The influence of work organizations on the generation and change of wage inequality

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How firms shape the gender wage gap and influence wage and bonus inequality in Germany between 1995 and 2010

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Abstract

One of the most important resources determining chances in life is the amount of income an individual has at its disposal. For most people in contemporary societies wages make up the majority of their overall income and are therefore a key dimension of social inequality. This phenomenon attracted scholarly interest before the recent debates about widening wage inequality in many industrialized societies and represents a core topic in sociology and economics.

Wages are the result of employment relationships and, as such, are determined by characteristics of the employee, but also by characteristics of the employer and the idiosyncratic match between them. This thesis aims to add to a growing strand in the literature that focuses on the latter two influences. This does not imply that individual attributes do not matter. It rather means that characteristics of the firm and the specific combination of these two factors need more attention. Associated with this switch in perspective is the emphasis of work organizations as social arenas in which (collective) actors struggle over the available organizational resources. Unlike human capital theory (and most other economic theories) which conceptualize wage levels as the result of valuation processes of individual skills and other productivity-relevant attributes on labor markets, relational inequality theory (RIT) treats work organizations as the actual place where wage inequality is generated. The thesis makes use of this comparably new theory in combination with concepts that emerged in the "new structuralism" literature to formulate a coherent theoretical framework. Overall, the thesis tries to understand and empirically explore the role that firms play for the processes of generation and change of wage inequality.

I make use of four samples of the German Structure of Earnings Survey (1995, 2001, 2006, and 2010), a large administrative dataset whose distinctive feature is the possibility to link employee with employer information in order to receive a linked employer-employee dataset (LEED). The first study addresses the generation of one type of wage inequality, namely the gender wage gap (GWG). The article demonstrates that firm-specific opportunity structures in form of status relations influence the GWG in firms. More specifically, relative wages of women in the firm increase with the share of female managers and advantages in educational certificates compared to men. The other two studies, which are written together with Martin Groß, focus on the change in wage inequality between 1995 and 2010 in Germany. Study 2 shows that three firm characteristics, namely average human capital, stability, and coverage by collective agreement, influence individual wages positively – net off individual attributes. However, there is much variation in effects along the wage distribution. We also detect

variation in effects and over time, which we interpret as the consequence of globalization and financialization, two processes that change the environment of firms and hence their pay and selection regimes. Using a series of RIF-decompositions we show that these changes in effects as well as changes in the composition contribute to the change in wage inequality. Finally, Study 3 complements this analysis with a look on bonus payments. We show that bonus inequality has been rising since 1995 and that this rise fuels the rise in overall wage inequality. We further highlight differences between firms and conclude that less stable firms and covered firms reduce bonus payments especially for low wage groups.

Overall, the findings emphasize the important role of firms for the generation and change of wage inequality. It is not only individual characteristics that determine wages, but also the firm one finds employment as well as the opportunity structures within it. Additionally, firms react and adapt to changes in the environment and change their pay and selection regimes accordingly. Such adaption strategies on the firm level influence wage inequality and have contributed to the rise in wage inequality in Germany between 1995 and 2010. These findings also have policy implications: Increasing the share of female managers should lead to a corresponding reduction of the GWG; re-strengthening of the collective bargaining system and unions should also lead to a decrease in wage inequality as should an expansion of firm internal labor markets.

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1 Introduction

Wages and income in general are key dimensions of social inequality because the amount of money that is at ones disposal greatly determines chances in live. Not only are affluent people better able to consume and afford a certain lifestyle, income is also positively correlated with other social inequalities such as life satisfaction (Boyce et al., 2010; e.g. Frijters et al., 2004), education (e.g. Blanden & Gregg, 2004), or health (e.g. Johnston et al., 2009). Hence, wage and income are key dimensions of social inequality. Furthermore, a widely recognized study by Wilkinson and Pickett (2009) shows that the degree of income inequality has severe consequences at the societal level: Inequality is positively related to crime rates, mental and physical health problems, obesity, and social cohesion. Consequently, the distribution of incomes and wages within societies is an important field of social stratification research. Since many in today`s societies obtain the largest part of their income through wages out of paid employment, questions regarding the magnitude of wage inequality and the mechanisms that generate and change wage inequality are of key interest to both social scientists as well as policy makers.

