving their recommendations to university officials. Studies have shown that the professors who give their recommendations tend to choose persons who they perceive to be more cooperative and therefore better fit their team. Collegiality therefore has a major impact on the recommendations which makes the system to be partly perceived as unfair. The influence of personal matters on tenure decisions might encourage the employment of candidates, who are not the best qualified and lacking effort, but shielded by their tenure contracts after being employed (Rothgeb, 2014).

Another big point of criticism lies within the increase in the number of part-time faculty, led back to decreasing government funds for universities. Normally, contingent professors (i.e. adjuncts, visiting professors, lecturers) are equally qualified as tenure-track professors but were not able to gain a position within the system. They do not have a home-institution and often teach multiple courses at different universities. Normally, part-time professors are paid by course and their contracts are renewed every year. Furthermore they do not have access to the same resources as tenure-track faculty and have to pay for their equipment, as well as further education by themselves. Due to their numerous positions at different campuses, contingent professors can be said to live without job security. One consequence of their difficult situation might be a decrease in the quality of education due to less attention, time and resources. On how to solve this problem, critics have come up with two opposing solutions. Advocates of the tenure-track system stand up for increasing the number of tenure-track positions in order to provide resources and in succession better chances to qualified personnel (Shulman et al., 2016). Opponents on the other hand argue that the tenure-track system causes suppression of highly qualified professors by it’s very existence through the creation of a two-tier

society. They see a decrease in productivity and an increase in inequality as outcomes and therefore claim a change and challenge of the system that has lost it's function of promoting academic excellence (Batterbury, 2008).

One solution to the former described problems is suggested by Cruz-Castro and Sanz-Menendez (2010), missing market mechanisms within the American tenure-track system. For them, the problem derives from the departments of the universities giving recommendations on who to grant, but not hiring themselves. As tenure already constitutes the highest reward possible, it is difficult to encourage competition afterwards and motivate professors for better productivity. Giving an example of a possible solution, they draw a comparison to the U.S. Economic Departments, who offer only few positions with tenure, but pay higher salaries to Assistants and contingent faculty.

Batterbury (2008) compares the American system to British academia, being very similar in terms of tenure-grants. Although in the U.K. contingent faculty has a higher chance of getting their contracts prolonged or even gain a permanent position after some years. Their salaries, as well as social securities that come with temporary employment are almost the same as for permanent professors and the application- and review-process for them is much briefer.

Having now presented an overview over the procedures till the grant of tenure, as well as advantages and disadvantages of the system and possible solutions, it is important to draw closer attention to how and why tenure is granted, as well as introduce status as a feature of productivity.

4 Literature review

The following Literature review will start with a section about two theories to better explain the underlying motivations of granting tenure and what effects it might have to earn the highest reward possible on individual behaviour. In a next step light will be shed upon social identity and – comparison theory, describing the reasons why individuals engage in comparisons and who they compare themselves to. A connection will be drawn to the importance of status on an individual and group context.

4.1 Human Capital theory

Human Capital theory claims that skills and knowledge are embodied within individuals and cannot be separated from them (Schultz, 1961). Paying special attention to the importance of knowledge, the "knowledge-based view" was derived from Human Capital theory (Crook et al., 2011). Firms' "knowledge" is therefore dependent on the individuals working in the organization and can be identified as the rules, processes and tangible assets used. Through differences in their knowledge firms distinguish themselves from competitors which improves their chances of growth and survival. While rules and processes refer to social knowledge, as it involves more individuals and depends on the social context within they are used, software would be an example for tangible assets. The importance of knowledge must therefore not be underestimated as it has been identified to be a major driver of competitive advantage (Kogut and Zander, 1992).

For that reason it is important to recognize employees and workers as capital of the firm that can be enhanced through distinctive investments. These investments normally take place through education and training and can either be initiated from the firm or the individual him- or herself. Speaking now from employees' perspective, it is important to mention that they themselves earn from these investments as their range of possibilities, as well as their salaries can be improved (Schultz, 1961). For organizations on the other hand, especially firm-specific knowledge has specific value to the firm as it serves as important driver of competitive advantage. The high value lies within it's easy replicability within the firm, but difficult imitability by competitors.

Knowledge can further be divided into information and know-how. While information embodies the knowledge of facts, know-how is defined by understanding the meaning of something or knowing how to apply the information available in practice. While both types hold economic value for the organization, know-how can less easily be imitated by competitors. Knowledge of firms therefore directly affects their performance and differences in their knowledge leads to different competitive positions in the market place (Kogut and Zander, 1992).

When now looking at tenure as the simple time individuals spend in one position and not as tenure in the academic field, Human Capital theory argues that with tenure, knowledge and skills improve. Longer job tenure therefore adds value to employees on the labor market as they differentiate

themselves from competitors through their distinctive and broader know-how. Although risks that come with increasing job tenure are losses of intrinsic motivation and feelings of boredom. A possible explanation might lie within the absence of the desire for further career advancement (Ng and Feldman, 2013). Taking this assumption to the academic level, it supports the former outlined criticism of the tenure-track system, arguing that after the grant of tenure inertia is encouraged and performance decreases. Although it is important to keep in mind that the market value of professors increases with tenure and this thesis tries to explore what happens after tenure was granted.

As knowledge has now been identified to be one of the most important influencing factors of competitive advantage, one could say that at universities and for professors it plays an even stronger role. The productivity of professors is often measured through the number of their publications because it embodies the output of their latest research. Studies also show that the decision upon the grant of tenure is to a large part dependent on professors' publication record (Batterbury, 2008). As already depicted above, knowledge needs to be held within organizations, even more importantly in universities. In order to keep employees from leaving their current workplace, it makes sense to give them incentives to stay. Within American academia the highest reward possible lies within the grant of tenure (Lutter and Schröder, 2016) which might encourage the development of a specific research field that cannot be easily transferred to another university and therefore sustains a competitive advantage for the professor and the university itself. When deciding upon tenure, it is important for universities to take the Human Capital of the professors into account. A typical measurement lies within scientific output in terms of professors' publication record. Here it is important to distinguish between a quantitative and a qualitative dimension. While the simple number of publications often is not that important, university authorities pay special attention to the journals in which professors' articles have been published (Rothgeb, 2014).

While Human Capital theory focuses on the individual actor, constituting an important source of competitive advantage for organizations, it is important to take into account the impact of social relations on firm's performance as well. Symbolic Capital theory therefore concentrates on taking advantage of social networks and status hierarchies for promoting success of the self and the firm.

4.2 Symbolic Capital theory

Pierre Bourdieu (1977) firstly introduced in his "Outline of a Theory of Practice" the connection between economic development and prestige. He argued that individuals calculate their social behaviour and who they interact with in order to become part of social groups from which they can later on gain advantages. That is how reputations are built up and the enhancement of this symbolic capital is therefore as important for human beings as economic capital due to symbolic capital facilitating the gain of wealth. Although in order to enhance one's status, investments have to be made. Individuals therefore (rationally) calculate how much time and money they are willing to invest into the development of specific social relations and that amount later displays their symbolic capital. The differences between symbolic capital and reputation therefore lies within the fact that for the former, investments are strategically planned dependent on the expected future returns.

In academia Symbolic Capital can firstly be found in terms of recognition among scientists (Allison et al., 1982). Recognition has been proven to be associated with tangible benefits, especially in cases of the academic market producing professors with highly differentiated abilities and successes in their fields. This leads researchers to being able to demand higher remunerations which identifies status as an indicator for individual success (Weiss and Fershtman, 1998).

Popularity is furthermore needed in order to find suitable colleagues who are willing to cooperate and facilitate the access to the right resources. In succession, research shall be facilitated and productivity increased which leads to additional recognition. Professors are therefore dependent on inter-collegial connections for doing research, but for being recognized they already must have done research (Allison et al., 1982). The problem therefore lies within the difficulty to firstly gain other scientists' awareness for the facilitation of research. Merton (1968) therefore identified two possible sources of recognition within academia. The first one would be the collaboration with already established researchers, as they have built up a reputation and a steady base of readers. As the second source the discovery of similar results of colleagues from the same field can be named, leading to mutual attention and interest. Especially junior scientists need supportive guidance, as they do not yet have the needed popularity. Once they have gained status, the early collaboration with a popular researcher might pay off even more through pushing their reputation. Merton refers to this phenomenon as

“retroactive recognition”, describing the gain of acceptance through the status position of a former colleague.

As another example of Symbolic Capital in academia awards can be identified. They are given to researchers for their highly qualitative research and innovative findings, at the same time neglecting their academic productivity into account. With each additional reward, professors’ reputation is enhanced, therefore positively affecting Symbolic capital. Institutions want to profit from their professors’ status and therefore pay respect to the number of awards one has collected when deciding upon the grant of tenure (Lutter and Schröder, 2016).

Coming from the individual to the institutional level, Symbolic Capital can also be defined as the “reputation gained from membership in prestigious national or international institutions”. Academics gain prestige through being part of a particular university and also the institution gains from the employment of established professors (Lutter and Schröder, 2016). Due to the fact that prestigious institutions have access to more resources, also the tuition fees at the Top universities tend to be higher. That leads to only a small share of wealthy students being attracted and an even smaller percentage of graduates having better career chances because of their possibility to study at the best scientific institutions. This process of social selection is also referred to as “the Matthew effect” describing the rich getting richer while the poor get poorer. As depicted, the phenomenon also holds for the development of scientific talent and is hard to overcome (Merton, 1968).

Regarding the grant of tenure, awards, as well as degrees and doctorates serve as measurements of Symbolic Capital and are commonly used by universities to take their decision. High prestigious universities prefer to hire alumni and professors who gained their PhD at another Top university for two important reasons. The first one builds on the assumption that only the best are able to gain a degree at the Top universities as the requirements, especially regarding the doctorate, are high and students really have to prove their skills. As only the best professors with outstanding skills and abilities should be granted tenure, university authorities refer to the PhD granting universities when deciding upon tenure. The second one refers to the Top universities wanting to keep their reputations of excellence and therefore hiring only from other Top universities or taking into account the number of awards collected by tenure applicants. A degree from one of America’s best universities or numerous prices of excellence are symbols of prestige and accumulated by the university as soon as

tenure is granted to the professor. Symbolic Capital also plays a role in the former presented theory of Human Capital, concentrating on individuals' skills and identifying scientific output as best measurement for the decision upon tenure. As outlined earlier, authorities often not only take the number of publications into account, but consider in which journals the articles were published. The journals themselves therefore also act as symbols of prestige showing that Symbolic Capital really plays a big role in the tenure decision.

4.3 Social identity and –comparison theory

The interest in intergroup behaviour and Social identity theory has grown throughout the 1990s. While before the focus lay on structures, interactions and relations within groups, nowadays the emphasis is upon the identification with a group, the comparison to out-groups and the deriving effects on the self (Hogg and Terry, 2000). Social identity theory therefore claims that people tend to classify societies into categories in order to locate oneself in the social environment. This classification may take place through the identification of specific attributes of physical or non-physical nature (i.e. gender, personality traits) and establishes feelings of relatedness (Ashforth and Mael, 1989). Hogg (2001) identifies five major arguments on why individuals feel the need for this self-identification, which will now be outlined more precisely:

1. Self-categorization and prototypicality: Self-categorization can also be described as the process in which individuals divide themselves into in-groups and out-groups. This takes place through the accompanied depersonalization of group members and the need to "feel part of something". The most important attribute of social groups therefore is the "perceived or actual prototypicality" of it's members (Hogg and Terry, 2000). Individuals are then no longer seen for their personal characters but as part of an in- or out-group. Self-perception and behaviour therefore have to match their group's prototype (Hogg, 2001). Organizations can also be seen as examples of large, hierarchical groups, consisting of multiple subgroups. These subgroups further distinguish themselves from each other through the different allocations of power and status (i.e. different departments, board of directors) (Hogg and Terry, 2000).

2. Social Attraction: The social attraction hypothesis argues that due to depersonalization- and categorization-processes, individuals tend to feel more attracted to in-group members than to

out-group members. As the in-group prototype is perceived to be the only right one, co-members are perceived to be similar to oneself and automatically feel more attracted to each other (Hogg, 2001).

3. Positive self-esteem: Social identity can also be derived from the basic need for positive self-esteem. The positive evaluation of a group's attributes can therefore be identified as reason why individuals consider themselves as members of particular groups. Especially aligned values, often deriving from similar underlying cultures lead individuals to build or consider oneself to be part of a group (Turner, 1975). Additionally to the comparison of the self with the group, latter one is furthermore compared to other groups. Because of individuals' need for positive valued identities, they will only decide for a specific group if it's attributes are also distinctively positively valued within this intergroup comparison. Through this comparison, out-groups are discriminated by members of the opposing group only because it helps them to enhance their individual self-esteem. Low self-esteem may therefore act as a motivator, encouraging this discrimination (Abrams and Hogg, 1988). Through this social behaviour, motivated by individuals' need of a positive estimation of themselves, a link is built from social identity to competition. Group members therefore compete for positive social identities while representing differing values of their groups in absence of a material reward or goal (Turner, 1975). Furthermore Turner (1975) argued that each group draws it's motivation for improvements only from the comparison with the out-group. This need for positive social identities is so strong that individuals' effort is even more increased in situations where the group's identity is threatened. Especially when one group finds itself at a weaker point, the members' performance is enhanced in order to improve the group's position relative to their opponents' (Ouwerkerk et al., 2000).

4. Uncertainty reduction: Additionally to a positive self-esteem, the uncertainty reduction hypothesis argues that individuals also tend to evaluate themselves. The motivation to do so lies within the need to reduce subjective uncertainty, through which information about the collective characteristics of the group and oneself shall be facilitated (Hogg and Terry, 2000). It furthermore can be seen as an extension of self-categorization theory and prototypicality as

both subordinate individual characteristics under the in-group prototype, in order to reduce uncertainty (Hogg, 2001).

