

Vertical and Horizontal Mobility and Their Financial Effects Among Male and
Female German University Graduates

Inaugural-Dissertation
zur Erlangung des Doktorgrades der Sozialwissenschaftlichen Fakultät
der Ludwig-Maximilians-Universität München

vorgelegt von
Johannes Wieschke

2020

Erstgutachter/in: Prof. Dr. Josef Brüderl

Zweitgutachter/in: Prof. Dr. Martin Abraham

Tag der mündlichen Prüfung: 15.04.2020

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Deutsche Zusammenfassung

German Summary

In den letzten Jahren und Jahrzehnten hat das deutsche Bildungssystem tiefgreifende Änderungen erfahren. Dies betrifft zum einen die sogenannte Bildungsexpansion, durch die immer größere Teile der Bevölkerung immer höhere Abschlüsse erlangten, wodurch unter anderem die früher bestehenden großen Bildungsnachteile von Frauen stark abgebaut wurden beziehungsweise teilweise sogar verschwanden.

Ursachen waren eine strukturelle Nachfrage nach höher qualifizierten Arbeitskräften und der individuelle Wettbewerb darum, die eigene relative soziale Position bzw. die des eigenen Nachwuchses zu sichern. Durch das Statistische Bundesamt, das Ergebnisse aus dem Mikrozensus 2017 bereitstellt, stehen entsprechende Daten zur Verfügung:

Während die Änderungen im Bildungssektor keinen nennenswerten Einfluss auf die Zahl der Personen ohne Schulabschluss hatten – deren Anteil beträgt in allen Altersgruppen etwa 4 Prozent –, hatten sie im Durchschnitt dennoch ein höheres Bildungsniveau der Gesamtbevölkerung zur Folge. Unter den 1952 oder früher Geborenen erlangten mehr als die Hälfte einen Bildungsabschluss der unteren Sekundarstufe und etwa 18 Prozent die Hochschulreife. Unter den zwischen 1967 und 1972 Geborenen änderten sich diese Zahlen auf 23 bzw. 34 Prozent, und für die Geburtskohorte 1987–1992 hatten sich die Verhältnisse im Vergleich zu einigen Jahrzehnten zuvor umgekehrt: In dieser Altersgruppe verfügen nur 16 Prozent über einen Bildungsabschluss der unteren Sekundarstufe und erstmals mehr als 50 Prozent über eine Hochschulzugangsberechtigung.

Dies hatte auch Auswirkungen auf die Prävalenz von Hochschulabschlüssen, die in der ältesten Kohorte von etwa 13 Prozent und in der Geburtskohorte 1982–1987 von fast 30 Prozent erworben wurden. Interessanterweise wuchs der Anteil der Hochschulabsolventinnen und -absolventen allerdings langsamer als der Personen mit Hochschulzugangsberechtigung. Von den Letzteren erlangten in der ältesten Kohorte (Geburtsjahr 1952 oder früher) mehr als drei Viertel auch einen Hochschulabschluss. Diese Zahl reduzierte sich in den folgenden Kohorten zuerst signifikant und stabilisierte sich dann: Von denen, die zwischen 1962 und 1987 geboren wurden und die Hochschulreife erlangten, schlossen etwa 60 Prozent ein Studium ab.

In diesem Kontext kam es außerdem zu einigen interessanten Änderungen hinsichtlich des Merkmals Geschlecht: In der ältesten Kohorte absolvierten Männer mit geringerer Wahrscheinlichkeit als Frauen nur die untere Sekundarstufe, erlangten aber mit doppelt so hoher Wahrscheinlichkeit eine Hochschulzugangsberechtigung. Noch drastischer fallen die

Unterschiede bei Hochschulabschlüssen aus, die bei den 1952 und früher geborenen Personen 20,3 Prozent der Männer und 7,8 Prozent der Frauen innehaben.

In der Geburtskohorte 1987–1992 verfügen allerdings 19 Prozent der Männer und nur 13 Prozent der Frauen über einen Bildungsabschluss der unteren Sekundarstufe, und in der Kohorte 1982–1987 erhielten (bis zum Jahr 2017) 27 Prozent der Männer und 30 Prozent der Frauen einen Hochschulabschluss. Damit übertrifft das durchschnittliche Bildungsniveau von Frauen in den jüngeren Kohorten das der Männer, die in den ersten Jahrzehnten der Bundesrepublik noch deutliche Bildungsvorteile hatten. Die ersten Kohorten ohne Nachteile für Frauen waren 1952–1957 (hinsichtlich Bildungsabschlüssen der unteren Sekundarstufe), 1972–1977 (Hochschulzugangsberechtigungen) und 1977–1982 (Hochschulabschlüsse).

Offen bleiben die Fragen, ob diese Vorteile für Frauen auch zu verschwindenden Nachteilen am oberen Ende des möglichen Bildungsstands führen werden, also in Bezug auf Doktor- und Professorentitel, und ob diese Vorteile zukünftig noch weiter wachsen werden. Das Verschwinden von Bildungsnachteilen ging bereits mit Änderungen auf dem Arbeitsmarkt einher: 1960 lag die Erwerbsquote von 25–49-jährigen Frauen in Deutschland bei etwa 45 Prozent, 1992 bei fast 70 Prozent. Für die männliche Bevölkerung gingen die jeweiligen Zahlen in diesem Zeitraum leicht zurück – vor allem unter den 25–34-Jährigen aufgrund von verlängerten Bildungsphasen –, blieben aber deutlich über denen für Frauen, sodass weiterhin signifikante Unterschiede bestanden. Bis 2013 nahm die Frauenerwerbsquote weiter zu, ging aber bei den Beschäftigten auch mit einer deutlichen Abnahme der durchschnittlichen Arbeitszeit einher. Da die Arbeitszeit von Frauen stärker zurückging als die von Männern, haben sich die Unterschiede zwischen *beschäftigten* Frauen und Männern in den letzten Jahrzehnten somit sogar vergrößert.

Die Bildungsexpansion hat somit weder im Bildungssystem noch auf dem Arbeitsmarkt zu perfekter Geschlechtergleichheit geführt. In diesem Zusammenhang ist Geschlechtersegregation von großer Bedeutung, und vertikale Mobilität wird durch zurückgehende Unterschiede beim Bildungsniveau und der Erwerbsbeteiligung zunehmend wichtiger: Hinsichtlich der Frage, *ob* Individuen arbeiten oder studieren, unterscheiden sich Männer und Frauen weniger stark als noch vor einigen Jahrzehnten. Persönliche Entscheidungen für bestimmte Studiengänge und Berufe summieren sich in Hochschulen und auf dem Arbeitsmarkt aber immer noch zu signifikanten Geschlechterunterschieden auf, die auch zu Unterschieden in anderen Variablen wie dem Einkommen führen. Das Geschlecht wird daher in großen Teilen dieser Arbeit eine zentrale unabhängige Variable sein.

Zum anderen änderte sich durch die ab Ende der 90er Jahre wirksam werdende Bologna-Reform der institutionelle Rahmen an den europäischen Hochschulen. Die Einführung der neuen aufeinander aufbauenden Bachelor- und Masterabschlüsse, die in Deutschland größtenteils die bis dahin vorherrschenden Diplom- und Magisterabschlüsse ersetzten, führte zu einer neuen Art der auch vertikalen Differenzierung, durch die sich neue Ungleichheiten ergeben können. Vor der Reform wurden Abschlüsse primär nach der Art der besuchten Hochschule hierarchisiert. Fachhochschuldiplome waren und sind mitunter nicht ausreichend für Stellen, für die stattdessen Universitätsdiplome vorausgesetzt werden. Magister- und Diplomabschlüsse wurden nicht auf diese Weise über- und untereinandergestellt. Dagegen sind die neuen Bachelor- und Masterabschlüsse stärker mit vertikaler Mobilität verknüpft, da mindestens ein Bachelorabschluss (oder ein äquivalenter Abschluss) vorausgesetzt wird, um ein Masterstudium beginnen zu können. Gleichmaßen wird auch für verschiedene Tätigkeiten ein Masterabschluss benötigt, während ein Bachelorabschluss nicht ausreichend ist, was ebenfalls die hierarchische Struktur des neuen Systems hervorhebt.

Da diese Änderungen noch relativ jungen Ursprungs sind, können langfristige Auswirkungen auf die davon betroffenen Personen noch nicht genau abgeschätzt werden, erste Ergebnisse stehen allerdings bereits zur Verfügung. Für Forschungszwecke sind Hochschulabsolventen daher eine besonders interessante Gruppe, zum einen weil sie in Deutschland heute einen wesentlich größeren Teil der berufstätigen Bevölkerung ausmachen als in früheren Jahrzehnten – vor allem unter jungen Menschen –, zum anderen wegen der jüngsten Änderungen, denen das Hochschulsystem und die Absolventinnen und Absolventen in den vergangenen Jahren unterworfen waren. Die ersten Jahre auf dem Arbeitsmarkt sind zudem von wichtigen Entscheidungen gekennzeichnet, die sich auf Löhne und Mobilität auswirken, sodass Effekte in dieser Phase vermutlich besonders ausgeprägt sind. Diese Arbeit konzentriert sich daher auf Universitätsabsolventinnen und -absolventen in den ersten Jahren nach ihrem Abschluss. In diesem Kontext sind nicht nur Situationen zu bestimmten Zeitpunkten von Bedeutung, sondern auch Entwicklungen und ihre Determinanten und Auswirkungen, sodass Karriereentwicklungen nachvollzogen werden können. Daher werden verschiedene Mobilitätstypen untersucht und in einen internationalen Kontext gestellt:

Deutschland, das gemäß der Theorie der Spielarten des Kapitalismus (*varieties of capitalism*) als koordinierte Ökonomie klassifiziert wird, ist im internationalen Vergleich nicht nur durch einen verhältnismäßig starken Beschäftigungsschutz, sondern auch durch eine relativ starke Verbindung von Bildung und Beruf gekennzeichnet. Dies betrifft etwa die verschiedenen Fächer, die an Hochschulen studiert werden können und in Deutschland oft großen Einfluss

darauf ausüben, für welche Tätigkeiten Absolventinnen und Absolventen als qualifiziert erachtet werden. Für den Fall sich ändernder Rahmenbedingungen im Bildungssystem ist daher auch mit Auswirkungen auf den Arbeitsmarkt zu rechnen.

Weitere womöglich wichtige institutionelle Unterschiede existieren nicht im Arbeitsmarkt selbst, sondern in der Sphäre des Wohlfahrtsstaats. Der Wohlfahrtsstaat ist natürlich mit dem Arbeitsmarkt verbunden, da es sein Zweck ist, Individuen ein Auskommen zu ermöglichen, die auf dem Arbeitsmarkt keines finden. Das Konzept der Dekommodifizierung bezieht sich auf den Grad, zu dem die Verteilung von Wohlstand von Marktmechanismen entkoppelt ist. Auch hier existieren signifikante Unterschiede zwischen verschiedenen Gesellschaften, da das Verhältnis von Familie, Staat und Markt nicht in jedem Land dasselbe ist. Deutschland gehört zu den korporatistischen Wohlfahrtsstaaten, in denen der Staat der Hauptanbieter von Sozialleistungen ist. Dennoch wird das Niveau sozialer Stratifikation dadurch für gewöhnlich beibehalten und zusätzlich der Familie eine wichtige Rolle für die Versorgung von Angehörigen zugeschrieben. Durch dieses Subsidiaritätsprinzip hängt die Menge an verteiltem Wohlstand auch davon ab, inwieweit die Familie potentieller Empfängerinnen und Empfänger in der Lage ist, finanzielle Unterstützung zu leisten.

Diese institutionellen Eigenheiten werden genutzt, um mögliche Erklärungen für Unterschiede zwischen den Ergebnissen dieser und anderer Untersuchungen zu finden. In dieser Arbeit werden mit Hilfe des Bayerischen Absolventenpanels (BAP) auf verschiedene Weisen bayerische Hochschulabsolventinnen und -absolventen auf dem Arbeitsmarkt in den Blick genommen. Dieser war in der Vergangenheit, wie auch das Bildungssystem, signifikanten Veränderungen unterworfen, beispielsweise durch eine starke Ausweitung der Erwerbsbeteiligung von Frauen. In vielerlei Hinsicht bestehen Geschlechtsunterschiede dennoch fort. So üben Männer und Frauen, nicht zuletzt aufgrund von Differenzen bei der Studienfachwahl, häufig verschiedene Berufe aus, verteilen sich anders auf Arbeitsmarktsektoren und Betriebe und weisen unterschiedliche Durchschnittsgehälter auf, was im sogenannten Gender Pay Gap resultiert. Abhängig vom Geschlecht können sich ändernde Rahmenbedingungen daher differierende Auswirkungen haben, weshalb das Geschlecht als eine zentrale unabhängige Variablen in viele der folgenden Analysen integriert wird.

Mobilität wird in dieser Arbeit teilweise als zu erklärende Variable verwendet, um zu bestimmen, welche Faktoren unter deutschen Hochschulabsolventinnen und -absolventen zu Mobilitätsentscheidungen führen. Zum anderen sollen auch die Effekte unterschiedlicher Mobilitätstypen untersucht werden, wobei Effekte auf das Einkommen im Zentrum stehen.

Einkommen ist eine erklärende Variable für verschiedenste Faktoren wie Gesundheit, Sterblichkeit, die Bildung der Kinder, politische Beteiligung und Kriminalität und damit ein wichtiger Faktor in zahlreichen Disziplinen, auch wenn diese Zusammenhänge nicht notwendigerweise auf Kausalbeziehungen zurückzuführen sind.

Im ersten Schritt werden eine neue Art der vertikalen Differenzierung im deutschen Bildungssystem sowie deren Effekte auf spätere Einkommen untersucht: Mit der europäischen Bologna-Reform wurden die neuen Bachelor- und Masterabschlüsse eingeführt, die in Deutschland größtenteils die bis dahin üblichen Diplom- und Magisterabschlüsse ersetzen, die nicht aufeinander aufbauten. In dieser Arbeit wird untersucht, welche langfristigen Auswirkungen das Betreten des Arbeitsmarkts mit einem Master- statt „nur“ mit einem Bachelorabschluss hat. Wie bereits erwähnt stellt das Einkommen dabei die abhängige Variable dar. Es zeigt sich, dass Personen mit einem Masterabschluss zu Karrierebeginn nicht signifikant mehr verdienen, was allerdings durch die im Schnitt niedrigeren Gehälter von Promovierenden erklärt werden kann. Nur in den Geisteswissenschaften scheint sich auch mittelfristig kein Einkommensvorteil durch einen Masterabschluss einzustellen. Bezüglich des Lebenseinkommens haben Bachelorabsolventinnen und -absolventen zudem durch die kürzere Studienzeit einen Startvorteil von mehreren zehntausend Euro, der nur allmählich kleiner wird.

Das nächste Kapitel untersucht sowohl die Häufigkeit als auch die finanziellen Auswirkungen von Arbeitgeberwechseln unter Hochschulabsolventinnen und -absolventen, wobei vor allem Geschlechtsunterschiede in den Blick genommen werden. Ohne Berücksichtigung von Kontrollvariablen wechseln dabei Frauen häufiger den Arbeitgeber, unter vergleichbaren beruflichen Umständen Männer. Die relativen Erträge aus Arbeitgeberwechseln unterscheiden sich nicht zwischen Männern und Frauen. Da Männer aber bereits zu Karrierebeginn höhere Durchschnittsgehälter haben, erhalten sie dadurch höhere absolute Gewinne.

Nach diesem Einblick in die Mechanismen von Arbeitsplatzmobilität wird im nächsten Kapitel versucht, verschiedene Limitationen zu überwinden und dabei nur die Ursachen für Arbeitgeberwechsel genauer in den Blick zu nehmen. Frauen wechseln den Arbeitgeber demnach häufiger als Männer aus persönlichen Gründen oder unfreiwillig, wobei Letzteres zu einem großen Teil durch unvorteilhafte Arbeitsbedingungen – wie befristete Verträge – erklärt werden kann. Dagegen zeigen sich keine Geschlechtsunterschiede hinsichtlich der Häufigkeit von Arbeitgeberwechseln aus beruflichen Gründen.

Das letzte Kapitel widmet sich wieder den finanziellen Auswirkungen von Arbeitgeberwechseln, wobei nun auch hier drei Kategorien genutzt werden, um einen

detaillierten Einblick in die Effekte zu gewinnen. Alle Arten von Arbeitgeberwechseln wirken sich positiv auf das Einkommen aus, Wechsel aus persönlichen Gründen jedoch zu einem geringeren Grad. Zudem kann wieder beobachtet werden, dass absolute, aber nicht relative Gewinne für Männer tendenziell höher ausfallen.

Chapter I:

Introduction

In this work, various types of mobility will be investigated in order to gain information about their determinants and effects on the German labor market. The focus will be, first, on the highly educated, for whom circumstances – both in the education sector and on the labor market – have changed substantially in the past decades. And for this group it will be, secondly, on the first years after obtaining a university degree, which are of great importance for career developments. The different aspects of mobility analyzed here as well as the social, institutional and economic backgrounds that influence mobility behavior and outcomes will be discussed in the following sections.

The first section focuses on different types of mobility that are prevalent in society: These include geographic mobility, social mobility, job mobility, and occupational mobility, which are also often connected to one another. Additionally, they can be further categorized into different subgroups, for example when taking into account the underlying motives and reasons for a mobility decision or event.

In the next section mobility is discussed with regard to the contexts which can be of importance for mobility and mobility research. One can be interested in frequencies, determinants or effects, so that the respective type of mobility can be used either as a dependent or as an independent variable. Furthermore, special attention can then be given to differences between certain groups – characterized by social, geographic or other attributes – with regard to determinants or effects of mobility.

The third section traces the changes in individuals' behavior both in the educational system and on the labor market which in the past decades have lead to significantly different distributions of degrees and workforce participation in Germany. Particular consideration is given to gender differences and their developments, thereby exploring the importance of further research into the careers of male and female university graduates.

After that, institutional characteristics and how they have changed in recent years are explored with regard to Germany in the fourth section. Concerning the educational sector, the new degree structures and the possible effects of the European Bologna reform are discussed. Concerning the labor market, the theory of the varieties of capitalism is used in order to make assumptions about how research into the types of mobility under consideration here might yield different results in this work using German data than in other countries that already have been studied. Another important concept which, however, is also related to the labor market, is that of decommodification. Here, the theory of the different types of welfare states is drawn

upon to further understand the mechanisms which can influence mobility consequences and behavior.

Following this, income, which – usually in the form of hourly wages – is an important variable in much of this work, is examined in various ways. It is discussed with regard to the role it plays in modern society, which effects it can have, and, especially relevant in the context of the following chapters, what its determinants are:

Human capital, search and matching theories are presented which are assumed to be able to explain income differences between certain groups: Often analyzed differences include those between genders or between individuals with different amounts of education. Furthermore, a combination of these two – income differences between genders among university graduates – is discussed. The conclusions also emphasize the importance of the research questions under investigation here.

After that, the Bavarian Graduate Panel is introduced which provides the data used in this work, although, depending on the research question, different waves and subpopulations form the basis of the analysis.

Finally, the last section gives an overview over the contents of the individual chapters which explore four different questions: income differences between bachelor's and master's graduates after the Bologna reform, gender-specific frequencies and financial effects of employer changes, gender differences in job mobility frequencies when different types of employer changes are distinguished, and, again using this distinction, gender differences in the financial effects of job mobility.

1. The different types of mobility

In sociology, mobility encompasses a wide variety of factors that individuals and groups can experience. In physical space, persons can move to another place in order to live and/or work there in a process called spatial (Savage, 1988) or geographic mobility (Ladinsky, 1967). Such changes can occur internationally or within national borders, for example with the intention to study or work elsewhere (Prazeres, 2013; Williams, Baláž, & Wallace, 2004), constituting international and intra-national mobility, respectively. Such moves can also be distinguished by the underlying intentions: Education-related mobility happens during school or university in order to gain new experiences and skills (e.g. learning a language during a stay abroad), or prior to a new education phase in order to be able to visit a certain institution (Christie, 2007; Holdsworth, 2009). Other motives include the possibility to (continue to) live with family members (family migration; Cooke, 2008), involuntary migration as in the case of refugees (Dustmann, Fasani, Frattini, Minale, & Schönberg, 2017) or work-related migration,

when the demands of a current employer or better opportunities elsewhere – like jobs with better payment, a better education match or more favorable working conditions – trigger a move to another location (Stark & Bloom, 1985). This can, of course, also cause the movements of other persons, especially family members, or at least make moves of other people belonging to an individual's social network more likely (Kalter, 2011; Massey & España, 1987). Furthermore, persons can move with the intention to stay only for a certain time span (the duration of which can be exactly known or not) or indefinitely, until a new reason to move emerges.

Social mobility, on the other hand, means changes in an individual's socioeconomic status within a society, either within their own (working) life (intra-generational mobility) or relative to their origins, i.e. usually their parents' status (intergenerational mobility) (Breen, 2004: 3). Because, in contrast to geographic location, status is a social construct (Ridgeway, 1991), social mobility has to be observed differently since it primarily occurs in people's minds, although it also often has effects on and is interconnected with certain aspects of the outside world.

An exact definition of socioeconomic status, however, is difficult to determine due to these circumstances – while the geographic location of an individual's workplace or home can theoretically be specified with almost unlimited accuracy –, and there are different opinions about which aspects are the most important ones (Bradley & Corwyn, 2002). In any case, status is usually associated with a certain degree of hierarchization, ascribing some kind of higher or lesser value to every social position (Lipset & Bendix, 1991: 1 f.). This results in a hierarchy sometimes referred to as a “social ladder“ (Kraus, Tan, & Tannenbaum, 2013), which can be climbed by improving one's own status.

Because most jobs are still linked to a certain location and because employment is an important factor for a person's socioeconomic status, these different types of mobility are often connected with the labor market and with one another. This leads to another viewpoint from which mobility behavior can be observed:

On the labor market, occupational mobility can occur when individuals change their (more or less narrowly defined) profession, while job mobility is characterized by employer changes. Here, too, both types of mobility can happen simultaneously, although it is also possible for an individual to only change their occupation but continue to work for the same employer – for example after a promotion to a position with different tasks – or vice versa. All of these variations are common (Moscarini, & Thomsson, 2007: 810) and can additionally go along with geographic and/or social mobility: Concerning the metaphor of the social ladder

mentioned above, the terms of upward and downward mobility relegate to a vertical axis along which individuals can move in the social sphere. Moving upward is associated with obtaining a higher social status, e.g. by getting a higher education or a job that is more prestigious or better paid. Horizontal mobility, on the other hand, means changing to a position that is perceived as different, but not as better or worse, which can be the case when the same kind of job is performed in a different division within an organization (DiPrete, 1987; Martin & Strauss, 1956). This highlights the importance that changes on the labor market can have for an individual.

2. Mobility in different research contexts

With regard to mobility, various research possibilities present themselves. Determinants, frequencies, rates, and effects of different mobility types are potential areas of interest. Within a certain research question, additional group comparisons – based on either individual or collective, societal characteristics – add further complexity to this topic. For a more collective approach, different countries are often compared with one another (Grusky & Hauser, 1984; Long, 1991). Depending on the research question, within-country comparisons are also possible, different regions can then be one type of observation level (Uunk, Mach, & Mayer, 2005).

It is important to note, however, that usually not geographic, but rather institutional differences and peculiarities that influence individual behavior are the focus of research in such cases, although the effects may not always be easy to distinguish. This is especially true when spatial mobility is the dependent or independent variable under investigation: It is not hard to imagine geographic characteristics on the one hand (e.g. potentially long distances when a country is particularly large) and institutional characteristics on the other hand (level of public support for job-related moves) that can both have effects on spatial labor market mobility (Greenwood, 1969).

Previous research has already shown that societies differ in terms of the amount of mobility, both with regard to social (Erikson & Goldthorpe, 1985; Tyree, Semyonov, & Hodge, 1979) and spatial mobility (Long, 1991). Due to underlying institutional differences, the consequences of mobility that individuals on average experience, may also depend on the society in question. In countries which are characterized by a high amount of inequality, for example, social mobility could more often mean drastic changes for the respective person than in egalitarian societies where opportunities are more similar for people in low and high status positions.

Furthermore, differences in mobility frequencies and rates and in the determinants and consequences of mobility decisions are not only present between countries, but within countries as well. Social stratification, institutions and common behavioral patterns can lead to different opportunity structures and to different results for mobile individuals. For example, an age-specificity of geographic mobility has been found “in virtually all developed and developing nations of the globe” (Rogers, Raquillet, & Castro, 1978), a relationship rooted in the age-dependency of the family life-cycle and of the working career of individuals (Corgeau, 1985).

3. The educational expansion, gender, and the labor market

Education is another prominent factor for stratification processes (Kerckhoff, 2001). It fulfills a placement function in society, regulating access to certain social positions, and correlates with social mobility. Processes of social exclusion can therefore also be tied to education (Geißler, 2002: 333). Depending on the outcome, results can thus be expected to differ between groups with different amounts or with different types of education. In Germany, the education sector also has experienced massive changes in previous decades in a process called educational expansion (Becker, 2003), caused by structural demands for a qualified workforce and by competition between individuals striving to secure their relative social position or that of their offspring (Geißler, 2002: 340). Relevant data is available from the Federal Statistical Office which reports results from the sample census 2017 (Statistisches Bundesamt, 2018a: 38–41):

While the changes in the educational sector have not significantly lowered the share of individuals without any school-leaving certificate at all – this number remains at about 4 percent for all age groups –, they still have resulted in a higher average education for the population as a whole. More than half of the people born in 1952 or earlier obtained lower secondary education, and about 18 percent reported a higher education entrance qualification (A Levels). For those born between 1967 and 1972, these two numbers had changed to 23 and 34 percent, respectively, and for the 1987–1992 birth cohort the picture from several decades ago has reversed: In this age group, only about 16 percent have lower secondary education, while those with a university entrance qualification for the first time make up more than half of the population.

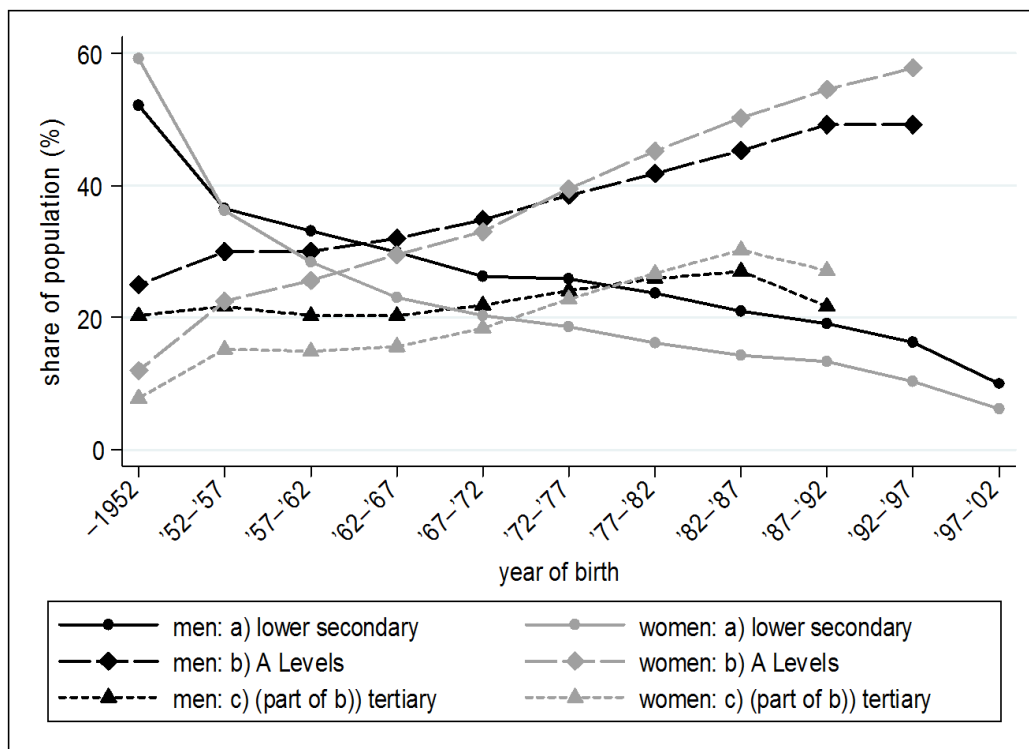
This also affected the prevalence of university degrees which were obtained by about 13 percent of the oldest cohort, a number which has more than doubled to almost 30 percent for those born between 1982 and 1987. It is interesting to note, however, that the share of university graduates rose more slowly than that of persons with a university entrance

qualification. In the oldest generation (born 1952 or prior), more than three quarters of those eligible for university also obtained a university degree. This number dropped significantly for the following birth cohorts and then stabilized: Only about 60 percent of persons born between 1962 and 1987 completed higher tertiary education, given that they had obtained an entrance qualification.

In this context, there have also been some interesting shifts with regard to gender: In the oldest cohort, men were less likely than women to complete schooling with only lower secondary education, but more than twice as likely to obtain a higher education entrance qualification. The probability of having a university degree is even more in favor of men for people born in 1952 or before (20.3 percent for men, 7.8 percent for women).

However, in the 1987–1992 birth cohort 19 percent of men and only 13 percent of women obtained lower secondary education, and in the 1982–1987 birth cohort 27 percent of men and 30 percent of women got a university degree by 2017. Women, who with regard to education were disadvantaged in the first decades both in the Federal Republic of Germany and in the German Democratic Republic, thus surpassed the average educational attainment of men in younger cohorts. The first cohorts without disadvantages for women were 1952–1957 (concerning lower secondary education), 1972–1977 (higher education entrance qualification) and 1977–1982 (university degree).

Fig. 1 Germany: selected educational attainments in 2017 by cohort and gender



Source: Statistisches Bundesamt, 2018a, author's visualization; performed with Stata 15

Note: pictured categories not exhaustive and not disjunctive

Figure 1 shows the development of various educational attainments in the German population by gender and birth cohort. Note that not all possible categories are pictured – therefore per cohort and gender sums of less than 100 percent are possible – and that individuals with tertiary education are a subset of those with a university entrance qualification, which also allows for sums of more than 100 percent. Since educational attainment can always change over the life course, numbers can be preliminary especially for younger persons: The decline in the prevalence of tertiary education for the 1987–1992 birth cohort is probably due to the fact that in this age group a significant number of people is still enrolled and has not finished their education yet.

It remains an open question whether the above-mentioned advantages for women will, first, also translate into disappearing differences at the upper end of the possible educational attainment, i.e. especially with regard to professorships, and, second, whether they will continue to increase even more. The disappearance of certain educational disadvantages already went along with changes with regard to work:

According to Reinberg, Fischer, and Tessaring (1995: 312 f.), in 1960 about 45 percent of women aged 25–49 were available for the labor market, a number that had risen to almost 70 percent by 1992. The respective numbers for men dropped somewhat in the same time – especially among those aged 25–34 because of on average longer education phases – but stayed well above those for women, so that significant differences remained.