In the aftermath of World War II, wages grew rapidly and at about the same rate for most wage groups across the industrialized countries, rendering questions targeting the distribution of wealth less important. However, beginning in the 1970s wage inequality began to rise substantially (e.g. Piketty & Saez, 2003). This trend was first detected for the U.S., but is now established for most of the industrialized countries including Germany (Dustmann et al., 2009). Since then a vast body of theoretical and empirical research has been conducted in order to find the causes of this dramatic rise in wage inequality (see e.g. Acemoglu & Autor, 2011 for an overview). Probably the most prominent explanation is *skill-biased technological change* (SBTC) arguing that rapid technological development and adaption of these technologies at the workplace changes the returns to skills disproportionately with high-skilled workers experiencing massive grows in their returns compared to less skilled workers. Another well-known explanation, which has been gaining popularity in recent times, is *financialization* (Davis & Kim, 2015; Dünhaupt, 2013). The idea here is that real economy has become more and more dependent on finance markets leading to short-term profit maximization strategies that favor managers and professionals while decreasing employment and wages for others.

Surprisingly, the field was and is still dominated by economists, while sociological research stayed more or less silent on the topic despite wage inequality being among the core questions of the discipline since its founding (DiPrete, 2007; Green, 2007; Myles, 2003). Only more

recently, further critique has been offered, arguing that pure market-based explanations are not enough to explain the within country pattern of changing wage inequality as well as cross-country variations (Card & DiNardo, 2002; McCall & Percheski, 2010). More sociologists have entered the discussion on behalf of these alternative explanations and add labor market institutions and occupational closure strategies as potential causes (Weeden & Grusky, 2014) to the debate.

Despite this tremendous body of literature, there are still puzzles regarding the causes of rising wage inequality over the last decades. One of these puzzles is the role that *work organizations* play. By work organization, I mean every collectivity of actors that deliberately structures and coordinates the activities, tasks, and interactions of participants in order to produce and sell a product or service. In particular, this is the firm an employee is directly employed at.[1] We have learned much on the relation between worker characteristics and the rise in wage inequality (either from a human capital perspective that looks at skills or from a more structural perspective looking at classes and occupation), but far less on the influence firm characteristics have. This comes as a surprise since both sides, the one of the employer as well as that of the employee, seem a priori equally important for wage determination. However, due to the early success of supply-side explanations like the SBTC, which seemed to explain the trends in the 1980s sufficiently well, and the lack of suitable linked employer-employee data, which only became more and more available in recent times, this focus on workers is understandable. But now that these data are readily available, more empirical research is dedicated to the role of firms. There are a number of recent studies demonstrating the importance of firms for the change in wage inequality. The studies by Barth and colleagues (2016) and Song and coauthors (2016) show that much of the increase in wage inequality in the U.S. between the 1970s and 2010s goes back to wage differences between firms. In a similar study Card and coauthors (2013) find that increasing firm-level heterogeneity (i.e. rising variation of the wage premium in different firms) explains a substantial part of the overall rise in wage inequality in Germany between 1985 and 2009. This means that processes at the firm level contribute to rising wage inequality and that it is essentially a between-firm rather than a within-firm phenomenon.

Although these studies use excellent data and refined methods, they merely highlight the finding that firms are indeed important for explaining wage inequality and its rise and they mostly deliver some sort of quantification for this importance (e.g. share of overall increase in wage inequality that is explained). What we do not learn much about, however, is the actual

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[1] The terms business, corporation, workplace, establishment, firm, and employer are used interchangeably.

organizational mechanisms that produce wage inequality between workers within the same firm and workers employed in different firms. Why is firm-level heterogeneity increasing? What are the firm-level dimensions and characteristics along which firms become increasingly different? How do these characteristics relate to more macroscopic explanations like financialization and technological change? This line of research cannot shed light on these kinds of questions.