5. Salience: Social identity becomes the salient tool of judgments because of it's adaptations to changes in social contexts (Turner et al, 1994). Motivated by a positive self-esteem and the need for uncertainty reduction, individuals categorize social contexts in a similar way as they do with people (Hogg, 2001). Although due to constant changing environments and social contexts, self-categorization has to fit, which makes it a variable concept. Multiple self-categories evolve and influence individuals' judgments (Turner et al, 1994).

While the just outlined arguments give an overview over the reasons why and how individuals tend to identify themselves with particular groups, the theory about social comparison takes a look at inter- and intra-group relations and the effects of individuals comparing themselves to others. Festinger (1954) therefore claimed that individuals tend to compare themselves to others who have similar abilities and opinions. As a consequence feelings of relatedness develop and people feel close to each other. Through social comparison individuals evaluate their opinions and abilities in order to find validation. In case of discrepancies, individuals will take actions in order to reduce them as their social identification with the group is high. The phenomenon here lies within the need of relatedness being so strong, that individuals will rather take actions to change themselves in order to fit the group rather than trying to turn other members and the group's character. Festinger (1954) furthermore strongly differentiates between abilities and opinions. While he draws a connection from abilities arising from intrinsic motivations to improve oneself, opinions on the other hand are influenced by individual personality traits. For that reason opinions are harder to change than abilities as they are consistent with already existing beliefs.

Social comparison was furthermore found to have important implications for motivation gains or losses within group contexts. Having the opportunity to compare oneself to others leads to an increase in task effort while the absence of this possibility decreases individual effort. Whether the person of comparison performs better or worse does not have any effect on motivation (Todd et al, 2006). A linked phenomenon is made up by social compensation. The term of social compensation refers to group members putting more effort into their work when they expect their co-workers to perform unsatisfactory. They therefore compensate for the bad performance of their colleagues in order to save

the collective goal. The feeling of relatedness to the group, as well as it's reputation were identified to be important motivators to the compensating members. The link to social identity theory lies within the feeling of belongingness to a group being the driver of performance improvements (Williams and Karau, 1991).

Although reward schemes in group contexts have an effect on the level of social compensation as well. Individuals are therefore willing to compensate for their co-workers (which might mean doing more work than the others) only in cases of being remunerated accordingly. They expect a higher share of the rewards and in cases of the rewards being shared equally around members, motivation decreases. Only in cases of high identification, individuals are willing to compensate without a higher reward than their members (Todd et al, 2006).

Attention should be paid to the former presented arguments also in academia as well as private organizations. When looking at the American academic market (which shall serve as representative for other economic markets), the identification of professors with the universities they are working at might influence their productivity and quality-adjusted productivity as well. Through the importance of Business School rankings, which will be outlined in more detail later in this thesis, intergroup comparison and competition between American universities is enhanced. Therefore a strong identification of professors with their universities is even more important in order to have a positive effect on their productivity and push the universities' reputation. While now the connection of professors to their universities and the dependence of latter ones regarding their quality-adjusted productivity and reputation has been outlined, in the following section attention is paid to the role of status within the academic context. At first the emphasis will be drawn to the role of individual status in intergroup settings, while later on light will be shed on the influence of group's status on behaviour.

4.4 The role of status in intergroup settings

4.4.1 Individual Status

Social status of individuals is normally defined by rankings that some have in their mind-sets about others within societies. While numerous rankings of one particular individual exist, status evolves if there are aligned rankings of different individuals, defining the relative position of one person within a society. These rankings are built on the resources, abilities and behaviour one has and high status is

rewarded socially (i.e. favourable treatment, transfer of authority). For that reason individuals try to increase their social status through investments in and calculation of their behaviour in absence of clear economic gains. Although social benefits can help individuals in trading activities when markets do not function perfectly (Weiss and Fershtman, 1998).

Regarding the origins of status, two differing opinions are advocated by researchers. While one see individual personality characteristics or physical attractiveness as major influencers, others argue that the social environment defines individuals' hierarchical roles (Anderson et al, 2001). Taking a look at the first group of outlooks and physical abilities, a possible explanation for increased status lies within physical superiority. Superiority encourages dominant behaviour which might then further lead to status (Savin-Williams, 1979). A heavily used concept, describing the influences of personal characteristics defining status differences, is made up by the "Big Five Personality Dimensions". It has been developed by numerous authors over the years and the real origins are not clear (Goldberg, 1993). From the multiple explored characteristics, Anderson et al (2001) defined extraversion, agreeableness, neuroticism, conscientiousness and openness to experience to be the most important ones. The authors explored the importance of the different dimensions, as well as physical attractiveness on individuals' definition of social hierarchies in face-to-face groups, distinguishing between sexes. While extraversion had a positive influence on both sexes and therefore led to an increased status-perception, neuroticism was negatively related to status for men. Agreeableness, as well as conscientiousness and openness were not related to status, although physical attractiveness facilitated the enhancement of status for men.

Advocates of the social environment theory on the other hand argue that not individual characteristics, but social contexts lead to different status positions. Especially situations in which the same task has to be fulfilled by different individuals can be used as anchors for defining status hierarchies. The absence of prior experience regarding the current task gives an even better impression about who the most able person is. The observing individuals build expectations on how the task should be accomplished in the best way and the individual who is able to fulfil those best gains higher status than the others (Berger et al, 1971).

Regarding the allocation of status from the social environment to individuals, the right evaluation of the self and one's own status-position plays a major role in group contexts (Anderson et al, 2006).

Social status can also be obtained through the identification with a particular group while the members boast individual characteristics. In this case it's the similar degree of status that keeps the group together and the abilities and behaviour of it's members directly affect the group's status. That is the reason why status groups are interested in keeping the accession restricted (Weiss and Fershtman, 1998). In order to stay part of the group, individuals have to monitor their behaviour carefully. As soon as they overestimate their status-position and act accordingly, they might be perceived as arrogant. Their behaviour is then interpreted as provocative and conflicts evolve which encourages disorganization. As already mentioned before distinguished group members are keen on defending the group's values and holding the group together. With increased conflicts, all members feel uncomfortable and as a consequence, self-enhancers will be rejected and excluded for the sake of the group. While the group persists, as a negative result the restrain of individual improvement can be identified. Individuals might never challenge current group structures and avoid enhancing their hierarchical positions (Anderson et al, 2006).

When now drawing a connection to the formerly presented theories about social identity and –comparison, it is important to mention that also within social identity theory, belongingness to a group has been identified as major influencer of social behaviour. The avoidance of self-improvement regarding one's status-position for staying member of a group therefore perfectly fits social identity, -comparison and -environment theory. If the allocation of status and the development of social hierarchies is bound to so many individual constraints, the next question one might ask is why it still makes sense to have them. The reason for hierarchies or the allocation of status therefore lies within the facilitated organization of groups. People with higher status distinguish themselves through their actual number of outputs, their possibility to evaluate the other members' outputs and their influence on others. Therefore they gain more opportunities to perform but also have more chances to show their abilities (Berger et al, 1980). It is obvious that status is dependent on how individuals act within groups and that is the reason why high status is only allocated to individuals who are perceived to be destined to the group's goal. They furthermore have to make high contributions in order to reach the best outcome which can either consist of specific knowledge or involve extensive effort. The assignment of status can therefore be seen as reward for their outstanding effort for the group (Anderson et al, 2006).

As a conclusion it can be said that social status is used as a source of public information in order to predict behaviour of individuals in societies. Although researchers are inconclusive whether the effects are positive or negative. Some see it as an important motivator of competition, encouraging and facilitating economic development. Others regard status as another reason for high status groups to exclude outsiders and maintain economic benefits to themselves. It has been shown that status allocations influence individual behaviour in group contexts as affinity to the group's goals is demanded (Weiss and Fershtman, 1998). This might lead individuals to restrict their abilities in order to avoid rejection of the group. Individuals' "need to belong" can also be defined as search for "social acceptance" and constitutes an important motivator to stay within the group (Baumeister and Leary, 1995). It already has been shown that groups define social hierarchies and allocate status accordingly. Therefore more light will be shed upon the importance of status in group contexts.

4.4.2 Status and motivation in group contexts

When picking up the formerly presented social identity and -comparison theory it has been shown that individuals tend to identify themselves with groups and compare themselves to other individuals. This comparison can either take place within the group and therefore against other group members, or against other groups, also referred to as out-groups (Pettit and Lount, 2010). When speaking of groups, it makes sense to take a closer look at work groups who are characterized by the underlying social dilemma of their members who have to work as much as they can for their least possible cost. Status is therefore allocated to the person who is able to fulfil this best. When competing for status, group members allocate their time between working and social activities (i.e. networking). Status can therefore be measured through economic output and social behaviour. While status-competition based on performance enhances the group's output, status based on networking-measures takes place at the expense of working time (Loch et al, 2000).

Status plays a major role in these comparisons and can lead to motivation gains or losses of the different group members. Motivation gains in intergroup contexts can be defined as "increased effort of individuals working in a group relative to working alone" whereas losses would imply a "decreased effort of individuals working in a group relative to working alone" (Pettit and Lount, 2010). Motivation gains of group members were therefore studied by Kerr and Sambolec (2007) who found that individuals put more effort into a task when they got information about peers within their group,

being more capable of fulfilling a specific task than themselves. The reason for their increased toil also lies within the former presented theory about social comparison. When confronted with the fact that their teammate was doing better, they changed their behaviour in order to protect their self-esteem. While this is a perfect illustration regarding the influence of social comparison on individual performance in groups, their further finding sheds light on the situation in which the group's status is at play. The effect was therefore even stronger in the case of the group's score depending solely on one's own performance which further supports the theory of social identity, promoting increased effort for the group's success due to high identification with the group. While in the first situation, the protection of individual self-esteem constitutes the source of motivation for increased effort, the second example refers to the protection of the group's status being the motivator. This phenomenon is also referred to as the "Köhler effect".

This analysis can be taken onto the next level through studying the influence of comparisons from in-groups and out-groups on individual behaviour. Due to direct comparison with out-groups, the individuals perceive situations to be highly competitive. In cases of strong identification with a group, this leads to an increase of individual effort. Especially in cases of one own group's status being low compared to the out-group's position (upward intergroup comparison), members work harder. Through individuals' strong identification, the group's unfavourable position is understood as one's own, which in succession members want to change. In cases of downward intergroup comparisons (one's own group's status is higher compared to the out-group's), the results show a negative relationship between identification and effort. Performance of the members therefore decreased with higher identification. A possible explanation might lie within the strong belief in the group's abilities and high self-esteem due to the group's high-status position (Ouwerkerk et al, 2000).

Although within a similar study opposing results were presented. In this case with downward comparison and the individuals knowing about the lower status-position of the opposing group, their effort and performance increased. Their higher position therefore led to motivation gains due to the comparison with a lower status group. This might derive from individuals' fear of performing worse than the group with the actual bad reputation and their group losing it's status-position (Pettit and Lount, 2010).

As in this case the group's reputation is threatened, another phenomenon studied by multiple researchers is the degree of members' commitment in situations of group-directed threat. Very similar to the theory of social identification, it can be distinguished between low and high commitment. In cases of threat, low committed members would therefore split themselves from the group and search for valuable alternatives, matching their abilities and opinions. Their individual goal would be more important to them than the group's identity and therefore they try to avoid negative self-identity. High committed members on the other side would engage in taking actions for increased differentiation of their own group to out-groups and even enhance their affirmation for the group. As a negative consequence, the risk for conflicts between the members although is increased, arising from discrepancies on how to differentiate themselves (Ellemers et al, 2002).

5 Development of the Research Question

This thesis lies explores the influence of tenure on productivity within the Top 20 Business Schools in the U.S.. The Literature review has shown that opinions on the American tenure-track system are torn. Proponents argue that the grant of tenure provides economic security and freedom of speech which in succession should encourage innovativeness and criticism of established views (Shulman et al, 2016). Furthermore, Human Capital theory has shown that knowledge is a critical factor when trying to achieve competitive advantage (Kogut and Zander, 1992). In order for individuals to improve their knowledge, organizations as well as they themselves have to invest in their development which can be encouraged through rewards (Schultz, 1961). Although studies have shown that for motivation to increase, rewards have to be individually allocated. If they are equally shared, motivation has been found to decrease (Todd et al, 2006). In the current thesis the grant of tenure is argued to be such a reward, as the requirements are very strict and many applicants fail. For that reason the proponents claim the grant of tenure to encourage further development and enhance output. Opponents on the other hand see it as the ultimate goal one can achieve, therefore leading to decreasing effort and inertia (Batterbury, 2008). This negative perception is underlined by research regarding the effects of job tenure on performance, arguing that the risks of losing intrinsic motivation and increased feelings of boredom can be led back to the absence of chances for career enhancement (Ng and Feldman, 2013).

As already mentioned earlier in this thesis, the career paths in American academia are very well comparable to the ones in business organizations. The grant of tenure in universities therefore stands for promotions on the executive level in business organizations, as both of them provide the recipient with high responsibilities, but also economic security. For that reason this thesis shall provide important insights and suggestions regarding potential reward schemes.

Regarding the influence of status on performance, Symbolic Capital theory showed that status is derived from investments in social relations (Bourdieu, 1977) and furthermore from the membership in prestigious institutions (Lutter and Schröder, 2016). While the grant of tenure can therefore be seen as a symbol of individual status, social identity theory claims that people tend to identify themselves with groups in order to locate themselves in the social environment and furthermore enhance their self-esteem (Ashforth and Mael, 1989). This identification only takes place as long as individuals perceive their identity to be positive and therefore researchers are expected to identify themselves with their institutions (Turner, 1975). Therefore they perceive their universities' status position as their own which has an impact on their quality-adjusted productivity.

Building the link to social comparison theory, a look is taken at status in social contexts. It describes individuals' tendency to compare themselves to similar others (Festinger, 1954), which might lead to increased efforts in their tasks (Todd et al, 2006). They also tend to divide individuals into in- and out-groups, whose abilities are then compared to each other (Pettit and Lount, 2010).