Until 2013, female employment quotas rose further, but went along with a significant decrease in average working time for employed persons due to more widespread part-time employment. Because working times decreased more strongly for women than for men, differences between *employed* men and *employed* women even increased in the last decades (Klenner and Lillemeier, 2015).

The educational expansion thus does not go along with perfect gender equality neither in the education system nor on the labor market. Gender segregation is an important characteristic in this context, and with decreasing differences in the amount of education and in labor market participation, the possibility of horizontal mobility becomes more important: In raw numbers – i.e. in their decisions *if* to work or study –, men and women do not differ as much as several decades ago. However, individual choices of occupations and study programs still accumulate to significant gender differences in the university and on the labor market which also translate into differences in other outcomes like income (Bobbitt-Zeher, 2007). Therefore, gender will be an important independent variable in much of this study.

4. Institutional contexts: education, economy, and the welfare state

Another more recent development in the German university system is the European Bologna reform, which introduced new types of degrees into the education system, namely the bachelor's and master's degrees which mostly replaced the old Diplom and Magister degrees. Before the reform, a hierarchization of degrees mainly occurred due to the type of university visited: For example, certain jobs required a university Diplom, while a Diplom from a university of applied sciences was not sufficient. Magister and Diplom did not compete with one another in this way as they are seen as occupying the same hierarchy level. The new bachelor's and master's degrees, however, are more strongly associated with vertical mobility, because a bachelor's degree (or an equivalent degree) is needed in order to be able to begin master's studies. Similarly, for certain employments a bachelor's degree is not enough, but a master's degree is needed, highlighting the hierarchical structure of the new system (Noelke, Gebel, & Kogan, 2012).

Due to the relative recentness of these changes, long-term consequences for the persons affected by this reform cannot be assessed yet, but first results can already be obtained. University graduates are thus a particularly interesting group for research purposes, both because they now make up a far larger part of the workforce than in past decades – especially among young people – and because of the recent changes that the university system and the graduates as a group have experienced in the last years. The first years on the labor market are also characterized by important decisions connected to wage developments and mobility (Fuller, 2008) so that effects can be expected to be most pronounced here. University graduates in the years following graduation are therefore the group focused in this work. In this context, not only situations at certain points in time are of interest, but also transitions, their reasons and effects, so that career developments can be traced. Various mobility types will therefore be analyzed and put into an international context:

As mentioned above, societies differ with regard to the amount and the effects of mobility behavior within them. A framework that seeks to explain such differences is the varieties of capitalism approach which groups countries into different categories according to their institutional characteristics. These characteristics can, irrespective of individual traits, have significant influence on persons' behaviors, because they make it easier – or just possible at all – to make certain decisions or because they provide incentives for individuals to consider alternative options that they would not have thought about in a different institutional context (Marsden, 1990).

Usually, two varieties of capitalism are distinguished, although of course there remain differences within these categories. One can view each of the varieties as ends of a spectrum, and countries can have elements of both of them. The way interactions between actors – e.g. governments, employers or employees – take place defines the affiliation to the two varieties of capitalism. These are liberal market economies, for example the United States or the United Kingdom, and coordinated (or organized) market economies, for example Germany. Not all factors that define the two types are immediately relevant in the context of the following analyses since the latter above all focus on individual behavior. But even decisions that are made at a higher organizational level can have indirect influence on individuals whose opportunities for decision-making are shaped by them.

In liberal market economies, trade unions tend to be less powerful, and market relationships between employers and employees are generally more important. This goes along with a more pronounced hire and fire policy in individual firms and, regarding the economy as a whole, with a smaller amount of wage coordination. Due to these circumstances, individuals are incited to frequently change employer, utilizing their more general and less firm-specific skills that they have acquired in the corresponding education system (Hall & Soskice, 2001: 29 f.).

Coordinated market economies, on the other hand, are typically characterized by a more pronounced role of industry-wide wage agreements and a stronger employment protection, which, among others, can for example be guaranteed by work councils that have a voice regarding layoffs (Hall & Soskice, 2001: 24 f.). These factors discourage employer changes, so that mobility may be of less importance in coordinated market economies.

Furthermore, the institutional context could be able not only to affect the job mobility rate but also the returns to employer changes. As mentioned above, there is usually less wage coordination in liberal market economies which can lead to more wage inequality and, following that, to larger wage changes when persons experience job mobility. Individual employer changes are also less notable when employer changes in general are viewed as common on a certain labor market, and are thus less likely to be viewed as a negative signal. This could result in higher positive returns in liberal market economies. On the other hand, less strict employment protection laws can make it more likely that individuals lose a job on short notice, which negatively affects the possibility of on-the-job-search. This is a factor that possibly contributes to better outcomes for persons experiencing job mobility within coordinated market economies.

Additional possibly important institutional differences are not present on the labor market itself, but in the sphere of the welfare state. The welfare state is of course related to the labor market as it is meant to enable individuals to make a living where the labor market is no longer able to do so: The concept of decommodification refers to the degree of wealth distribution that is independent from market mechanisms (Esping-Andersen, 1990: 105 f.). Here, too, there are significant differences between societies, as the relationship between family, state, and market is not the same in each country. Esping-Andersen (1990: 111 f.) therefore distinguishes three types of welfare state regimes:

The so-called liberal welfare states (like the United States) are characterized by a low degree of decommodification, based on strict rules for the entitlement to (unemployment) benefits, which are additionally rather low and associated with social stigma. In corporatist welfare states like Germany, on the other hand, the state – and not the market – is the main provider of welfare. However, levels of social stratification are usually maintained, and family is additionally ascribed an important role in caring for its members. This concept of subsidiarity means that the amount of wealth distributed by the state also depends on the ability of the (potential) recipient's family to provide financial assistance. The highest levels of decommodification can be found in the social democratic welfare states (mainly in Northern Europe) where benefits are generally quite high and stem from a universal insurance system which provides a significant amount of wealth distribution within the respective society.

Various effects of the type of welfare state are conceivable: A less generous welfare state might lead unemployed persons to be less selective when looking for a new employment. This could result in faster transitions out of unemployment, but also in lower incomes. These relationships between the welfare state and individual behavior can then also be connected to the effects of the different varieties of capitalism.

5. Income, education, and gender

In this work, mobility will, on the one hand, be used as an outcome variable in order to determine which factors lead to different mobility decisions among German university graduates. On the other hand, the aim is to deal with the effects of various mobility types, more specifically with the effects they have on individuals' wages. In society, higher wages lead to more opportunities. Income is a predictor for such diverse factors as obesity (Drewnowski & Specter, 2004), smoking (Huisman, Kunst, & Mackenbach, 2005), health (Ecob & Smith, 1999), mortality (Backlund, Sorlie, & Johnson, 1996; Fiscella & Franks, 1997), children's schooling (Chevalier, Harmon, O'Sullivan, & Walker, 2013), political participation (Frey, 1971), and crime (Ellis, Beaver, & Wright, 2009: 36 f.), making it an

important variable in various disciplines, although these relationships are not necessarily direct and causal.

The importance of income as a predictor is of course also due to the fact that it varies considerably over the population in virtually every society. Significant differences can for example be found between persons with different amounts of education, with tertiary education yielding income advantages of up to 150 percent relative to upper secondary education in OECD countries, while already individuals with upper secondary education on average often earn significantly more than those with even lower educational degrees (OECD, 2017: 104).

In Germany, tertiary education on average goes along with 50 to 90 percent – depending on the exact type of degree, e.g. bachelor's or master's – more income relative to upper secondary education (OECD, 2017: 114). This advantage is particularly pronounced for older workers (OECD, 2013: 111), which could be explained either by seniority, which depends on age – for example when work experience has stronger effects on income for the highly educated – or by a cohort effect, when tertiary education was rewarded to a higher degree several decades ago, so that wage growth over the career could start from a (relatively) higher level. The first option seems to be the more plausible one as financial returns to higher education did not change drastically relative to those of other types of education in the first years of individuals' careers (Pollmann-Schult, 2006).

However, within the group of persons with tertiary education there are large income differences as well. For example, average wages partially depend on the discipline that workers graduated in. Using US data, Kim, Tamborini, and Sakamoto (2015) even reported that these differences between fields of studies are often larger than the average differences between those with and without tertiary education in general.

Fields of study are thus an important determinant in this context because they are associated with individuals' placement on the labor market and with the size of the financial returns to education (Altonji, Blom, & Meghir, 2012). As apprenticeships also lead to different jobs with widely varying wages (Fitzenberger & Kunze, 2005), a higher education degree is on average, but not always associated with an income advantage.

The concept of human capital plays an important role in this context. According to this theory, differences in wages are (in part) due to differences in individuals' productivity which is rewarded by employers. Productivity levels in turn are the result of, on the one hand, education and, on the other hand, work experience (Becker, 1962). Years of schooling and of other kinds of education (like apprenticeships and studies) are thus an important determinant

of productivity and of wages. The wage advantages that university graduates on average have are therefore in line with human capital theory since these graduates have usually spent the most time in the education sector.

However, it is hypothesized that not all kinds of human capital are of the same value on the labor market, which already becomes apparent when looking at the income differences within the group of university graduates. For example, different income trajectories in the course of individuals' careers show that the same amount of work experience can be rewarded differently, thereby either closing, widening or creating income gaps between persons. Furthermore, human capital acquired in the education sector can have different characteristics, depending on the type of education that persons seek to achieve:

Researchers for example distinguish cultural and communicative as well as economic and technical resources which can be obtained during studies. While each study program may contain elements of all of these types of human capital, they do so to varying degrees and usually feature a dominant type. Wage differences between persons with the same amount of education can then be explained by the fact that certain types of education and of human capital – predominantly technical and economic capital – are of higher value on the labor market (Kalmijn & van der Lippe, 1997), leading to significant income differences even within the group of university graduates or within the group of individuals with a vocational education (van de Werfhorst, 2002).

Also, possessing human capital does not in itself guarantee an adequate job where the respective amount and type of human capital is needed and rewarded. Human capital also has to be applied in a certain way in order to maximize an individual's potential productivity and income. On complex labor markets, all kinds of mismatches can occur: vertical mismatches in case of over- or undereducation (in terms of years of schooling) as well as horizontal mismatches between education and occupation (Nordin, Persson, & Rooth, 2010: 1047). This can for example be due to the unavailability of workers or jobs who/which employers or potential employees wish for, or due to incomplete information (Jovanovic, 1979), since looking for a job (or, from the employer's perspective, for an employee) is associated with search and opportunity costs (Wilde, 1981). Time is an important aspect of these costs that make it difficult to gain a complete picture of all jobs that are theoretically available and educationally adequate.

Educational matches and mismatches can therefore also influence the income gap within the group of university graduates when fields of study differ with regard to how difficult it is to obtain a good match with the respective degree. This is due to wage advantages of individuals

with a good match of education and occupation, at least in most fields (van de Werfhorst, 2002: 302). The occupational specificity plays an important role here since study programs which are more aligned to the needs of the labor market also facilitate finding a job that is suitable for the respective education (Leuze, 2007: 44). Less occupationally specific fields of study for example include those from the humanities which are also characterized by relatively low wages (Noelke et al., 2012: 706).

These relationships again highlight the importance of mobility – for example in the form of employer changes which are central parts of the later analyses – because occupational or job mobility is necessary in order to increase the likelihood of a good match between education and occupation.

As gender is also an important variable in much of this work, it will often be examined with regard to wages in order to determine how mobility affects wages for men and women and thereby the so-called gender pay gap. This gender difference in earnings is a widespread phenomenon – usually to the disadvantage of women and not only for monthly incomes, but also when controlling for working times (OECD, 2017: 116) – that can be observed against many different backgrounds:

Research sometimes focuses on the temporal perspective, investigates how the gender pay gap has changed over time, and ultimately tries to make predictions regarding future developments (Blau & Kahn, 2007). Other studies also conduct geographic comparisons and show that the gender pay gap is not limited to certain countries, but present more or less everywhere (Weichselbaumer & Winter-Ebmer, 2005). And while it has often diminished in the past decades, differences still remain which are attributed to a variety of factors. In principle, every variable that affects incomes can also affect the gender pay gap in two different ways:

First, the distribution of these variables can differ between men and women. Again referring to the concepts introduced above, this for example could mean that women on average have less (or less profitable) human capital than men; the resulting lower level of productivity would in turn also lead to lower wages. Or, with regard to mismatches, it could be the case that men more often work in jobs where they are able to apply their human capital in an optimal way, for example because of larger investments in job search. This way, group differences – in this case between men and women – in behavioral patterns can indirectly influence income differences: The selection of a specific field of study as well as mobility decisions on the labor market can affect individuals' wages and, because these decisions are in turn influenced by gender, the gender pay gap.

Secondly, a gender pay gap can emerge when the financial returns to certain variables differ by gender. Again regarding human capital, this could mean that – irrespective of actual differences in human capital endowments – the same number of years of schooling increases incomes to a higher or lower degree for one group than for the other. This is often related to possible discrimination, which is also one possible explanation for any gender difference in wages that cannot be attributed to one of these two mechanisms, the other explanation being unobserved heterogeneity, when important explanatory variables are missing. The so-called adjusted gender pay gap, which already takes into account factors that can partially explain income differences, is then usually smaller than the raw gender pay gap which does not consider any control variables.

However, interaction effects, too, have to be taken into account when including certain variables, one of which is education: While controlling for education can decrease the gender pay gap because on average women less often have a university degree (OECD, 2013: 40) and university graduates are better paid, this does not mean that the gender pay gap is less of an issue within this group. In fact, in Germany and other countries the gender pay gap is larger among university graduates than in the general population (Johnston & Lee, 2012; OECD, 2017: 116), meaning that it could increase in the course of an educational expansion that affects men and women similarly.

As detailed above, in the past decades women did benefit more from the educational expansion in Germany because on average their educational attainment was lower than that of men. This probably contributed to the fact that the gender pay gap, too, decreased during this time. It does not change as fast anymore now, and this could in turn be partially attributed to the facts that in recent cohorts men's and women's educational attainments are more similar, that persons with tertiary graduation make up an ever larger part of the population, and that within this group the gender pay gap is larger. Because of this, it becomes all the more important to analyze university graduates, their behavior and their outcomes on the labor market.

6. Data

For all of the following analyses, the Bavarian Graduate Panel (Bayerisches Absolventenpanel – BAP) will be used, which by design focuses on university graduates and thus on the group under investigation in this work. In this survey, which is conducted by the Bavarian State Institute for Higher Education Research and Planning, about every four years a graduation cohort is selected, consisting of the graduates of the Bavarian universities and public universities of applied sciences in the respective year. These are then questioned about

their studies and the transition into the labor market about one to two years after graduation. Five and ten years after, further surveys of the same cohort seek to explore mid- and long-term developments, making it possible to trace individual careers beginning with the entry into the labor market.

These careers can be pictured with a significant amount of detail: In the questionnaires, respondents are asked to give information about all the employments they have had since graduation, including the employments' starting and ending dates, the monthly income, working times and characteristics of their employer, e.g. the occupational sector and the number of employees.

The following chapters use the first two waves of the graduation cohort 2005/06 and of the graduation cohort 2009/10, for which the first two surveys had already been conducted. Depending on the research question, each data set consists of about 2,000 to 5,000 graduates from almost all disciplines. Graduates not included in the samples mostly consist of teachers and physicians whose professions are characterized by very standardized and unique labor market structures which are not easily comparable to those of other professions. While the 2005/06 sample to a large part still consists of university graduates who have obtained one of the old degrees (Diplom and Magister), respondents from the 2009/10 cohort often have a bachelor's or master's degree instead, which will be of importance for one part of the following work.

Since the Bavarian Graduate Panel is selective in several respects, a couple of limitations have to be considered when working with the data. On the one hand, only Bavarian university graduates are sampled (although it is for example possible that questioned bachelor's graduates later obtained a master's degree in another part of Germany), and there are some peculiarities of the Bavarian labor market which many of these graduates enter after obtaining their degree. Above all, unemployment rates are lower (Arbeitsagentur, 2019) and wages are higher than in most other German states (Eichhorn, Huter, & Ebigt, 2010: 291) However, the mechanisms under investigation here are expected to be very similar, although wage developments may begin at a higher level. Comparisons with another German-wide graduate panel study also show many similarities between these samples (Falk, Kratz, & Müller, 2014: 8 ff.)

7. Structure of the work

In a first step, a new type of vertical differentiation in the German educational system and its effect on labor market outcomes will be investigated: The European Bologna reform introduced the bachelor's and master's degrees (Teichler, 2011: 8). These largely replaced the

Diplom and Magister degrees which until then were common in Germany and which did not build upon one another. A bachelor's degree, on the other hand, is usually necessary for obtaining a master's degree, and many jobs require a master's degree while a bachelor's degree is no sufficient qualification. There is already research regarding the social selectivity of these new degrees (Auspurg & Hinz, 2011; Kretschmann, Gronostaj, Schulze, & Vock, 2017; Reimer & Pollak, 2009) which make social mobility in terms of education more complex because of the stronger differentiation. Chapter II aims to investigate the long-term effects of obtaining a master's degree relative to entering the labor market with a bachelor's degree. As mentioned above, income will be the primary dependent variable here. That way, insight will be gained into what the consequences of selectivity into master's programs are, determining whether and to what extent the new degrees can be tied to social mobility.

Chapter III will deal with job mobility, i.e. employer changes, in two ways: First, the frequency and rate of employer changes among university graduates will be investigated, taking into account different determinants – especially gender – that can affect this type of labor market behavior. Employer changes thus constitute the dependent variable of this part of the analysis. The second part of the chapter will deal with the effects that these employer changes have on individuals' wages, again also looking for differences between men and women. This way, the analysis also shows how gender-specific frequencies and consequences of job mobility influence the gender pay gap, a phenomenon that did not disappear in the course of the educational expansion and of growing labor market participation of women in the past decades.

After gaining an insight into the mechanisms of job mobility among university graduates, chapter IV aims to overcome some limitations and focuses on a certain aspect of changing employer, namely on the different reasons to do so. Because job mobility can occur in different circumstances that may also be dependent on gender, it is necessary to further differentiate between various types of employer changes. The research question in this chapter therefore is whether (and which) gender differences in the frequency of employer changes can be observed when job mobility is not treated as one homogeneous category. Instead, involuntary employer changes, voluntary employer changes for personal reasons and voluntary employer changes for professional reasons are distinguished in order to gain a more complete and more detailed picture of the mechanisms involved in job mobility among university graduates.

Chapter V again focuses on the financial effects of employer changes. Here, too, the three categories are now used to determine if the relationships found in chapter III are the result of

different effects which possibly act in different directions and could (partly) offset each other. Using interaction effects both with gender and with the type of employer change, the analysis searches for differences between men and women for each type of job mobility. International results from other studies are furthermore discussed in light of the effects found here. Finally, chapter VI summarizes the results and provides an overview over the conclusions gained in this work.

Chapter II:
Labour Market Returns of Bachelor's and Master's Degrees in Germany:
Differences and Long-Term Developments*

Abstract: Through profound higher education reforms in the last twenty years, German higher education has become more vertically stratified by introducing a two-tier system of degrees. This paper analyses the labour market returns to these degrees within a human capital framework and based on data from a longitudinal graduate survey. In the estimation of random-effects panel regressions, attention is paid to entry wages, wage growth and cumulative income over the years after graduation, as well as to alternative ways of human capital acquisition (such as work experience) and differences between fields of study. Results show that master's graduates overall have no significant advantage at labour market entry, but do enjoy steeper wage growth. Taking up a doctoral position – especially in engineering and in math and sciences – has a strong negative effect on wages. When this is accounted for, master's graduates also have higher entry wages. However, the later labour market entry of master's graduates also results in marked disadvantages in cumulated incomes when graduates of the same age are compared. After several years on the labour market, this gap slowly begins to close. At least financially, a master's degree therefore also has to be seen as an investment that will possibly only pay off in the very long run.

*This is a manuscript of an article submitted to the Journal for Labour Market Research. Co-authors are Susanne Falk and Maike Reimer

Author's share: 75 percent: preparing data; empirical analyses; writing sections 3, 4, and 5

1. Introduction

In 1998, Germany, France, Italy and the United Kingdom signed the Sorbonne declaration which postulates the “harmonisation of the architecture of the European higher education system” (Sorbonne Joint Declaration, 1998). Following this, in German higher education, the old one-staged “Diplom” and “Magister” degrees have gradually been replaced by the two-tier bachelor’s and master’s degrees in almost all fields of study¹. In Germany, like in other European countries with traditional one-cycle degree structures, the Bologna reforms have therefore introduced a new dimension of vertical stratification (Noelke, Gebel, & Kogan, 2012). Students who do not wish to obtain a master’s degree are able to leave university with a university degree after a shorter amount of time than before the Bologna process, and enter the labour market. The importance of both vertical and horizontal dimensions of educational stratification on labour market outcomes has been demonstrated in previous studies (e.g. Luthra & Flashman, 2017; Noelke et al., 2012). It is therefore of particular interest how the newly introduced vertical stratification dimension will shape labour market transitions and outcomes in different horizontal strata, primarily constituted by field of study. Due to the relative recency of the reform, the consequences for labour market outcomes have only begun to be investigated. Existing studies for Germany and Switzerland (where the transition from one- to two-tier system was also a recent result of the Bologna reforms) generally focus on labour market entry, comparing income of graduates of both degree types (e.g. Neugebauer & Weiss, 2018; Bittmann, 2019; Glauser, Zangger, & Becker, 2019) and employ cross-sectional models.

In this paper, we pursue four analytical goals. The first is to extend the temporal perspective to a period of up to eight years after graduation and provide longitudinal analyses of entry level wages, wage development gradients and cumulative returns over the entire period. Second, we will explicitly include the time spent in employment in our models, regarding it as an opportunity for further skill development that may positively affect labour market outcomes – both in itself and depending on the degree with which graduates start their careers. Third, we also take relevant context factors of higher education and of the labour market into account that contribute to income development, thus identifying both personal and career related factors responsible for differences in income levels and developments

¹ Exempt from the reform are most prominently the fields of law and medicine, along with some minor fields such as theology.

between bachelor's and master's graduates. Fourth, we will examine how the increased vertical stratification interacts with the horizontal dimension of field of study.

2. Human capital acquisition in higher education and work and its labour market consequences

2.1 Stratification in higher education and labour market returns

Education is an important factor for social stratification processes. Kerckhoff (2001) gives “stratification, standardization, and vocational specificity” as three characteristics of the education sector that influence stratification in a society, while Shavit, Arum, Gamoran, & Menachem (2007) refer to higher education eligibility and attendance as one important factor, to the mode of differentiation as another, and to the market structure as the third. Characteristics such as these become important when variations within them can set individuals on different paths and ultimately place them in different levels (or strata) of society, e.g. by influencing labour market outcomes (Triventi, 2013b). These different aspects of an educational degree can be of importance when economic returns to these degrees on the labour market are assessed. According to human capital theory, wages are determined by an individual's productivity. The more productive someone is, the more valuable are they for an employer who can reward this with higher wages (which also serves to prevent the employee from leaving for better payment elsewhere).

Productivity can be increased in different ways, with education as one of the most important ones (Becker, 1962: 25). Different degree levels are then connected to vertical differentiation since more time is needed to obtain a higher degree. Another productivity-enhancing factor is work experience that is accumulated over time on the job and can increase an individual's human capital in general or the human capital that is only valuable in certain jobs or companies (Becker, 1962: 10 ff.). Because there is a trade-off between education and work experience – the longer someone spends in the education system, the later they can fully enter the labour market (Sloane, Battu, & Seaman, 1996) – it can be difficult to determine which decision maximise wages. This is especially true for the employees analysed here, because they are among the first in Germany whose long-term financial returns to the new bachelor's and master's degrees can be studied. In the light of these assumptions, there are three possibilities for how the vertical degree difference could affect income at labour market income and later development:

First, the additional education of a master's degree may be equivalent to the work experience that can be gathered in the same amount of time in terms of the effects on human capital. In this scenario, a parallel wage development can be expected: At their labour market entry,

respondents with a master's degree would earn more than bachelor's graduates at their entry and about as much as bachelor's graduates with two years of work experience, i.e. about as much as a peer from the same bachelor's graduation cohort would earn at that point. There would thus be no financial incentive for a master's degree and even a financial disadvantage for master's graduates because, when the whole career is considered, they would have less time to earn money than bachelor's graduates who entered the labour market at a younger age. Second, when only education is seen as a full-time investment in human capital - while when working, significant amounts of time have to be spent just applying one's human capital without increasing it - the effects of work experience and of education on productivity should differ. This would lead to higher incomes of master's graduates compared to bachelor's graduates of the same bachelor's graduation cohort (i.e. with more work experience). This would not necessarily mean that a master's degree pays off, however, at least when long-term or lifetime incomes are considered, because the wage advantage still would first have to compensate the income lead gained by earlier labour market entry.

Third, obtaining a master's degree can also be considered an investment in productivity-enhancing skills (Barone & van de Werfhorst, 2011). Then human capital would not only increase faster during master's studies than on the labour market, but master's graduates would also profit more from the same amount of subsequent work experience than bachelor's graduates, resulting in steeper income growth for those holding a master's degree.

Also, horizontal aspects of stratification - especially characteristics of the field of study - can affect various aspects of graduates' transition after leaving higher education. For example, the occupation-specificity of a study programme is a factor that leads to horizontal differentiation (Noelke, Gebel, & Kogan, 2012). This is especially important in the context of the German labour market which is characterised by a strong link between education and work (Leuze, 2007), i.e. qualification certificates have a strong effect on occupational status (Bol & van de Werfhorst, 2011). For graduates of highly occupation-specific fields of study that offer more specialised instead of general resources (van de Werfhorst, 2002), the transition into the labour market is more structured, especially when there are additional institutionalised links between universities and potential employers (Noelke et al., 2012). Here, an additional feature of the German higher education system comes into play: In addition to traditional research-oriented universities, bachelor and master degree programmes are also offered by universities of applied sciences. Their profile is more practically oriented and strongly aligned to current labour market demands and they focus on a limited range of disciplines, mainly business, engineering/informatics and social fields. While officially, both institution types are equally

part of higher education and their respective degrees are on an equal level, the duration of programmes differs, as do the curricular orientation and opportunities for further study (Müller & Wolbers, 2003: 32 f.).

In addition to the strata of higher education, there are also aspects of the labour market to be considered that lead to the fact that not all entry level positions are open to graduates with bachelor's and master's degrees equally. In Germany, on the one hand, access to certain well-paid positions depends on the degree – e.g. in collective wage agreements, master's and bachelor's degrees are assigned to different wage groups at labour market entry (Neugebauer & Weiss, 2018: 352). This obviously can affect entry level wages, and if such positions are connected with better career development prospects, this differential placement enables master's graduates to achieve higher wage growth. This would also make it much more likely to gain higher lifetime incomes than bachelor's graduates despite having initially less work experience.

However, there are also entry positions only available to master's graduates that do not necessarily come with an income or status advantage: In Germany, most doctoral theses are written while working part- or full-time in a research institution. While these positions offer the prospect of yet another academic qualification with potential long-term income benefits, they often are not particularly well paid relative to other positions available to master's graduates. Depending on how and within which time frame this additional degree leads to income growth, income differences between bachelor's and master's graduates may be affected in different ways.

2.2 Previous Findings

For Germany, the study of Neugebauer and Weiss (2018) shows that a master degree from university or universities of applied sciences is associated with higher earnings in all fields of subjects except for design and art, compared to a Bachelor degree (Neugebauer & Weiss, 2018: 358). The study also demonstrate a significant advantage of bachelor degree holders of universities of applied sciences compared to bachelors of universities in business and computer sciences, but not in technical subjects or design and art. Regardless of the type of degree wages of graduates of universities are 15% lower than those of universities of applied sciences (Trennt, 2019). According to research for Switzerland, where the Bologna process recently also introduced the bachelor's and master's degrees, the latter go along with significant wage advantages relative to the former (Glauser et al., 2019).

For the United States that have a long standing two tier systems, Kane and Rouse (1995) analysed the effects of different degrees of US-American community colleges and found

similar returns for graduates attending college for two years and four years, respectively. Also using data from the US, an analysis further differentiating between degree types found positive effects on wages for master's graduates relative to bachelor's graduates (Jaeger & Page, 1996). For England and Wales, too, postgraduates (e.g. with a master's degree) were found to receive significantly higher wages than first degree holders (Walker & Zhu, 2011). Also, apart from wages, the occupational status was used as a dependent variable in several studies. Using data from fifteen European countries, Bol and van de Werfhorst (2011) found positive effects for higher tertiary relative to first stage tertiary degrees, although the mechanisms of how educational degrees affect occupational status differ between labour markets. For a number of Central and Eastern European countries, similar effects were found, with master's graduates achieving – on average – higher occupational status than bachelor's graduates (Noelke et al., 2012).

Furthermore, the type of major seems to be of additional importance when effects of the degree are investigated: In a study using US data, a graduate's (e.g. master's) degree was found to positively affect wages relative to a bachelor's degree in some fields of study, but not in other fields such as liberal arts, humanities, arts, and architecture (Kim, Tamborini, & Sakamoto, 2015). Further research even showed a negative effect of a master's degree in the humanities, meaning that in this field master's graduates on average earn less than bachelor's graduates (Altonji, Arcidiacono, & Maurel, 2016). These major-specific effects of the type of degree add to the wage differences between different fields of studies which were already found previously (Rumberger, 1993; Altonji, Blom, & Meghir, 2012) and which are also investigated with regard to their effects on factors such as social or gender inequality (Iannelli, Gamoran, & Paterson, 2018). Field of study can thus be an important factor not only for horizontal, but also for vertical stratification: Concerning lifetime earnings, the study of Kim et al. (2015) even found bigger differences between graduates of different majors than between high school and college graduates.

However, many of the discussed studies base on cross-sectional data and often use OLS regression models for estimating economic returns to higher education, partly also disregarding mid- and long-term developments of wage returns. Cross-sectional designs are not ideal because they do not accurately reflect the lifetime value of different degrees or majors. Only a few studies base on a longitudinal modelling of wage returns. This is partly due to scarcity of longitudinal data, which in cases such as the German one is not surprising given the fact that graduates affected by the Bologna reform have first entered the labour market quite recently. Therefore, the focus of this analysis will be on a longitudinal modelling

of wage returns to the new bachelor's and master's degrees, with an additional focus on interaction effects with fields of study and inclusion of time spent in work as possible source for skill enhancement.

3. Data and Operationalisation

The data used for the analysis stem from the Bavarian Graduate Panel (BAP). Therein, about every 4 years a cohort of university graduates is selected who are then questioned about 1 year, 6 years and 10 years after graduation. The basic population thus consists of the graduates of universities and public universities of applied sciences in Bavaria. A comprehensive survey is conducted in which graduates are questioned about their studies and the time after graduation. Among others, respondents are asked to give information about all the employments they have had so far and to also report significant changes (e.g. in income) within a job.