Status positions also constitute sources of public information as they help to predict individuals' behaviour. It can furthermore be defined as the rankings individuals have in their mind-sets about others (Weiss and Fershtman, 1998), for which reason the official American Business School rankings were taken into account within the present study. They evaluate universities based on specific criteria and identify the best. Through this assignment of ranks, status if furthermore given to the different Business schools which in succession attracts prospect students and researchers. In the current thesis it is assumed that researchers compare in- and out-groups regarding their status positions. While in-groups are made up by the researchers' own business schools, out-groups are defined by other universities. This comparison of the own status position to other researchers' leads to the location and evaluation of the self which is furthermore expected to have an effect on the researchers' productivity.

In order to better define the effects regarding the grant of tenure on productivity, it is distinguished between *productivity* and *quality-adjusted productivity*. Productivity is therefore often misunderstood as being the result of increased production. This must not necessarily be the case as productivity implies the smart use of resources, indicating that more output shall be created with the least of input. Output shall therefore be able to be expressed in physical units. What productivity lacks is the indication of quality (Tangen, 2005). For that reason within the current study a qualitative dimension is also taken into account. It is therefore distinguished between *productivity*, only considering the number of publications, while *quality-adjusted productivity* takes a look at publications in prestigious journals.

In the former presented section it has been shown that individuals tend to divide others into in- and out-groups and identify themselves with their in-group (Pettit and Lount, 2010). In order to enhance their self-esteem and find their place within the social environment, they compare themselves to others which furthermore has an effect on their motivation (Todd et al, 2006). This social comparison can either take place upward (the comparison with a higher status Business school) or downward (the comparison with a lower status Business school). Although the findings for these two types of comparisons are different. While on one hand an increase in task-effort in cases of upward comparison could be found (Ouwerkerk et al, 2000), on the other hand motivation gains due to downward comparison could be witnessed (Pettit and Lount, 2010). When taking the degree of social identification into account, it could be shown that higher identification with a group in downward comparison leads to a decrease in effort (Ouwerkerk et al, 2000). All of the presented findings have it's perquisites. Through upward comparison individuals see a better version of themselves which encourages them to put more effort into improving themselves. Taking a look at downward comparison on the other hand, motivation gains can be explained through the fear of losing one's or the group's position. The decrease in effort due to a high identification with the group in downward comparison might be led back to the individuals strongly believing in the group's abilities which encourages inertia (Ouwerkerk et al, 2000).

Within the current study, it is assumed that comparisons takes place between researchers and special attention is paid to the effects of these after tenure has been granted. As through the Top 20 Business School ranking a status position was assigned to each university, downward- and upward comparisons

have been made possible. Therefore the professors who were granted tenure at a university of a better rank than the university they have been working before, will be referred to as *upgraders* which at the same time can be identified to engage in downward comparison.

On the opposing side stand researchers that gained tenure at a university of a worse rank than their previous place of employment had. They are identified as *downgraders*, or as engaging in upward comparison within the following thesis. Underlying the former presented literature review about inertia occurring in terms of downward comparison due to the absence of further career enhancements after the grant of tenure, it is assumed that productivity and quality-adjusted productivity might be different for *upgraders* than for *downgraders*.

To my knowledge explorative studies, taking a closer look on the effect of the tenure grant and the status-position of the granting university on individual productivity and furthermore distinguishing between quantity and quality of output, have not been done so far. In order to give a better impression on the effect of such high reward schemes on productivity, the research question in this thesis can therefore be formulated as follows:

Research Question: How does tenure affect their researchers' productivity and quality-adjusted productivity with respect to the status position of the tenure-granting university within the Top 20 Business Schools in the U.S.?

6 Data and Measurement

In order to give a better understanding of how the influence of tenure on productivity with regard to the status-position of the tenure-granting university can be measured, the following chapter will take a look upon the data that has been collected. In the next step values have to be given to the professors' different career levels in order to define whether they were up-or downgraders and acted in up- or downward comparison. For that reason numerous rankings of the best universities and Business Schools on an international scale, as well as in the U.S. were taken into account. All the rankings can be found in Appendix 1 to 3 of the thesis. The universities within the ranking provide the additional benefits of information about the professors being easily accessible for which reason a big database could be elaborated. Therefore the data was collected from the official webpages of the universities

regarding researchers' career steps and publications. The section of this chapter will close with the definition of the variables before the final results can be presented.

6.1 The rankings

6.1.1 Top 20 Business Schools in the U.S.

The Top 20 Business School ranking was used in order to specify the Business Schools about which data should be collected. As already mentioned above, most of it was collected from the official webpages of the universities. The ranking that was used in order to define which Business Schools should be taken into account is published on a yearly basis by *U.S. News and World Report*. For their ranking, they sent a survey to the universities offering the 480 MBA programs that were accredited by the *Association to Advance Collegiate Schools of Business International* (AACSB). The methodology of the ranking was retrieved from the official webpage of *U.S. News. and World Report*, taking the following criteria into account:

1. Qualitative: Surveys were given to business school deans and directors of the different MBA programs, as well as recruiters and companies whose contacts were provided by the ranked universities. They were asked to rank the MBA programs on a scale from 1 to 5.
2. Placement Success: Alumni were asked about their starting salaries and employment rates after they graduated from an MBA program.
3. Student selectivity: Scores of the *Graduate Management Admission Test* (GMAT) and *Graduate Record Examination* (GRE), as well as students' mean undergraduate *Grade Point Average* (GPA) and acceptance rate were taken into account from the entering MBA students.

Within the current study the ranking for the year 2017 for the best MBA programs was used. On the first three rankings one can find Harvard University, the University of Pennsylvania the University of Chicago with their Business Schools respectively. Harvard and Wharton share the first place with a score of 100 points. Their success can be traced back to their high starting salaries and employment rates, as well as their strong reputation among employers. Booth makes up for the third place as it scores with popular companies like Amazon, McKinsey and BCG being recent employers of their graduates. Emory University and it's Goizueta take the last rank with an

average starting salary of $ 138.864 and GMAT score of 638 (in comparison to Harvard: $ 153.830 and 729) (Morse and Hines, 2017).

For facilitating reasons, only professors of the departments in the areas of Strategy, Management or Organizational Behaviour were taken into account. It is important to mention that the number and size of departments, as well as the areas of specialization are highly distinctive from each other between the different universities. In order to equally represent the Business Schools, the number of observed departments varies so that a somehow equal number of professors occurs per Business School. The table giving an overview over the *U.S. News and World Report* – ranking of the universities with their Top 20 Business Schools that in the U.S., as well as the observed departments in the study, can be found in Appendix 1.

6.1.2 Top 100 Business Schools worldwide

As many of the observed professors have taken their PhD or some of their career steps outside of the U.S., an international ranking for Business Schools was used in order to assign a rank to the different career levels and later define whether the professors were up- or downgraders. Therefore the Top 100 Business School – ranking of *Financial Times (FT)* was used, again evaluating MBA programs of 2017 in order to ensure a good comparability to the American Top 20 – ranking. Regarding the methodology, which was again retrieved from the official Financial-Times-webpage, 137 programmes took part from which the offering Business schools must have been accredited by the AACSB. Three criteria were evaluated and responsible for the assignment of a specific rank:

1. Alumni data: A survey asking about the current salary and increases, the career progress, work experience and aims achieved had to be taken by at least 20% of the contacted alumni. It accounts for 55% of the ranking's weight. Past responses of two years were also included into the weighting, accounting for 25% each while the current survey takes 50%.
2. Business school data: The internationality of the program, as well as gender- and international diversity of the teaching staff, board members and students were evaluated. Schools having a 50:50 ratio of male and female staff were given the highest score.
3. Quality of research: The number of articles published by the schools' full time faculty within 50 internationally popular journals of the Business Schools accounts for 10% of the ranking.

Financial Times then calculated the Z-score for each criterion, weighted them according to the former outlined key and gets the final score (Ortmans, 2017).

The list is headed by the French INSEAD with an average salary after three years of $ 177.157. Stanford and the University of Pennsylvania follow with $ 214.742 and $ 190.826 respectively. While within these three Stanford provides the biggest advantages to their alumni regarding salary, INSEAD is ranked higher regarding the career progress and research quality. The University of Pennsylvania on the other hand exceeds both of them in employment rates but performs poorly in research.

6.1.3 Top 50 Business Journals

As already mentioned before, the productivity of the professors will be divided into productive and highly qualitative performance. In order to identify their work as highly qualitative, the journals in which their articles were published are taken into account. For that all articles were examined on whether they were published in one of the journals listed in the *Financial Times* ranking of the Top 50 Business Journals. The ranking was renewed and extended in 2016 from 45 to 50 journals that were suggested by the Top 200 Business Schools whose MBA programs are listed within *Financial Times'* Global-, Executive- or Online MBA rankings. *Financial Times'* webpage declares a response rate of 67% and the schools were asked to suggest five new journals to include into and five to exclude from the previous list. As a result four journals dropped out and four new were adopted (Ortmans, 2016).

Within the current thesis an article was identified to be of high quality as soon as it was published in a journal listed by *FT*. In contrast to the Business Schools, for facilitating reasons no attention is paid to the rank of the journal.

6.2 The database

From the Top 20 Business School ranking of *U.S. News and World Report*, data has been collected of the professors within strategy-, management- and organizational behaviour-related departments. As already mentioned before, only publicly available information was gathered and in most cases the CVs of the professors could be downloaded from the departments' webpages. The professors were

therefore divided into groups dependent on their career levels within the American tenure-track system, looking the following:

1. Assistant professors
2. Associate professors
3. Full Professors

In the following sections *professor* is used as a term for describing all positions, independent from career level within the tenure-track system. For precisely depicting the career paths of the professors, information about the PhD, as well as all former research positions with dates, years and locations are presented. As the procedures upon the grant of tenure are highly distinctive from university to university (and sometimes also from department to department), it is important to remember that the promotion to Associate professor does not imply the grant of tenure, although with full professorship tenure has to be granted at the latest.

Regarding the PhD, data about the location, year and whether the degree was earned in business was collected. For outlining the further career path of the professors, all positions that were taken at the levels of Assistant- up to full Professor, as well as visiting occupations were observed. The same data was collected for the current position, distinguishing between the year of entry into the Business School and the year in which the current career level was reached. It is important to mention that at one point in the career of tenure-track faculty, the decision upon the grant of tenure must be taken by the authorities. This means that either tenure will be granted or not. In case of a negative decision the contract normally finishes after one year and is not prolonged (Batterbury, 2008). Therefore all universities have their own timetable for giving their staff an overview over the procedures for granting tenure and after which amount of time an application is possible. While one university already guarantees tenure at the level of Associate professor, the next one grants tenure after some years as Associate while the third university gives it only with the promotion to full Professor. As within the CVs of professors the exact moment of their tenure-grant is most of the time not clearly evident, only through the detailed observations of their different career steps it was possible to track down this exact point in time and the university at which tenure was granted. Through the identification of the tenure-granting university a rank could be assigned to it according to the global

Top 100 Business School ranking. As the ranking depicts the status positions of the universities, the professor could be defined to be either an *up-* or *downgrader* after gaining tenure.

Within the next step, information about the professors' publications was collected. Only articles in refereed journals were taken into account as they can be identified to be of larger importance to research as chapters in books or non-refereed articles. Furthermore through the distinction between scientific productivity and quality-adjusted productivity, comparability is perceived to be stronger when only publications in refereed journals were taken into account so that the highly qualitative articles in the Top 50 Business Journals can be distinguished from the rest. In order to guarantee full traceability, the title, journal, volume and year of each publication were documented. All articles were counted per professor in order to give an impression of what his or her productivity looks like. Having now precisely outlined the data that was collected, within the following section the derived variables will be explained in more detail.

6.3 Variables and Model

As the goal of this thesis is to explore the effect of tenure on productivity and quality-adjusted productivity with respect to the status-position of the granting Business School, attention must be paid to the different competitive situations involved. While researchers are expected to compete for a highly desired tenure-track position, the universities at the same time aim for a good position in the rankings. Taking a look at the researchers, it has already been explained that not every applicant for a tenure-track position is also granted tenure. As it embodies the ultimate goal one can achieve and constitutes a symbol of individual status, competition between researchers is assumed to be high. Once having reached the level of being a tenured professor, a decline of motivation for improvement is suspected, which furthermore has an impact on productivity and quality-adjusted productivity. Tenure can therefore be identified as the independent variable.

1) Independent variable: *tenure*

On the opposite side stand the universities, also competing for high status positions. As the Business school- and university rankings in the U.S. are renewed every year and the ranks mostly switch between the Top universities, competition for the best researchers and students is assumed to be high. Due to the professors and students being important influencers in the universities' successes, they have

a direct impact on their status-positions as well. On the other hand this thesis suggests that the status positions of students and researchers are dependent on their universities' prestige and through high identification their productivity and quality-adjusted productivity are expected to be influenced. The status position of the Business School is therefore identified as a moderator on productivity.

2) Moderator: *status position of the university*

As already depicted above, productivity is distinguished between a quantitative and a qualitative dimension. While the quantitative dimension is therefore defined by the number of articles that were published by each professor, the qualitative dimension is made up by the publications in the Top 50 Business Journals. As influencing factors on the tenure-grant process, awards, as well as the publication record of professors have been identified. Therefore two underlying theories about why especially these two should be taken into account, have been presented: Human- and Symbolic Capital theory. While Human Capital theory argues that knowledge of employees embodies the most important resource of organizations which can therefore be measured through output (Kogut and Zander, 1992), Symbolic Capital theory suggests that membership in institutions positively affects success, for which awards can be given as an example. Within the current thesis productivity and quality-adjusted productivity can be identified as the dependent variable, being measured through scientific output (articles).