For the following analysis, the graduation cohort 2009/10 is used² for which the first two surveys have already been conducted, the second one between June 2017 and March 2018.

Initially, the sample consisted of 6,764 individuals. Respondents without a bachelor's or master's degree were excluded from the sample, as well as observations with at least one missing value on one of the important variables which are later used in regression analysis. After that, the dataset contained 2,283 persons.

The dependent variable for the analysis is the logarithmised hourly wage, generated from the monthly incomes, the yearly bonuses and the weekly working times which the respondents reported. The real working time was used for this, but as a robustness check additional analyses with a variable using the contractual working time were also performed. Implausible outliers (hourly wages of less than 5 or at least 100 euros, monthly incomes of less than 400 euros) were excluded.

Independent variables include personal (gender, academic background, A-level grade), study (field, type of university), and job characteristics (employer changes, executive positions, type of organisation and contract, sector, firm size, doctoral studies). For the variable indicating the highest obtained degree, respondents whose last degree was a Diplom, Magister or Staatsexamen degree were also excluded. Dependent and independent variables are described in more detail in section 4.1 where information about distributions and differences can be found.

² The surveyed population graduated between October 1st 2009 and September 30th 2010 – for bachelor's and master's graduates between October 1st 2008 and September 30th 2010

4. Analysis

4.1 Descriptive statistics

Table 1 contains shares for the time-constant independent variables for bachelor's and master's graduates and for all respondents. In the last column the stars indicate whether the difference between bachelor's and master's graduates is statistically significant. The share of men is higher among master's graduates, which is probably (in part) the result of different choices of the field of study. For example, men more often study math and sciences where it is more common to continue with a master's degree after the bachelor's studies. Because of that, the share of respondents with this subject group is also higher among master's graduates than among bachelor's graduates. The university variable indicates the type of institution of the last studies, universities or universities of applied sciences (it is possible to achieve a bachelor's and a master's degree at different types of universities). It is important to note that universities of applied sciences do not, as the table seems to indicate, produce half of all bachelor's graduates; they do, however, produce half of the bachelor's graduates who do not continue with a master's programme.

There also appears to be a self-selection of graduates with an academic family background and of those with better A-level grades into master's programmes, while bachelor's and master's graduates only slightly differ with regard to their job mobility, i.e. in the frequency of employer changes.

Table 1: Time-constant sample characteristics. Percentages and means

	Bachelor	Master	Total	
Gender: male	43.5%	51.2%	49.6%	**
University	45.0%	78.3%	71.6%	***
<i>Field of study</i>				
Humanities	19.7%	14.8%	15.8%	*
Social sciences	17.7%	8.6%	10.5%	***
Law and economics	30.5%	26.0%	26.9%	*
Math and sciences	17.5%	32.1%	29.1%	***
Engineering	14.5%	18.5%	17.7%	*
Academic background	46.3%	57.8%	55.5%	***
A-level grade	2.32	2.05	2.11	***
Ever employer change	45.0%	50.7%	49.6%	*
Number of employer changes	0.62	0.68	0.67	
N	462	1,821	2,283	

Source: BAP 2009/10, authors' calculations; performed with Stata 15

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2 contains additional job characteristics – for minimal and maximal work experience – which often have significant effects on wages and which also differ between the two types of degree holders. An important finding is that for several variables master's graduates on

average do not find themselves in more favourable conditions with regard to their earnings: For example, they less often hold executive positions and less often have permanent contracts relative to bachelor's graduates. In part this is certainly due to the fact that PhD students, who mainly consist of master's graduates, usually do not have these characteristics. However, several of these differences can still be found at the end of the observation period (when most PhDs are completed) or when PhD students are excluded.

On the other hand, master's graduates also have advantages regarding other variables, although in part only in later career stages. In large companies, for example, wages tend to be higher, and master's graduates are overrepresented there. They also more often work in listed companies (where wages are higher relative to those in non-listed companies in this sample) and in the public service (where wages are lower).

For monthly incomes as well as for hourly wages, significant differences favouring master's graduates can be observed. These differences increase over time, both in absolute and relative terms, so that at the end of the observation period master's graduates on average have an advantage of 622 euros (per month) and 2.6 euros (per hour) respectively.

Table 2: Time-variant sample characteristics. Percentages and means

	Exp.	Bachelor	Master	Total	
<i>Executive position</i>					
No executive position	min.	70.3%	76.8%	75.5%	**
	max.	55.2%	62.7%	61.1%	**
Lower level	min.	25.3%	19.5%	20.7%	**
	max.	33.3%	29.8%	30.5%	
Middle-high level	min.	4.3%	3.6%	3.8%	
	max.	11.5%	7.6%	8.4%	**
<i>Organisation type</i>					
Public service	min.	15.6%	33.3%	29.7%	***
	max.	16.9%	27.3%	25.2%	***
Listed company	min.	18.4%	20.5%	20.1%	
	max.	20.8%	25.3%	24.4%	*
Non-listed company	min.	55.0%	38.8%	42.0%	***
	max.	50.9%	39.8%	42.0%	***
Non-profit, other	min.	11.0%	7.4%	8.1%	*
	max.	11.5%	7.6%	8.4%	**
<i>Occupational sector</i>					
BIC ¹	min.	15.6%	14.1%	14.4%	
	max.	14.9%	13.0%	13.4%	
Manufacturing	min.	24.0%	25.8%	25.4%	
	max.	24.9%	30.4%	29.3%	*
Services	min.	34.4%	20.6%	23.4%	***
	max.	30.1%	20.7%	22.6%	***
Media et al. ²	min.	26.0%	39.5%	36.8%	***
	max.	30.1%	35.9%	34.7%	*

	Exp.	Bachelor	Master	Total	
Currently PhD student	min.	1.9%	24.2%	19.7%	***
	max.	1.3%	13.8%	11.3%	***
Permanent contract	min.	80.1%	57.6%	62.1%	***
	max.	90.3%	73.4%	76.8%	***
<i>Firm size</i>					
Small firm	min.	43.5%	35.1%	36.8%	**
	max.	39.0%	29.1%	31.1%	***
Medium firm	min.	22.5%	17.3%	18.4%	*
	max.	22.9%	17.6%	18.7%	**
Large firm	min.	34.0%	47.6%	44.8%	***
	max.	38.1%	53.3%	50.2%	***
Contractual working time (h/week)	min.	37.7	35.7	36.1	***
	max.	37.1	37.4	37.3	
Gross earnings (€/month)	min.	3,014.1	3,315.4	3,254.4	***
	max.	3,764.4	4,386.3	4,260.5	***
Gross earnings (€/hour)	min.	16.8	18.3	18.0	***
	max.	21.2	23.8	23.3	***
N		462	1,821	2,283	

Source: BAP 2009/10, authors' calculations; performed with Stata 15

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

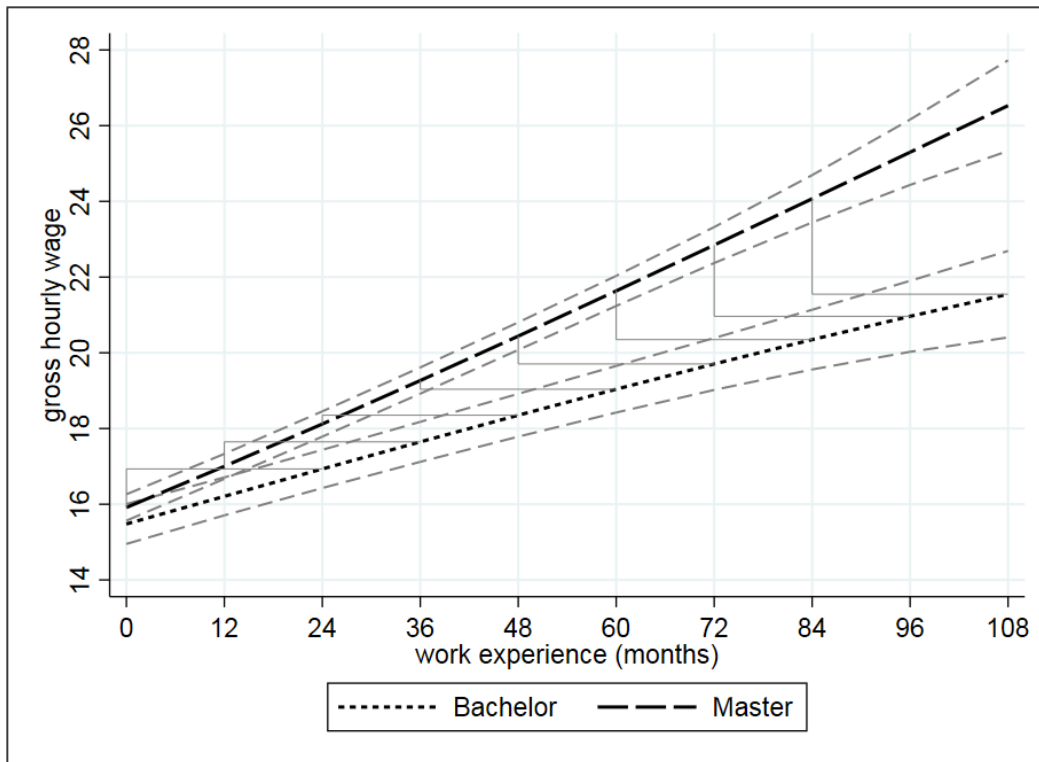
4.2 Multivariate analysis

Random-effects panel regressions are estimated to assess the wage effects of a master's degree relative to those of a bachelor's degree. Figure 1 shows the average marginal effects of model 1, with the logarithmised hourly wage as the dependent variable. Here, only the degree and work experience (linear, squared and interaction with degree) are included as independent variables. The added lines compare master's graduates' wages with those of bachelor's graduates with two more years of work experience.

As can be seen, master's graduates earn slightly more than bachelor's graduates at the beginning of their respective careers – although the difference gains significance only after several months –, but less than bachelor's graduates with two more years of work experience. However, respondents with a master's degree indeed experience steeper wage growth, which allows them to surpass the earnings of those who do not have such a degree, but who have spent more time on the labour market.

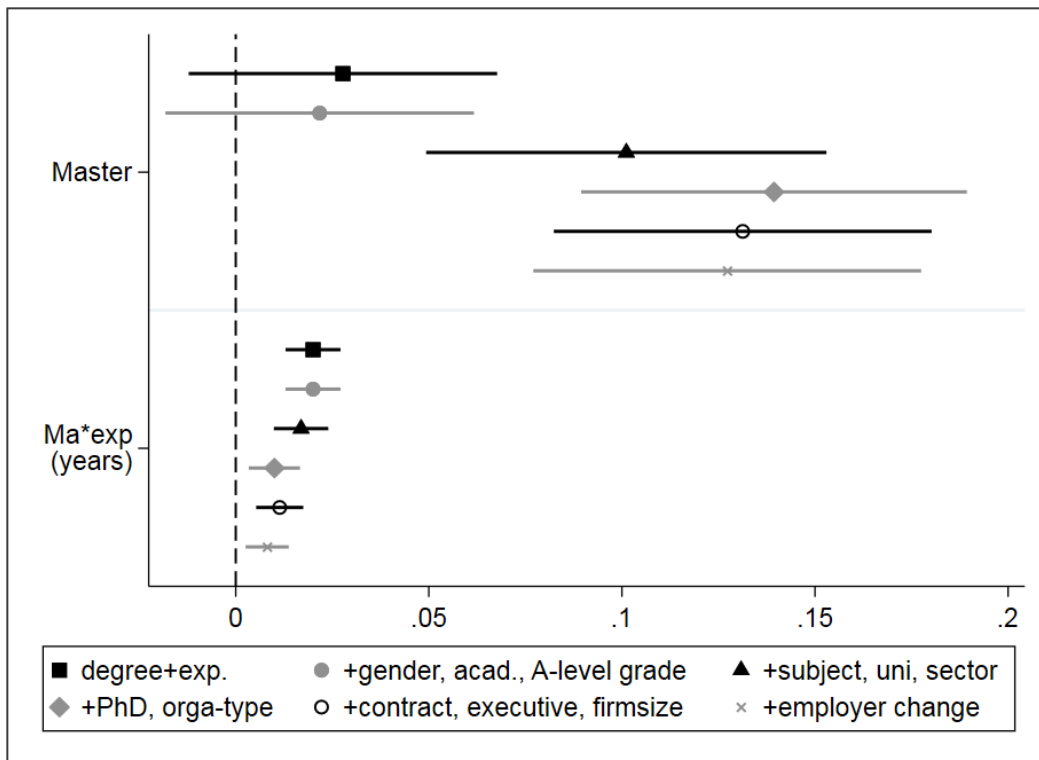
Additional independent variables are included with each model. The consequences for the main effect (i.e. the degree coefficient) can be seen in figure 2.

Fig. 1 Hourly wages in euros of bachelor's and master's graduates. Model 1 without control variables. Average Marginal Effects with 95% CIs



Source: BAP 2009/10, authors' calculations; performed with Stata 15

Fig. 2 Stepwise Random-Effects panel regressions of log. hourly wages. Coefficients of main effects with 95% CIs



Source: BAP 2009/10, authors' calculations; performed with Stata 15

Figure 2 shows the sizes of the degree coefficient – i.e. the wage difference between bachelor's and master's graduates when both have no work experience – and of the interaction of the degree with work experience, i.e. how much the wage difference grows with each year of work experience. Both coefficients appear six times, once for each model.

The main effect decreases at first when some personal characteristics are included, namely gender, the academic background and the grade of the university entrance qualification (mostly Abitur). Given the respective coefficients (see table 3), this seems to be primarily due to the fact that master's graduates are more often male, a characteristic that is positively associated with wages.

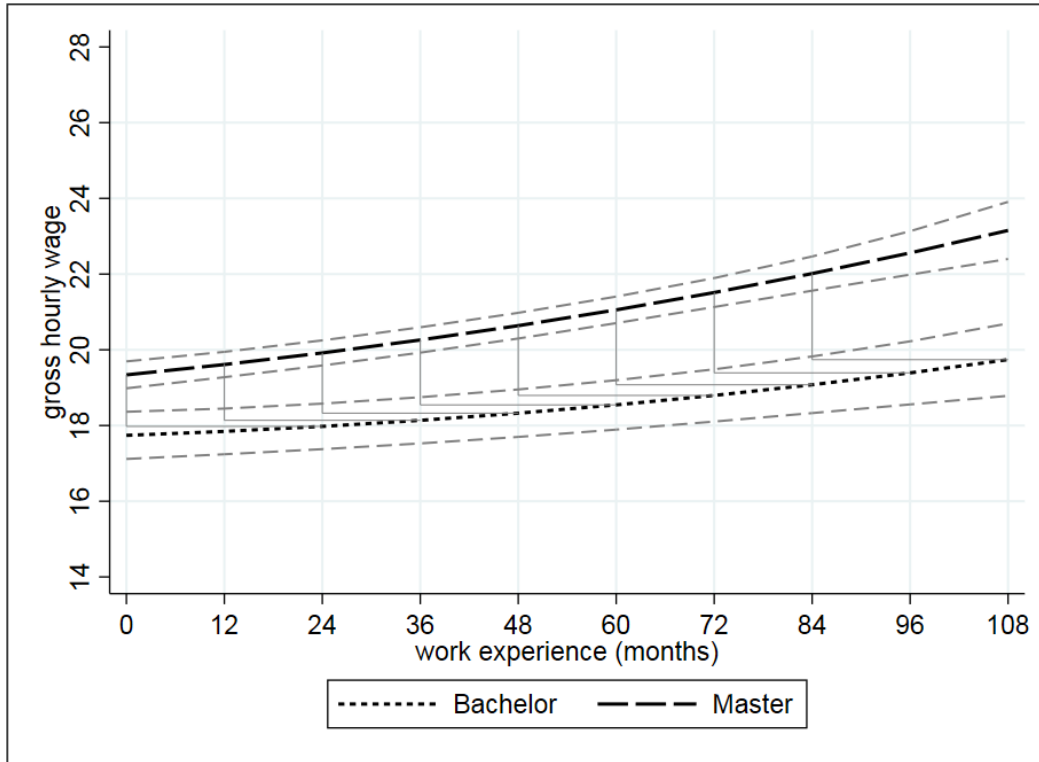
The main effect increases and becomes highly significant when the field of studies, the type of university (university or university of applied sciences) including a degree interaction and the occupational sector are included, and increases further when information about PhD studies and the type of organisation are added. Master's graduates thus earn significantly more relative to bachelor's graduates once PhD students, who on average have lower wages, are controlled for. This makes sense, since a bachelor's degree is usually not sufficient for PhD studies, so that PhD students almost exclusively consist of master's graduates in this sample.

Regarding wage differences between the different university types, the coefficients of the university variable and of its interaction with the master's degree have to be considered. According to model 3, the positive master effect is less pronounced for master's graduates from universities who earn significantly less than master's graduates from universities of applied sciences, as the negative interaction effect shows. This coefficient decreases and loses its significance after controlling for PhD students, who are overrepresented among graduates from universities. Differences between university types therefore seem to be insignificant when the field of study and doctoral studies are accounted for.

Several other independent variables, too, exert significant influence on respondents' wages. For example, wages are higher in the manufacturing sector, in large companies, or for those with a permanent contract or an executive position. However, there are no large differences between bachelor's and master's graduates in regard to these variables – at least when PhD students are already controlled for, who for example mostly have fixed-term contracts. Therefore, neither the degree coefficient nor its interaction with work experience changes very much when all these variables are included in the regression. The inclusion of the employer spells, however, diminishes the coefficient of work experience (only the squared variable is still significant after that), resulting in less steep wage growths.

Figure 3 shows the average marginal effects of model 6, where all control variables are included. Starting wages are higher for both groups of respondents, but more so for master's graduates, who now have a wage advantage relative to bachelor's graduates (even relative to those with more work experience) already from the beginning. The wage growth is still steeper for respondents with a master's degree.

Fig. 3 Hourly wages in euros of bachelor's and master's graduates. Model 6 with all control variables. Average Marginal Effects with 95% CIs



Source: BAP 2009/10, authors' calculations; performed with Stata 15

The results for all six regression models can be found in table 3.

Table 3: Random-effects panel regressions of log. hourly wages

	M1	M2	M3	M4	M5	M6
Master	0.028	0.022	0.101***	0.139***	0.131***	0.127***
Experience (months)	0.004***	0.004***	0.004***	0.004***	0.002***	0.000
Master*experience	0.002***	0.002***	0.001***	0.001**	0.001***	0.001**
Experience ²	-0.000*	-0.000*	-0.000*	-0.000***	-0.000	0.000
Gender: male		0.130***	0.079***	0.097***	0.073***	0.089***
Academic background		-0.034*	-0.022	-0.015	-0.013	-0.026
A-level grade		0.000	-0.033*	-0.054***	-0.061***	-0.070***
Field of study						
Humanities			(ref.)	(ref.)	(ref.)	(ref.)
Social sciences			0.048	0.073**	0.059*	0.074**
Law/economics			0.196***	0.213***	0.170***	0.212***
Math and sciences			0.018	0.124***	0.126***	0.138***
Engineering			0.037	0.109***	0.098***	0.141***

	M1	M2	M3	M4	M5	M6
University			0.021	0.026	0.039	0.031
University*Master			−0.097**	−0.065	−0.048	−0.065
<i>Occupational sector</i>						
BIC ¹			(ref.)	(ref.)	(ref.)	(ref.)
Manufacturing			0.219***	0.185***	0.186***	0.126***
Services			−0.040	−0.018	0.003	−0.017
Media et al. ²			−0.109**	0.052	0.077*	0.025
Currently PhD stud.				−0.383***	−0.269***	−0.209***
<i>Type of organisation</i>						
Public service				(ref.)	(ref.)	(ref.)
Listed company				0.134***	0.036	0.047
Non-listed comp.				0.053	−0.000	0.013
Non-profit, other				0.066	0.038	0.025
Fixed-term contract					−0.212***	−0.150***
<i>Executive position</i>						
None					−0.176***	−0.131***
Low-level					(ref.)	(ref.)
Mid/high-level					0.051	0.027
<i>Firm size (employees)</i>						
Small (<100)					−0.071**	−0.037
Medium (100–499)					(ref.)	(ref.)
Large (500+)					0.056*	0.036
1 st employer						(ref.)
2 nd employer						0.232***
3 rd employer						0.373***
4 th employer						0.463***
5 th employer						0.421**
Constant	2.739***	2.698***	2.696***	2.595***	2.847***	2.821***
<i>N</i>	146,806	146,806	146,806	146,806	146,806	146,806

Source: BAP 2009/10, authors' calculations; performed with Stata 15

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

However, some effects can differ when not the real, but the contractual working time is considered (results available on request). Then, the master effect is larger and highly significant in every model because the negative effect of doctoral studies on wages is smaller: PhD students on average report a high amount of overtime that does not affect their incomes – to a large part, this is probably time spent on the dissertation without compensation – so that their hourly wages are much higher relative to those of non-PhD students when the contractual working time is used for the calculation. In that case, the negative PhD effect also completely disappears after all control variables are added. Furthermore, the wages of PhD students with master's degrees from different types of universities differ when the actual working time is used. This is because the gap between contractual and actual working time is

smaller for those PhD students who obtained their master's degree at a university of applied sciences. Industry-sponsored doctoral studies might play a role here.

In order to capture the interplay between vertical and horizontal aspects of stratification, additional regressions for the five fields of study distinguished here were estimated (detailed results available on request). Results show that in model 1, only for law and economics there is a positive master effect, while in math/sciences – unless the contractual working time is used – there even is a negative effect. This is probably due to the share of PhD students in these two fields which in one case is very low and in one case very high. Eventually, however, the wages of master's graduates almost always surpass those of bachelor's graduates with the same amount of work experience, the exception being the humanities.

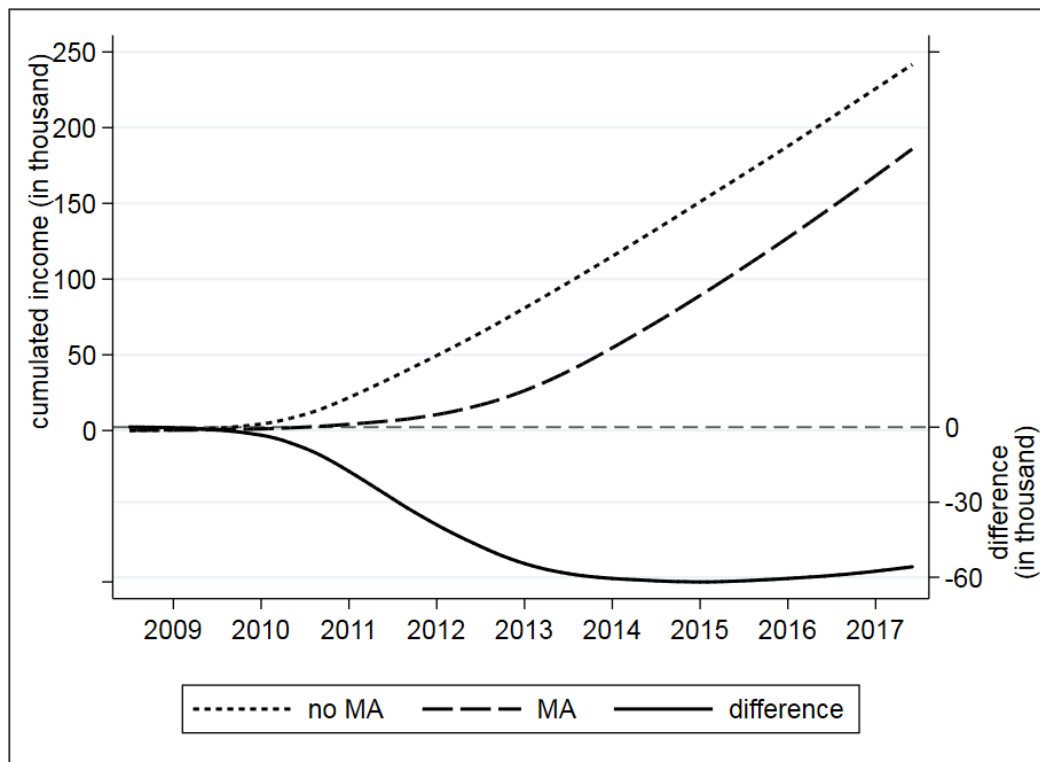
For graduates of the humanities and social sciences, doctoral studies do not have a big influence, because wages of PhD students do not differ significantly from those of others in these fields. This makes obtaining a doctoral degree a less risky additional investment in education for these graduates: A financial disadvantage accumulates during master's studies, but not anymore after that, while for a master's graduate in math/sciences the disadvantage will continue to rise if they choose to do a doctorate. Depending on the subject, PhD studies can therefore be seen as a long-term investment or as no true investment at all, because in some cases there are just no opportunity costs.

4.3 Cumulated incomes

As mentioned above, higher wages for master's graduates do not necessarily result in an overall better economic position because of the income advantage that bachelor's graduates gain by their earlier labour market entrance. In this section, it will be investigated how this advantage develops over time until the end of the observation period when respondents possess up to eight years of work experience. For this purpose, bachelor's graduates of the graduation cohort 2008–10 will be analysed. Those who did not proceed to complete a master's degree will be compared to those who did. Respondents who obtained a master's degree in 2008–10 would not be a suitable comparison group since they could enter the labour market at the same time than bachelor's graduates without further studies.

Figure 4 shows the average cumulated gross monthly incomes of bachelor's graduates with and without a further master's degree above the zero line, and the difference between the two values below the zero line. If an employment was not observed in a particular month, the respondent was included with the value zero in the calculation of the average.

Fig. 4 Average cumulated gross monthly incomes in euros. Bachelor's graduation cohort 2008–10 with and without master's studies afterward



Source: BAP 2009/10, author's calculations; performed with Stata 15

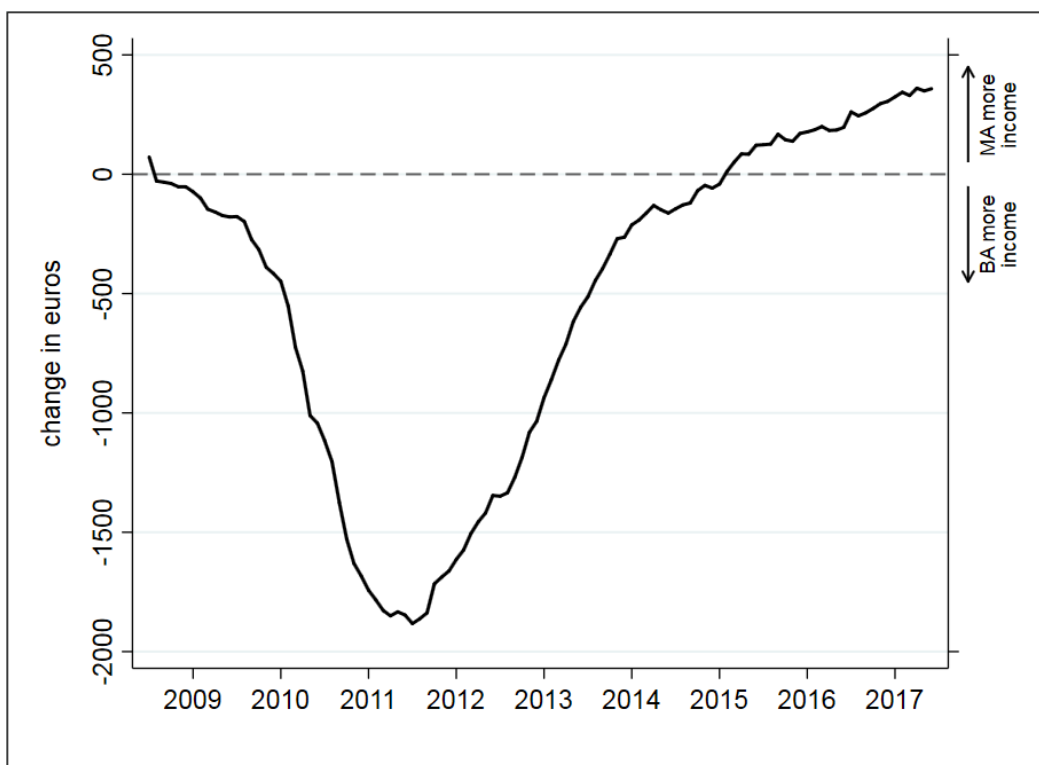
A noticeable rise in cumulated incomes can be observed since 2010 for graduates without further studies, and since 2011 for those with further studies, marking the times when significant numbers of graduates start to enter the labour market. The difference in average cumulated incomes meanwhile rises until the year 2014, when it reaches more than 60,000 euros. In 2015, the difference starts to decrease, but is still more than 50,000 euros at the end of the observation period.

Furthermore, figure 5 shows how this difference develops over time: It increases more and more quickly in the first years until 2011, when the average graduate without further studies earns more than 1,500 euros more than the average graduate who proceeded to complete a master's degree. This does not mark the point where the incomes of the first group are highest, but the point where most of them have already entered the labour market while many of the comparison group have not.

Afterward, the line gets closer to zero again, indicating that the difference in cumulated incomes still rises, but not so fast anymore: The work experience-related wage gains by graduates without further studies are offset by the large income increases of the master's graduates who just enter the labour market (and thus make jumps from zero euros to several thousand).

However, as can be seen in figure 1, master's graduates initially have a wage disadvantage compared to respondents of the same age but without further studies due to a lack of work experience. Therefore, the cumulated wage difference only begins to decrease in 2015, when the steeper wage growth of master's graduates has compensated the disadvantage in work experience. At least in the first two or three years afterward, the difference does not decrease as fast as it increased in the first years of the observation period, because bachelor's graduates usually begin to work about two years earlier, and during this time their wages exceed those of the later master's graduates (who at this point are mostly still master's *students*) far more than master's graduates' wages later exceed those of bachelor's graduates. Whether and how this changes in the following years, cannot be answered with the data used here due to the end of the observation period. More data, which cover more of the respondents' careers, are necessary to investigate this question.

Fig. 5 Change in cumulated income difference in euros. Bachelor's graduation cohort 2009/10 with vs. without Master afterward



Source: BAP 2009/10, author's calculations; performed with Stata 15

When subject-specific developments are considered, here, too, some differences can be found (detailed results available on request): In math/sciences and in engineering, the cumulated income difference is still growing at the end of the observation period. In the first case, this is mainly the result of high numbers of PhD students who earn significantly less than other graduates, both with and without a master's degree. In the latter case, the mechanism is

different: Engineers with a master's degree initially do not earn more than those with just a bachelor's degree and the same amount of work experience – again, mainly because of PhD students –, but also, the returns to work experience hardly differ. Therefore, for engineers with a master's degree it is difficult to compensate the disadvantage in work experience with steeper income growth.

For other subjects, the lifetime income difference decreases much faster, because doctoral studies do not exert such negative effects. Especially in the humanities the difference is also much smaller to begin with (less than 40,000 euros at its peak).

When estimating these lifetime incomes, some limitations have to be considered, too. Due to a later entry into the labour market, master's graduates overall tend to work less – although it is possible that their degree also decreases the likelihood of unemployment, resulting in similar amounts of work experience in the long run –, but for higher wages. Because of progressive taxes, however, working two months for a gross income of 1,000 euros per month can result in a higher net income than working one month for 2,200 euros. On the other hand, in the second scenario higher entitlements e.g. to a pension are acquired. Master's graduates may furthermore have to take on higher debts which could even be treated as negative lifetime incomes, while the higher incomes of Bachelor's graduates without further studies relative to master's students may (partially) be offset by higher living costs. It is thus difficult to measure exact advantages and disadvantages regarding cumulated earnings with these data.

5. Discussion and Conclusion

The aim of this study was to assess the effects of a master's degree on entry wages, wage development and cumulative returns relative to the effect of a bachelor's degree, taking into account that bachelor's graduates have an earlier opportunity to achieve an income and to acquire relevant human capital in a working environment.

Our results show that as a result of their longer investment in human capital through education, master's graduates do not have significantly higher entry wages, which is not in line with expectations rooted in human capital theory which predicts a higher productivity of master's graduates and therefore higher wages for them. Since they experience steeper wage growth, however, the additional human capital acquired in university seems to be of higher value than the work experience that can be obtained on the labour market in the same time. Thus master's graduates start to close the gap within the time period observed. With respect to cumulative income, however, they do not yet fully compensate the earlier gainful employment of bachelor graduates and their considerable wage growth through work experience. The estimations suggest that it may take several more years until master's graduates have

compensated the financial disadvantage resulting from their delayed labour market entry: While monthly incomes and hourly wages may be higher for master's graduates, this is not necessarily true for accumulated lifetime earnings. These are still in favour of bachelor's graduates at the end of the observation period.

The study also investigated how factors associated with the person, their academic achievement and the labour market they entered are relevant for the differences. The Master advantage seems to be partially driven by the fact that higher achieving students and men are more likely to take up a master's degree and also to have higher incomes. On the side of the labour market, doctoral positions are especially important for the wages of master's graduates in the first years. Because these positions are only available to master's graduates, and often have relatively low incomes, they lower the average wages of master's graduates relative to bachelor's graduates. When PhD students are controlled for, respondents with a master's degree earn significantly more at labour market entry than those with a bachelor's degree, and experience even steeper wage growth, although important job characteristics like firm size, the type of contract or executive positions are not always in their favour.

A further goal of the study was to investigate how the vertical Master – Bachelor differences present themselves in different disciplines. While the pattern remains similar in most fields of study, again the field-specific prevalence and relative disadvantage of doctoral studies leads to variations. In math and sciences, doctoral studies are most common and also most pronouncedly associated with lower wages relative to other jobs. In this field, therefore, the average entry wages of master's graduates are significantly lower, and – just like in engineering – the lifetime earnings gap gets particularly large and for a long time does not begin to decrease. In other subjects (especially in the humanities), where PhDs are less prevalent and/or relatively well paid, the gap does not get as big and closes faster. Thus, in some subjects master's and especially PhD studies have to be seen as a long-term investment with regard to financial outcomes. On the other hand, in the humanities there is no significant wage advantage for master's graduates, and in the humanities and the social sciences doctoral positions offer similar wages than other jobs which makes them far easier investments.

One aspect that remains to be investigated more profoundly is the role of the two university types. In our analyses, whether the Master degree was acquired at a university or university of applied sciences does have an overall influence on wages, but this also depends on the degree of the respondents and on the control variables included in the models. Additional analyses should therefore focus on subpopulations which share the same degree, subject and university type.

A limitation of this study is the fact that respondents could not be followed over their whole career, primarily because the widespread introduction of the new bachelor's and master's degrees in Germany is still quite recent. More data on university graduates needs to be collected in the future so that developments in later career stages can be assessed. Bachelor's or master's graduates may, in the long run, be more prone to employment interruptions, e.g. because of unemployment or parenthood, thus either widening or decreasing the gap. Moreover, it is quite plausible that the absence of a Master degree can be disadvantageous especially mid-career when employees move up to managerial positions. It is yet unclear how many of the Bachelors graduates will return to higher education later after some years of work experience in order to increase their labour market prospects.

Another limitation is the fact that the sample consists of persons with at least one university degree from Bavaria and is thus not representative of Germany as a whole in certain aspects. While the Bavarian higher education system is large and diverse, the labour market is decidedly better than average, and wages are on average higher than in the rest of Germany (Eichhorn, Huter, & Ebigt 2010). However, this affects bachelor's graduates as well as master's graduates, and the mechanisms analysed here are expected to be the same in all parts of Germany – after all, standardisation and comparability of higher education systems not only on a national level, but even in all of Europe were central goals of the Bologna reform.

Chapter III:
Frequency of Employer Changes and their Financial Return:
Gender Differences amongst German University Graduates*

Abstract: Gender differences in the frequency of employer changes and their financial return were examined in a sample of Bavarian university graduates. The search and matching theories were used to develop hypotheses which were then tested against each other. The results show that in the first few years after graduation women change employer more frequently than men. In large part this can be explained by gender differences in labor market structures, in particular the fact that a woman's first job is less likely to be in a large company, in an executive position or on a permanent contract and women tend to be less satisfied with their first job. After controlling for variance in these factors the coefficient changes sign, indicating that under similar circumstances men change employer more often. Furthermore, both men and women benefit financially from changing employer. The absolute return is higher for men, but as men tend to have a higher starting salary there is no gender difference in the relative return and hence no effect on the gender gap. The results are also discussed in the light of the specifics of the structure of the German labor market.

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<https://labourmarketresearch.springeropen.com/articles/10.1186/s12651-017-0235-3>

1. Introduction

Differences between men and women are widely discussed with regard to the labor market. A significant part of the sociological and economic literature concentrates on explaining the gender differences in wages, sometimes referred to as the gender pay gap (GPG). These differences vary over countries, cohorts and time spans, but are found almost everywhere and almost all the time (Gartner & Hinz, 2009: 566; Mandel & Semyonov, 2010: 957; Weinberger & Kuhn, 2010: 389; Triventi, 2013a: 571; Kassenboehmer & Sinning, 2014: 339). There are several theories and models which account for a substantial part of the gender pay gap, e.g. by including differences in human capital endowments.

One aspect of the gender pay gap that has been neglected thus far in the German context are the potential gender-specificities in job mobility, the characteristics and effects of which have been explored in several previous studies. However, most of these studies were based on data from Anglophone countries with flexible labor markets and they have produced mixed results. For example, there is evidence that moving directly from one job to another has a beneficial effect on incomes (Keith & McWilliams, 1999), but another study suggested that indirect job transition also has positive effects (Antel, 1991). One factor that probably influences these mechanisms is the labor market structure as described in the varieties of capitalism literature. One would therefore expect analyses of German data to yield different results since Germany is usually classed as having a coordinated market economy (Hall & Soskice, 2001: 21 f.) and there is currently less evidence on the mechanisms underpinning the gender pay gap in such economies. The main features of the German labor market include a high segmentation on the basis of qualifications and skills, low mobility between segments (Scherer, 2004: 373) and high employment protection (Hall & Soskice, 2001: 19). These factors probably affect the frequency of job changes and their outcomes which makes it important to analyze coordinated market economies as well.

Given the rising number of university graduates and the importance of the early years of an individual's employment - when wage growth is especially strong (Fuller, 2008: 158) but the influence of family not yet very pronounced (Triventi et al., 2015: 26) - the population analyzed in this study has particular importance.

The issues on which this study focused were (1) the frequency with which individuals change employer during their early career, (2) the nature of the relationship between gender and changes of employer and (3) how changes of employer affect wages and the gender pay gap in Germany. Thus the results can be compared with those of other studies to provide an analysis of the effects of labor market structure.

2. Theory and State of Research

The search and matching theories provide the theoretical foundation for this study; they apply not only to the search for a first job, but to subsequent job changes as well. According to these theories, individuals try to find a job that matches their preferences and abilities as closely as possible in order to maximize the financial and non-financial returns of work. Employers, too, are looking for the optimal match between post and employee for the same reasons (Scherer 2005: 428). However, potential employees have only limited information about the labor market (Jovanovic, 1979: 973) so every job search involves investing money, time and other resources, hence job searches have costs (Wilde, 1981: 1124). These costs rise with the effort made but are also positively correlated with the number of posts considered. According to the theory, individuals will search as long as the expected returns of the search exceed the costs.

Because search costs are not exclusively financial and because income is only one of several important characteristics of a job one would expect different people in the same situation to use different searching behaviors and this makes searching behavior hard to predict. Gender differences in labor market preferences (Daymont & Andrisani, 1984: 414) may thus also contribute to differences in job mobility (Ng et al., 2007). Generally speaking, however, the probability of an individual changing job should be negatively correlated with the quality of their current job, because the higher the quality of one's current job, the fewer the number of better jobs. The following analyses focus on objective job characteristics because data on individual preferences are not available.

Due to educational and, following this, occupational selectivity, men are more likely than women to work in sectors in which there is a strong relationship between education and occupation (e.g. engineering), so it is easier for them to find a good match. Furthermore, because women tend to have lower incomes even at the beginning of their occupational career (Kunze, 2005: 87; Leuze & Strauß, 2014: 286) it should, other things being equal, be easier for women in their first job to find a better one. However, this assumption possibly cannot (or only to a limited extent) be confirmed when occupational segregation, which can also lead to lower incomes for women, is considered: Because it is often only possible to move to another occupational sector if one acquires the appropriate qualifications, not every job is available to everyone without an interruption in employment (Schiener, 2006: 133 f.). This is especially important in the German context since the German labor market is characterized by stronger segmentation than, for example the British one. In Germany, academic degrees and "occupationally defined fields" play an important role in separating sectors of the labor

market from one another. This also makes “entrapment scenarios” (Scherer, 2004: 373 f.) in which suboptimal entry jobs have long-lasting negative effects on career (Scherer, 2004: 378) more likely.

Thus it is rather likely that due to self-selection, individuals with unsatisfactory jobs are more likely than their peers with satisfactory jobs to be employed in sectors with less attractive workplaces, i.e. gender differences in working conditions can be (partly) explained by the gender distribution of employees across the various sectors. This could be an important explaining factor when gender differences in employer change frequencies cannot be found. In fact there is evidence that occupational segregation by gender is decreasing, but gender differences in the labor market and in choice of academic subjects are still present (Charles & Bradley, 2009: 941; Blau, Brummund, & Liu, 2013: 481).

Furthermore, there are various starting points from which the structure of the labor market can lead to gender-specific effects of employer change on income. One possibility, for example, is that there are better career prospects in occupational sectors where there is more vertical differentiation between jobs. If men and women are unevenly distributed over such labor markets then changing employer could, on average, yield different results for men and women.

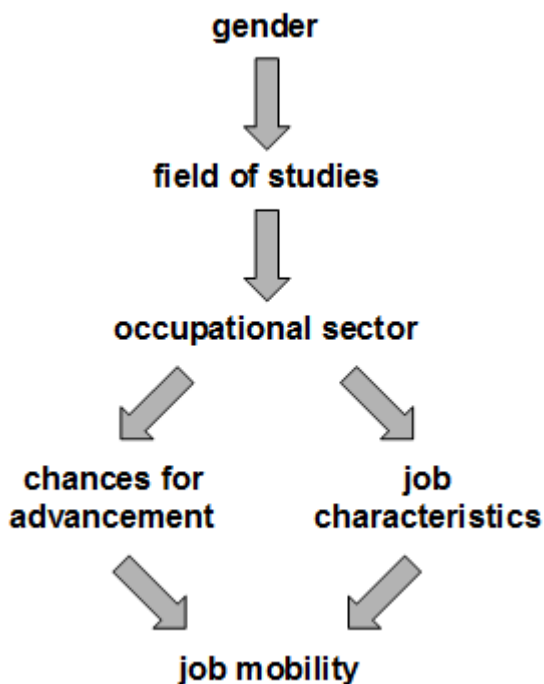
Another possibility, however, is the predominance of the effect of the entry job. If the incomes are low in this job, it is easier to increase one’s income by changing job than in a comparison group where incomes are already higher before the change. On the other hand, people who accept a lower starting salary may have a lower target income. These assumptions lead to different hypotheses, which are then tested against each other in the empirical section. Previous studies did not find a gender difference in the frequency of employer change; however they did find a gender difference in the returns of employer changes. Men seem to benefit to more from changing employer than women (Loprest, 1992; Del Bono & Vuri, 2011; Johnston & Lee, 2012; Merluzzi & Dobrev, 2015). Both the frequency of job change and its return should, therefore, be examined in an analysis of the temporal changes in the gender pay gap.

3. Hypotheses

The arguments outlined in section 2 imply that two factors should be considered in an analysis of possible gender differences: The first step is to ask whether men and women differ with respect to the frequency of employer changes and what factors are responsible for any such difference. Figure 1 is a directed acyclic graph showing the assumed causal effects. There are gender differences in the distribution of employees across occupational sectors (e.g.

18 percent of women and 42 percent of men find their first job in the manufacturing sector) – amongst other reasons this is due to gender differences in choices of field of study. There are also sector differences in chances of advancement as a result of changing employer. Similarly, on average different starting positions with regard to certain job characteristics – e.g. the frequency of permanent contracts or the firm size have been shown to influence not only income (Orlowski & Riphahn, 2011: 38) but also the probability of employer change (Dütsch & Struck, 2014: 116). Employer changes are thus affected by two factors – chance of advancement and job characteristics – although it is assumed that these work in different directions. The following analyses were intended to reveal which factor is the more important.

Fig. 1 Assumed relationships



Source: Author; created with LibreOffice Draw 4.3

Two hypotheses were therefore tested against each other:

1. Women change their employer more often than men because, for the same search cost, their on average worse starting position means that it is more likely they will benefit from doing so, e.g. in the form of a higher salary or a better match between the job and their qualifications (**H1**: search gain hypothesis).
2. Women do not change their employer more often than men because segregation of the labor market means that it is not easier for them to find a better job for the same search cost, despite their on average worse starting position (**H2**: segregation hypothesis).

It should also be noted that the question whether women change their employer more often than men is rather descriptive because even hypothesis 1 does not state that women are

inherently more mobile. The hypotheses instead concentrate on the reasons for potentially higher job mobility among women.

The second step of the analysis deals with the financial consequences of employer change rather than the frequency of such changes. The question addressed here is whether there are gender differences in the return on employer changes. Again, there are two conflicting hypotheses:

1. Women benefit more from changing employer than men because their generally worse starting position makes it easier for them to achieve a wage increase in this way (**H3**: entry job hypothesis).
2. Men benefit more from changing job than women because they are more likely to be employed in a sector where the chances of advancement through job mobility are good (**H4**: advancement hypothesis).

In both cases the effects probably cannot be attributed to one single factor (e.g. the entry job or promotion opportunities); it is likely that several factors are at work simultaneously, possibly acting in different directions.

4. Data

The data used in the analysis were obtained from the Bavarian Graduate Panel (BAP – **Bayerisches Absolventenpanel**). This panel consists of cohorts of university graduates who are recruited about every four years and then questioned several times, at about one, five and ten years after graduation. The statistical population consists of all graduates of the universities and public universities of applied sciences in Bavaria in the selected year. A comprehensive survey is always conducted in order to gain a sample of Bavarian graduates which is as representative as possible. Previous research has shown that there are only minor differences between the data from the BAP and the DZHW³ graduate panel which is recruited from the population of all German graduates (Falk, Kratz, & Müller, 2014: 8 ff.).

The following analysis is based on the 2005/06 graduate cohort. To date this cohort has been surveyed twice, so information about their academic studies and the first years of their occupational career is available. Occupational data are recorded to within a month, so it is possible to reconstruct income dynamics and assign them to different jobs. Individuals may change job whilst remaining with the same employer (e.g. indicated by a change in income or working hours), but since the objects of investigation in this analysis were the frequency and

³ Deutsches Zentrum für Hochschul- und Wissenschaftsforschung – German Centre for Higher Education Research and Science Studies

effects of employer changes, the term “job mobility” is used only to refer to changes of employer, not to job changes within a company.⁴

Although the data cannot be generalized to the entire population since only people with tertiary education were questioned, they have several advantages over other data sets. As shown in previous studies, the gender gap in wage growth – and wage growth itself – is a phenomenon that is particularly pronounced amongst university graduates (Johnston & Lee, 2012: 135 f.). This analysis of graduates should, therefore, contribute substantially to understanding of the gender pay gap.

The time span analyzed here – the years immediately after graduation – is also of particular interest, since a high proportion of income growth across the career is achieved in the early career (Fuller, 2008: 158) and because interruptions in employment for family reasons are not very common in this period. Furthermore, important variables are available to a high level of precision: income is described as a metric variable and information about employment characteristics is given on a monthly basis, from the date of graduation. Thus both the emergence and the development of the gender pay gap amongst university graduates can be tracked very precisely.

Initially, the sample consisted of 3,325 individuals with 222,446 person months (66.9 observations per person, on average). Observations with missing values, episodes with a gross monthly income of less than 400 euros, episodes where gross hourly pay exceeded 100 euros and episodes of self-employment (for which only net income data are available) were dropped from the sample. When this had been done the dataset consisted of 2,258 persons (1,001 women and 1,257 men) and 146,817 observations (65 per person).

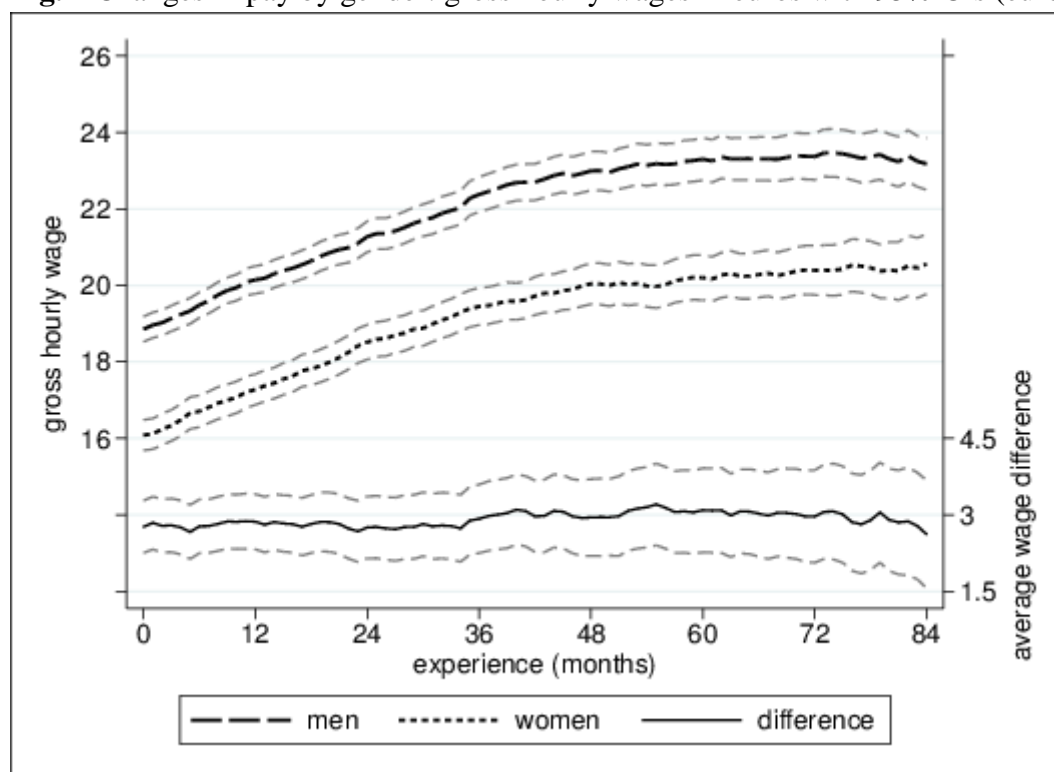
5. Descriptive Statistics

This section presents a descriptive overview over the gender pay gap in the sample. Figure 2 shows the trends in gross hourly wages for men and women as their experience increases, beginning with the first job after graduation. Hourly wages are used instead of monthly income to control for differences in working hours. On average women do less paid work than men (Kleiner, Schunck, & Schömann, 2015: 103; in this sample, the gender differences in average contractual and actual working hours per week amounted to about 1.5 to 3.5 hours

⁴ Participants were asked to regard a job change as a new spell of employment if it involved a change of employer or another important characteristic. It is likely that not everyone reported all relevant changes, so the incomes of immobile respondents are probably underestimated. To take account of this all analyses were conducted twice: the second time, the income of participants who reported one spell of employment and no change in income was increased by 2 percent every 12 months. The only effect this had on the results was to reduce the income advantage for mobile employees relative to immobile employees.

and 2.5 to 5.5 hours, respectively; gender differences in working hours also tended to increase with work experience), so the relative difference in hourly wages is lower than that for monthly income. Immediately after graduation the difference in hourly wages amounts to approximately three euros. It slightly changes over the following years, but never differs much from this starting value. A large part of the gender difference in income is thus already present at the beginning of the working career. Over the observation period absolute wages rose from 18.9 euros to 23.2 euros for men (+22.9 percent) and from 16.1 euros to 20.6 euros for women (+27.8 percent).

Fig. 2 Changes in pay by gender: gross hourly wages in euros with 95% CIs (euros)



Source: BAP 2005/06, author's calculations; performed with Stata 13

Table 1: Changes in income

		Months 0–11	Months 73–84	Abs. change	Rel. change
Monthly income	Men	3,261 €	4,032 €	771 €	23.7%
	Women	2,621 €	3,189 €	568 €	21.7%
	GPG (€)	640 €	843 €	203 €	31.9%
	GPG (%)	19.6%	20.9%	1.3 pp	6.7%
Hourly wages	Men	19.44 €	23.36 €	3.92 €	20.2%
	Women	16.64 €	20.45 €	3.81 €	22.9%
	GPG (€)	2.80 €	2.91 €	0.11 €	3.9%
	GPG (%)	14.4%	12.5%	–1.9 pp	–13.5%

Source: BAP 2005/06, author's calculations

Notes: GPG: Gender Pay Gap; pp: percentage points

Table 1 contains several statistics that show the development of absolute and relative incomes. In order to control for outliers, not the average incomes with work experiences of 0 and 84 months are used, but the averages over months 0 to 11 and 73 to 84. As can be seen, in absolute terms the pay gap widens, both when examining monthly income and hourly wages. The difference in monthly income rises from 19.6 percent to 20.9 percent, whereas the difference in hourly wages drops from 14.4 percent to 12.5 percent. Subsequent analyses of the changes in income and the gender pay gap take this into account in order to provide as complete a picture as possible. It should also be noted that the incomes reported here are probably not representative of Germany as a whole, since average wages in Bavaria exceed those in other parts of Germany (Eichhorn, Huter, & Ebigt, 2010: 291).

Table 2: Time-constant sample characteristics by gender and employer change. Proportions and means with standard deviations in parentheses

		Female		Male	
University	No change	0.57	(0.50)	0.43	(0.50)
	Change	0.63	(0.48)	0.53	(0.50)
<i>Field of study</i>					
Language/cultural	No change	0.21	(0.41)	0.04	(0.19)
	Change	0.25	(0.44)	0.08	(0.27)
Social sciences	No change	0.18	(0.38)	0.03	(0.18)
	Change	0.16	(0.37)	0.03	(0.17)
Law/economics	No change	0.33	(0.47)	0.33	(0.47)
	Change	0.37	(0.48)	0.35	(0.48)
Math/sciences	No change	0.18	(0.38)	0.22	(0.42)
	Change	0.16	(0.37)	0.25	(0.43)
Engineering	No change	0.10	(0.30)	0.38	(0.48)
	Change	0.05	(0.22)	0.30	(0.46)
Academic background	No change	0.50	(0.50)	0.43	(0.50)
	Change	0.54	(0.50)	0.47	(0.50)
Study abroad	No change	0.38	(0.49)	0.35	(0.48)
	Change	0.45	(0.50)	0.44	(0.50)
Semesters	No change	9.83	(1.63)	9.72	(1.73)
	Change	9.87	(1.65)	9.88	(1.73)
Final grade	No change	1.84	(0.49)	1.92	(0.50)
	Change	1.82	(0.48)	1.89	(0.50)
Satisfaction 1 st job ¹	No change	3.91	(1.03)	4.10	(0.88)
	Change	3.50	(1.07)	3.74	(1.05)
<i>N</i>	No change	467		645	
	Change	455		544	

Source: BAP 2005/06, author's calculations

Note: ¹ Satisfaction: five-point scale with 1 = lowest and 5 = highest

Further descriptive statistics can be found in Tables 2 and 3, which give average values for the time-constant (2) and time-varying (3) independent variables, separated by gender, employer

change and – in case of the time varying variables in Table 3 – work experience. This makes it possible to identify differences and trace important changes over time. The first set of variables includes university (vs. university of applied sciences) and field of study (five categories) both of which are important predictors of subsequent position in the labor market. The variable parental academic background (i.e. at least one parent vs. no parents with a university degree) is used to capture respondents' social origin. Study abroad, which captures previous mobility experiences, is of importance mainly for the regressions on employer changes.

Table 3: Time-variant sample characteristics by gender, employer change and work experience. Shares and means with standard deviations in parentheses

		exp. = minimum		exp. = maximum	
		Female	Male	Female	Male
<i>Occupational sector</i>					
1: BIC ¹	No Change	0.12 (0.33)	0.12 (0.32)	0.12 (0.33)	0.12 (0.32)
	Change	0.10 (0.31)	0.14 (0.35)	0.07 (0.26)	0.13 (0.33)
2: Manufacturing	No Change	0.21 (0.41)	0.48 (0.50)	0.21 (0.41)	0.49 (0.50)
	Change	0.16 (0.36)	0.34 (0.47)	0.21 (0.41)	0.44 (0.50)
3: Services	No Change	0.42 (0.49)	0.26 (0.44)	0.41 (0.49)	0.26 (0.44)
	Change	0.44 (0.50)	0.28 (0.45)	0.43 (0.49)	0.26 (0.44)
4: Media et al. ²	No Change	0.25 (0.43)	0.14 (0.34)	0.25 (0.44)	0.14 (0.34)
	Change	0.30 (0.46)	0.23 (0.42)	0.29 (0.46)	0.17 (0.38)
<i>Firm size (employees)</i>					
Small (<100)	No Change	0.36 (0.48)	0.21 (0.41)	0.36 (0.48)	0.22 (0.41)
	Change	0.42 (0.49)	0.31 (0.46)	0.34 (0.47)	0.22 (0.42)
Medium (100–499)	No Change	0.17 (0.38)	0.14 (0.34)	0.17 (0.37)	0.14 (0.34)
	Change	0.21 (0.41)	0.20 (0.40)	0.22 (0.41)	0.16 (0.37)
Large (≥500)	No Change	0.47 (0.50)	0.65 (0.48)	0.47 (0.50)	0.65 (0.48)
	Change	0.37 (0.48)	0.49 (0.50)	0.45 (0.50)	0.62 (0.49)
Executive position	No Change	0.24 (0.43)	0.35 (0.48)	0.33 (0.47)	0.44 (0.50)
	Change	0.12 (0.33)	0.18 (0.39)	0.30 (0.46)	0.45 (0.50)
Public sector	No Change	0.42 (0.49)	0.29 (0.45)	0.43 (0.50)	0.29 (0.45)
	Change	0.38 (0.49)	0.32 (0.47)	0.45 (0.50)	0.33 (0.47)
Permanent contract	No Change	0.78 (0.41)	0.85 (0.35)	0.82 (0.39)	0.87 (0.34)
	Change	0.53 (0.50)	0.67 (0.47)	0.78 (0.41)	0.86 (0.34)
Multinat. company	No Change	0.49 (0.50)	0.67 (0.47)	0.49 (0.50)	0.66 (0.47)
	Change	0.39 (0.49)	0.54 (0.50)	0.43 (0.50)	0.63 (0.48)
Part-time (<30 h/week)	No Change	0.14 (0.34)	0.03 (0.18)	0.15 (0.36)	0.02 (0.15)
	Change	0.14 (0.35)	0.09 (0.28)	0.16 (0.36)	0.03 (0.17)
Wage (€/h)	No Change	17.31 (6.77)	19.77 (5.51)	18.61 (7.35)	21.5 (7.59)
	Change	15.37 (5.92)	18.43 (6.43)	22.09 (7.95)	27.6 (9.39)
<i>N</i>	No Change	473	650	473	650
	Change	528	607	528	607

Source: BAP 2005/06, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

Number of semesters and final grade (which for multivariate analysis is standardized over field of study and inverted so that higher values indicate better grades) are indicators of academic performance and are expected to influence wages.

Table 3 gives data on occupational sector (four categories), firm size and dummy variables for holding an executive position, public sector employment, employment on a permanent contract, employment with a multinational company and part-time employment. These job characteristics have a major impact on income and should also influence individuals' willingness or need to change employer. Gross hourly wages and the mean values for overall job satisfaction in one's first job (1 = lowest satisfaction and 5 = highest) are included.

Table 2 thus shows, for example, that people who changed employer are more likely to have studied abroad and at universities; people who do not change employer are more likely to have attended universities of applied sciences. These facts seem to highlight the importance of previous mobility experiences for future mobility (David, Janiak, & Wasmer, 2010: 201): For students at universities – compared to those at universities of applied sciences – there are on average greater distances between the places of their secondary and tertiary education (Kratz & Lenz, 2015: 13). Hence university students may more often make mobility experiences which, through learning-by-doing effects, could enhance future (job) mobility (DaVanzo, 1981: 46). Previous research has also shown that internationally mobile students tend change employer more often than those who did not study abroad (Kratz & Netz, 2016: 17).

Even more interesting are the statistics presented in Table 3, which gives respondents' characteristics at their first and last observation. As can be seen from columns 1 and 2, individuals who do not change employer during the observation period initially have a wage advantage of about 1–2 euros per hour, but as work experience increases this becomes a disadvantage of several euros per hour; the disadvantage is especially pronounced for men. Other variables also show major shifts. The proportion of mobile men working in small companies falls from 31 percent to 22 percent, whilst the proportion working in large companies rises from 49 percent to 62 percent, a change that probably contributes to the income variations described above.

The chance of being on a permanent contract increases for both men and women – especially if they change job. There are also gender-specific developments in working hours. About 14–16 percent of both mobile and immobile women work part-time (less than 30 hours per week), both at the beginning of their career and after several years. However, the proportion of men in part-time work falls, from 9 percent to 3 percent for those who change job and from 3 percent to 2 percent for those who do not.

6. Analysis

6.1. Frequency of Employer Change

The first step of the analysis presented here investigates the relationship between gender and the frequency of employer changes. One hypothesis was that women would be more likely to change job, because for a given search cost they are more likely to gain an advantage from changing employer (**H1**: search gain hypothesis). The competing hypothesis assumes that this is not the case due to gender differences in job availability and segregation in the labor market (**H2**: segregation hypothesis).