3) Dependent variable: *productivity/ quality-adjusted productivity*

From the outlined variables the following model can be derived:

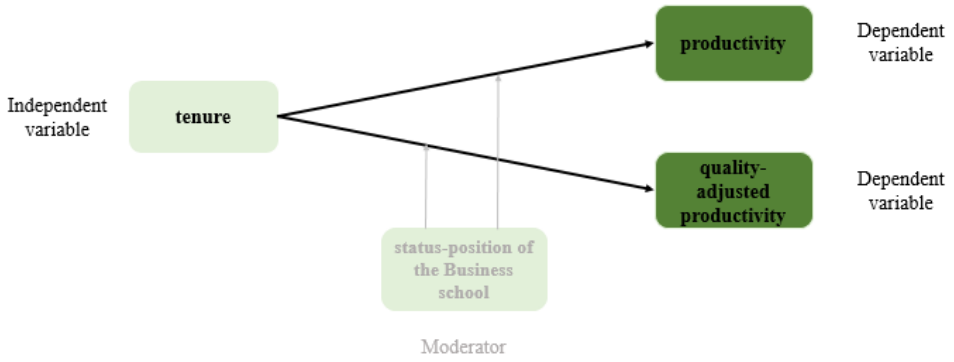


Figure 1: Model describing the influence of tenure on productivity and quality-adjusted productivity with the status-position of the university as moderator

Tenure is therefore expected to have an influence on the productivity and quality-adjusted productivity of the professors while at the same time being influenced by the status-position of their Business School.

6.4 Descriptive statistics

For analysing the effects of tenure on productivity and quality-adjusted productivity within the Top 20 Business Schools in the U.S., the programs *Microsoft Excel*, as well as the statistics program *STATA* were used. The database itself was created within Excel and was adjusted to be easily transferrable into *STATA.* The dataset consists of 526 objects who were assigned to be either Assistant-, Associate-, or full Professor, for facilitating reasons coded with 1, 2 and 3, reflecting their positions within academic careers respectively. Looking into the variable gender, the dataset includes 30,61% female and 69,39% male professors (Appendix 4).

When looking at the shares of the different universities and their Business schools in the whole dataset, for the University of Pennsylvania the most professors were observed. It makes up for a share of 8,94% of the whole database which stands for 47 professors (Appendix 5), while only the *Management* department (Appendix 1) was taken into account. It is closely followed by Northwestern University with 45 professors and a share of 8,56% (Appendix 5), constituted by it's *Strategy* and *Management and Organization* departments (Appendix 1). On the third rank and with significant distance there is Harvard University, with the *Strategy* and *Organizational Behaviour* department (Appendix 1). Being ranked on the first place of the Top 20 Business School ranking, it accounts for 7,03% of the dataset with 37 registered professors (Appendix 5). The smallest share is embodied by the University of Chicago with 1,9% and information about only 10 researchers (Appendix 5) within three departments (Appendix 1). The strongest represented department over all Business schools within the current study is called *Management and Organizations* with 108 employed professors. It is followed by *Management* and *Strategy* with 94 and 89 objects respectively. There are three departments included who employ less than five professors: *Management Science* (one person), *Operations and Management Science* (one person) and *Operations Management* (3 persons). (Appendix 6). The departments including the area of *Operations Management* do not have a direct

strategy- or management-context, but were still taken into account due to their Business schools' share within the database being small compared to other Business Schools. *Operations and Management Science* can be found in Dartmouth College which is with 23 professors in the midfield of sizes. *Operations Management* belongs to Yale University, taking part with only 18 professors in the database. *Management Science* can be found in the University of Chicago that is represented with only 10 professors (Appendix 5).

Regarding the different represented positions within the dataset, the shares of Assistant- Associate- and full professors look the following:

1	2	3
25,10%	20,88%	54,02%

Table 1: Shares of academic position

Of the 526 individuals only 522 were observed, as information about four regarding their current position was missing. The information that could always be assigned to the individuals was their university, department and gender. University and department were obvious as the person could be found on the official webpages. Regarding gender, name and photograph on the webpages made the assignment possible. The four individuals whose declaration of their current position was missing were also excluded from any further analysis as neither their productivity or quality-adjusted productivity could be assigned to their position, nor could the exact moment of their tenure grant be tracked (Appendix 7). Although their publications have been recorded in order to make a future extension of the dataset easier.

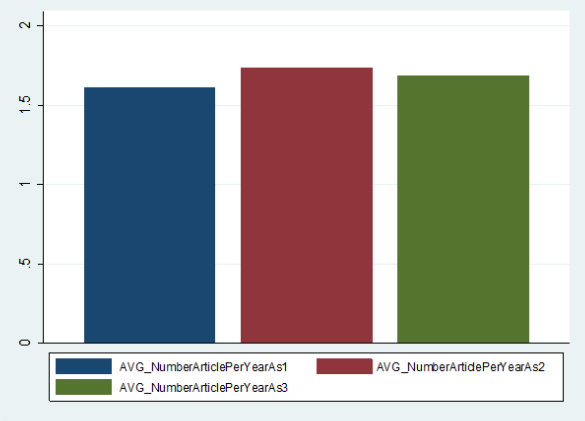
The share of professors makes up the largest part which is intuitive as it is the last position one can achieve and therefore takes the longest time in the career of professors. Assistant professors make up the second largest part of the database with 25,02% and Associates the smallest with 20,88%. Important for the further analysis is the fact that "Associates with tenure" were included to the group of Associates for facilitating reasons.

7 Results

Having given an overview over what the database looks like and what it's main characteristics are, the obtained findings describing the influence of tenure on productivity and quality-adjusted productivity will now be presented in more detail. At first a look will be taken upon the average productivity and quality-adjusted productivity according to the different positions. In a next step rankings will be presented, depicting the places of the different Business Schools regarding their Assistants', Associates' and full Professors' productivity and quality-adjusted productivity. Comparisons will be made to their positions in the Top 20 Business School ranking and possible connections discussed. The last part of the results-section gives an insight on the influence of tenure on productivity with respect to the status-position of the university through the analysis of the particular group of professors who switched university and were then granted tenure.

7.1 Productivity and quality-adjusted productivity – overview

At first the average productivity per person and year was calculated through identifying the number of years, as well as the dates in which the person worked as 1, 2 and 3. As the publishing year has been collected for every article, in a next step the number of articles could be assigned to a position. The articles were then counted for every professor and divided through the years he or she has spent in a particular position as productivity varies a lot across researchers. In order to provide a better comparability, productivity has therefore been calculated as the average number of articles per person and year, assigned to the different positions (Figure 2).



	avg_numbe~1n	avg_numbe~2n	avg_numbe~3n
1	1.61085	1.73661	1.6587

Figure 2: Average productivity of academic positions per year

One can see that there are no extreme differences between the productivity in the different career levels, but changes can still be observed. In order to give a better understanding about the influence of the changes in productivity, not only the absolute, but also the relative change will be observed. The calculation for the increase in productivity from 1 to 2 therefore looks the following:

Total increase: 1,733661 – 1,61085 = 0,122811 articles

Relative increase: 0,122811/1,61085 = 0,07624 = 7,62%

The output from Assistant- to Associate professor therefore increases by 0,122811 articles which constitutes approximately 7,62%.

From Associate- to full Professor a decline in productivity can be observed. Using the same calculation as before, productivity can be described like this:

Total decrease: 1,73661 – 1,6587 = 0,07791 articles

Relative decrease: 0,07791 / 1,73661 = 0,04486 = 4,49%

While the observed effects are small, it is interesting to observe that from the first to the second position productivity is increasing while from the second to the third position it declines. One could argue that the motivation of Assistant professors is still high due to their need to prove themselves and being granted tenure. As already mentioned before with the promotion to full professorship tenure has to be granted at the latest. One could therefore suspect a decline in motivation and a decrease in output which would be supported by the presented results. Although at this point it is important to keep in mind that it has not been controlled for tenure yet.

In a next step the same procedure will be done for quality-adjusted productivity. Regarding the number of articles within the dataset, they make up for a number of 12.556 in total. From this total amount 4.433 have been published in the Top 50 Journals identified by *FT* but approximately 300 articles could not be assigned to the positions of the professors due to missing information. The number of observed articles within the Top 50 Business Journals influencing the analysis therefore makes up for 4.136. Taking these into account the average quality-adjusted productivity of Assistants, Associates and full Professors can be described as follows:

	avg_n~1_top5	avg_n~2_top5	avg_n~3_top5
1	.698865	.744912	.556058

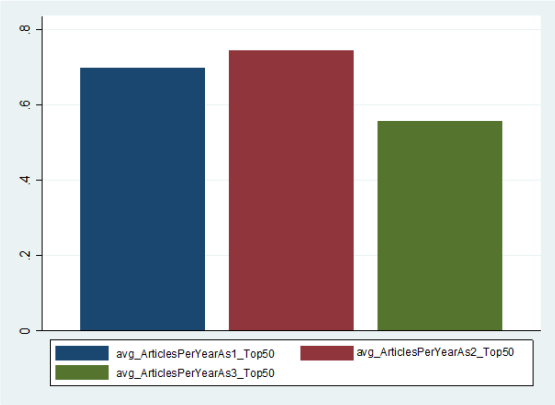


Figure 3: Average quality-adjusted productivity of academic positions per year

The first thing that has to be noticed is that due to the smaller number of the articles that have been published in the Top 50 Business Journals, also the articles published per person are less. Although a bigger effect can be observed here than with quality-adjusted productivity: the downfall from Associate- to full Professor. While productivity also declined from the second to the third position, the effect for quality-adjusted productivity is much stronger. There is hardly any change from Assistant to Associate in quality-adjusted productivity which is very well comparable to the results regarding productivity. Full professors on the other hand publish much fewer articles in the Top 50 Business Journals than their superior colleagues while the decline regarding productivity was not that strong. From Assistant- to Associate professor the increase in quality-adjusted productivity looks like this:

Total increase: 0,744912 – 0,698865 = 0,046047 articles

Relative increase: 0,046047 / 0,698865 = 0,065889 = 6,59%

Compared to the former presented results for productivity the relative increase for the first two positions is almost the same: 7,62% for productivity and 6,59% for quality-adjusted productivity. A big difference in results can be observed for the quality-adjusted productivity of Associates and full Professors:

Total decrease: 0,744912 - 0,556058 = 0,188854 articles

Relative decrease: 0,18854 / 0,744912 = 0,253525 = 25,35%

The output of the current analysis therefore shows that although there is hardly any change in productivity from Associate- to full Professor, the qualitative output decreases with the achievement of the last academic career level. Additionally to the argument of motivation decreasing over time due to the absence of further career development, one could identify full professors to be stuck in old structures and lack innovativeness for which reason their articles are no longer published in the Top 50 Business journals.

7.2 Productivity and quality-adjusted productivity – Business Schools

Now that an overview has been given over the productivity and quality-adjusted productivity of Assistant-, Associate- and full Professors, a closer look will be taken at the represented Business Schools and their position in the *U.S. News and World Report's* ranking. In the following three rankings will be presented, at first showing which Business School is the strongest in productivity for a specific position and later the same analysis will be done for quality-adjusted productivity. The former presented average numbers of publications per person were therefore added up per Business school and again the average per person and year was calculated.

7.3 Productivity

7.3.1 Assistant professors

The most productive Assistant professor within the dataset can be found in the Business school of Northwestern University with 2,161508 articles being published per person and year.

	BS_Rank	University	AVG_Numbe~1n	AVG_Numbe~2n	AVG_Numbe~3n
1	5	Northwestern University	2.1615079	2.2516147	1.7965772
2	15	University of California - Los Angeles	2.0462885	1.4884891	1.6531995
3	16	Cornell University	2.0195862	1.07625	1.5283587
4	6	Stanford University	1.8801242	2.592507	1.6712401
5	4	MIT	1.8761905	1.3051587	2.3607167
6	9	Yale University	1.8017857	1.71875	1.3314815
7	10	Columbia University	1.7847118	2.5571429	3.0757668
8	12	Duke University	1.7783929	2.0829082	2.6339527
9	17	University of Texas - Austin	1.7094322	1.4633117	1.3867045
10	18	University of North Carolina - Chapel Hill	1.6240575	1.1946849	2.0181818
11	3	University of Chicago	1.6015175	1.0666667	1.3808712
12	14	University of Virginia	1.5	1.3789683	1.1623575
13	2	University of Pennsylvania	1.4726307	1.992417	1.4911091
14	11	University of Michigan	1.4571746	1.5342262	1.1946659
15	7	University of California - Berkeley	1.4481905	1.5349206	2.1265201
16	20	Emory University	1.4046703	1.4013889	.52156863
17	13	New York University	1.3159061	1.6528439	1.8140076
18	19	Carnegie Mellon University	1.178836	1.4827098	1.3347877
19	1	Harvard University	.91547619	1.833547	1.4209854
20	8	Dartmouth College	.85724461	.99891324	.99097888

Table 2: Ranking of the universities according to their Assistants' productivity in their Business schools

Although the Business school is only ranked on position 5, this lies well above the average productivity of Assistants (1,61085 articles) by publishing 34,19% ((2,161508-1,61085)/1,61085) more articles. On the second rank one can find the University of California at Los Angeles that is only ranked at the 15th position. It's Assistants publish 2,04629 articles per person and year and only distinguish to Northwestern through 0,115218 articles or 5,63% ((2,161508-2,04629)/2,04629). They are followed by Cornell University with 2,0195862 articles which can still be found 25,37% ((2,0195862-1,61085)/1,61085) above average productivity. A possible explanation for the high above average productivity of the presented universities' Assistants could be the early tenure grant. While this does not hold for Northwestern University (tenure is only granted with the promotion to full Professor), the University of California and Cornell University already grant tenure with the promotion to Associate professor. Interestingly the best ranked university in the Top 20 Business school ranking (Harvard University) is on the second last rank regarding the productivity of it's Assistant professors. Tenure at Harvard is only granted with the promotion to full professor which could lead Assistant professors to be not sufficiently motivated to put much effort in their early years. Although Northwestern University shows that a later tenure grant must not mean a low productivity at the first level in tenure-track employment. The last rank is taken by Dartmouth College with 0,85724 articles per person and year. This lies far beneath average productivity with constituting almost the half of it ((1,61085-0,85724)/1,61085) = 0,46783 = 46,78%). Although within the Business school ranking the university can be found within the Top 10. Carnegie Mellon University is ranked on third from last with it's 19th rank of Business schools and 1,17884 average publications per Assistant professor. Although this still lies 26,82% ((1,61085-1,17884)/1,61085)) beneath the average, the university can be found before the best-ranked university Harvard and Dartmouth College.

7.3.2 Associate professors

When now taking a look at the productivity regarding Associate professors of the different Business schools, the ranking has changed. On the first place one can find Stanford University with 2,5925 articles which lies 49,29% ((2,5925-1,73661)/1,73661) above average productivity. The least productive career level in Stanford is taken by full Professors with almost one article (2,59251-1.67124 = 0,92127) being published less per year than by Associates. Being ranked on the 6th place in the Top 20 American Business school ranking, Stanford with it's Associates' productivity also lies far

ahead of the Top Assistants' productivity of Northwestern with 2,1615 articles. With it's 6th rank in the Top 20 Business school ranking, Northwestern University is one of the most productive one as it can again be found in the Top 3 regarding productivity. It is ranked on the third place with 2,25161 articles per person and year which constitutes a 29,63% ((2,25161-1,73661)/1,73661) higher productivity than average.

	BS_Rank	University	AVG_Numbe~1n	AVG_Numbe~2n	AVG_Numbe~3n
1	6	Stanford University	1.8801242	2.592507	1.6712401
2	10	Columbia University	1.7847118	2.5571429	3.0757668
3	5	Northwestern University	2.1615079	2.2516147	1.7965772
4	12	Duke University	1.7783929	2.0829082	2.6339527
5	2	University of Pennsylvania	1.4726307	1.992417	1.4911091
6	1	Harvard University	.91547619	1.833547	1.4209854
7	9	Yale University	1.8017857	1.71875	1.3314815
8	13	New York University	1.3159061	1.6528439	1.8140076
9	7	University of California - Berkeley	1.4481905	1.5349206	2.1265201
10	11	University of Michigan	1.4571746	1.5342262	1.1946659
11	15	University of California - Los Angeles	2.0462885	1.4884891	1.6531995
12	19	Carnegie Mellon University	1.178836	1.4827098	1.3347877
13	17	University of Texas - Austin	1.7094322	1.4633117	1.3867045
14	20	Emory University	1.4046703	1.4013889	.52156863
15	14	University of Virginia	1.5	1.3789683	1.1623575
16	4	MIT	1.8761905	1.3051587	2.3607167
17	18	University of North Carolina - Chapel Hill	1.6240575	1.1946849	2.0181818
18	16	Cornell University	2.0195862	1.07625	1.5283587
19	3	University of Chicago	1.6015175	1.0666667	1.3808712
20	8	Dartmouth College	.85724461	.99891324	.99097888

Table 3: Ranking of the universities according to their Associates' productivity in their Business schools

Furthermore Northwestern follows the same scheme of publishing regarding career levels as Stanford. Professors in both universities are the least productive ones, followed by Assistants and Associates as the most productive. Columbia University can be found on the second rank with only 0,03536 (2,592507-2,5571429) articles behind Stanford that stands for a marginal decrease of 1,36% ((2,592507-2,5571429)/2,592507). Interestingly the Top 3 universities regarding the productivity of Associate professors can be found within the Top 10 of *U.S. News and World Report's* ranking. Harvard University which has the best Business school in America according to *U.S. News and World Report*, has dramatically improved it's position compared to the Assistants' productivity-ranking. Being placed second last before, it now finds itself at the 6th rank for Associates' productivity with a 5,58% ((1,83355-1,73661)/1,73661)) higher productivity than average. Dartmouth College can again be found on the last rank with 0,99891 articles which lies 42,48% ((1,73661-0,99891)/1,73661) beneath average. Associates' productivity distinguishes from Assistants' only through 0,14167 articles (0,99891-0,85724) Surprisingly the University of Chicago, which can be found on the third place in

the Business school ranking, makes up for the second last rank with 38,58% ((1,73661-1,06667)/1,73661)) beneath average productivity.

7.3.3 Full Professors

In order to make the comparison complete another analysis will be made upon the Business school ranking for the full Professors' productivity. As one can directly see the margin of articles published per person and year is very broad. On the first place stands Columbia University with 3.07577 articles while the last rank is taken by Emory University who's Professors only publish 0.52157 articles per person and year. Columbia's professors therefore publish 5,9 times more articles than Emory University and compared to average this constitutes a higher productivity of 85,43% ((3.07577-1.6587)/1.6587). While Emory took the rank of 16 for Assistants' and 14 for Associates' productivity, it's professors publish 68,56% ((1.6587-0,52157)/1,6587) less than average. Duke University can be found on the second rank and already distinguishes itself from Columbia University with a decline in productivity of 14,36% ((3,07577-2,63395)/3,07577).

	BS_Rank	University	AVG_Numbe~1n	AVG_Numbe~2n	AVG_Numbe~3n
1	10	Columbia University	1.7847118	2.5571429	3.0757668
2	12	Duke University	1.7783929	2.0829082	2.6339527
3	4	MIT	1.8761905	1.3051587	2.3607167
4	7	University of California - Berkeley	1.4481905	1.5349206	2.1265201
5	18	University of North Carolina - Chapel Hill	1.6240575	1.1946849	2.0181818
6	13	New York University	1.3159061	1.6528439	1.8140076
7	5	Northwestern University	2.1615079	2.2516147	1.7965772
8	6	Stanford University	1.8801242	2.592507	1.6712401
9	15	University of California - Los Angeles	2.0462885	1.4884891	1.6531995
10	16	Cornell University	2.0195862	1.07625	1.5283587
11	2	University of Pennsylvania	1.4726307	1.992417	1.4911091
12	1	Harvard University	.91547619	1.833547	1.4209854
13	17	University of Texas - Austin	1.7094322	1.4633117	1.3867045
14	3	University of Chicago	1.6015175	1.0666667	1.3808712
15	19	Carnegie Mellon University	1.178836	1.4827098	1.3347877
16	9	Yale University	1.8017857	1.71875	1.3314815
17	11	University of Michigan	1.4571746	1.5342262	1.1946659
18	14	University of Virginia	1.5	1.3789683	1.1623575
19	8	Dartmouth College	.85724461	.99891324	.99097888
20	20	Emory University	1.4046703	1.4013889	.52156863

Table 4: Ranking of the universities according to their full Professors' productivity in their Business schools

An interesting fact to observe as well is that Columbia and Duke University both do not follow the average scheme of productivity. For both universities productivity increases with the career level while the average implies the lowest productivity for Assistants, an increase for Associates but a decrease again for full Professors whose productivity lies slightly above Assistants'. MIT follows on

the third place with an average productivity of 2,36071 articles per Professor and year which compared to average makes up for a higher productivity of 42,32% ((2.36071-1,6587)/1,6587). In MIT the Professors are the strongest publishers and distinguish themselves from Associates through almost 1 more article being released per year. Coming back to the last ranked Emory University, it's Professors' productivity lies 68,56% ((1,6587-0,52157)/1,6587)) beneath average with only 0,52157 articles published per professor and year which is almost one article less than Assistants and Associates put in print. Productivity almost doubles to the second last ranked Dartmouth College with an average of 0,99098 articles and increase of 90% ((0.99098-0,52157)/0,52157). Dartmouth was able to improve a little compared to the Assistants' and Associates' ranking for which in both cases it took the last place. Important to mention is that Associates' productivity almost equals Professors' which are both higher than Assistants'. In the following a similar analysis will be done regarding the patterns of quality-adjusted productivity in the Business schools and whether there is a connection to the Top 20 ranking.

7.4 Quality-adjusted productivity

7.4.1 Assistant professors

	BS_Rank	University	AVGQL_Num~1n	AVGQL_Num~2n	AVGQL_Num~3n
1	11	University of Michigan	.94089744	.76299603	.4895272
2	2	University of Pennsylvania	.86544402	.99152692	.65907914
3	18	University of North Carolina - Chapel Hill	.86222718	.76445406	.86623377
4	16	Cornell University	.76791383	.565	.70351008
5	6	Stanford University	.75992063	.9122549	.38213738
6	17	University of Texas - Austin	.71295788	.6190704	.41202857
7	12	Duke University	.70583333	.63137755	.60674588
8	3	University of Chicago	.69440084	.61666667	.42954545
9	13	New York University	.69295635	1.2583053	.8066358
10	14	University of Virginia	.67857143	.88994709	.65036325
11	15	University of California - Los Angeles	.63872549	.24905303	.39861673
12	9	Yale University	.61645022	.5	.41353276
13	8	Dartmouth College	.6045211	.84796176	.66677469
14	4	MIT	.58214286	.48029101	.79753594
15	7	University of California - Berkeley	.56149206	.68461538	.57309469
16	10	Columbia University	.55830201	.85034014	.58834485
17	5	Northwestern University	.50525321	.52911877	.37735351
18	19	Carnegie Mellon University	.45912698	.54591837	.44593596
19	1	Harvard University	.43031746	.74561966	.58840608
20	20	Emory University	.41868132	.75	.22941176

Table 5: Ranking of the universities according to their Assistants' quality-adjusted productivity in their Business

On the first rank regarding quality-adjusted productivity of Assistant professors one can find the University of Michigan with 0,940897 articles. It lies 34,63% ((0,940897-0,698865)/0,698865) above average and 0,075453 articles ahead of the second ranked University of Pennsylvania. Furthermore it is interesting to observe that for the University of Michigan quality-adjusted productivity continually decreases from Assistant to full Professor. This does not match the pattern of average quality-adjusted productivity, identifying Associate professors as the strongest performers. The University of Pennsylvania on the other hand perfectly illustrates this pattern which takes the second rank in the Top 20 Business school ranking, as well as it's Assistant professors' quality-adjusted productivity can be found to be the second strongest with 23,69% ((0,86444-0,698865)/0,698865) above average. The third place is taken by the University of North Carolina that only makes up for the 18th rank in *U.S. News and World Report's* ranking. It's Assistant professors' quality-adjusted productivity is almost the same as for the University of Pennsylvania with only 0,003224 articles behind. This can be interpreted as remarkable result when taking into account that their ranks in the Top 20 ranking are very divergent. Emory University was already ranked last for it's Professors' productivity and can now again be found on the last place with 0,418681 articles, lying 40,09% ((0,698865-0,418681)/0,698865) below average quality-adjusted productivity.

7.4.2 Associate professors

	BS_Rank	University	AVGQL_Num~1n	AVGQL_Num~2n	AVGQL_Num~3n
1	13	New York University	.69295635	1.2583053	.8066358
2	2	University of Pennsylvania	.86544402	.99152692	.65907914
3	6	Stanford University	.75992063	.9122549	.38213738
4	14	University of Virginia	.67857143	.88994709	.65036325
5	10	Columbia University	.55830201	.85034014	.58834485
6	8	Dartmouth College	.6045211	.84796176	.66677469
7	18	University of North Carolina - Chapel Hill	.86222718	.76445406	.86623377
8	11	University of Michigan	.94089744	.76299603	.4895272
9	20	Emory University	.41868132	.75	.22941176
10	1	Harvard University	.43031746	.74561966	.58840608
11	7	University of California - Berkeley	.56149206	.68461538	.57309469
12	12	Duke University	.70583333	.63137755	.60674588
13	17	University of Texas - Austin	.71295788	.6190704	.41202857
14	3	University of Chicago	.69440084	.61666667	.42954545
15	16	Cornell University	.76791383	.565	.70351008
16	19	Carnegie Mellon University	.45912698	.54591837	.44593596
17	5	Northwestern University	.50525321	.52911877	.37735351
18	9	Yale University	.61645022	.5	.41353276
19	4	MIT	.58214286	.48029101	.79753594
20	15	University of California - Los Angeles	.63872549	.24905303	.39861673

Table 6: Ranking of the universities according to their Associates' quality-adjusted productivity in their Business schools

New York University leads the rank with a quality-adjusted productivity of 1,258305 articles published in the Top 50 Business journals per person and year. This quality-adjusted productivity can be identified to be pretty strong as it lies 68,92% ((1,258305-0,744912)/0,744912) above average and 26,91% ((1,258305-0,9915269)/0,9915269) above the second ranked University of Pennsylvania. The University of Pennsylvania can again be found on the second place regarding the quality-adjusted productivity of it's Associate professors. While it did not score very well in the productivity-rankings (taking the ranks 13, 5 and 11 respectively), it does for quality-adjusted productivity. Especially Assistants' and Associates' quality-adjusted productivity is pretty strong with 0,266778 articles behind New York University and 33,11% ((0,991527-0,744912)/ 0,744912) above average. It has been outlined earlier in this thesis that research quality of the Business Schools is taken into account for their rankings. The good scores regarding quality-adjusted productivity for the University of Pennsylvania can be interpreted as affirmation that highly qualitative articles do have an impact on the Business School rankings and are given more weight than the bare number of articles. Stanford University takes the third rank with 0,079272 articles less than the University of Pennsylvania. While it has better performed in the productivity ranking, in the current case it still lies 22,46% ((0,912255-0,744912)/ 0,744912) above average. On the last rank of the present ranking one can find the University of California at L.A. with only 0,249053 articles per year and Associate professor. This lies 66,57% ((0,744912-0,249053)/ 0,744912) below average and constitutes the worst output so far. When comparing it to the second last ranked MIT, the number of articles in the Top 50 Business journals almost doubles with 0,249053 representing more than 50% (0,249053/0,480291) of MIT's publications.