Table 4 gives the frequencies (by gender and overall) for total number of employer changes during the observation period. As can be seen from the third column, about half the sample did not change employer over this period and about a third changed employer just once. Less than one fifth of the sample changed employer more than once and less than 1 percent reported the maximum of four changes.

There were some gender differences in employer mobility. Almost 52 percent of men did not change employer during this period and 33 percent did so only once, whereas the corresponding figures for women are about 47 percent and 31 percent, a cumulative difference of about 7 percentage points. Women are over-represented in all the remaining employer mobility categories (although on average women reported only 63.5 working months whereas men reported 67.9), yielding averages of 1.83 employers for women and 1.67 for men. A chi-squared test yielded a highly significant result, $p = .000$, but Cramér's $V = .109$ indicates only a weak relationship between gender and the number of employer changes.

Table 4: Final number of employers by gender

Total number of employer changes	Female	Male	Total	Cumulative
0	47.25%	51.71%	49.73%	49.73%
1	30.67%	32.94%	31.93%	81.67%
2	14.89%	12.41%	13.51%	95.17%
3	6.19%	2.47%	4.12%	99.29%
4	1.00%	0.48%	0.71%	100.00%
Total	100.00%	100.00%	100.00%	

$N = 2,258$; χ^2 : $p = .000$; Cramér's V : .109

Source: BAP 2005/06, author's calculations

Next cross-sectional logistic regressions were used for a multivariate analysis of the effect of gender on the probability of changing employer at least once during the observation period. The values of the first observations, when the individuals had just entered the labor market,

were used in this analysis. In this methodological context, however, nested models can be problematic because their β -coefficients refer to differently scaled dependent variables and cannot, therefore, be compared with each other (Best & Wolf, 2012: 383; Mood, 2010: 72). For this reason, average marginal effects are reported, as these can be compared across different nested models (Best & Wolf, 2012: 388; Mood, 2010: 80). Table 5 contains the results of the estimated regression models.

In the raw model without any control variables the gender coefficient is negative and significant, indicating that men were somewhat less likely than women to change employer at least once. Models 2 to 4 include several control variables: personal and study characteristics in model 2, occupational sector in model 3 and further job characteristics in model 4. As can be seen from the relevant columns, the inclusion of personal and study characteristics reduces the value of the gender coefficient to insignificance. This change is observed even when only the university or the field of study variable is included. Since the relationship between education and occupation is particularly strong in the case of engineering, it is not surprising that the largest negative effect was found for this field of study. Adding occupational sector as a control variable does not have a strong effect on the gender coefficient, but it does reduce the importance of the field of study, as one would expect given the connections shown in Figure 1. Both field of study and occupational sector thus act as intervening variables.

Finally, both field of study and occupational sector do not have significant coefficients once the other job characteristics are accounted for. This indicates that these job characteristics are more important predictors of employer changes than the remaining aspects of occupational sector, namely career prospects. In the full model gender has a significant coefficient, $p = .044$, but the sign has changed, indicating that given the same personal and occupational background, men were more likely to leave their first employer than women. The greatest effects – all of which make employer changes less likely – were associated with having a permanent contract, holding an executive position, working for a large company and overall job satisfaction. Only once all four of these variables were included did the gender coefficient become positive and significant. Other variables that exerted a significant influence were studying abroad, which made employer change more likely, and employment in the public sector, which made it less likely. As women were over-represented in the public sector including this variable reduces the gender coefficient and increases the p -value, but not above the threshold of .05.

Table 5: Average marginal effects for logistic regressions on employer change

Employer change	Model 1	Model 2	Model 3	Model 4
Male	−0.045*	−0.002	−0.008	0.044*
University		0.040	0.016	0.016
<i>Field of study (FoS)</i>				
Language/cultural		(reference)	(reference)	(reference)
Social sciences		−0.055	−0.070	−0.068
Law/economics		−0.073*	−0.044	−0.007
Math/sciences		−0.073	−0.076*	−0.047
Engineering		−0.143**	−0.098*	−0.053
Acad. background		0.017	0.018	0.019
Study abroad		0.072**	0.071**	0.069**
Semester		0.001	0.000	−0.009
Over FoS: std. grade		−0.005	−0.009	−0.003
<i>Occupational sector</i>				
1: BIC ¹			0.056	0.067
2: Manufacturing			(reference)	(reference)
3: Services			0.088**	0.031
4: Media et al. ²			0.147***	0.010
<i>Firm size (employees)</i>				
Small (<100)				−0.015
Medium (100–499)				(reference)
Large (≥500)				−0.108***
Executive position				−0.156***
Public sector				−0.077**
Permanent contract				−0.241***
Multinat. company				−0.016
Part-time				0.005
Hourly wage				−0.002
<i>Job Satisfaction</i>				
1: Very low				(reference)
2				0.058
3				−0.022
4				−0.109*
5: Very high				−0.196***
Constant	0.503***	0.503***	0.503***	0.503***

N: 2,258; * p ≤ .05, ** p ≤ .01, *** p ≤ .001

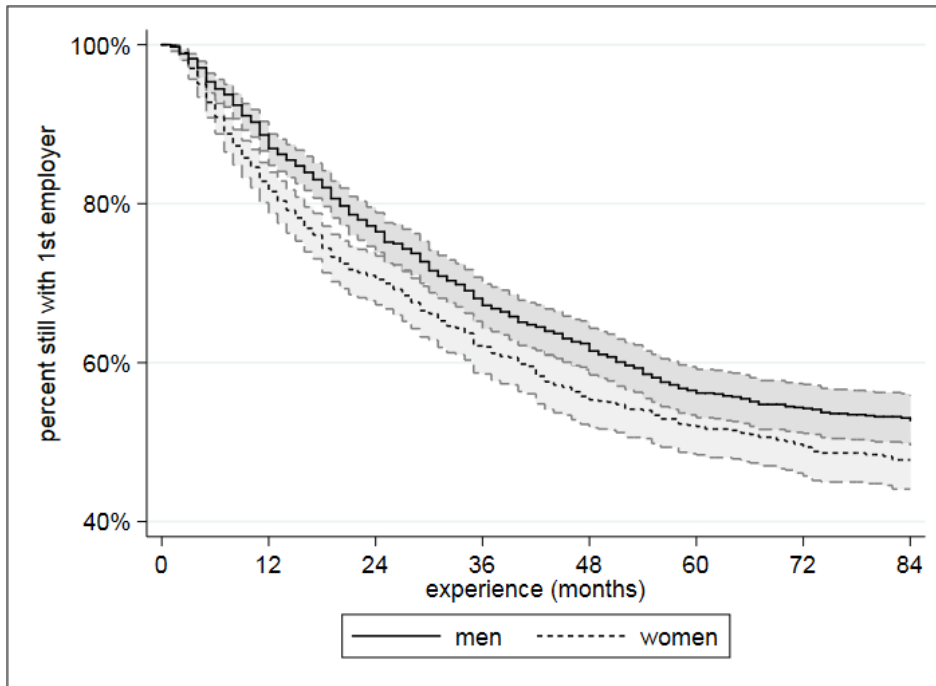
Source: BAP 2005/06, author's calculations

Note: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

Additionally, an event history analysis was conducted to provide a more detailed picture of the changes. Kaplan-Meier survival curves were calculated for the proportions of male and female respondents who still worked for their first employer. As can be seen in Figure 3, the

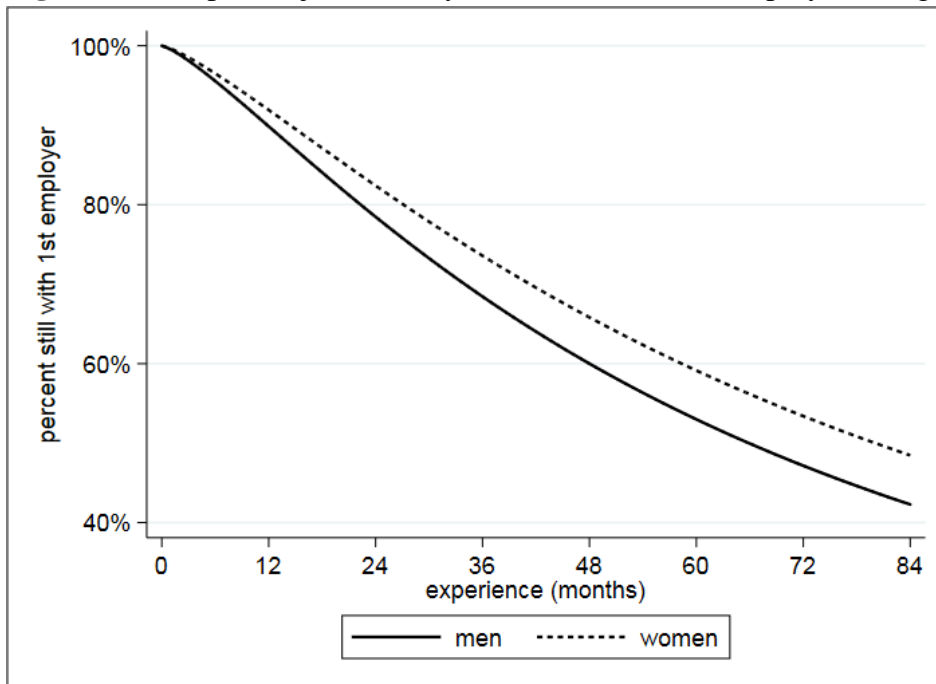
curve for men is slightly above that for women – especially in the first two years on the labor market – indicating that men are slower to leave their first employer.

Fig. 3 Gender-specific job mobility: time course of first employer change and 95% CIs



Source: BAP 2005/06, author's calculations; created with Stata 13

Fig. 4 Gender-specific job mobility: time course of first employer change



Source: BAP 2005/06, author's calculations, control variables included; created with Stata 13

A test of group differences yields a significant p-value of .008. This difference is reversed as soon as the effects of other independent variables are controlled for in a log-logistic regression; the gender coefficient is significant here, and the relationship between gender and employer change is shown in Figure 4. Once the independent variables are included the

women's curve sits above the men's curve, indicating that men leave their first employer more quickly if control variables are included.⁵

The first of the two competing hypotheses predicts higher female job mobility due to their worse starting position (**H1**: search gain hypothesis) and seems to be supported by the results. In the cross-sectional logistic regressions, the negative gender coefficient in model 1 is highly significant and changes algebraic sign only once personal, study and employment characteristics are included. This indicates that women are not inherently more mobile than men; their greater mobility is a reflection of certain occupational sector-related gender differences. Women are less likely to start their working career with a permanent contract, in an executive position or in a large company and these variables play large and significant roles in employer mobility. At the same time neither the coefficient for field of study nor those for most of the occupational sectors were statistically significant. The large coefficient for permanent contracts, suggests that this – alongside the gains to be made from changing employer – is another important determinant of job mobility. If an employer does not offer an extension to a fixed or temporary contract or an alternative post within the company one has to change employer in order to avoid unemployment. When men and women with the same characteristics are compared, however, men seem to be more mobile; the explanation for this may lie in gendered labor market preferences. Men and women differ in how they value job characteristics such as remuneration and working hours (Daymont & Andrisani, 1984: 414; Fortin, 2005: 425), which may make men more likely to leave a job than women, if other factors are equal; this would be reflected in a significant gender coefficient. Were it possible to control for individual differences in labor market preferences and not just for objective job characteristics this gender difference in job mobility might disappear, since previous research has shown that several subjective criteria play an important role in explaining differences in turnover intentions (Sousa-Poza & Henneberger, 2004: 131).

Further analyses are necessary to provide a more complete picture of the effects of male and female job mobility, so the next step in the analysis was an investigation of gender-specific returns on employer changes.

6.2. Return on Employer Change

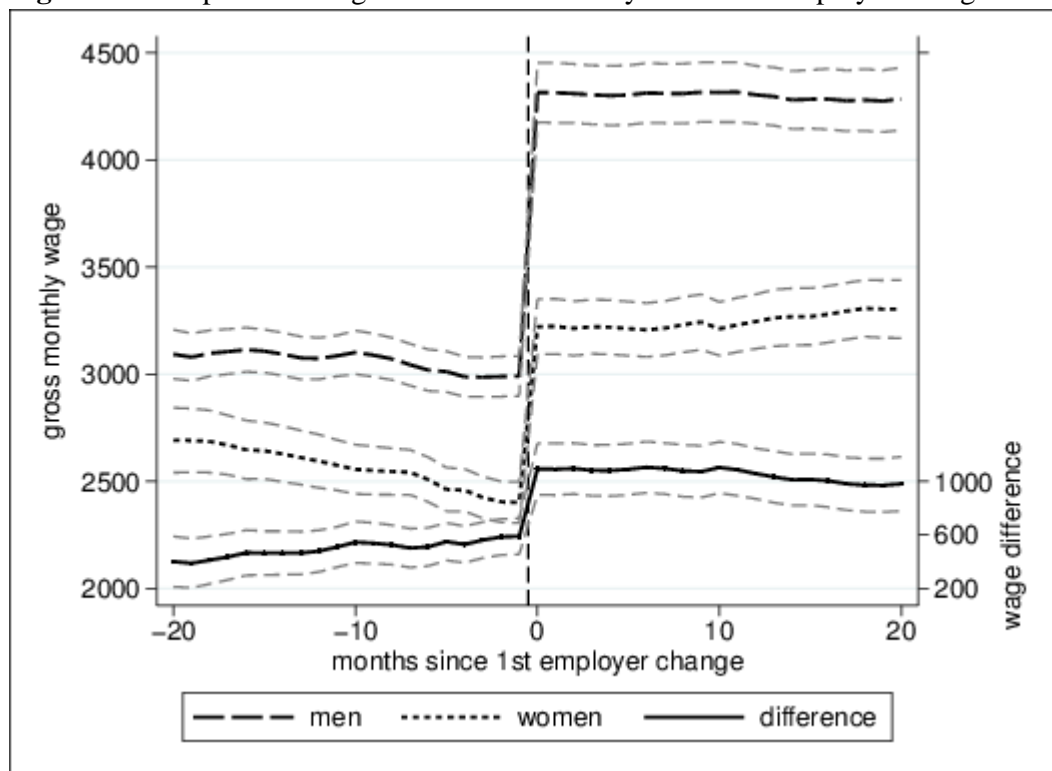
This section begins with a descriptive examination of the relevant data. One hypothesis is that women benefit more from job mobility than men because their on average worse starting

⁵ To test these findings, alternative model specifications (exponential model, Weibull model) were tested; they yielded similar results.

positions make it easier for them to increase their pay (**H3**: entry job hypothesis), the other hypothesis is that men benefit more, because they are more likely to be employed in sectors with good prospects for advancement (**H4**: advancement hypothesis).

Figures 5 and 6 show the average monthly incomes and hourly wages for men and women who changed employer, both before and after the first employer change, without controlling for differences in other variables. Figure 5 shows that immediately before the first employer change the average monthly incomes for men and women were 2,992 euros and 2,402 euros respectively, whilst after the first employer change the corresponding figures were 4,314 euros and 3,222 euros. Thus men achieved an average monthly salary increase of 1,323 euros or 44.2 percent as a result of changing employer, whereas women achieved an average increase of 821 euros or 34.2 percent. The monthly pay advantage for men thus amounts to 590 euros (or 19.7 percent) before the employer change and 1,092 euros (or 25.3 percent) afterwards.⁶

Fig. 5 Gender-specific changes in income: monthly income of employer changers and 95% CIs

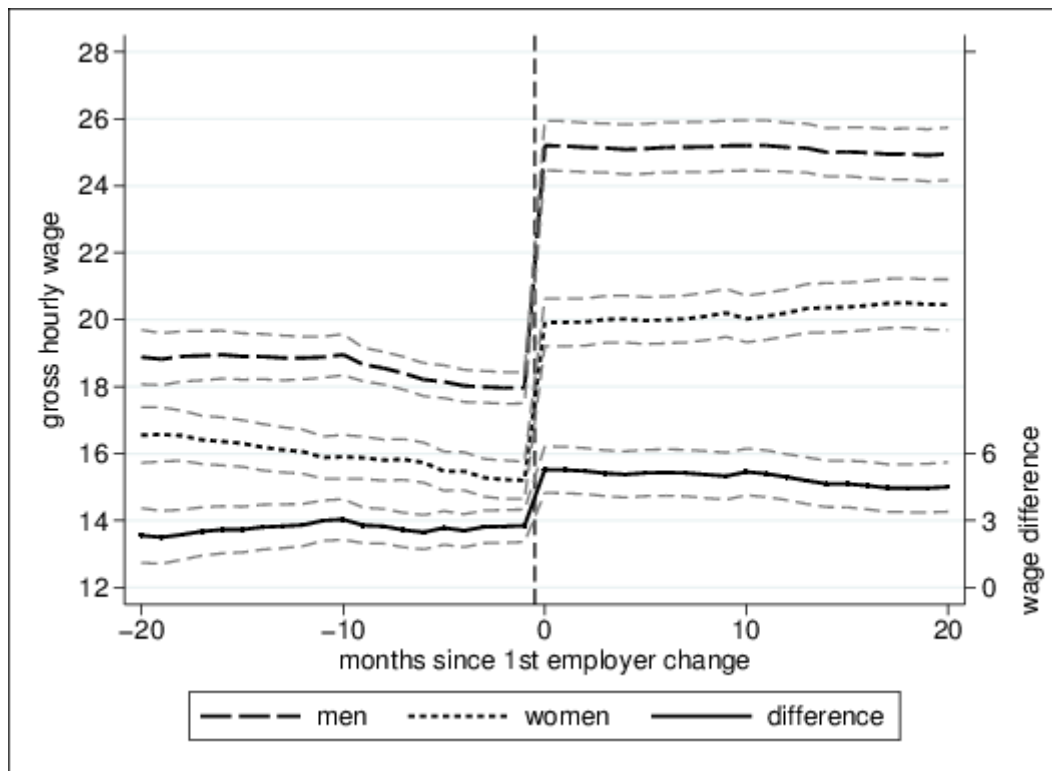


Source: BAP 2005/06, author's calculations; created with Stata 13

⁶ Incomes appear to decrease prior to the employer change; this is caused by self-selection. Better working conditions and higher pay act as a disincentive to change job (see section 6.1), hence people on lower salaries make their first change in employer at an earlier stage. This means that there are fewer observations of this population at higher negative numbers (e.g. if an individual changes job after 10 months there will only be 10 months of observations prior to the change, if an individual does not change jobs until he or she has been employed for 20 months there will 10 additional months of pre-change observations). Hence people on higher incomes are over-represented at the early points in time, leading to higher average incomes and lower numbers of observations at employer change minus 20 months than at employer change minus 1 month.

The differences are less pronounced when considering hourly wages. Figure 6 shows average hourly pay increased from 17.97 euros to 25.20 euros (7.23 euros or 40.2 percent) for men and from 15.20 euros to 19.92 euros (4.72 euros or 31 percent) for women, constituting hourly wage advantages for men of 2.77 euros (15.4 percent) and 5.28 euros (21 percent) before and after the first employer change, respectively. The data appear to support the second hypothesis, which predicts greater wage increases for men because they tend to be employed in labor markets which offer better prospects, regardless of how income is measured. Both monthly income and hourly wages, and absolute and percentage changes in income indicate that men, on average, benefit more from job mobility than women, at least in financial terms.

Fig. 6 Gender-specific changes in pay: hourly wages of employer changers and 95% CIs



Source: BAP 2005/06, author's calculations; created with Stata 13

The multivariate analysis uses fixed effects models to investigate the relationship between employer change, income, and gender. Table 6 shows the regression results for two sets of two models. Models 1a and 2a contain only a variable indicating the number of employers the respondents have had so far, and an interaction between this variable and gender. The other models (1b and 2b) also include work experience and the employment characteristics already used in the logistic regression on employer change (the personal and study characteristics used there are constant over time and therefore excluded from this regression). In models 1a and 1b, the dependent variable is the logarithm of gross hourly wages, for the second set of

models it is just the gross hourly wage. Being unemployed between two jobs can also affect wages (Schmelzer, 2012), but is only of minor importance in this sample, which consisted mainly of young, highly educated workers in a region with low unemployment rate, especially among people with tertiary education. Furthermore, different types of unemployment cannot be distinguished with the existing data so the issue of unemployment is not addressed by the following models.

The coefficients in the first column show highly significant, large, positive values for the employer spell variable, indicating large income increases after an employer change. However, there appears to be a saturation effect, as the coefficient for the fifth employer spell is smaller than that for the fourth and is not statistically significant. Further regressions were carried out using other reference categories, but the results are not reported here. These showed significant differences between all the other employment spell categories with the exception of income in fifth job, which was not significantly different from any other category. A possible explanation for this is the low number of cases: Table 4 shows that less than one percent of the participants reported having five different employers over the observation period. However other studies have also found that a large number of job changes is disadvantageous (Fuller, 2008: 177), one of the possible explanation cited is that too many changes “might signal to the employers that the employees are prone to leaving their job” (Schmelzer, 2012: 93).

Table 6: Fixed-effects-regression models on hourly (log-transformed) wage

(log.) hourly wage	Model 1a	Model 1b	Model 2a	Model 2b
1 st employer	(reference)	(reference)	(reference)	(reference)
2 nd employer	0.315***	0.227***	5.563***	4.018***
3 rd employer	0.524***	0.360***	9.328***	6.341***
4 th employer	0.738***	0.530***	12.364***	8.545***
5 th employer	0.604	0.412	10.086*	6.809
1 st employer*male	(reference)	(reference)	(reference)	(reference)
2 nd employer*male	0.031	0.011	2.145***	1.579**
3 rd employer*male	0.064	0.047	4.520***	3.949***
4 th employer*male	0.064	0.038	4.917**	4.160*
5 th employer*male	0.260	0.169	8.831	6.158
<i>Occupational sector</i>				
1: BIC ¹		-0.089*		-3.233***
2: Manufacturing		(reference)		(reference)
3: Services		-0.075**		-1.792***
4: Media et al. ²		-0.140***		-3.029***
Years of experience		0.011***		0.193***
Years of experience ² /100		0.021		0.031

(log.) hourly wage	Model 1a	Model 1b	Model 2a	Model 2b
<i>Firm size (employees)</i>				
Small (<100)		−0.043		−0.585
Medium (100–499)		(reference)		(reference)
Large (≥500)		0.029		1.102*
Executive position		0.161***		3.600***
Public sector		0.050*		0.209
Permanent contract		0.129***		1.249**
Multinat. company		0.056*		1.007**
Constant	2.834***	2.685***	17.987***	16.217***

N: 146,817; * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Source: BAP 2005/06, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations; Models 1a and 1b use log-transformed gross hourly wage as the dependent variable, models 2a and 2b use untransformed gross hourly wage

When looking at the interaction effects, however, one can see that no significant coefficients are present there and this does not change when control variables are included. The main effect of these additional independent variables is to reduce the size of the employer spell and interaction coefficients without affecting their significance.

As noted in section 5, however, one has to be careful when assessing income changes because they can be expressed in absolute and relative terms and this can affect the interpretation. For example, when there is a baseline difference in income, as here, equal percentage changes do not mean that the (absolute) pay difference stays the same; in fact under these circumstances equal percentage increases would increase the difference in wages, just as equal absolute increases in wages would reduce the gender pay gap (which is calculated as a relative difference). Table 1 shows that even in the early career there is a widening of the absolute income difference and at the same time a narrowing of the relative one. Because the logarithm of hourly wage is used as the dependent variable in the first two regression models estimated above (1a and 1b), the coefficients can be interpreted approximately as relative changes in income. That none of the interaction effects is significant therefore indicates that employer changes have no effect on the gender pay gap. This is consistent with the fact that the interaction coefficients are statistically significant when using raw hourly wage as dependent variable⁷, as in the additional two regression models. This suggests that although changing employer delivers a larger absolute increase in income for men than women, the percentage

⁷ Using raw gross hourly wage is, of course, potentially problematic because of the usual linear regression assumptions so these results should be considered with care. However, not least because they are consistent with the other results presented in sections 5 and 6.2, they provide certain evidence.

difference between men's and women's incomes remains the same because of difference between their starting salaries.

The advancement hypothesis is thus confirmed with regard to absolute wage increases, meaning that men benefit more from job mobility than women. These larger gains do not, however, contribute to a widening of the gender pay gap, because in terms of relative income changes, there seems to be no significant difference between genders. Although changes of employer play an important role in income increases, the main source of income inequality can thus be traced to the differences in income which are already present in graduates' first jobs.

7. Conclusion

This article has examined two relationships: first, the relationship between gender and the frequency of employer changes, and second, the relationship between gender and the financial return on employer changes. Previous research suggested that men benefit more from job mobility but change employer at a similar frequency to women. These results were only partly replicated with the German data used in this study.

A sample of Bavarian university graduates was used to determine the frequency and effects of employer changes. The results show that women change employer more often than men, which may be largely due to the less favorable terms of their first jobs. Compared with men, women in their first job are less likely to be on a permanent contract, to hold an executive position and to work in a large company; they are also less satisfied with their first job. After controlling for variance in these and other factors, the algebraic sign of the gender coefficient in the regression model changed, indicating that men are more mobile when these variables are taken into account. Gender differences in preferences are one possible reason for this difference in mobility: If, as previous studies suggest, men are more career-oriented and prioritize income over job security one would expect them to display higher mobility because changing employer is one route to a career advancement and higher pay. This assumption could not, however, be tested with this sample, because information about individuals' labor market preferences was not available. Additional research using different datasets is needed to address this question.

The results show that changing employer delivers large income increases for both men and women, as long as there are not too many changes over a short period. The financial return on employer change is not clearly related to gender, as only the absolute, not the relative increase in income was larger for men, thus indicating that employer changes do not affect the gender pay gap.

In summary, the job mobility of university graduates during their early career appears to have a substantial impact on their income. The gender pay gap is present at the beginning of individuals' careers and does not increase substantially in the following years; women could potentially reduce it by changing employer more often.

Several aspects have to be considered in the context of these results. First, the sample consists of a selective group of Bavarian university graduates which is not representative of this age cohort of the German population as a whole, mainly because of the exclusion of people without tertiary education. Selectivity thus extends to important characteristics like age, education, experience, and place of residence. This means that further research is necessary to investigate the frequencies and effects of employer changes in other populations not considered here.

Second, there are different kinds of job mobility, and also changes of employer can occur in different ways. Previous works have shown the importance of rationale and volition with respect to employer changes. Involuntary changes of job seem to decrease income whereas changing job voluntarily appears to increase income (Keith & McWilliams, 1995: 133). According to some authors this is only or especially the case when there is no intervening episode of unemployment (Keith & McWilliams, 1999: 473; Schmelzer, 2012: 93), but others have reported that indirect job mobility (i.e. when there is an intervening episode of unemployment) has a stronger beneficial effect on income (Antel, 1991: 305).

Economic and family factors appear to play an important role in voluntary employer changes, with economically motivated and family-related changes having positive and negative effects on income respectively (Fuller, 2008: 177). Incomes can also be positively affected by the use of firm-internal labor markets (Felmlee, 1982: 149; Pavlopoulos, Fouarge, Muffels, & Vermunt, 2014: 314 f.), but gender-specific effects have been found in several of these cases. Family-related employer changes only reduce women's incomes (Keith & McWilliams, 1995: 133 f.) and women are also more likely to change employer for family-related reasons (Keith & McWilliams, 1997: 331). Analysis of an Australian sample showed that for women changing employer was less likely to result in promotion and produced a smaller financial return, sometimes even a negative financial return (Johnston & Lee, 2012: 149).

These findings are somewhat contradictory, suggesting that there may be national differences in labor market mechanisms. In this sample positive income effects were found although there was no differentiation between different types of employer changes (e.g. voluntary and involuntary changes) which can work in different directions. This can, perhaps, be attributed to the characteristics of the German labor market which is more strongly segmented than, for

example, the British one. One of the consequences of this is that there is less downward mobility, which often decreases wages, in Germany (Scherer, 2004: 373). Furthermore, losing one's job at short notice is less common in Germany, and particularly amongst the highly educated, young respondents who made up the sample for this study; the frequency of family-related job changes is also likely to be low in this population. These factors make it far more likely that employer changes are voluntary and hence yield an increase in salary.

The finding that the gender pay gap does not diminish over time may also be due to the specific characteristics of the German labor market, in which field of study has a strong impact on entry into the labor market and entry job characteristics have long-lasting consequences (Scherer, 2004: 378). It is therefore plausible that the gender pay gap is present at graduation – largely because of gender differences in self-selection of field of study and hence occupational sector – and does not diminish in subsequent years. Nonetheless, additional analyses based on more extensive samples including individuals with fewer academic qualifications, older individuals, and data on the reasons for employer change, should be conducted in order to identify the effects of labor market mobility.

Chapter IV:

The Different Ways of Changing an Employer.

Gender Differences in Frequencies and Determinants Among German University Graduates*

Abstract: In this paper, a sample of Bavarian university graduates was used to examine gender differences in the frequency of different types of employer changes. Hypotheses were developed based on the matching and human capital theories, and tested with multinomial logistic regressions. The results show that, in the first few years after graduation, women change employer more frequently than men involuntarily or for personal reasons while there are no differences regarding changes for professional reasons. For the former effects, job characteristics like income, the type of contract, and executive positions – which on average are more favorable for men – are of great importance and can explain large parts of the gender differences. Once these characteristics are controlled for, a significant gender effect for employer changes for professional reasons appears, indicating that, in similar circumstances, men experience these changes more frequently than women. The results are discussed with reference to implications and possibilities for future research.

*This is a manuscript of an article submitted to Economics & Sociology (<https://www.economics-sociology.eu/>).

1. Introduction

When considering workers' career developments, job mobility is an important factor. Employer changes have received some attention in previous studies, but some research gaps remain: First, the “varieties of capitalism” literature emphasizes the importance of structural differences between labor markets. Germany's labor market, which is seen as a coordinated market economy (Hall & Soskice, 2001: 21f.), is characterized by several features that can influence job mobility: Qualification-based segmentation is strongly pronounced, and the degree of mobility between segments is low (Scherer, 2004: 373). Furthermore, the legislation leads to stronger employment protection relative to liberal market economies (Hall & Soskice, 2001: 19). Existing studies, however, often focus on such liberal market economies and not on coordinated market economies.

Second, the term “job mobility” includes a variety of mobility types: Employer changes as well as job changes within a company can occur for different reasons and with differing consequences for wages, positions, working time, and other characteristics. Not all of these factors have received the necessary attention yet. The issue of gender also has to be considered: The labor market has undergone significant changes in the last decades, with rising shares of female labor participation since the 1990s. In Germany, employment rates fell from 78.4 to 76.4 percent for men and rose from 57.0 to 68.8 percent for women between 1991 and 2013, although the difference in working hours increased due to the increased prevalence of (especially female) part-time work (Klenner & Lillemeier, 2015: 2). Job mobility can thus be important for both men and women, while significant wage differences still remain (Gartner & Hinz, 2009: 566).

This paper focuses on employer changes using a sample of Bavarian university graduates who were interviewed in a panel survey between 2012 and 2018. Different types of employer changes are analyzed: employer-induced changes and employee-induced changes for personal or professional reasons. It is examined which variables affect the frequency of employer changes and the gender differences in these frequencies in order to close a research gap for the German labor market.

2. Data and Operationalization

The Bavarian Graduate Panel (BAP) provides the data for the following analyses. In this panel, about every four years a cohort of graduates is selected. The basic population consists of all the graduates of Bavarian universities and public universities of applied sciences in the selected year. These graduates are then interviewed three times, about 1.5 years, 6 years and 10 years after graduation. This study uses data from the 2009/10 graduation cohort

(graduation between October 1st 2009 and September 30th 2010 – for bachelor and master graduates between October 1st 2008 and September 30th 2010) for which to date the first two surveys have been conducted. Teaching and medicine degrees were not part of the sample.

Information about study experiences and all employments since the graduation was collected. Respondents were asked to (retrospectively) list starting and ending dates (on a monthly basis) and job characteristics of these employments, with the request to also report significant changes within an employer, e.g. rises in salary.

Whenever an employer change was reported, respondents were asked if they or their employer chose to terminate or not to extend the contract. If an employee-induced quit was reported (i.e. the respondent did not want to extend or terminated the contract), respondents were asked if they chose to do so because of professional or personal reasons. Using this information, the dependent variable was created which distinguishes between involuntary employer changes, employee-induced changes for personal reasons, and employee-induced changes for professional reasons.

A major advantage of this dataset is the fact that respondents' employments were observed since immediately after the graduation. This allows us to analyze their careers from the beginning until about seven to eight years afterward. For this analysis of job mobility, the time span between about 25 and 35 years of age is also of particular interest because it is characterized by high degrees of mobility (Mayer, Grunow, & Nitsche, 2010: 391f.) – for university graduates even more so than for the whole population (Kratz, 2015: 8).

Drawbacks of the dataset include the focus on people with tertiary education and on *Bavarian* university graduates. Average wages (but also living costs) are higher in Bavaria than in Germany as a whole (Eichhorn, Huter, & Ebigt, 2010: 291), but effects on job mobility are expected to work in the same directions for Bavarian and German university graduates.

After excluding observations with missing or implausible values, the dataset still contained 4,798 individuals – 2,513 men and 2,285 women – who experienced 3,509 employer changes.

3. Theory, State of Research, Hypotheses

Regarding the type of employer change, three different outcomes are distinguished: involuntary (employer-induced) changes, employee-induced changes for professional reasons and employee-induced changes for personal reasons.

For **involuntary changes**, the employer's perspective has to be considered since a layoff is triggered by the employer rather than the employee. Layoffs may mainly occur for two reasons: First, a difficult economic situation, e.g. because of customers' reduced demands, can reduce a company's demand for workers. Layoffs are then used to lower the costs. In small

companies and less stable sectors, average workforce fluctuation could therefore be stronger, resulting in a higher number of involuntary employer changes. A gender effect can then be expected, when women are more often employed in such sectors because of their choice of field of study – in Germany, educational credentials are very important for labor market placement (Scherer, 2004: 373).

Secondly, according to matching theory, employees as well as employers are trying to establish employments with an optimal match. This is made more difficult by the fact that there is incomplete information about job requirements and employees' skills (Scherer, 2005: 428). Employers can therefore be discontent and try to recruit workers with a better education-occupation match in order to increase productivity, laying off mismatched employees in the process (Blau & Kahn, 1981a: 272). As Ochsenfeld (2014: 536) stated, "academic disciplines assume a licensing function for occupations". During studies, human capital is acquired which enhances graduates' productivity on the labor market (Becker, 1962). However, different subjects convey different types of human capital (van de Werfhorst, 2002: 288) which are more or less occupation-specific. An educational mismatch occurs when the job of an individual is not related to their field of study. Mismatches are more common in social and cultural sciences than e.g. in engineering (Robst, 2007: 402).

Due to this, gender differences in the probability of being laid off are expected because of the gender segregation during studies which occurs due to gender-specific self-selection into different subjects (Blau, Brummund, & Liu, 2013: 481; Charles & Bradley, 2009: 941). Women are overrepresented in various fields of study with a weaker link between education and occupation while men are overrepresented in fields of study with a low mismatch probability (Leuze, 2007: 44). To facilitate layoffs, employers could more often give fixed-term contracts to employees whose productivity and job match cannot easily be identified, i.e. to graduates of social and cultural sciences (where women are overrepresented). However, female graduates are far more often employed in the public sector (Ochsenfeld, 2012: 518) where employer-initiated changes are on average less probable (Ellguth & Kohaut, 2011: 22). The first hypothesis thus states:

H1: Controlling for the public sector makes it more likely, controlling for the field of studies less likely to change employer involuntarily for women relative to men, two effects that possibly cancel each other out.

Previous research with British data has found a higher probability for women than for men to be laid off (Booth & Francesconi, 2000: 183). However, several studies using US data have found that men are more likely than women to be laid off (Blau & Kahn, 1981a: 293;

Campbell, 1997: 1072; Fuller, 2008: 177; Keith & McWilliams 1995: 135; Keith & McWilliams 1997: 331; Keith & McWilliams 1999: 473). The labor markets of both the United Kingdom and the United States are characterized as liberal market economies, and these studies do not focus on respondents with tertiary education. These factors might contribute to differing results in this study.

Personal reasons for an employer change include a variety of circumstances. The concept of a tied mover refers to “a family migrant who, if single, would not have chosen to migrate”. The move is made nonetheless because the partner’s wage gain that can be achieved through migration sets off the wage loss of the tied mover so that the family income still increases. From a human capital perspective, men are as likely as women to become tied movers given an equal relative income (potential) (Cooke, 2003: 339). However, incomes are unevenly distributed, and a significant gender wage gap in Germany still persists, even or especially within those with tertiary education (OECD, 2013: 119). Women are therefore expected to more often be a tied mover which counts as a personal reason for an employer change.

The birth of children is another important factor that can influence mobility behavior. Although legislation in Germany makes it easier to return to the old job after a phase of childcare, discriminatory practices may in some cases make individuals look for another employer nonetheless. Furthermore, a temporary exit out of the labor force could lower the perceived (psychological) costs of an employer change, and altered circumstances – like the long-term necessity of childcare – can make other jobs more desirable. Since women still perform more childcare than men (Berghammer, 2013: 62), they are more prone to be subjected to these mechanisms. The “traditional division of labor by sex within the family” (Blau & Kahn, 1981b: 563) could thus lead to gender differences in the probability of changing the employer for personal reasons. Caring for other (especially older) family members is also a task primarily carried out by women (Sachverständigenkommission, 2017: 31) and can have similar effects. From this, the second hypothesis is derived:

H2: Women more often change employer for personal reasons than men.

Regarding this type of employer change, several studies using US data have already found significant gender differences (Fuller, 2008: 177; Keith & McWilliams, 1995: 135; Keith & McWilliams, 1997: 331; Keith & McWilliams, 1999: 473). This also seems to be in line with the fact that in Germany, mothers take parental leave more often and for longer periods of time than fathers (Bujard, 2013: 127) which, however, does not necessarily imply an employer change.

Professional reasons for an employer change are the third category. The arguments outlined in the section about involuntary changes in part apply here too, although here the employee perspective is more important than the employer's perspective. Incomplete information about the labor market (Jovanovic, 1979: 973) leads to imperfect job matches which can decrease individuals' job satisfaction and increase their turnover intentions. Higher incomes elsewhere can also be an incentive to change the current employer.

In this context, the educational gender segregation by field of study is important as well. In addition to the better match offered by several male-dominated subjects, those subjects on average also offer higher wages, which for women could further increase the likelihood of changing the employer compared to men. The third hypothesis therefore states:

H3: Controlling for the field of study makes it more likely to change employer for professional reasons for men relative to women, because women study subjects with a weaker link between education and occupation and with lower financial returns more often than men. The empirical evidence regarding this type of quit is mixed. Studies using US data on the one hand conclude that men quit for economic reasons more often than women (Keith & McWilliams, 1995: 128), but also find that women have “non-family-related quits” more often – which probably mainly consist of economic quits – than men (Keith & McWilliams, 1997: 326).

4. Analysis

In the following analysis the relationship between gender and job mobility is investigated. Gender is the central independent variable, while the three types of employer change constitute the dependent variable: involuntary (employer-induced) employer changes and employee-induced changes for either professional or personal reasons. Field of study and job characteristics are subsequently added as further independent variables.

4.1 Descriptive Statistics

Table 1 contains descriptive statistics about the relevant variables for women, men, and for all respondents. These three columns are split into two columns each where values of time-variant variables – especially job characteristics – are given for the beginning of the respondents' careers and for the end of the observation period. The last two columns, which contain the information about all respondents, also indicate if the difference between men and women is significant for the respective point in time.

Table 1: Sample characteristics by gender and work experience. Percentages and means

	Women		Men		Total	
Work experience:	min.	max.	min.	max.	min.	max.
<i>Field of study</i>						
Language/cultural	28.6%		6.3%		16.9%***	
Social sciences	16.1%		6.2%		10.9%***	
Law/economics	27.6%		28.1%		27.8%	
Math/sciences	18.2%		26.3%		22.4%***	
Engineering	9.4%		33.1%		21.8%***	
Child	5.8%	30.0%	5.0%	31.6%	5.4%	30.8%
<i>Organization type</i>						
Public service	29.8%	27.0%	25.8%	20.7%	27.7%**	23.7%***
Listed company	15.2%	20.0%	23.6%	28.5%	19.6%***	24.4%***
Non-listed company	42.5%	40.7%	45.6%	45.9%	44.1%*	43.4%***
Non-profit/other	12.5%	12.3%	5.0%	5.0%	8.6%***	8.4%***
Executive position	20.0%	32.6%	28.0%	45.7%	24.2%***	39.4%***
<i>Occupational sector</i>						
BIC ¹	13.4%	12.3%	14.4%	13.9%	14.0%	13.1%
Manufacturing	17.3%	21.2%	35.6%	40.4%	26.9%***	31.3%***
Services	30.1%	29.5%	18.5%	17.7%	24.0%***	23.3%***
Media et al. ²	39.2%	37.1%	31.5%	27.9%	35.2%***	32.3%***
<i>Type of contract</i>						
Permanent	58.2%	74.5%	66.5%	79.5%	62.6%***	77.1%***
Fixed-term	36.9%	21.8%	29.6%	15.8%	33.1%***	18.7%***
Self-employed/other	4.9%	3.7%	3.8%	4.7%	4.3%	4.2%
<i>Firm size (employees)</i>						
Small (<100)	43.9%	37.3%	32.2%	28.0%	37.8%***	32.4%***
Medium(100–499)	20.1%	21.5%	18.3%	17.0%	19.1%	19.1%***
Large(≥500)	36.0%	41.2%	49.5%	55.1%	43.1%***	48.5%***
Currently PhD studies	13.9%	7.6%	17.9%	8.5%	16.0%***	8.1%
Wage (€/month)	2,831.7	3,626.1	3,581.0	4,793.4	3,224.2***	4,237.5***
Wage (€/h)	16.6	21.3	19.3	25.3	18.0***	23.4***
N	2,285		2,513		4,798	

Source: BAP 2009/10, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

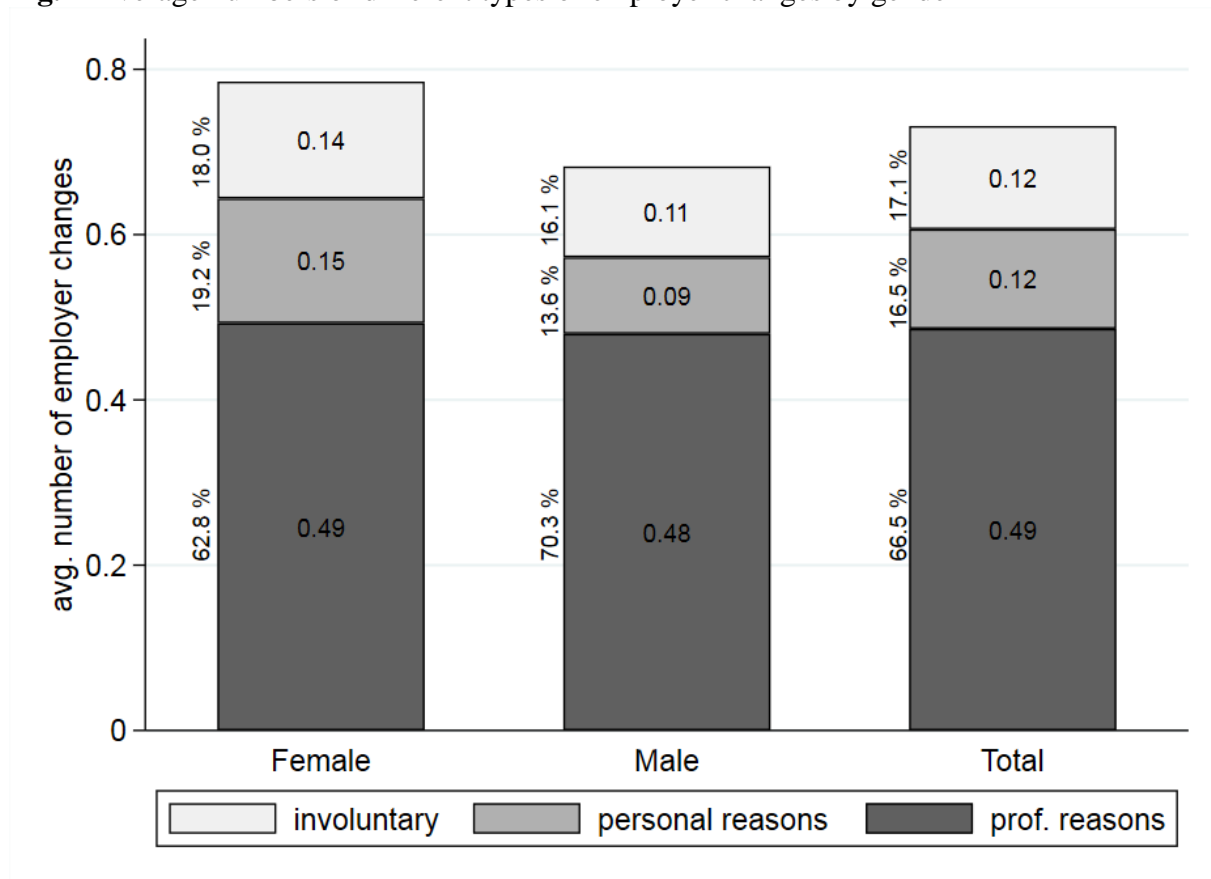
Significance of the difference between men and women: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

As expected, large gender differences can be seen with regard to the fields of study: In language and cultural studies, women are strongly overrepresented, while the same can be observed for men in engineering. Only in law and economics is the difference between genders not significant. Male and female respondents reported the presence of children with very similar frequency, but for most job characteristics, there are significant differences. For example, women work in the manufacturing sector far less often, but more often in the service sector. Also, they less often have permanent contracts especially in the beginning, and on

average work in smaller companies. Unsurprisingly, men's wages are also significantly higher than women's. The gender pay gap varies between 14 and 24.4 percent, depending on working experience and on whether monthly or hourly wages are used.

Figure 1 shows the average number of employer changes for men, women, and in total, separated by the type of employer change. Respondents on average experience 0.73 employer changes. This number is higher for women (0.79 changes) and lower for men (0.68 changes). The resulting difference is quite small, but statistically significant.

Fig. 1 Average numbers of different types of employer changes by gender



Source: BAP 2009/10, author's calculations; created with Stata 15

Note: Percentages indicate the share of each type of employer change in all changes combined and thus sum up to 100 for each column

Both for men and women, employee-induced employer changes for professional reasons are the most common type of employer change, constituting about two thirds of all changes, but no significant difference is present here. For women, involuntary changes and especially employee-induced changes for personal reasons are more common than for men ($p = .032$ and $p = .000$, respectively): Almost one in five changes occurs due to personal reasons for women while the respective number for men is 13.6 percent.

Compared to other studies, the share of involuntary employer changes is quite low. This is true both for Germany (Erlinghagen, 2005: 154) but especially for the US (Fuller, 2008: 168).

Likely reasons are the German labor market structure with a stronger focus on employment protection, which has a negative effect on job mobility (Gangl, 2003: 444), and the fact that this sample contains university graduates for whom the German labor market is, on average, characterized by especially favorable conditions like low levels of unemployment (OECD, 2013: 89).

4.2 Multivariate Analysis

In the following section, stepwise multinomial logistic regression models are calculated. The basic population consists of all the employments – up to five per respondent – reported in the questionnaire. Since in this case the β -coefficients of stepwise models cannot be compared with each other (Best & Wolf, 2012: 383; Mood, 2010: 72), the results tables contain average marginal effects for which comparisons are possible (Best & Wolf, 2012: 388; Mood, 2010: 80).

4.2.1 Involuntary employer changes

The first hypothesis rests on the assumptions that women work in the public sector more often – this should be associated with *fewer* involuntary employer changes – and have studied subjects more often which make involuntary employer changes *more* likely. Therefore, the gender coefficient is expected to change in the positive or negative direction, depending on which of these two variables is controlled for. Table 2 contains estimation results for different specifications.

Without any control variables, women are laid off significantly more often than men although the effect is quite small. The inclusion of the variable “type of organization” was expected to increase the coefficient in the negative direction, revealing that women would be laid off more often if they would work in the public sector less often. The opposite is the case here since the already negative coefficient gets closer to zero and loses its significance. The results show that in fact public service employees have the highest risk of being laid off compared to employees of private companies and non-profit organizations. This is also highlighted by the fact that less than a third of employments in the public sector have a fixed-term contract and more than 80 percent of those in private companies do.

It is likely that PhD students play a role here. They usually have to change employer after a few years because professorships offer significantly fewer postdoctoral employments than employments for PhD students; and doctoral studies are most often begun shortly after regular studies, so that most of the respondents’ doctoral studies are probably included in the observation period of this study. PhD students are therefore excluded from these regressions. However, further analyses show that even without PhD students, there are still not as many

permanent contracts in the public and in the non-profit sector – where mostly women are employed – as in the private sector. Therefore, the variable also does not exert the expected effect on the gender coefficient which still changes in the positive direction – but now stays significant – when the organization type is controlled for.

Table 2: Multinomial logistic regressions on the type of employer change: involuntary employer change. Average Marginal Effects

	M1	M2	M3	M4	M5	M6
Gender: male	–0.015**	–0.008	–0.015**	–0.010	–0.008	0.009
<i>Organization type</i>						
Public service		(ref.)	(ref.)			(ref.)
Listed company		–0.091***	–0.042***			0.011
Non-listed company		–0.064***	–0.014			0.023**
Non-profit/other		–0.026	0.011			0.013
<i>Field of study</i>						
Language/cultural				0.027*	0.025*	0.018*
Social sciences				(ref.)	(ref.)	(ref.)
Law/economics				–0.014	–0.006	0.018
Math/sciences				–0.008	–0.002	0.009
Engineering				–0.013	–0.002	0.015
<i>Occupational sector</i>						
BIC ¹					0.008	–0.000
Manufacturing					(ref.)	(ref.)
Services					0.022**	–0.002
Media et al. ²					0.030***	–0.006
<i>Type of contract</i>						
Permanent						(ref.)
Fixed-term						0.141***
Self-employed/other						0.002
Executive position						–0.032***
<i>Firm size (employees)</i>						
Small (<100)						(ref.)
Medium(100–499)						–0.020**
Large(≥500)						–0.021**
Wage (1000 euros)						–0.009***
constant	0.075***	0.075***	0.060***	0.060***	0.060***	0.060***
N	7,993	7,993	7,092	7,092	7,092	7,092

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: BAP 2009/10, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

In line with the hypothesis, on the other hand, the gender coefficient changes in the positive direction when the field of study is controlled for, and thereby becomes insignificant. This is because the probability of involuntary employer changes differs between subjects: For example, graduates of engineering – where the share of women is 20 percent – experience such changes less often than graduates of the humanities where the share of women is 80 percent.

To assess the effect of the field of study on labor market outcomes, further variables are included. The effect size of the field of study is reduced when the occupational sector is controlled for – in the manufacturing sector, involuntary changes are least likely – and the coefficients for these sectors in turn become insignificant after several more variables are included. Then the most prominent effects stem from permanent contracts, monthly income, and to a lesser degree from executive positions and firm size – all of which are negatively associated with the likelihood of an involuntary change. The gender coefficient meanwhile becomes positive but stays insignificant, indicating that given similar labor market conditions there are no differences between men and women in the likelihood of an involuntary employer change.

Respondents' subjects therefore seem to have an influence on labor market positioning and thereby on the risk of experiencing involuntary employer changes. This results in disadvantages for women compared to men because of gendered choices of the field of study. The first hypothesis can thus only be partly confirmed. As expected, controlling for the field of study makes involuntary employer changes less likely for women relative to men, because subjects that are male-dominated tend to place individuals in more favorable working conditions. But working in the public sector does not make it less likely to be laid off, even when PhD students are excluded from the analysis, so that in this regard women do not experience advantages due to their overrepresentation in the public sector.

4.2.2 Employer changes for personal reasons

The second hypothesis states that women on average change employer more often than men for personal reasons. As can be seen in table 3, this seems to be the case – the gender coefficient is highly significant – but without detailed information about personal circumstances the exact reasoning is hard to determine. When control variables are included, the coefficient changes and loses some of its significance, but remains significant at the 5 percent-level.

Since income and children are of particular interest in familial decision-making, these variables are examined in greater detail. Including monthly income reveals a negative effect while the gender coefficient decreases by about a third, indicating that because women, on average, have lower incomes, they are more likely to change employer for personal reasons. The concept of tied movers could play a role here: Individuals whose share of the household income is small may be more prone to giving up their job when their partner finds a better one somewhere else. And if the personal reason is that a family member has to be taken care of,

higher incomes could make it possible to pay for professional caretakers, making it unnecessary to change employer.

Table 3: Multinomial logistic regressions on the type of employer change: employer change for personal reasons. Average Marginal Effects

	M1	M2	M3	M4	M5	M6
Gender: male	−0.032***	−0.022***	−0.051**	−0.028***	−0.046**	−0.046**
Wage (1000 euros)		−0.008***	−0.013***		−0.013***	−0.014***
Male*wage			0.009*		0.009*	0.009*
Child				−0.009	−0.014	−0.012
Male*child				−0.028**	−0.025*	−0.024*
<i>Organization type</i>						
Public service					(ref.)	(ref.)
Listed company					0.030**	0.032**
Non-listed company					0.030***	0.033***
Non-profit/other					0.014	0.016
<i>Field of study</i>						
Language/cultural					−0.023*	−0.023*
Social sciences					(ref.)	(ref.)
Law/economics					−0.024*	−0.026*
Math/sciences					−0.042***	−0.044***
Engineering					−0.026*	−0.027*
<i>Occupational sector</i>						
BIC ¹					0.004	0.003
Manufacturing					(ref.)	(ref.)
Services					−0.003	−0.001
Media et al. ²					0.018	0.019
<i>Type of contract</i>						
Permanent						(ref.)
Fixed-term						−0.002
Self-employed/other						−0.045***
Executive position						−0.011
<i>Firm size (employees)</i>						
Small (<100)						(ref.)
Medium(100–499)						0.001
Large(≥500)						−0.001
Constant	0.072***	0.072***	0.072***	0.072***	0.072***	0.072***
N	7,993	7,993	7,993	7,993	7,993	7,993

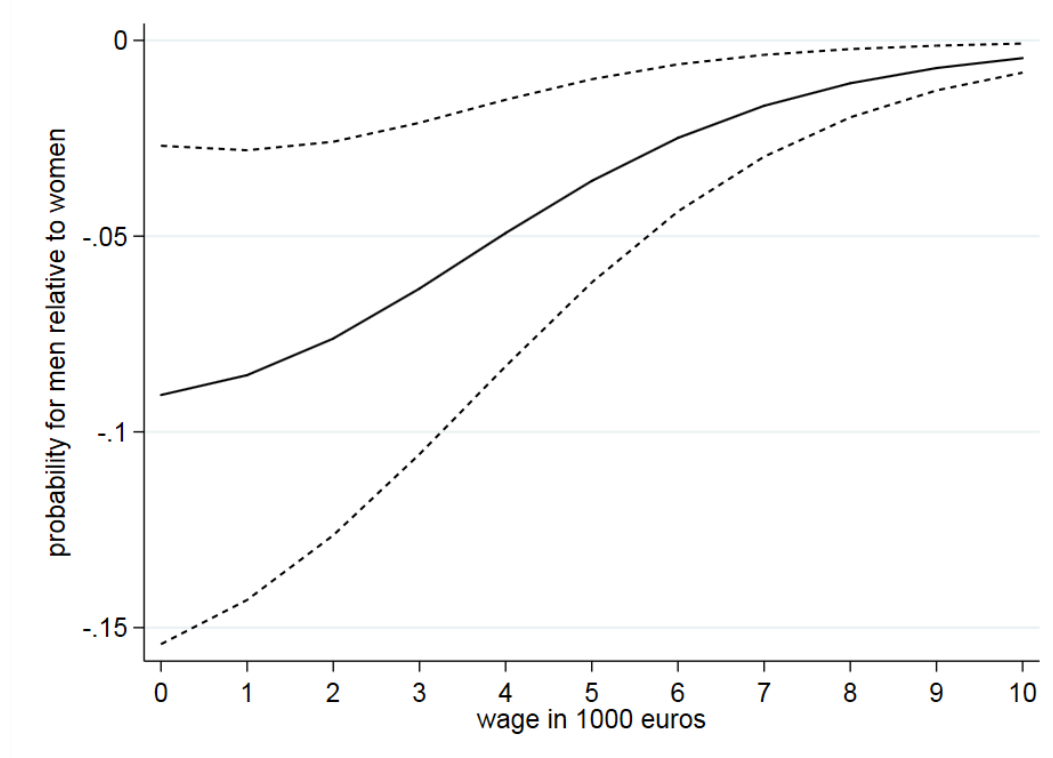
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: BAP 2009/10, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

The picture becomes more complex when an interaction term between gender and income is included: Then the gender coefficient increases while the interaction coefficient is positive and significant. The consequences can be seen in figure 2. Higher incomes still have a negative effect on the probability of changing employer for personal reasons, but they do so to a higher degree for women. For top earners, the probability hardly differs anymore between genders.

Fig. 2 Multinomial logistic regression on the type of employer change: employer change for personal reasons. Average Marginal Effects for men relative to women with 95% CIs



Source: BAP 2009/10, author's calculations; created with Stata 15

The variable *child* indicates if children are present in the household during the current or next employer spell. When this variable is included together with a gender interaction, one can see that the probability of an employer change for personal reasons is highest for mothers and childless women, lower for childless men and lowest for fathers. However, the effect of children on the overall gender coefficient is not very strong; it also has to be noted that the sample mainly contains respondents in their 30s who in many cases are not (yet) parents even at the end of the observation period: Only about 28 percent of female and 22 percent of male respondents have stated to have taken parental leave, and overall less than a third have stated that there were children living in their household at the time of the survey. As the cohort gets older, these numbers and thus the overall importance of children will very likely increase.

Other variables exert significant influence, too, but mostly without strongly affecting the size of the gender coefficient. Relative to graduates of the social sciences the effect for most other subjects is negative, especially for math and sciences. Employments in the private sector are more likely to end in a quit for personal reasons, possibly because of less generous parental leave regulations and possibilities for part-time work compared to the public sector (in this sample, the average contractual working time in the public sector is about five hours lower than in the private sector). There is also a significant negative effect of being self-employed

relative to being employed with a permanent or fixed-term contract. The gender effect cannot be fully explained, however, as the coefficient stays significant.

Compared to employer changes which occur involuntarily (see table 2 above) or for professional reasons (see table 4 below), job characteristics are remarkably unimportant here. This makes sense, given the fact that from a company perspective, personal reasons are an external factor which usually should not be influenced by variables like the number of employees.

4.2.3 Employer changes for professional reasons

For employer changes for professional reasons, the third hypothesis states that the gender coefficient should change in the positive direction as soon as the field of study is controlled for. Initially, i.e. with gender as the only independent variable, no significant effect is present as can be seen in the first column of table 4. After including the field of study, the size of the coefficient indeed increases, but the effect remains insignificant. For the different subject groups, there are also only minor differences. Graduates of math and sciences are somewhat less likely to change employer for professional reasons than graduates of the humanities and of law and economics.

An analysis of the other independent variables provides further insights. Being employed in a listed company is associated with a reduced probability of changing employer for professional reasons relative to being employed in the public sector or in non-listed companies. This seems to be due to the fact that permanent contracts – which are correlated with a higher probability – are more prevalent in listed companies. Controlling for the type of contract thus changes the sign of the coefficient so that employer changes for professional reasons are then least likely in the public sector. The contract effect on the other hand decreases when monthly income is added as an independent variable, while the gender coefficient becomes significant. This means that higher wages make employer changes less likely so that men, who on average have higher earnings, change employer more often relative to women as soon as the earnings are controlled for.

Table 4 Multinomial logistic regressions on the type of employer change: employer change for professional reasons. Average Marginal Effects

	M1	M2	M3	M4	M5	M6
Gender: male	0.006	0.015	0.016	0.017	0.059***	0.065***
<i>Field of study</i>						
Language/cultural		(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Social sciences		-0.011	-0.011	-0.001	-0.002	-0.000
Law/economics		-0.001	0.002	0.017	0.057***	0.060***
Math/sciences		-0.044**	-0.025	-0.036*	-0.004	-0.010
Engineering		-0.027	0.006	0.015	0.030	0.027

	M1	M2	M3	M4	M5	M6
<i>Organization type</i>						
Public service			0.041*	−0.050**	−0.094***	−0.099***
Listed company			(ref.)	(ref.)	(ref.)	(ref.)
Non-listed company			0.096***	0.082***	0.040**	0.027
Non-profit/other			0.041	−0.011	−0.061**	−0.073***
<i>Occupational sector</i>						
BIC ¹			0.077***	0.071***	0.070***	0.060**
Manufacturing			(ref.)	(ref.)	(ref.)	(ref.)
Services			0.075***	0.065***	0.030	0.024
Media et al. ²			0.033*	0.003	−0.025	−0.032*
<i>Type of contract</i>						
Permanent				(ref.)	(ref.)	(ref.)
Fixed-term				0.187***	0.138***	0.131***
Self-employed/other				0.123***	0.065**	0.060*
Wage (1000 euros)					−0.061***	−0.052***
<i>Firm size (employees)</i>						
Small (<100)						(ref.)
Medium(100–499)						−0.008
Large(≥500)						−0.052***
Executive position						−0.089***
Constant	0.292***	0.292***	0.292***	0.292***	0.292***	0.292***
<i>N</i>	7,993	7,993	7,993	7,993	7,993	7,993

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: BAP 2009/10, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

There also seems to be less job mobility out of executive positions and out of large firms – in line with previous research (Kalleberg & Mastekaasa, 1998: 1265) –, possibly because with their own internal labor markets they offer better career prospects than smaller firms are able to do. Once all these variables are controlled for, the previously significant difference between listed and non-listed private companies also disappears. It seems that employees in listed companies do not change employer so often because higher wages and internal labor markets make that unnecessary. Concerning occupational sectors, the probability of employer changes for professional reasons is least likely in the manufacturing sector, an effect which can also partly be explained by favorable labor market conditions in this sector: higher wages, more executive positions, larger companies and more permanent contracts.