7.4.3 Professors

	BS_Rank	University	AVGQL_Num~1n	AVGQL_Num~2n	AVGQL_Num~3n
1	18	University of North Carolina - Chapel Hill	.86222718	.76445406	.86623377
2	13	New York University	.69295635	1.2583053	.8066358
3	4	MIT	.58214286	.48029101	.79753594
4	16	Cornell University	.76791383	.565	.70351008
5	8	Dartmouth College	.6045211	.84796176	.66677469
6	2	University of Pennsylvania	.86544402	.99152692	.65907914
7	14	University of Virginia	.67857143	.88994709	.65036325
8	12	Duke University	.70583333	.63137755	.60674588
9	1	Harvard University	.43031746	.74561966	.58840608
10	10	Columbia University	.55830201	.85034014	.58834485
11	7	University of California - Berkeley	.56149206	.68461538	.57309469
12	11	University of Michigan	.94089744	.76299603	.4895272
13	19	Carnegie Mellon University	.45912698	.54591837	.44593596
14	3	University of Chicago	.69440084	.61666667	.42954545
15	9	Yale University	.61645022	.5	.41353276
16	17	University of Texas - Austin	.71295788	.6190704	.41202857
17	15	University of California - Los Angeles	.63872549	.24905303	.39861673
18	6	Stanford University	.75992063	.9122549	.38213738
19	5	Northwestern University	.50525321	.52911877	.37735351
20	20	Emory University	.41868132	.75	.22941176

Table 7: Ranking of the universities according to their full Professors' quality-adjusted productivity in their Business school

With the first ranked University of North Carolina and an average quality-adjusted productivity of 0,866234 articles and the last ranked Emory University with 0,229412, the number of publications in the Top 50 Business journals more than triples (0,866234/0,229412). Surprisingly the University of North Carolina can only be found on the 18th rank in the Top 20 Business School ranking, while it's Professors' quality-adjusted productivity lies 55,78% ((0,866234-0,556058)/0,556058)) above average. Emory University on the other hand differentiates itself from the average with almost the same ratio but in a negative way. It's quality-adjusted productivity can therefore be found to be 58,74% ((0,556058-0,229412)/0,556058) lower than average. As it is already the third time that Emory takes the last rank in the productivity and quality-adjusted productivity rankings, again an assumption can be made that this serves as a reason for it's last rank in the Top 20 ranking as well. On the second rank one can find the New York University that already scored the first place for Associates' quality-adjusted productivity. It lies 0,059598 articles behind the University of North Carolina and 45,06% ((0,8066358-0,556058)/0,556058) above average while being ranked on the 13th place in the Top 20 Business School ranking. MIT follows on the third rank and is only 0,009 articles behind New York University. Although the difference in full Professors' quality-adjusted productivity

is small, MIT can be found on the fourth rank in U.*S. News and World Report's* Top 20 Business School ranking being nine ranks ahead of New York University.

Having now discussed the positions of the Business Schools according to their Assistants', Associates' and full Professors' productivity and quality-adjusted productivity, the last section of the results follows, giving insights into the influence of tenure with respect to universities' status-positions.

7.5 Statistical significance - Pairwise correlation

	BS_Rank	AVG_Nu~1	AVG_Nu~2	AVG_Nu~3	AVGQL_~1	AVGQL_~2	AVGQL_~3
BS_Rank	1.0000						
AVG_Number~1	0.0542	1.0000					
AVG_Number~2	-0.1423*	0.2275*	1.0000				
AVG_Number~3	-0.0333	0.3319*	0.4212*	1.0000			
AVGQL_Numb~1	0.0122	0.3461*	0.0195	0.0086	1.0000		
AVGQL_Numb~2	-0.0428	-0.0694	0.4659*	0.0246	0.3814*	1.0000	
AVGQL_Numb~3	0.0050	0.1071	0.1658*	0.4657*	0.3717*	0.4004*	1.0000

Table 8: Pairwise correlation between the rank of the Business schools and productivity and quality-adjusted productivity of Assistants, Associates and Professors

In order to evaluate the former presented discussion about the impact of Assistants', Associates' and Professors' productivity and quality-adjusted productivity on the rank of the Business schools in the Top 20 ranking, a pairwise correlation was conducted. The analysis therefore shows a weak, but significant relationship between the ranks of the Business schools and the average productivity of Associate professors. The negative relationship depicts that with a higher number of published articles per Associate professor, the value regarding the rank of the university falls. It is important to understand that a lower value means a better position in the ranking. Harvard Business school can be given as an example, being ranked first in *U.S. News and World Report's* ranking. The value of the first place is one and therefore the lowest, but at the same time the rank depicts the best one can achieve. This means that with more articles published per Associate professor per year, the better the rank of the Business school will be. As a possible explanation of Associates' impact on their Business schools' rank could lie within their intermediate position between Assistants and full Professors. With Assistants being still very new in the field and not having as much opportunities for publications as Associates, one can expect their impact on universities' success as rather low. Full Professors on the

other hand must already have been granted tenure and as it has been shown before, their productivity decreases. The highest productivity could therefore be shown for Associate professors, which might be the reason for it's impact on the Business schools' rank. As another explanation Associate professors' motivation and strive for tenure can be given, as many will not have been granted it yet. Therefore they publish more articles than Assistants and full Professors and due to the high amount of publications, their research is strongly taken into account for the Business school rankings.

As Associates' productivity was the only variable showing a significant relationship with the rank of the Business school, neither Assistants' and full professors productivity, nor their and Associates' quality-adjusted productivity have a significant impact on the ranks of their Business schools.

7.6 The influence of tenure on productivity and quality-adjusted productivity

In order to explore the effects of the tenure grant and furthermore the status-position of the granting Business school on productivity and quality-adjusted productivity, the exact time and location had to be traced back. As already mentioned before the Business schools' status positions are reflected by their rank within the Top 100 Business School ranking by *Financial Times* as many professors held positions at universities outside of the U.S. and/or not present within the Top 20 ranking. Only through the assumption of professors identifying themselves with their Business schools and comparing each other to competing universities, the influence of tenure with respect to status on productivity and quality-adjusted productivity could be analysed. Therefore a look was taken at the specific group of professors who switched to another university and were granted tenure at the same time.

WasChangeUniversityTenure	Freq.	Percent	Cum.
0	184	34.98	34.98
1	63	11.98	46.96
N/A	279	53.04	100.00
Total	526	100.00	

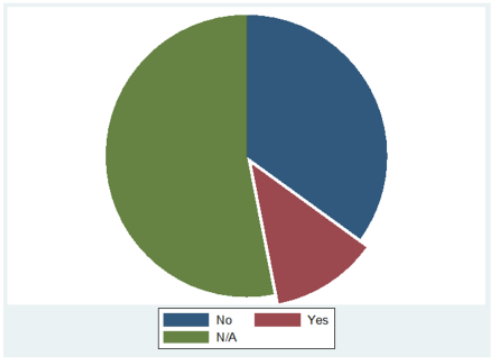


Figure 4: Shares of tenured professors with or without switch of the university

In a next step they were identified as *up-* or *downgraders*, engaging in either down- or upward comparison with their former Business school. Important to mention at this point is the fact that the former presented productivity, allocated to different positions does not equal the current analysis due to the tenure grant not necessarily coming with the promotion to Associate or full Professor. The granting procedures are highly distinctive between universities and decisions are taken for each person individually by university authorities. Within the current thesis the official stated tenure-granting procedures of the universities or, if divergent, from the departments, were taken into account for specifying the moment of the tenure grant.

From the 526 tenure-track faculty professors within the database, for around 130 persons no information about their tenure grant could be gathered. Approximately 140 objects at this moment in time were still Assistant professors, meaning that they have not been granted tenure yet. This leaves 247 professors, representing 46,96% of the objects in the database for whom the moment of the tenure grant could be traced back. From these another 74,49% did not switch university when they were granted tenure, meaning that the influence regarding the status-position of the Business school on quality-adjusted productivity could not be observed as a comparison between productivity/ quality-adjusted productivity before and after tenure was not possible. This leaves 25,51% of the 247 professors (signifying 11,98% of the whole dataset) who switched university and were granted tenure at their new place of employment.

Within the next step, values were assigned to the tenure-granting universities with the information of *Financial Times'* Top 100 Business school ranking and the switch of the professors was identified to be either an up-or downgrade.

WasChangePositive	Freq.	Percent	Cum.
0	34	6.46	6.46
1	29	5.51	11.98
N/A	463	88.02	100.00
Total	526	100.00	

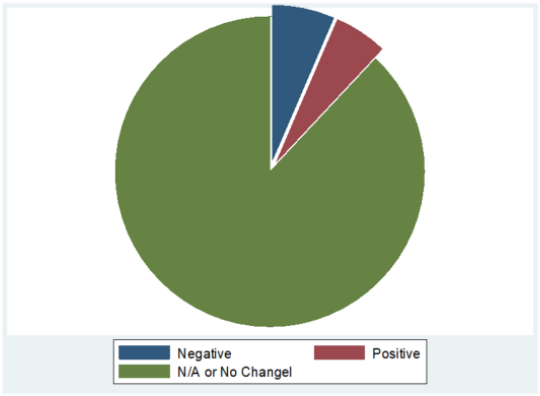


Figure 5: Share of up- and downgraders

As a whole 63 professors were observed in order to study the effect of tenure on productivity and quality-adjusted productivity with regard to the status-position of the tenure granting university.

They make up for the share of professors who switched universities and were granted tenure at the same time. 54% of them were therefore identified as downgraders, meaning that the Business school in which tenure was granted is ranked worse than their earlier place of employment. From the whole dataset this constitutes 6,46%. On the other side stand professors who were able to improve regarding the status-position of their home-university, also referred to as upgraders. They make up for 5,51% of the whole dataset, symbolizing 46% of the former described observed professors. In the following a look will be taken upon up- and downgraders and the influence of their tenure grant on productivity with respect to the status-positions of the granting universities. Furthermore t-tests were conducted in order to depict the significance of the findings.

7.6.1 Downgraders

As already mentioned above, downgraders have switched their place of employment to a university that is ranked worse within *Financial Times'* Top 100 worldwide Business school ranking than their former one. They were granted tenure at the new Business School and the deriving effect on their productivity and quality-adjusted productivity was observed. The pattern regarding downgraders' productivity compared to average productivity looks the following:

Productivity	Average # of articles per person and year
Downgraders before tenure	1,18
Downgraders after tenure	1,48

Productivity	Average # of articles per person and year
Average before tenure	1,14
Average after tenure	1,64

Table 9: Downgraders' and average productivity in articles per person and year

The first thing one should therefore take a look at is the productivity of downgraders before tenure being higher than average while the effect turns after tenure and average publishers outperform downgraders. Putting this into numbers downgraders publish 0,04 articles or 3,51% more before

tenure while after tenure 0,16 articles or 10,81% more articles are produced on average. The next interesting effect that can be observed is the increasing productivity after tenure for downgraders as well as the average. Calculating the relative effect per professor and year, it increases after the grant of tenure by 0,5 articles per year, making up for incredible 43,86% ((1,64-1,14)/1,14) on average. When now comparing these results to the productivity of downgraders, a similar pattern can be observed. Although the increase of 0,3 articles is not as strong as for the average results. With 25,42% increase in productivity for downgraders compared to 43,86% on average, downgraders increase their publication record less after the grant of tenure than does average.

In order to gain confirmation for the above presented results, a paired t-test was conducted. Therefore a look was taken at the productivity of downgraders through the comparison of the average number of articles written before and after tenure, showing the following results:

```
. ttest AVGArticlesBeforeChangeNegati == AVGArticlesAfterChangeNegativ

Paired t test
```

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
AVGA~ati	34	1.184964	.0922157	.5377052	.9973496	1.372578
AVG~ativ	34	1.489689	.1722615	1.004448	1.13922	1.840157
diff	34	-.3047249	.1619643	.9444062	-.6342439	.024794

```
    mean(diff) = mean(AVGArticlesB~ati - AVGArticles~ativ)       t =  -1.8814
Ho: mean(diff) = 0                                     degrees of freedom =       33

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.0344         Pr(|T| > |t|) = 0.0688          Pr(T > t) = 0.9656
```

Table 10: Paired t-test for the productivity of downgraders

With degrees of freedom being 33 and a p-value of 0,0688, latter one fails to reject the *Null Hypothesis* as it is larger than the commonly used level of significance of 0,05. Therefore no evidence for a significant deviation between the productivity of downgraders before and after their tenure-grant, as well as their switch of university could be found, meaning that there is no significant difference in the productivity before and after the tenure grant.

Now that the effects of the tenure grant and the status-position of the university on productivity have been outlined, the analysis will be taken to the qualitative dimension with the discussion of the effects on quality-adjusted productivity. The output of downgraders can therefore be described as follows:

Performance	Average # of articles in the Top 50 Business Journals per person and year
Downgraders before tenure	0,46
Downgraders after tenure	0,6

Performance	Average # of articles in the Top 50 Business Journals per person and year
Average before tenure	0,41
Average after tenure	0,56

Table 11: Downgraders' and average quality-adjusted productivity in articles per person and year

For quality-adjusted productivity the differences between downgraders and average are smaller, although this time downgraders publish more articles than average before, as well as after tenure. While for productivity average publishes more articles after tenure than downgraders, now downgraders outperform average in both cases. Before tenure they publish 0,05 articles or 12,1% more than average while after tenure the difference becomes a little smaller with 0,04 articles or 7,14%. As before, quality-adjusted productivity increases within both groups after tenure was granted. The increase in quality-adjusted productivity on average is therefore constituted by 0.15 articles standing for 36,59% ((0,56-0,41)/0,41) which is smaller than the former observed effect for productivity with an increase of 43,86%. When controlling for status-positions and therefore paying attention to the professors switching to a lower ranked university where also being granted tenure, quality-adjusted productivity increased by 0,14 articles or 30,43% ((0,6-0,46)/0,46). The raise is therefore approximately 6% smaller than for average. Interestingly the former presented increase in productivity of downgraders accounted for 25,42% and was therefore smaller than the increase in quality-adjusted productivity. This means that downgraders have a slightly larger increase in quality-adjusted productivity than in productivity after they were granted tenure and switched to a university of a worse rank. For average the opposite effect occurred: the increase in productivity makes up for 43,86% while average quality-adjusted productivity with an increase of 36,59% is approximately 7% smaller. When now taking a look at the paired t-test for downgraders, again the *Null Hypothesis* could not be rejected with a p-value of 0,1266, being larger than 0,05. Quality-adjusted productivity after tenure therefore does not significantly differ from the number of articles written before tenure and an effect of the tenure grant on quality-adjusted productivity cannot be witnessed.

```
. ttest AVGQLArticlesBeforeChangeNeg == AVGQLArticlesAfterChangeNega

Paired t test
```

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
AVGQLA~g	34	.4572543	.0563699	.32869	.3425689	.5719396
AVGQL~ga	34	.5969377	.0934635	.5449814	.4067847	.7870908
diff	34	-.1396835	.0891217	.5196643	-.3210029	.041636

```
     mean(diff) = mean(AVGQLArticlesB~g - AVGQLArticles~ga)       t =  -1.5673
 Ho: mean(diff) = 0                                     degrees of freedom =       33

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.0633         Pr(|T| > |t|) = 0.1266          Pr(T > t) = 0.9367
```

Table 12: Paired t-test for the quality-adjusted productivity of downgraders

.

7.6.2 Upgraders

On the opposite side of downgraders stand upgraders who were able to improve regarding the status positions of their universities within the global Top 100 Business School ranking when being granted tenure. Their productivity patterns are again compared to the average, looking the following:

Productivity	Average # of articles per person and year
Upgraders before tenure	1,1
Upgraders after tenure	1,8

Productivity	Average # of articles per person and year
Average before tenure	1,14
Average after tenure	1,64

Table 13: Upgraders' and average productivity per person and year

The first important thing to mention here is that it is the first time that the size of output of the tenure-controlled group (in this case upgraders) before tenure is smaller than average. Upgraders before tenure therefore publish 1,1 articles which are 0,05 articles or 4,55% (0,05/1,1) less than average. Although after tenure they lie above average, with a 10,43% ((1,8-1,63)/1,63) higher publication rate. For the former discussed downgraders the opposite effect could be observed: they were stronger publishers than average before tenure but can be ranked behind average after tenure was granted. With

a number of 1,8 articles per person and year, upgraders after tenure can be identified as the strongest publishers

When now comparing the different productivity patterns of upgraders to average and downgraders, the same effect can be observed: productivity increases after tenure has been granted. The average productivity of professors has already been outlined in more detail above and shown an increase of 0,5 articles, accounting for 43,86%. Although the effect for upgraders with 0,7 articles is even stronger: productivity rises per 63,64% which is also the strongest development so far.

```
. ttest AVGArticlesBeforeChangePositi == AVGArticlesAfterChangePositiv

Paired t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
AVGA~iti |      29    1.098646    .1233058    .6640218     .846066    1.351227
AVG~itiv |      29      1.7952    .2748419    1.480069    1.232212    2.358188
---------+--------------------------------------------------------------------
    diff |      29   -.6965539    .2252742    1.213139   -1.158007   -.2351006
------------------------------------------------------------------------------
     mean(diff) = mean(AVGArticlesB~iti - AVGArticles~itiv)       t =  -3.0920
 Ho: mean(diff) = 0                                     degrees of freedom =       28

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.0022         Pr(|T| > |t|) = 0.0045          Pr(T > t) = 0.9978
```

Table 14: Paired t-test for the productivity of upgraders

For the paired t-test the degrees of freedom now account for 28 and have therefore declined a little, compared to the former presented results for downgraders. The p-value is smaller than the assigned level of significance of 0,05 and the *Null Hypothesis* is rejected, stating that there is no change in productivity before and after tenure. Productivity can therefore be identified to increase significantly after tenure has been granted.

Within the next step the qualitative dimension is taken into consideration, with quality-adjusted productivity patterns looking the following:

Performance	Average # of articles in the Top 50 Business Journals per person and year
Upgraders before tenure	0,36
Upgraders after tenure	0,51

Performance	Average # of articles in the Top 50 Business Journals per person and year
Average before tenure	0,41
Average after tenure	0,56

Table 23: Upgraders' and average quality-adjusted productivity per person and year

Upgraders' quality-adjusted productivity in both cases, before and after tenure lies below average: with 0,05 articles or 13.89% ((0,41-0,36)/0,36) before and also 0,05 articles or 9,8% ((0,56-0,51)/0,51) after tenure. Within the group of upgraders again an increase in quality-adjusted productivity of 0,15 articles can be observed. They make up for 41,67% constituting a fairly strong improvement. Compared to the increase of 36,59% on average, the enhancement of upgraders is stronger.

```
. ttest AVGQLArticlesBeforeChangePos == AVGQLArticlesAfterChangePosi

Paired t test
```

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
AVGQLA~s	29	.3558229	.062047	.3341332	.2287255	.4829204
AVGQLA~i	29	.5130366	.0858502	.4623177	.3371803	.6888928
diff	29	-.1572137	.0763101	.4109427	-.3135279	-.0008994

```
    mean(diff) = mean(AVGQLArticlesB~s - AVGQLArticlesA~i)       t =  -2.0602
Ho: mean(diff) = 0                                     degrees of freedom =       28

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.0244         Pr(|T| > |t|) = 0.0488          Pr(T > t) = 0.9756
```

Table 31: Paired t-test for the quality-adjusted productivity of upgraders

When again taking a look at the conducted t-test, the significance of the above presented results can be proven with a slightly lower p-value than 0,05. The *Null Hypothesis* is again rejected, showing that not only productivity, but also the quality-adjusted productivity increases after the grant of tenure.

8 Discussion

Within the previous section it has been shown that productivity increases in all observed cases after tenure was granted. This surprising result might lead to the conclusion that advocates of the American tenure-track system are right by defending it. Their arguments of secure employment and working conditions leading to higher motivation and increasing effort of the employees might be true. Furthermore it could be the case that through the grant of tenure collaborations with other researchers are facilitated as the tenure grant is a symbol of individual status as well. It can be interpreted as the official declaration of the university to keep a researcher until his retirement, which expresses a strong belief in the researchers' capabilities and marks him with a symbol of academic excellence. As outlined earlier in this thesis, symbolic capital and status in academia leads to increased interest in

collaborations with researchers and with more inter-collegial connections, the chances of productivity to increase are higher.

One might have noticed that after productivity and quality-adjusted productivity were controlled for tenure, the results changed in comparison to Assistants', Associates' and full Professors' publishing patterns, describing the average. Therefore it is important to repeat that tenure is not tied to the promotion to Associate or full Professor and the results take early, as well as late grants into account. This in sum leads to an increase in productivity for up-, as well as downgraders. The former presented results about the average productivity of professors on different levels within their careers, reflecting an increase from level 1 to 2 and a decrease from 2 to 3 are therefore not contradicting.

With Associate professors being the strongest publishers and some Business schools granting tenure already at this particular career level, it is not surprising that productivity can increase after tenure was granted. Important to notice is that tenure can already be gained with the promotion to Associate professor, as well as after some years, constituted by the position *Associate professor with tenure.*

While the increase in productivity and quality-adjusted productivity can therefore be explained with the grant of tenure, the comparatively low increase in case of downgraders' productivity might have something to do with the status-position of the university. Although the motivations for the switch to another university cannot be proven, assumptions can be made. Reasons for switching the place of employment not only for academics might be unsatisfactory working conditions (such as working hours, salary and benefits), an unpleasant environment (collegiality, location of the working place) or poor career options. Status could therefore influence career decisions as well, with tenure holding features of working conditions, career options and status. While conditions refer to a higher salary once tenure was granted, it constitutes a large step in one's career and furthermore is a symbol of status. One of this features might have led professors to start at a new university and in the now discussed case they decided to downgrade. As professors' prestige is tied to their university's and with a switch to a lower ranked university both of them decrease, the motivator to switch university in the first place and tolerate a lower status-position might lie within the possibility of being granted tenure. While ones might not want to wait for their tenure grant any longer and therefore switch university, for others it might constitute the last chance of being it granted. Due to tenure not being granted to everybody and in most cases having a strict timeline after which at some point a decision has to be

taken, there might be the risk of not being granted at all. Taking this into account, especially in latter cases the impact on professors' motivation might be detrimental. Still within the current thesis it could be shown that also for downgraders productivity and quality-adjusted productivity increase after tenure was granted. The negative effects of downgrading might therefore be offset by the positivity of having gained tenure, at the same time diminishing the effect through a smaller increase than for upgraders. When now comparing the relative increases in productivity and quality-adjusted productivity to average, the following table gives a short overview over the observed effects:

	Downgraders	Average
Productivity	25,42%	43,86%
Performance	30,43%	36,59%

Table 17: Increases in productivity and quality-adjusted productivity after tenure-grant for downgraders and on average

In summary there are four important conclusions one can take away:

1. Productivity as well as quality-adjusted productivity increase after tenure was granted.
2. The increases in productivity as well as quality-adjusted productivity are smaller for downgraders than for average.
3. The increase in productivity is larger than the increase in quality-adjusted productivity after the tenure grant without consideration of the status positions.
4. The increase in quality-adjusted productivity is larger than the increase in productivity after the tenure grant for downgraders.

Interestingly it can be stated that the productivity, as well as quality-adjusted productivity of downgraders lie below average. The increase in productivity on average is smaller than average quality-adjusted productivity while the increase in quality-adjusted productivity for downgraders is bigger than for productivity. Downgraders therefore publish more highly qualitative articles after being granted tenure whereas the average tends to publish a higher amount. The reason for downgraders to engage more in high-quality publications could be found within their need to prove themselves as they have now a lower status position after their university switch. One can assume that

publishing in higher-prestige journals needs increased effort due to them also being symbols of status and high quality. Therefore downgraders might want to publish in them in order to take advantage of the journals' reputation and boost their own status as well.

The results speak for tenure being a very important motivational factor in a positive way so far. As both for down- and upgraders productivity increased with the grant of tenure, one can suspect that economic security and freedom of speech have the impact they are advocated for: satisfied professors, putting more effort into their work and therefore publishing more articles. Attention must also be paid to the strength of the effect. When ranking the different groups according to their increase in productivity, the following scheme can be observed:

1. Upgraders: 63,64%
2. Average without controlling for status: 43,86%
3. Downgraders: 25,42%

These results show that the status position of the university does have an impact on researchers' productivity. Upgraders therefore might be over enthusiastic due to having been able to improve their status position and being granted tenure. With gaining a long-life secure academic position and at the same time improving status, it seems as if this would lead to a long-term motivation for publishing more articles. Another explanation might be the need to prove that one is worth the tenure grant by writing more articles than average. Important to mention here is that this also has positive effects for the universities or Business schools themselves. If the tenure grant in general leads to an increase in productivity, the advocates of the system might be right by underlining it's positive effects. Another implication deriving from these results for academics as well as other organizations might be that it makes sense to hire applicants from less prestigious institutions as the have gained experience in the sector and might be motivated by the upgrade in status they receive through the new place of employment.

The former presented table, showing the increases before and after tenure for downgraders and average (Table 17) shall now be completed with the data about upgraders in order to give a better overview over all effects:

	Downgraders	Average	Upgraders
Productivity	25,42%	43,86%	63,64%
Performance	30,43%	36,59%	41,67%

Table 32: Increases in productivity and quality-adjusted productivity after tenure-grant and switch of university for downgraders, average and upgraders

Interesting to observe is that the increases in productivity are indeed much stronger for upgraders than for downgraders. The enhancement of productivity is far stronger than for quality-adjusted productivity but in overall tenure had a positive effect on both dimensions with productivity and upgraders showing the strongest effects. As the weakest performers downgraders in productivity can be identified, at the same time being the only group of professors that shows a stronger increase in quality-adjusted productivity than in productivity.

9 Conclusion

The main objective of this thesis is to analyse the influence of tenure on quality-adjusted productivity with respect to the status-position of the university within the Top 20 Business schools in the U.S.. Firstly, the American tenure-track system was critically evaluated. Within the next section, the literature review was presented, where the reader was introduced to the theories, explaining the impact individuals' aim for prestige can have on their quality-adjusted productivity. Human Capital theory therefore puts individuals and their output in the centre of organizational success, within the current thesis being depicted by professors and their impact on their universities' ranking. Symbolic Capital theory on the other hand argues that individuals want to profit from their symbolic capital, which is constituted by the prestige of the universities the professors work at or the journals in which their articles are published. Social identity theory claims that individuals have a tendency to identify themselves with their institutions and project the institutional reputation onto their own. For that reason they will do the best they can in order to succeed and enhance their own and institutional status. In connection with social comparison theory, this leads to competitive situations on the individual

level becoming organizational, therefore depicting the fight of Business schools or universities for the best place in official rankings.

Within the next part of this thesis the research question was developed the created database presented and the rankings used described. The collected data was therefore outlined in more detail, methodologies were explained and descriptive statistics presented. The penultimate chapter occupied itself with the presentation of the results, leading to the last part of discussing the effects of tenure on productivity and concluding the final findings.

Although this chapter should close with answering the research question of how the tenure-grant affects productivity of professors with respect to the status-position of the university in the Top 20 Business schools in the U.S., it cannot easily be answered. The influence of the Business schools' status positions was accounted for through the identification of up- and downgraders in the moment of professors' tenure-grant. It was assumed that the productivity and quality-adjusted productivity would be different for the two observed groups, therefore showing that the status-position has an impact. Although a surprising effect could be observed, showing an increase in productivity, as well as quality-adjusted productivity for both groups. The tenure grant therefore has a positive impact on productivity and quality-adjusted productivity, albeit the effect being stronger for upgraders. This shows that status-positions of institutions do influence individuals' behaviour and output, with improvement of one's reputation having a stronger effect.