After the inclusion of all control variables, men are significantly more likely to change employer for professional reasons. Previous research has shown that men and women differ in labor market preferences – men are e.g. more likely to put emphasis on high wages and on leadership positions (Daymont & Andrisani, 1984: 414) – which, however, were not covered in this survey. The significant effect found here may thus disappear or get smaller when individual preferences are controlled for. The data also do not contain information about

certain personal characteristics which according to previous research affect turnover intentions, namely “personal attitudes towards job seeking (i.e., job search attitude), their perceptions of social pressure to engage in job seeking (i.e., subjective norm), and their job search self-efficacy” (van Hooft, Born, Taris, & van der Flier, 2005: 135). However, this research found no significant gender differences for these variables (van Hooft et al., 2005: 143) so that they would not necessarily have had an effect on the gender coefficients analyzed here.

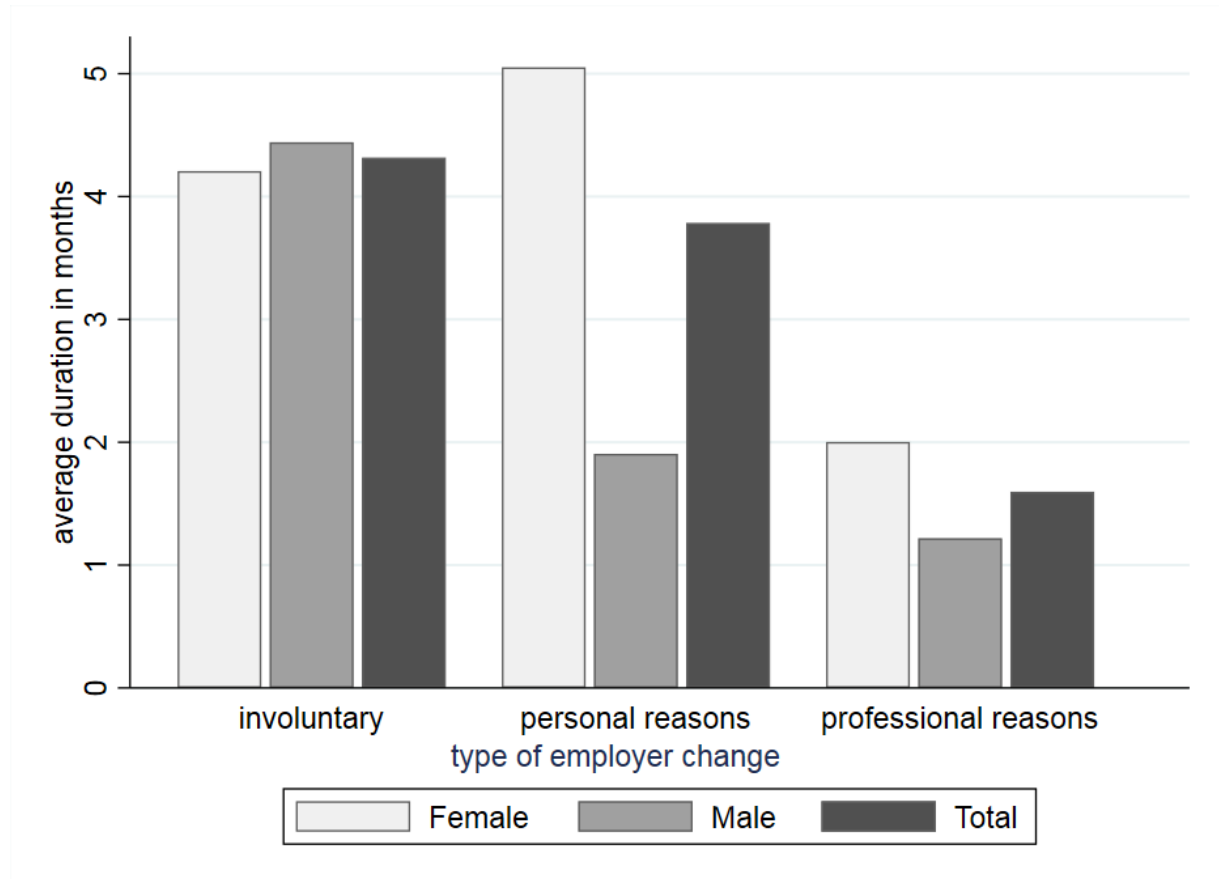
5. Discussion and Conclusion

In conclusion, the hypotheses could partly be confirmed. Women change employer involuntarily more often which can be explained by subject choices and subsequent labor market placement. Favorable working conditions make it less likely for men relative to women to be forced to seek a new job. These factors also play a role for employee-induced changes for personal reasons for which the raw gender effect is greatest and which are mainly affected by wages and personal circumstances. These changes are less likely for fathers and for respondents with higher incomes who work in the public sector.

For employee-induced changes for professional reasons, a gender effect only appears after controlling for various labor market variables. With regard to this type of employer change, men on average seem to be more mobile when in similar circumstances as women, and in reality experience a similar amount of mobility because of their differing values on variables that influence the probability of employer changes.

However, the identified effects are often rather small, and the results leave room for future research on job mobility. For example, an analysis of the time between two employments reveals further gender differences. As can be seen in figure 3, gender and the type of employer change can have an influence on the duration of phases of non-employment. After being laid off, respondents on average needed more than four months to begin a new employment, an employee-induced change for professional reasons is associated with less than two months of non-employment. Gender differences are most prominent for changes for personal reasons: In these cases, women start their next employment after about five months, men already after two months. Gender differences are significant both for personal and professional employer changes. This probably contributes to the fact that men on average have spent more time on the labor market at the end of the observation period: about 73 months and, thus, almost half a year more than women with an average 67 months.

Fig. 3 Time between jobs by type of employer change and gender



Source: BAP 2009/10, author's calculations; created with Stata 15

There are also implications for the gender pay gap. Previous research has shown that wages can increase significantly after an employer change (Wieschke, 2018: 12) and that this can depend on the type of employer change (Fuller, 2008: 177; Schmelzer, 2012: 90) and on gender (Johnston & Lee, 2012: 149). How this affects men's and women's wages together with the gender differences found here remains to be analyzed.

Lastly, the fact that the sample used for the analysis consists of university graduates probably also plays a role. Opportunity costs of inadequate or non-employment are higher for the highly educated because they on average receive higher wages (OECD, 2013: 100). Especially employer changes for personal reasons are hypothesized to negatively affect career outcomes because the career of tied movers is probably seen as less important and because other personal reasons – like the desire to have more time for (child)care – are also likely to divert resources from pursuing a career. Because of the on average higher opportunity costs for university graduates, these employer changes may thus be less frequent in this sample than in the whole population. It is therefore possible that not all of the results are valid for a sample containing respondents with all levels of education.

Chapter V:
Employer Changes and their Effects on Wages.

Differences between Genders and between Different Types of Job Mobility Among German
University Graduates*

Abstract: Wages can change significantly over the course of an individual's career. Such changes, as well as changes in other job characteristics, are often the result of job mobility. Using a sample of Bavarian university graduates, this work analyses the effects that employer changes have on men's and women's wages. For this, employer changes are grouped into three categories in order to account for different circumstances. Partly in contrast to previous research, the results show significant and positive effects of job mobility, irrespective of gender and of the type of employer change. However, financial returns are lower in case of changes for personal reasons and – at least when absolute instead of relative changes are analysed – for women. The results are discussed with respect to the specifics of the German labour market structure and to gender segregation on the labour market.

*This is an original manuscript of an article published by Taylor & Francis in the Journal of Education and Work on 23rd April 2020, available online:

<https://www.tandfonline.com/doi/full/10.1080/13639080.2020.1755427>

1. Introduction

In modern labour markets, mobility is an important factor for many individuals. This includes vertical and horizontal job mobility (DiPrete, 1987) as well as spatial mobility (Savage, 1988), which is also often tied to job mobility. In this process, personal and occupational circumstances – e.g. income and working time – can change significantly in a short time, making mobility an important factor for many different labour market outcomes. In this study, employer changes (ECs) and their consequences will be addressed. Depending on the circumstances, an employer change can occur for various reasons, which are categorised into three groups here. The first type are employer-induced (i.e. involuntary) ECs, the second one employee-induced changes for personal reasons and the third one employee-induced changes for professional reasons. For these, the terms ‘involuntary EC’, ‘personal EC’ and ‘professional EC’ will be used. These different ways of changing employer also mark different situations – both personal and occupational – for the individuals involved, so that different consequences may be expected.

Those effects will also be discussed with regard to gender which continues to be another important predictor for wages. Especially when considering monthly incomes, but also – although to a lesser degree – for hourly wages, significant differences between men and women can be observed in Germany. These differences can partly be explained when such diverse factors as segregation (Barón & Cobb-Clark, 2010; Hinz & Gartner, 2005; Mandel & Semyonov, 2014), discrimination (Pena-Boquete, De Stefanis, & Fernandez-Grela, 2010) or human capital (Becker, 1985; Grove, Hussey, & Jetter, 2011) are taken into account. This highlights the complexity of the topic (Blau & Kahn, 2017) as the gender pay gap is ‘the product of many small disadvantages that women face in several socio-institutional domains’ (Triventi, 2013a).

These two aspects – job mobility and gender – will be brought together in this study in order to assess the relative importance of different types of employer changes as well as their potential influence on the gender pay gap. Furthermore, the peculiarities of the German labour market will be considered since it is expected that the labour market structure can have strong effects on individuals’ mobility and its consequences. The results will also be compared with those of previous studies which dealt with the effects of job mobility in different ways.

2. Data and Operationalisation

This study uses data from the Bavarian Graduate Panel (Bayerisches Absolventenpanel – BAP). The selected graduation cohort is that from 2009/2010 for which to date two surveys have been conducted, one about 1–2 years after graduation, one about 8 years after. The

graduation occurred between October 1st 2009 and September 30th 2010, for bachelor and master graduates between October 1st 2008 and September 30th 2010. For the first survey, which primarily included questions about studies and the first employment, all graduates – except those with medicine or teaching degrees – from the Bavarian universities and public universities of applied sciences from the selected cohort were contacted. The response rate was about a third, and about half of those also participated in the second survey (Kopečný, Wieschke, & Reimer, 2018). There, respondents were asked to give information about all the employments they have had since their graduation: starting and ending dates, incomes, working time, type of contract and other job characteristics.

They were also asked to report important changes within one job and to state the reasons for every employer change that occurred: whether they or their employer chose to terminate (or not to extend) the contract, and if they themselves did so, whether for personal or professional reasons. Using this information, the main independent variable was created which distinguishes between employer-induced (i.e. involuntary) and two types of employee-induced ECs: those for personal and those for professional reasons.

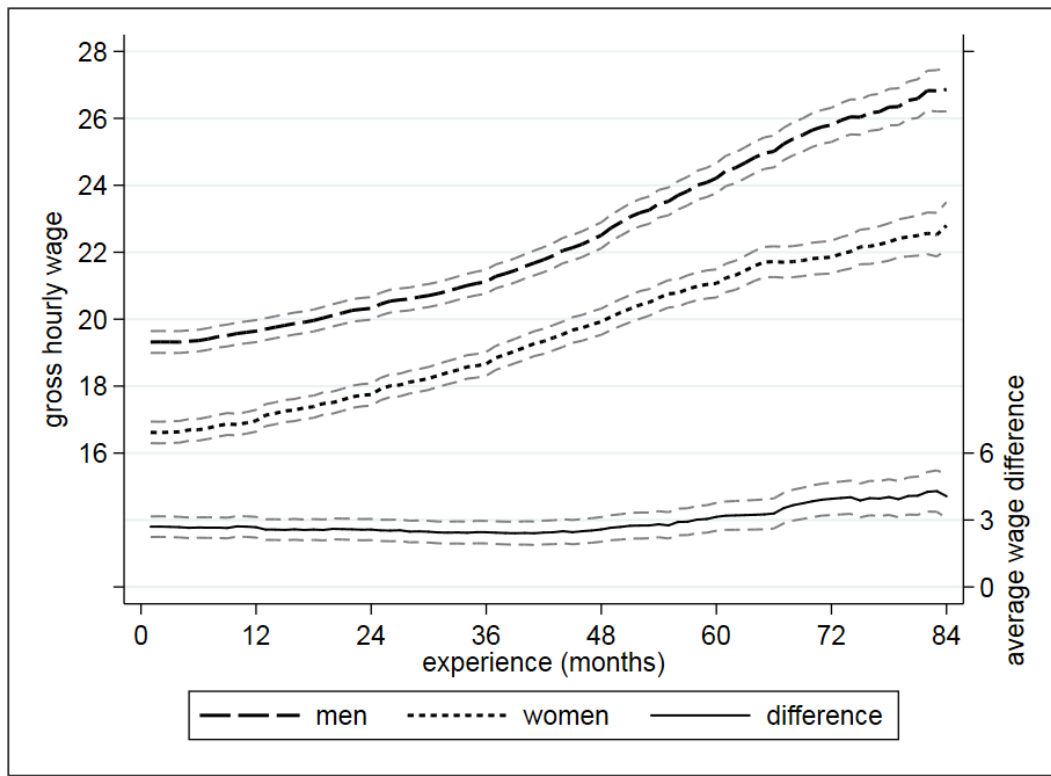
3. Theory, State of Research, Hypotheses

For the analyses of the financial returns to employer changes, wage gains and wage losses following different types of job mobility are investigated. Income is a very important job characteristic that, unlike other characteristics, has a direct influence on individuals' lives and can often be observed relatively easy (i.e. with low search costs) by potential employees when the decision whether to begin the respective employment has not yet been made (Wilde, 1981: 1137). This makes it a good measure when analysing the outcomes of rational search behaviour, because wages will almost always be taken into account by individuals looking for a new job.

Regarding employer changes, it has been pointed out that it may be important to distinguish between several types of ECs, especially when different types of ECs influence wages in different directions (Fuller, 2008: 177; Wieschke, 2018: 12). In an aggregated analysis these effects may then offset each other (Keith & McWilliams, 1997: 327), resulting in an over- or underestimation of the true effects. This is therefore considered in this study. While women are not included in all samples due to their different labour market preferences and situations which complicate analyses (Pavlopoulos et al., 2014: 300), the gender pay gap and how it is influenced by employer changes is an important part of the research question here. Special attention is thus given to gender differences in wages and in financial returns. Figure 1 shows that significant wage developments occur in the years after graduation – employer changes

may be a contributing factor here – and that significant wage differences between genders exist, both in the beginning and at the end of the observation period.

Fig. 1 Changes in pay by gender: gross hourly wages in euros with 95% CIs



Source: BAP 2009/10, author's calculations; performed with Stata 15

The theory of the varieties of capitalism provides additional insights that have to be taken into account. Traditionally, liberal and coordinated market economies are the two 'ideal types at the poles of a spectrum' (Hall & Soskice, 2001: 8). The latter ones, to which Germany belongs, are characterised by high levels of employment protection and less flexibility and permeability regarding labour market segments (Hall & Soskice, 2001: 19; Scherer, 2004: 373). Instead, there is a strong link between education and occupation which makes mobility between different segments of the labour market difficult (Andersen & van de Werfhorst, 2010: 337).

3.1 Involuntary employer changes

Search theory has implications in case of involuntary ECs, where the decision to terminate or not to extend a contract is made by the employer. In Germany, employment protection laws usually prescribe a mandatory period of notice of at least four weeks before the contract actually ends. This period is reduced to two weeks when the layoff occurs during the probationary period. In the case of fixed-term contracts, employees usually are informed beforehand whether their contract will be extended; if it is not, they can know of the end of their employment months before it actually ends.

This gives individuals some time to adapt to the new situation, primarily by looking for a new employment already during the last weeks or months with the current employer (Burdett 1978). However, the incomplete information about the labour market (Jovanovic, 1979: 973) makes it necessary to invest resources – primarily time – into the job search (Mortensen, 1970: 848). Furthermore, desired jobs may become available only with time, while only limited time is available for the job search in case one wants to avoid an unemployment spell. In this case, even suboptimal jobs with worse qualification matches and/or lower wages may have to be accepted that would not be considered had the layoff not taken place. Even if unemployment is not avoided at all costs and the job search continues during unemployment, scar effects can reduce incomes, at least in coordinated labour markets like the German one (Schmelzer, 2012: 93) – either because of depreciation of human capital (Mincer & Ofek, 1982: 16), because of a reputational effect, i.e. stigmatisation (Keith & McWilliams, 1995: 131; Schmelzer, 2012: 83) or because reservation wages decline with the duration of unemployment (Kiefer & Neumann, 1979: 105).

In each case, there are mechanisms exerting downward pressure on wages when an employer is changed involuntarily. It can therefore be expected that the returns to an involuntary EC are lower than those for voluntary ECs which by definition should only occur once the employee feels ready. This results in the first hypothesis:

H1: Wages decrease if the employer is changed involuntarily.

These negative wage effects of involuntary employer changes have already been found in previous research (Keith & McWilliams, 1995: 131; Fuller, 2008: 169), especially for men (Blau & Kahn, 1981a: 294; Fuller, 2008: 172). The current study will examine if these results can be replicated for Germany, where the labour market structure is different.

3.2 Employer changes for personal reasons

According to search theory, quits are usually made if a positive return is expected (Blau & Kahn, 1981b: 564). This expected return can have a financial dimension, but can also take on other forms, depending on the individual's preferences (Latzke, Kattenbach, Schneidhofer, Schramm, & Mayrhofer, 2016: 141). If an employer change for personal reasons occurs, the income does not have to be the dominant factor contributing to the mobility decision. Instead, the employer change might be driven by the necessity of caring for children or other relatives, or by spatial mobility as a tied mover to support the partner's career (Cooke, 2003: 340). The expected return to the employer change would then be more time for care or the possibility of continuing to live in the same household with one's partner. Since the income would not be the most important reason for the job mobility in this case, it is likely not to be affected

positively. This mechanism is further strengthened by the fact that individuals in these situations cannot always choose when to change employer, e.g. because care responsibilities are necessary promptly when the need for care arises.

On average, however, women in Germany still perform more unpaid care work than men (Berghammer, 2013: 62; Wetzstein, Rommel, & Lange, 2015: 3 f.), and earn less – especially among university graduates (OECD, 2013: 119) –, which reduces the opportunity costs of unemployment or part-time employment relative to men. This makes it likely that women are more susceptible to these mechanisms. On the other hand, family ‘breadwinners’ could feel the need to increase their incomes (e.g. by changing employer) to support their family, e.g. when children come into the household. For women this is more difficult due to the obligatory maternal leave. Working times thus also tend to be longer for fathers relative to childless men, while they are shorter for mothers relative to childless women (Klenner & Lillemeier, 2015: 20). From this, two hypotheses are derived:

H2: For women, wages decrease if the employer is changed for personal reasons.

H3: For men, wages increase if the employer is changed for personal reasons.

Previous research, too, has found negative wage effects for voluntary employer changes for personal reasons (Fuller, 2008: 177), although this effect was sometimes only found for women and not for men (Keith & McWilliams, 1995: 133 f.). Johnston and Lee (2012) found positive effects for men and negative effects for women, but did not differentiate between types of employer changes in their analysis.

3.3 Employer changes for professional reasons

Changes for professional reasons work differently than involuntary changes and changes for personal reasons. Again, it is expected that a change occurs if a positive return is expected (Blau & Kahn, 1981b: 564). If a change occurs for professional reasons, this return is likely to be associated with job characteristics. ‘Soft’ characteristics like the working environment can usually not be observed before actually taking the job so that objective criteria like the wage should usually be most important. Furthermore, a voluntary change implies that the timing of the quit can be chosen freely. There is thus no pressure to find a job within a certain amount of time in order to avoid unemployment, so that an individual searching on-the-job can stay with their current employer as long as it takes to find a job that meets their needs – i.e. usually a job with higher wages (Keith & McWilliams, 1999: 461). Such a job can be found more easily when there is a bad match in the current job and thus a relatively low productivity (Jovanovic, 1979: 974). On the other hand, the presence of firm-specific human capital that employees have acquired will make an employer change less likely because the resulting

higher productivity of an employee is only rewarded by the current employer (Parsons, 1972: 1140). But if for this reason no job is found where the employer is willing to pay significantly higher wages, an employer change will just not occur. The next hypothesis thus states:

H4: Wages increase if the employer is changed for professional reasons.

This also pictures the results of previous studies which have found positive effects of economic quits for the US (Fuller, 2008: 177; Keith & McWilliams, 1995: 133 f.).

Regarding gender differences in the financial returns, the different labour market situations have to be taken into account. In Germany, female university graduates earn less than men already when entering the labour market (Leuze & Strauß, 2014: 285 f.). This is at least in part due to gender-specific choices of the field of study (Ochsenfeld, 2014: 544), because, as mentioned at the beginning of section 3, there exists a strong link between education and occupation and because average wages differ significantly between occupational sectors. The gender-specific choice of field of study thus leads to a gender segregation on the labour market so that men and women have different opportunities to increase their wages by changing employer.

In this context, the rationale of decision-making is important. Psychological studies have shown that the effort that is made to gain a financial saving depends on the relative size of this saving (Tversky & Kahneman, 1981: 457). The greater the relative saving, the more likely experimental participants were to accept the associated costs (Moon, Keasey, & Duxburx, 1999: 152). Also, the reservation wage of unemployed workers seems to depend on the size of unemployment benefits (Cooke, 1981: 394). This indicates that for the decision whether to change employer not only the absolute income at the new job is of importance, but so are the relative gains. An income increase by a certain (absolute) sum would therefore be assessed differently by female graduates who on average earn less than male graduates. This results in the last hypotheses:

H5: In case of an employer change for professional reasons, absolute wage gains are larger for men because of their on average better economic position, while relative income gains are equal.

When relative wage changes are considered, there is evidence for positive effects of employer changes for professional reasons (Fuller, 2008: 170; Keith & McWilliams, 1995: 131; Keith & McWilliams, 1999: 473) and for no effects at all (Keith & McWilliams, 1997: 329), both without any gender differences. For absolute wage changes, gender differences favouring men have been found, but without distinguishing between different types of employer changes (Wieschke, 2018: 11).

4. Analysis

4.1 Descriptive Statistics

Table 1: Sample characteristics by gender and work experience. Percentages and means

Work experience:	Women		Men		Total	
	min.	max.	min.	max.	min.	max.
<i>Field of study</i>						
Language/cultural	28.8%		6.5%		17.2%***	
Social sciences	16.2%		6.2%		11.0%***	
Law/economics	27.6%		28.0%		27.8%	
Math/sciences	18.0%		26.3%		22.4%***	
Engineering	9.4%		33.1%		21.7%***	
Child in household	5.9%	29.9%	5.0%	31.7%	5.5%	30.8%
<i>Organisation type</i>						
Public service	29.7%	27.1%	25.7%	20.7%	27.6%**	23.8%***
Listed company	15.4%	20.0%	23.4%	28.2%	19.6%***	24.3%***
Non-listed company	42.4%	40.4%	45.8%	46.1%	44.1%*	43.4%***
Non-profit/other	12.6%	12.5%	5.0%	5.0%	8.7%***	8.6%***
Executive position	19.9%	32.7%	27.9%	45.4%	24.0%***	39.3%***
<i>Occupational sector</i>						
BIC ¹	13.4%	12.3%	14.4%	14.0%	13.9%	13.2%
Manufacturing	17.3%	21.1%	35.6%	40.3%	26.8%***	31.1%***
Services	30.3%	29.6%	18.6%	17.9%	24.2%***	23.5%***
Media et al. ²	39.0%	37.1%	31.5%	27.8%	35.1%***	32.3%***
<i>Type of contract</i>						
Permanent	58.1%	74.1%	66.5%	79.3%	62.5%***	76.8%***
Fixed-term	36.8%	21.9%	29.6%	15.8%	33.0%***	18.7%***
Self-employed/other	5.1%	4.0%	3.9%	4.9%	4.5%*	4.5%
<i>Firm size (employees)</i>						
Small (<100)	44.2%	37.7%	32.5%	28.3%	38.1%***	32.8%***
Medium(100–499)	20.0%	21.3%	18.2%	16.8%	19.1%	18.9%***
Large(≥500)	35.8%	41.0%	49.4%	54.9%	42.9%***	48.3%***
Currently PhD studies	13.9%	7.7%	17.8%	8.5%	15.9%***	8.1%
<i>Working time</i>						
>35h	78.2%	76.1%	89.8%	92.8%	84.3%***	84.8%***
>20–35h	12.3%	15.1%	6.0%	5.4%	9.0%***	10.0%***
≤20h	9.4%	8.9%	4.2%	1.8%	6.7%***	5.2%***
Wage (€/month)	2,824.2	3,615.2	3,575.5	4,780.5	3,215.7***	4,222.5***
Wage (€/h)	16.6	21.3	19.3	25.3	18.0***	23.4***
<i>N</i>	2,330		2,536		4,866	
<i>N (employer changes)</i>	1,638		1,594		3,232	
involuntary	307		257		564	
personal reasons	330		230		560	
professional reasons	1,001		1,107		2,108	

Source: BAP 2009/10, author's calculations; performed with Stata 15

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations

Significance of the difference between men and women: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 1 contains descriptive statistics about independent and dependent variables for men, women, and all respondents. Shares and means are given, as well as the absolute numbers of employer changes reported in the sample. For time-variant variables, the values at the beginning and at the end of the observation period are given. The last column furthermore contains asterisks to designate the significance of gender differences.

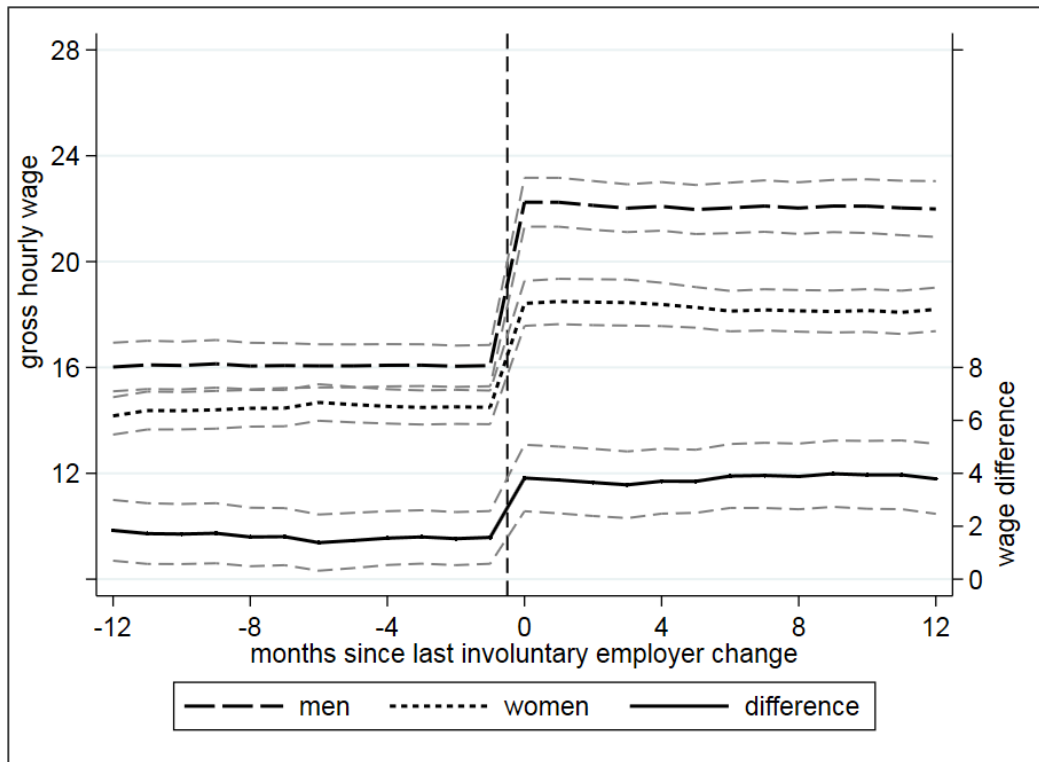
As can be seen in the first rows, there are significant gender differences regarding the chosen subjects, especially in engineering – less than one in ten women, but almost every third man graduated in this field – and in language and cultural studies – here the numbers are 29 and 6 percent, respectively. Only in law and economics there is no significant difference. This probably contributes to the large gender pay gap (GPG) which can already be found at the first job and which does not get smaller in the following years. The absolute income difference rises from more than 700 euros (GPG: 21.0 percent) to almost 1,200 euros (GPG: 24.4 percent), the difference in hourly wages increases from 2.7 to 4 euros, with the GPG increasing from 14 to 15.8 percent. This goes along with significant wage growth for both men and women which, however, seems to be more pronounced for men. The next section will deal with the question whether different returns to job mobility play a role here.

Expectably, significant changes can also be observed for the presence of children in the household. At the beginning, children are only reported by about 5 percent of the respondents; in the end, by about 31 percent. Labour market outcomes, too, change over time and show significant gender differences: For example, more experienced graduates more often work in listed companies, in the manufacturing sector, with permanent contracts, and in large firms. These characteristics are also correlated to higher wages and are more often reported by men than by women.

The most common type of employer change in this sample is the change for professional reasons. These changes represent almost two thirds of all changes for women and men. For women, changes for personal reasons are more likely than involuntary changes; for men, it is the other way around.

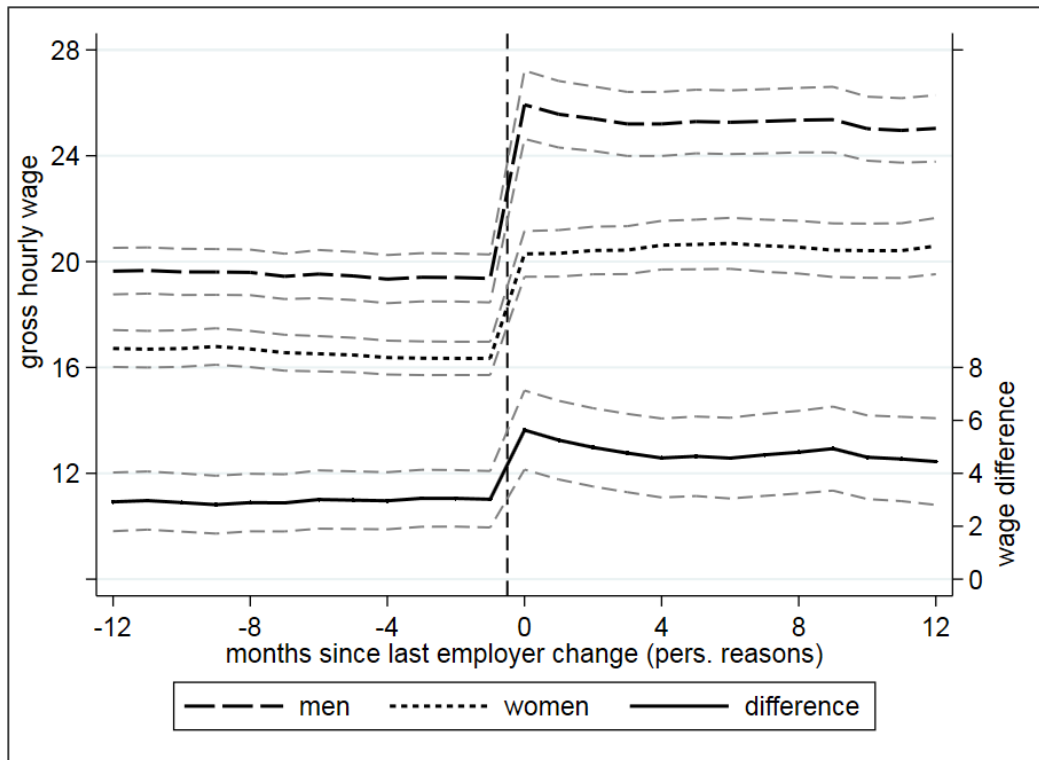
Pictured in figures 2 to 4 are the gross hourly wages of men and women prior to and after each type of employer change. If an individual changes their employer more than once for the same reason, the information about both changes is used. Because of this, the wage for one job can be part of each part of the income curve, before and after the vertical line (if a second change for the same reason occurs within 12 months of the last change).

Fig. 2 Gender-specific changes in pay: hourly wages in euros before and after involuntary employer changes and 95% CIs



Source: BAP 2009/10, author's calculations; performed with Stata 15

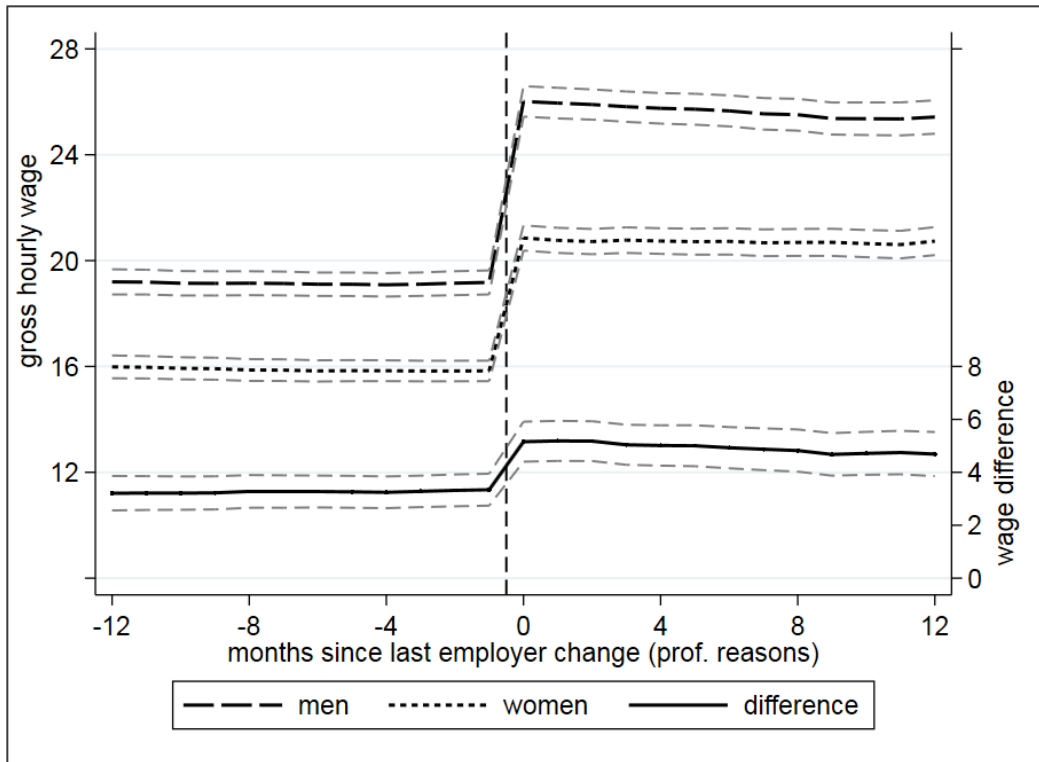
Fig. 3 Gender-specific changes in pay: hourly wages in euros before and after employer changes for personal reasons and 95% CIs



Source: BAP 2009/10, author's calculations; performed with Stata 15

The x-axis uses actual work experience, i.e. even in case of an indirect change (with some time spent unemployed between two jobs) the last wage of the old job is found at $x = -1$ and the first wage of the new job at $x = 0$.

Fig. 4 Gender-specific changes in pay: hourly wages in euros before and after employer changes for professional reasons and 95% CIs



Source: BAP 2009/10, author's calculations; performed with Stata 15

Furthermore, table 2 describes the developments of hourly wages and of the gender pay gaps in both absolute and relative terms. The columns 'year before' and 'year after' use the average wages over the respective 12 months, not just the incomes immediately before and after an employer change.

It is shown that after an employer change average wages increase significantly, irrespective of the type of employer change and of gender. In less than 20 percent of cases, hourly wages decrease – more often after involuntary changes (21 percent) than after changes for professional reasons (16 percent). This is only partly in line with previous research which sometimes also found negative or at least no positive wage effects, especially for involuntary changes and for changes for personal reasons (see section 3). Also, in all three cases the average wage difference between men and women increases by about 2 euros following the employer change. The relative difference, too, gets bigger, but to a lesser extent. The changes in the size of the gender gap are most pronounced for involuntary employer changes from which men seem to profit significantly more than women. However, the wages before and

after such a change are lower than in case of an employer change for personal or professional reasons.

Table 2: Wage developments for different types of employer changes

		year before	year after	abs. change	rel. change
Involuntary	Men	16.07 €	22.09 €	6.02 €	37.5 %
	Women	14.47 €	18.29 €	3.82 €	26.4 %
	GPG (€)	1.60 €	3.80 €	2.20 €	137.7 %
	GPG (%)	10.0 %	17.2 %	7.3 pp	72.9 %
Personal reasons	Men	19.50 €	25.33 €	5.83 €	29.9 %
	Women	16.54 €	20.48 €	3.95 €	23.6 %
	GPG (€)	2.96 €	4.85 €	1.89 €	63.6 %
	GPG (%)	15.2 %	19.1 %	3.9 pp	26.0 %
Professional reasons	Men	19.14 €	25.68 €	6.54 €	34.2 %
	Women	15.87 €	20.72 €	4.85 €	30.5 %
	GPG (€)	3.27 €	4.96 €	1.69 €	51.8 %
	GPG (%)	17.1 %	19.3 %	2.2 pp	13.2 %

Source: BAP 2009/10, author's calculations

Notes: GPG: Gender Pay Gap; pp: percentage points

4.2 Multivariate Analysis

In this section, the financial returns to employer changes will be analysed using fixed-effects panel regressions. Fixed-effects models require weaker assumptions than random-effects models because they control for group-specific unobserved heterogeneity (Brüderl & Ludwig, 2015: 327). The dependent variable is either the logarithmised hourly wage (models 1A–C) or just the hourly wage (models 2A–C). Models A only contain working experience and the employer spell (including an interaction with gender) as independent variables, models B also the type of employer change with a gender interaction. Further job characteristics are added in models C. Since fixed-effects models reduce heterogeneity by controlling for time-constant characteristics, variables like gender and the field of study do not have to be included. The results are presented in table 3.

Table 3: Fixed-effects-regression models of hourly (log-transformed) wage

(log.) hourly wage	M 1A	M 1B	M 1C	M 2A	M 2B	M 2C
Experience (years)	0.008***	0.008***	0.006**	0.027	0.030	–0.002
Experience ² /100	0.013***	0.013***	0.011***	0.479***	0.473***	0.425***
1 st employer	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
2 nd employer	0.299***	0.222***	0.191***	5.170***	4.345***	3.772***
3 rd employer	0.420***	0.343***	0.289***	6.944***	6.144***	5.236***
4 th employer	0.538***	0.461***	0.397***	9.432***	8.646***	7.424***
5 th employer	0.718***	0.654***	0.547***	12.446***	11.825***	9.735***

(log.) hourly wage	M 1A	M 1B	M 1C	M 2A	M 2B	M 2C
1 st employer*male	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
2 nd employer*male	0.027	0.029	0.017	1.742***	1.474	1.260
3 rd employer*male	0.069*	0.072	0.038	3.738***	3.463***	2.789**
4 th employer*male	0.051	0.053	0.016	3.848*	3.573	2.890
5 th employer*male	-0.180	-0.183	-0.085	-1.817	-2.215	-0.549
<i>Type of employer change</i>						
Involuntary		0.095*	0.001		0.219	-1.305
Personal		(ref.)	(ref.)		(ref.)	(ref.)
Professional		0.096**	0.055		1.235	0.564
Involuntary*male		0.058	0.026		0.563	-0.050
Personal*male		(ref.)	(ref.)		(ref.)	(ref.)
Professional*male		-0.021	-0.010		0.155	0.258
Currently PhD studies			-0.191***			-3.123***
<i>Occupational sector</i>						
BIC ¹			-0.094***			-2.079***
Manufacturing			(ref.)			(ref.)
Services			-0.113***			-2.111***
Media et al. ²			-0.105***			-2.280***
<i>Firm size (employees)</i>						
Small (<100)			-0.017			0.045
Medium(100–499)			(ref.)			(ref.)
Large(≥500)			0.034*			0.823*
Executive position			0.111***			2.370***
<i>Organisation type</i>						
Public service			(ref.)			(ref.)
Listed company			0.039			1.255**
Non-listed company			-0.003			0.248
Non-profit/other			-0.002			0.195
<i>Type of contract</i>						
Permanent			(ref.)			(ref.)
Fixed-term			-0.137***			-1.973***
Self-employed/other			-0.147***			-1.216
<i>Working time (hours)</i>						
Full-time (>35)			(ref.)			(ref.)
Long part-time (>20–35)			0.109***			2.334***
Short part-time (<=20)			0.111***			2.769***
_cons	2.803***	2.803***	2.901***	17.969***	17.961***	18.999***
N	340,018	340,018	340,018	340,018	340,018	340,018

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: BAP 2009/10, author's calculations

Notes: ¹ BIC: banks, insurances, consulting; ² Media et al.: Media, education, associations; Models 1A–C use log-transformed gross hourly wage as the dependent variable, models 2A–C use untransformed gross hourly wage

As can be seen in the first column, job mobility has large, positive, and significant effects on hourly wages which increase with each employer spell. Only the wage difference between the 3rd/4th and the 5th employer is not significant anymore, probably (in part) because of the low number of respondents (13 out of 4,866) who reported five different employers.

Only in case of the third employer, the interaction with gender is significant at the 5 percent level, and this effect disappears when the type of employer change is included as an independent variable. The coefficients for the employer spells get smaller, but retain their significance.

The variable ‘type of employer change’ and its interaction with gender indicate whether the wage returns are affected by these factors. There are in fact differences regarding changes for personal reasons: The returns to this type of employer change are significantly smaller than the returns for involuntary and professional changes. However, gender differences in the returns to different types of employer changes cannot be found, and for each type the returns are positive. This contradicts the first two hypotheses, which stated that involuntary employer changes and – for women – personal employer changes would on average decrease wages. Hypotheses 3 and 4 predicted wage increases after changes for professional reasons and – for men – for personal employer changes. Both seems to be the case, although, according to these results, this holds true for every type of employer change, for men as well as for women.

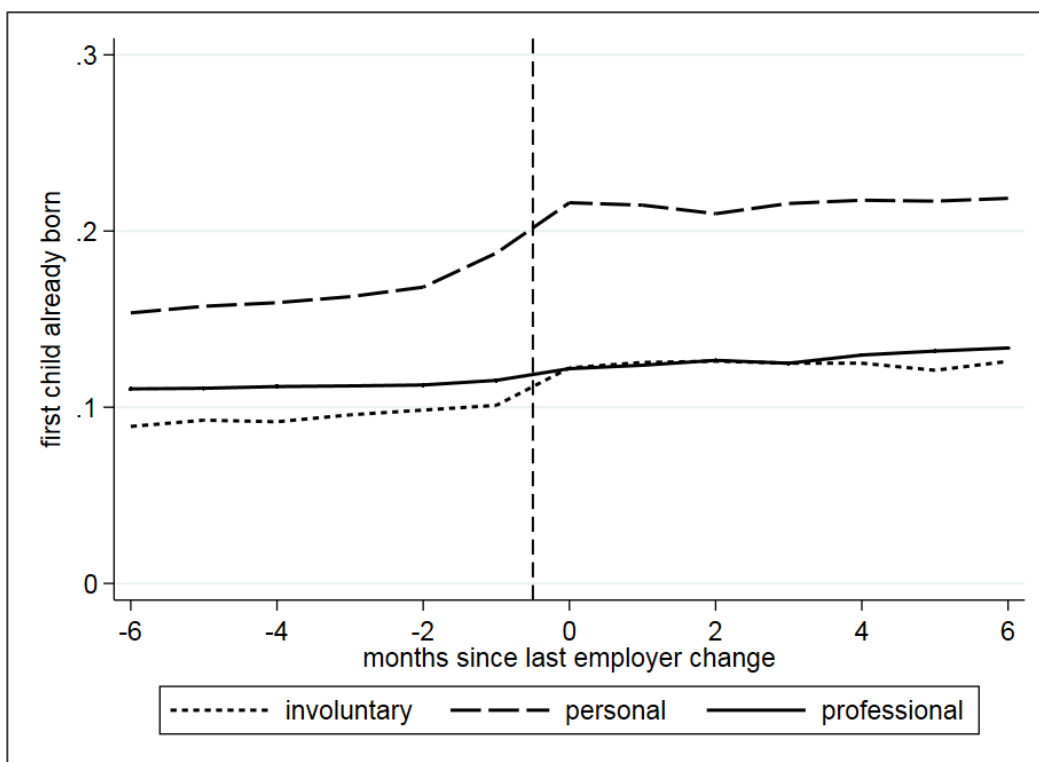
When job characteristics are added as independent variables, the coefficients for the employer spells again get smaller, but still without losing their significance. This is not the case for the variable ‘type of employer change’, for which significant differences between the three categories are then not present anymore. This is related to the effects of the control variables: Aside from employer changes, positive effects on wages are primarily exerted by employments in the manufacturing sector, in large companies, in executive positions and with permanent contracts, while average earnings are lower for PhD students. Wage differences between the organisation types are only found when the other variables are not controlled for, i.e. employees of listed companies earn more because of more favourable job characteristics which are taken into account here.

The mechanism that leads to the disappearance of the difference between personal and other employer changes becomes clearer when the relative frequencies of important variables prior to and after ECs are examined. For example, involuntary and professional ECs far more often go along with a transition from fixed-term to permanent contracts than personal ECs. For this reason, relative to involuntary and professional employer changes the financial returns to

personal employer changes are significantly lower without control variables, but do not differ anymore once these job characteristics are included in the regression model.

The differences in the shifts of other independent variables are of course also due to different starting points: When a change for personal reasons occurs, almost 70 percent of respondents already had a permanent contract before, a number that increases only slightly with the employer change. On the other hand, for involuntary employer changes the number increases from 28 to 60 percent – PhD students play a significant role here (without them, the returns to personal employer changes only differ from those to professional changes, not from those to involuntary changes), since they usually have fixed-term contracts. This highlights the fact that different types of employer changes often occur in different circumstances and that working conditions for graduates in their early careers often get better after they are forced to look for another job. Comparable starting points which, however, develop differently, can e.g. be observed for the working time: On average, it decreases after personal employer changes and increases otherwise. The average prevalence of an executive position is about 22 percent before a personal or professional employer change, but afterward 28 and 36 percent, respectively.

Fig. 5 Shares of respondents with at least one child prior to and after different types of employer changes



Source: BAP 2009/10, author's calculations; performed with Stata 15

Personal employer changes thus do not seem to be strongly connected to changes in most job characteristics. Instead, they are possibly related to personal circumstances to a higher degree, although this assumption is difficult to verify without additional data. The variable for the presence of children is the only possibility here. The shares of respondents with at least one child before and after different types of employer changes are pictured in figure 5. In case of personal employer changes, an especially strong increase of the share of mothers and fathers can be observed in the months prior to and after the change. This seems thus to be a reason for personal employer changes to occur although other reasons may still be more important – even among respondents with such a change, children are not the norm at the end of the observation period. Furthermore, it has to be emphasised that employer changes for personal reasons usually still go along with higher wages, even though the average returns are lower.

The fifth hypothesis is tested in models 2A–C, where the hourly wage without logarithmisation is used as dependent variable so that the coefficients represent absolute changes. It was assumed that for professional employer changes, absolute wage gains would be larger for men because they on average earn more already at career start. This hypothesis is partly confirmed by the regression results, which contain significant interactions between gender and the employer spell for the first three changes (model 2A) and for the second change (models 2B and C), respectively. Again, the missing significance for the fourth employer change is not surprising given the low number of respondents who experienced this amount of job mobility. That some of these interaction coefficients lose their significance once the type of employer change is controlled for, could be explained by the fact that women change employer more often for personal reasons and less often for professional reasons; as explicated above, these changes are associated with changes in other important independent variables.

Regarding the effects on wages, the differences between genders and between the types of employer changes which were found here, are overall smaller than expected. On average, employer changes financially pay off in any case, and only the size of this positive return varies between groups.

5. Conclusion and Discussion

Using data from the Bavarian Graduate Panel, this paper analysed the effects of job mobility on individuals' wages, distinguishing between different kinds of job mobility and with a focus on gender differences.

Employer changes were split into three categories and could occur for personal or professional reasons or involuntarily. While only in some cases wage increases were

expected, employer changes were found to have positive and significant effects on hourly wages irrespective of gender and of the type of job mobility. This contradicts the results of previous studies which also found negative effects, especially for involuntary employer changes (see section 3).

A possible explanation for this are the characteristics of the German labour market. After at least two years of employment, one is usually entitled to one year of unemployment benefits which amount to 60–67 percent of the net income. Only after that, the unemployment benefits decrease to living wage. Because of the comparatively high level of unemployment benefits in the first year of unemployment, German workers who just got unemployed might not feel the need to begin a new job as fast as possible, irrespective of the level of pay or the match with their qualification. Instead, they could take more time for the job search until they have found an employment with appropriate wages and skill requirements. From this, those who have to change employer involuntarily could profit to a higher degree, because after this type of mobility the average duration of unemployment is longer than after a change for professional reasons.

Furthermore, information about the ending dates of fixed-term contracts as well as mandatory periods of notice that get longer with the duration of job tenure protect employees from losing their job from one day to the next. That way, they can already look for a new employment before actually becoming unemployed which has effects on their bargaining positions and opportunity costs. Keith and McWilliams (1995: 126) reported how many respondents in their sample already had a new job lined up prior to job separation. The numbers ranged from 10 percent to 54 percent, depending on the reason for the employer change (economic quits went along with higher and involuntary changes with lower frequencies) and on gender (mostly higher numbers for men). In the sample analysed here, a new employment will be considered as having already been lined up when it begins in the month after the end of the previous job. This probably results in an underestimation since it is also possible to get a confirmation for a job which starts at a later point in time. Nonetheless, the frequencies are significantly higher than in the sample of Keith and McWilliams: After employer-induced ECs, there is no period of unemployment in about half the cases. For personal ECs, the numbers are 55 percent for women and 78 percent for men, while more than three quarters of professional ECs go along with no time between the old and the new employment.

According to previous research, the duration of unemployment between two jobs can also influence wages: Schmelzer (2012) found that increases could only be observed without an interruption, and involuntary changes went along with wage decreases when individuals were

unemployed for some time prior to the new job. This could not be found with the sample used in this study. An interaction between the variable ‘type of employer change’ and different specifications of unemployment between the two jobs yielded no significant coefficients.

Another factor besides labour market regulations is a country’s current economic situation. Previous research found negative effects of involuntary employer changes during recessions, but positive effects during economic growth (Blau & Kahn, 1981a: 292). The sample analysed here consists of Bavarian university graduates for whom the labour market in Germany is characterised by favourable working conditions like low levels of unemployment (Albrech, Fink, & Tiemann, 2016: 12 f.), Germany as a whole is experiencing economic growth since 2010 (Statistisches Bundesamt, 2018b). As a sought-after group (with unemployment benefits to fall back to), graduates have bargaining power which probably contributes to the fact that they, on average, do not experience any wage losses after an employer change. However, effects of the economic situation and of labour market regulations are difficult to disentangle with this sample. Additional data with a wider geographical or time horizon would therefore be needed to further investigate these effects.

Differences can be found with regard to the returns to personal employer changes which are lower, although still positive. These differences can be explained by different circumstances and by the changes in independent variables like permanent contracts and executive positions, i.e. variables with strong positive effects on incomes. Such characteristics are relatively rare before involuntary employer changes, but the prevalence increases drastically afterward, going along with large wage increases. In contrast, they are already quite common before personal or professional changes, but do not change much anymore after the former and increase even further in case of the latter. Thus, the returns to different types of employer changes do not differ anymore after controlling for job characteristics.

Gender differences can primarily be observed with regard to absolute wage changes, but only for job mobility in general, not for certain types of employer changes. Again, average returns are always positive, but these wage gains tend to be lower for women who also have lower wages to begin with. This result is in line with the assumption that individuals try to achieve relative rather than absolute gains; relative gains therefore do not differ between men and women, but absolute gains do because of the different starting wage levels. Here, too, labour market segregation plays a role, so that the differences are not significant anymore for the second and fourth employer once job characteristics are controlled for.

As usual with survey data, incomplete information given by the respondents might be a limitation of this study. Participants were asked to list all the employments they have had

since their graduation retrospectively and to also give information about important changes (like rises in salaries) within their jobs. If this was not done thoroughly, the frequencies of employer changes and individuals' wages may be underestimated here. Furthermore, the returns to employer changes would be too high and those to work experience too low. As a robustness check, for jobs where no changes were reported wages were increased every 12 months by 2 and 5 percent, respectively. The coefficients for work experience indeed increased and those for the employer spells decreased significantly, but no effect lost its significance, and all other results remained essentially unchanged.

Overall, the results obtained here in part contradict those of other studies which primarily used data from liberal market economies. While in Germany, too, job mobility seems to be important, it rarely has negative effects on wages, even in case of employer changes that occur involuntarily or for personal reasons. Downward mobility is thus less frequent, for which the more selective population – university graduates in a growing economy – and the different labour market structure of a coordinated market economy are two likely reasons.

Further research could widen the scope by including individuals without tertiary education and/or with more experience on the labour market. Comparisons with different time periods and countries could be made to gain additional insights into the mechanics of employer changes. In this context, different dependent variables like working time can also be investigated in order to cover other aspects of job mobility.

Chapter VI:

Synthesis

Taking into account significant changes that the German education system and the labor market have experienced in the last years and decades – the educational expansion for men and especially for women, an expansion of female labor market participation, and the Bologna reform – this work tried to analyze relationships between gender, educational degrees, job mobility, and wages.

First, it was investigated whether the new bachelor's and master's degrees, which in Germany were introduced following the Bologna reform, offer different financial returns to university graduates. When comparing graduates at career start, the results showed significant wage advantages for respondents with a master's degree, a gap that tends to widen further over the life course. However, two especially important factors – which are also connected with one another – have to be considered here. First, there are differences between graduates of different fields of study. Second, doctoral studies, the prevalence of which also differs between fields of study and which generally are not undertaken by bachelor's graduates, can also heavily influence incomes.

When analyzing fields of study separately, only for the field of law and economics – where doctoral studies are the least common – a positive master effect can already be observed in the first model without control variables. In contrast, there is no effect in most other fields, and even a negative effect in the case of math and sciences. PhD students play a significant role here, because they often have lower wages than their peers, lowering the average wages of graduates with a master's degree. In math and sciences, doctorates are very common, and the wage penalty for PhD students is quite large, which explains the negative master effect in the first model. Thus, positive master effects at career start can always be observed as soon as PhD students are controlled for. However, this also highlights the fact that the opportunity costs of further education can increase even more when master's graduates choose to invest in an additional doctoral degree. Only for graduates from the humanities and the social sciences this is usually not the case, since for these fields of study there is no wage penalty for PhD students relative to master's graduates without doctoral studies.

Furthermore, comparing graduates from their respective career starts on ignores the fact that bachelor's graduates who enter the labor market without a master's degree and thus about two years earlier, can already gain advantages in this period. Compared to bachelor's graduates of the same cohort who continue with master's studies, they get a head start regarding the accumulation of work experience and lifetime incomes, which can have long-lasting effects:

The average income difference between bachelor's graduates and master's *students* is larger than that between master's and bachelor's graduates (although leaving university could also mean an increase in living costs due to higher standards, reducing the difference in *available* income).

Because of this and because of the differences in work experience, the lifetime earnings gap disappears rather slowly and is still significant at the end of the observation period in this study. Especially when master's graduates continue with doctoral studies which often have lower financial returns than a regular employment, they might thus need decades to compensate for the disadvantages that have accumulated during their prolonged qualification phase. Thus, "the more education, the better" does not have to be true, at least regarding incomes and at least in the short run. For bachelor's students in Germany, a recent survey also found a decreasing inclination to continue with further (e.g. master's) studies after graduation, with only 47 percent planning to do so in 2018 (Deutsche Bildung AG, 2019: 38).

To determine the long-term effects of master's degrees relative to bachelor's degrees in Germany, more time has yet to pass, so that newer data can make additional analyses possible. In the light of the important role doctoral studies play concerning income, it could be worthwhile to differentiate not only between bachelor's and master's graduates, but as well between persons with and without a doctoral degree within the group of master's graduates.

Regarding job mobility, gender was the main grouping variable under investigation. First results showed that women were more likely to change employer than men, although this effect reversed when employment characteristics were added as control variables. The initial effect was thus the result of on average less favorable working conditions for women, e.g. a lower probability of having a permanent contract. The positive effect for men in the full model with all control variables, on the other hand, might disappear when psychological factors like risk aversion are taken into account, which unfortunately was not possible with the available data.

The financial returns to employer changes were quite large both for men and women. However, initially no significant difference could be found when the logarithmized wage was used as the dependent variable. Only when the non-transformed hourly wage was used, which makes the coefficients indicate absolute instead of relative wage changes, larger returns were found for men. This can be explained by the fact that among German university graduates, already at career start men have significant wage advantages relative to women. When wages then increase by the same percentage, larger absolute returns for men are the result.

In both cases – frequencies of and returns to job mobility –, considering only employer changes in general can be seen as a simplification of the true mechanisms of job mobility. Depending on an individual's situation and goals, employer changes can occur for various reasons, and different effects might be expected for men and women when they differ in relevant independent variables. For this reason, further analyses distinguished between three types of employer changes: first, employer-induced (i.e. involuntary) changes, second, employee-induced changes for personal reasons, and third, employee-induced changes for professional reasons.

Regarding the frequencies of employer changes, the results indicated that involuntary employer changes are more common for women. This is at least in part the result of different choices of the field of study which are correlated with labor market outcomes – e.g. permanent contracts – that in turn affect the probability of involuntary employer changes. Employer changes for personal reasons, too, are more likely for women, but here personal circumstances play a more prominent role relative to job characteristics. For employer changes for professional reasons, there are similarities to the results in the previous chapter: Again, men are more likely to experience this type of job mobility when job characteristics are accounted for; however, now there is no gender effect in the raw model without control variables (which previously indicated a higher probability of job mobility for women), probably because involuntary and personal employer changes are no longer included in this part of the analysis. This indicates that pooling all types of employer changes indeed hides some of the effects, because they can point in different directions and thereby offset each other. Distinguishing between different types of job mobility is therefore important in order to gain a complete picture of the relationships at work.

Results were only partially in line with the hypotheses concerning the financial returns to employer changes. Not only was it assumed that the different types of job mobility would affect men and women differently, it was also expected that they would differ significantly in their returns, irrespective of gender. However, it was shown that in this sample positive (and quite large) wage increases could always be expected following a job mobility event, even in case of involuntary employer changes. Average returns were only smaller for employer changes for personal reasons, a finding which could be explained by the fact that such changes usually occur in different circumstances, i.e. in situations where respondents already have found a position with better pay and other favorable job characteristics. In such situations it is more difficult to increase wages even further.

Gender differences could only be observed for employer changes in general, and only when returns were measured in absolute rather than in relative terms. Then, there were advantages for men who on average have significant wage advantages already at the beginning of their careers. Similar relative wage increases (e.g. by 10 percent for all respondents) thus translate into larger absolute increases for those with higher starting salaries.

These results can be put into an institutional context by interpreting them with regard to the specifics of the German labor market and welfare state. Perhaps the most surprising finding was the fact that for no group there was a negative effect of job mobility on wages, neither for men nor for women nor for respondents changing employer involuntarily or for reasons that are not job-related. Other studies often found negative effects especially in case of lay-offs (i.e. involuntary employer changes), a result that could not be replicated with the data used here. The previous studies from Keith and McWilliams (1995, 1997, 1999) and Fuller (2008), however, also mainly used data from the US, which are characterized by a liberal labor market and a liberal welfare state.

On the coordinated German labor market, companies have less possibilities for a hire and fire policy due to the stronger employment protection laws, and wage inequality within a sector is less pronounced. Furthermore, unemployment benefits are comparatively generous – although not as generous as in the case of the social democratic welfare states in Northern Europe – which can also affect individuals' behavior and financial returns in the context of job mobility. Under these circumstances, it is easier for (potential) employees to find a new employment with (at least) the same level of pay in case of a lay-off, both via on-the-job-search – because of mandatory periods of notice – and when searching during unemployment – because higher benefits make the matter of finding a new job less urgent so that more time can be invested until a suiting employment is found.

However, Germany is also characterized by a rather strong link between education and occupation (Andersen & van de Werfhorst, 2010; Leuze, 2007). If certificates are thus of more importance on the German labor market, negative effects on wages could perhaps be expected in case of a change in occupation that leads to a worse qualification-job-match. Future research could include this type of mobility in order to gain a more complete understanding of labor market mechanisms.

Furthermore, other samples should be used to review the results found here: First, it should be investigated whether the effects are the same when not only university graduates, but individuals with different educational backgrounds of all ages are included. Second, other economic circumstances – namely recessions – could be analyzed in order to determine if this

influences the effects. And third, the analyses should be repeated for other countries so that it can be determined if the mechanisms discussed here – the varieties of capitalism and the welfare state – are in fact responsible for the differences between this study and previous ones.

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