This thesis has shown that motivation and productivity of individuals are influenced by their organizations' status. Institutions should therefore be aware of their status-positions and compare themselves to others in order to govern their employment decisions and profit from them. Lower status organizations might therefore be able to compensate for their moderate reputation through giving their employees chances of promotions, while higher status organizations can easily attract new employees but should work on keeping their positions.

10 Limitations

Although this thesis provides important insights into the influence of the American tenure-track system with respect to Business schools' status-positions onto professors' productivity, some limitations regarding validity of the results have to be outlined.

As the first and foremost limitation the imperfect information within the database has to be mentioned. The most important sources were the CVs of the professors with only information being disclosed they wished of. Furthermore CVs were sometimes not available and the data was therefore collected from other sources, i.e. profiles of the professors in databases for scientific articles. Due to the information being not publicly released or stated the database might lack information about specific points in the careers and publication records of the professors.

Secondly, only refereed journal articles were taken into account, leaving books, book-chapters, case-studies and articles in the media out of this thesis. Refereed articles were therefore identified to depict the most important output of professors in terms of research, at the same time having an impact on their personal prestige levels. Although books and case-studies can also be identified as important products of professors' work due to their educational importance. For future research a look might therefore be taken at the influence of the tenure-track system on education, taking the number of books and chapters or case studies into account.

As the third limitation one can identify the sample as biased due to it not being picked randomly, but only professors of the Top 20 Business schools in the U.S. within the tenure-track system being taken into account. The sample was defined due to the assumption of prestige being of higher importance within the Top universities and the tenure-track system being strongly present in the U.S.. For further studies it would be interesting to do a similar study in middle-class universities or Business schools in order to have a basis for further comparisons of the current findings. As it would go beyond the scope of the current thesis, another suggestion would be the study of similar systems in other countries that are comparable to the award of tenure (i.e. permanent contracts of professors) and their influence on productivity.

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12 Appendices

Appendix 1: *U.S. News and World Report's* ranking of the universities with their Top 20 Business Schools in the U.S.

Observed University	Observed Business School	Observed Departments
Harvard University	Harvard Business School	Strategy Organizational Behaviour
University of Pennsylvania	The Wharton School	Management
University of Chicago	Booth School of Business	Strategic Management Management Science Entrepreneurship
Massachusetts Institute of Technology	Sloan School of Management	Technological Innovation, Entrepreneurship and Strategic Management Global Economics and Management
Northwestern University	Kellogg School of Management	Strategy Management and Organizations
Stanford University	Graduate School of Business	Organizational Behaviour
University of California at Berkeley	Haas School of Business	Management of Organizations Business and Public Policy
Dartmouth College	Tuck School of Business	Strategy and Management Entrepreneurship Operations and Management Science
Yale University	Yale School of Management	Management Organizational Behaviour Operations Management
Columbia University	Columbia Business School	Management
University of Michigan	Ross School of Business	Strategy Management and Organizations

Duke University	Fuqua School of Business	Strategy Management and Organizations
New York University	Stern School of Business	Management and Organizations
University of Virginia	Darden School of Business	Strategy, Ethics and Entrepreneurship Leadership and Organizational Behaviour
University of California at Los Angeles	Anderson School of Management	Strategy Management and Organizations
Cornell University	Johnson Graduate School of Management	Management Management and Organizations
University of Texas at Austin	McCombs School of Business	Management Business, Government and Society
University of North Carolina	Kenan-Flagler Business School	Strategy and Entrepreneurship Organizational Behaviour
Carnegie Mellon University	Tepper School of Business	Strategy Entrepreneurship Organizational Behaviour and Theory
Emory University	Goizueta Business School	Organization and Management

Appendix 2: *Financial Times'* ranking of the Top 100 Business Schools in the world

	Top 100 Business Schools in the world
1	Insead
2	Stanford Graduate School of Business
3	University of Pennsylvania: Wharton
4	Harvard Business School
5	University of Cambridge: Judge
6	London Business School
7	Columbia Business School
8	IE Business School
9	University of Chicago: Booth

10	Iese Business School
11	Ceibs
12	Northwestern University: Kellogg
13	MIT: Sloan
14	University of California at Berkeley: Haas
15	HKUST Business School
16	Yale School of Management
17	Esade Business School
18	Dartmouth College: Tuck
19	New York University: Stern
20	HEC Paris
21	IMD
22	SDA Bocconi
23	University of Michigan: Ross
24	Duke University: Fuqua
25	Nanyang Business School
26	National University of Singapore Business School
27	Cornell University: Johnson
28	Indian School of Business
29	Indian Institute of Management Ahmedabad
30	Alliance Manchester Business School
31	Rotterdam School of Management, Erasmus University
32	UCLA: Anderson
33	University of Oxford: Saïd
34	Shanghai Jiao Tong University: Antai
35	University of Virginia: Darden
36	CUHK Business School
37	City University: Cass
38	Carnegie Mellon: Tepper
39	University of Hong Kong
40	Georgetown University: McDonough
41	University of Washington: Foster
42	Lancaster University Management School
43	University of North Carolina: Kenan-Flagler
44	Warwick Business School
45	Imperial College Business School
46	University of Texas at Austin: McCombs
47	Indiana University: Kelley
48	University of Southern California: Marshall
49	Macquarie Graduate School of Management

50	Indian Institute of Management Bangalore
51	Emory University: Goizueta
52	University of Maryland: Smith
53	Cranfield School of Management
54	Mannheim Business School
55	Sungkyunkwan University GSB
56	AGSM at UNSW Business School
57	Arizona State University: Carey
58	Michigan State University: Broad
59	University of St Gallen
60	University of Notre Dame: Mendoza
61	Georgia Institute of Technology: Scheller
62	University of California at Irvine: Merage
63	Ohio State University: Fisher
64	Rice University: Jones
65	Brigham Young University: Marriott
66	University of Toronto: Rotman
67	Wisconsin School of Business
68	Washington University: Olin
69	Purdue University: Krannert
70	Rutgers Business School
71	The Lisbon MBA
72	ESMT Berlin
73	University College Dublin: Smurfit
74	Edhec Business School
75	Durham University Business School
76	Melbourne Business School
77	University of South Carolina: Moore
78	University of Rochester: Simon
79	Vanderbilt University: Owen
80	University of Strathclyde Business School
81	Boston College: Carroll
82	Boston University: Questrom
83	University of Illinois at Urbana-Champaign
84	University of Iowa: Tippie
85	University of Pittsburgh: Katz
86	George Washington University
87	Babson College: Olin
88	University of Minnesota: Carlson
89	Incae Business School
90	Pennsylvania State University: Smeal
91	University of Edinburgh Business School
92	Grenoble Ecole de Management
93	University of Texas at Dallas: Jindal

94	Western University: Ivey
95	Indian Institute of Management Calcutta
96	Temple University: Fox
97	Ipade Business School
98	Birmingham Business School
99	Vlerick Business School
100	Queen's University: Smith

Appendix 3: *Financial Times'* ranking of the Top 50 Business Journals

	Top 50 Business Journals
1	Academy of Management Journal
2	Academy of Management Review
3	Accounting, Organizations and Society
4	Administrative Science Quarterly
5	American Economic Review
6	Contemporary Accounting Research
7	Econometrica
8	Entrepreneurship Theory and Practice
9	Harvard Business Review
10	Human Relations
11	Human Resource Management
12	Information Systems Research
13	Journal of Accounting and Economics
14	Journal of Accounting Research
15	Journal of Applied Psychology
16	Journal of Business Ethics
17	Journal of Business Venturing
18	Journal of Consumer Psychology
19	Journal of Consumer Research
20	Journal of Finance
21	Journal of Financial and Quantitative Analysis
22	Journal of Financial Economics
23	Journal of International Business Studies
24	Journal of Management
25	Journal of Management Information Systems
26	Journal of Management Studies
27	Journal of Marketing
28	Journal of Marketing Research
29	Journal of Operations Management
30	Journal of Political Economy
31	Journal of the Academy of Marketing Science
32	Management Science
33	Manufacturing and Service Operations Management

34	Marketing Science
35	MIS Quarterly
36	Operations Research
37	Organization Science
38	Organization Studies
39	Organizational Behavior and Human Decision Processes
40	Production and Operations Management
41	Quarterly Journal of Economics
42	Research Policy
43	Review of Accounting Studies
44	Review of Economic Studies
45	Review of Finance
46	Review of Financial Studies
47	Sloan Management Review
48	Strategic Entrepreneurship Journal
49	Strategic Management Journal
50	The Accounting Review

Appendix 4: Shares of female and male professors in the dataset

Gender	Freq.	Percent	Cum.
f	161	30.61	30.61
m	365	69.39	100.00
Total	526	100.00	

Appendix 5: Shares of the universities and their Business schools based on the number of observed professors

University	Freq.	Percent	Cum.
Carnegie Mellon University	25	4.75	4.75
Columbia University	25	4.75	9.51
Cornell University	15	2.85	12.36
Dartmouth College	23	4.37	16.73
Duke University	24	4.56	21.29
Emory University	20	3.80	25.10
Harvard University	37	7.03	32.13
MIT	17	3.23	35.36
New York University	26	4.94	40.30
Northwestern University	45	8.56	48.86
Stanford University	26	4.94	53.80
University of California - Berkeley	27	5.13	58.94
University of California - Los Angeles	25	4.75	63.69
University of Chicago	10	1.90	65.59
University of Michigan	36	6.84	72.43
University of North Carolina	25	4.75	77.19
University of Pennsylvania	47	8.94	86.12
University of Texas - Austin	35	6.65	92.78
University of Virginia	20	3.80	96.58
Yale University	18	3.42	100.00
Total	526	100.00	

Appendix 6: Shares of departments over all universities with the number of professors observed

Department	Freq.	Percent	Cum.
Organization Management	20	3.80	3.80
Organizational Behavior and Theory	14	2.66	6.46
Strategy and Entrepreneurship	13	2.47	8.94
Business, Government and Society	16	3.04	11.98
Leadership and Organizational Behavior	8	1.52	13.50
Strategy, Ethics and Entrepreneurship	12	2.28	15.78
Operations Management	3	0.57	16.35
Organizational Behavior	26	4.94	21.29
Operations and Management Science	1	0.19	21.48
Strategy and Management	15	2.85	24.33
Business and Public Policy	11	2.09	26.43
Management of Organizations	16	3.04	29.47
Management and Organizations	108	20.53	50.00
Global Economics and Management	6	1.14	51.14
Technological Innovation, Entrpreneur..	11	2.09	53.23
Entrepreneurship	15	2.85	56.08
Management Science	1	0.19	56.27
Strategic Management	6	1.14	57.41
Management	94	17.87	75.29
Strategy	89	16.92	92.21
Orga. Behavior	41	7.79	100.00
Total	526	100.00	

Appendix 7: Shares of the represented positions within the dataset (4 professors excluded due to missing information about their current position)

Current Position_Position	Freq.	Percent	Cum.
1	131	25.10	25.10
2	109	20.88	45.98
3	282	54.02	100.00
Total	522	100.00	

Zusammenfassung

Die vorliegende Meisterarbeit hat es sich zur Aufgabe gemacht, den Einfluss der Gewährung von *tenure* in den Top 20 *Business Schools* in den U.S.A., unter Beachtung der Status-Positionen der Universitäten, zu untersuchen. Viele Wissenschaftler haben die Vor- und Nachteile des Amerikanischen *tenure-track* Systems analysiert, wobei eine Studie, die sowohl den Einfluss des *tenure-grant*, als auch der Statuspositionen auf die wissenschaftliche Produktivität misst, fehlt. Diese Masterarbeit schlägt deswegen vor, dass das Streben nach *tenure* gleichzeitig ein Streben nach Status darstellt und damit von der Statusposition der Universität abhängt. Zusätzlich zu diesem individuellen Ziel kommt das Streben nach Prestige seitens der Universitäten selbst, was durch die jährlich veröffentlichten Universitäts- und Business School-Rankings noch verstärkt wird. Diese stellen wichtige Entscheidungsgrundlagen für potentielle Studenten, als auch internationale Wissenschaftler dar, weswegen Prestige einen großen Einfluss auf den Erfolg und die Entwicklung von Universitäten hat. Status kann daher als wichtiger Motivationsfaktor identifiziert werden, da er nicht nur wissenschaftliche Produktivität, sondern weiters auch die Statuspositionen der Unis beeinflusst. Dabei wurden lediglich Lehrstühle in den Bereichen Strategie, Management und Organisationsverhalten betrachtet.

Produktivität wird mittels der Anzahl an veröffentlichten Artikeln gemessen, wobei diese von qualitätsbezogener Produktivität unterschieden wird. Letztere bezieht sich nur auf *Journals*, die Teil des Top 50 *Business Journal* Rankings von *Financial Times* sind. Die statistische Analyse der Ergebnisse hat gezeigt, dass beide Arten von Produktivität nach der Gewähr von *tenure* steigen, wobei der Effekt für Produktivität stärker ist. Daraus kann man schließen, dass eine niedrigere Statusposition der Universität teilweise einen negativen Einfluss auf die Leistung der Professoren hat, da die Produktivität zwar steigt, allerdings weniger als für Professoren an Universitäten von höherem Status. Die Datenerhebung hat zur Erstellung einer übersichtlichen Datenbank geführt, in der die verschiedenen Karrierestufen der Professoren in den Top 20 *Business Schools*, inklusive veröffentlichter Artikel, detailreich abgebildet wurden. Die Strukturen der untersuchten Lehrstühle können bis zum Jahr 2017 nachvollzogen werden, weshalb die Datenbank sowohl eine gute Basis für weitere Studien, als auch kontinuierliche Erweiterungen bietet.

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