This thesis thus follows a different approach. Because recent research has found firms to be important, we can move one step further and look at the contribution of single firm characteristics to the rise in wage inequality. In this way, it is possible to discover the roots of the observed rising heterogeneity between firms. In addition, these characteristics can be linked to other explanation like globalization, technological change, and financialization because most of these trends take place in the environment of firms and thus serve as conditions for firm decisions and business strategies. This does not imply that these trends have no influence on wages. Rather, it is assumed that the influence is mediated and translated within organizational contexts. Firms have to react to changes in their environment and they apply different adaptation strategies leading to rising heterogeneity on the firm level regarding pay levels. This makes it ever more important for workers to choose the *right* employer. In addition, trends in a firm's environment alter wage determination processes within the firm which leads to changes in within-firm inequality. Therefore, by linking broad processes on the societal or market level with specific organizational wage setting mechanisms on the firm level we are able to arrive at more integrated explanations of wage generation and change, which not only include individual characteristics or firm characteristics, but rather include both simultaneously.

The first task is thus to formulate a theory that places work organizations and not markets at its center. It is work organizations in which workers are employed and thus the actual context in which wage setting takes place. In fact, studies show that for the U.S. inequality within work organizations is almost as large as it is for the whole economy (Lazear & Shaw, 2008). In addition, work organizations differ in their average wage level (firm wage differentials) which makes the employing work organization an independent source of wage inequality – net of individual attributes (Lengfeld, 2010). Work organizations are hence central to the analysis of wage inequality because they constitute an arena in which wages are bargained over by different actors (within firm inequality) and they represent differently paying units employees move between (between firm inequality).

Baron and Bielby demanded an inclusion of work organizations in social stratification research dating back to 1980. They proposed a structural approach that assumes rewards to be linked to positions rather than individuals against human capital theory. In such a structural framework, individual attributes (i.e. marginal productivity) are not valued by a market process. Instead, other mechanisms that generate inequality are at work, namely ranking, social closure, and exploitation. It is relations of persons and positions within the workplace from which inequality is generated. Tomaskovic-Devey and Avent-Holt (2014) formulate a theory called *relational inequality theory* (RIT), in which these ideas are incorporated. In addition, they give this structural approach an interactional basis. This is what they call "claims-making". They conceptualize the generation of wage inequality within work organizations as the result of an interactional claims-making process in which actors or sets of actors raise claims for a certain portion of available organizational resources and try to enforce their claims by activating locally valid status expectation in social interactions in order to legitimate why they deserve the claimed portion (and not someone else). This theoretical framework offers a perspective regarding the generation and change of wage inequality that is centered at work organizations.

The framework therefore is used as the theoretical basis for the empirical work. The present thesis encompasses three empirical studies that use the Structure of Earnings Survey (GSES), a large administrative linked-employer-employee dataset (LEED), to investigate the *organizational* mechanisms that generate and change wage inequality in Germany between 1995 and 2010. Of course, this is too large a problem for one thesis. I therefore select three cases where such organizational mechanisms can be illustrated: the gender wage gap (Study 1), the contribution of firm human capital, stability, and coverage by a collective agreement to the rise in wage inequality (Study 2), and the role of these three firm characteristics in the generation of bonus inequality (Study 3).

The first study addresses the *generation* of wage inequality. It comprises of an analysis of the gender wage gap and how it is generated within organizational contexts. Relational inequality theory suggests that the context in form of status relations between men and women greatly determines individual chances. Wage inequality is expected to be lower in firms where status relations are in favor of women. For example, wage inequality should be lower in firms, where the share of women in management positions is high or where women have a higher educational level than their male colleagues – after controlling for positional rank and individual education. The results confirm these expectations: Women`s wages relative to

men's increase with the share of women in management and with advantages in educational credentials.

The second study explores potential organizational causes of the *change* in wage inequality, specifically the rising wage inequality in Germany between 1995 and 2010. Firms face ever more pressure to work efficiently in the course of globalization and financialization. However, different firms may resort to different strategies to adapt to these conditions: While firms with a high level of human capital may invest in product and process innovation, less stable firms (which are firms with a high turnover rate) could try to cut wages. Our results show that changes in these firm characteristics (either their effect or their composition) over time contribute to the rise in wage inequality, especially in the lower half of the wage distribution.

The third study deepens the analysis of the organizational causes of rising wage inequality by looking at bonus payments which are an important channel for the tremendous rise of top wages and hence the rise in wage inequality in the upper parts of the wage distribution (Lemieux et al., 2009). Financialization and globalization provide managers and other top wage employees with a higher status due to their perceived importance for the firm's fortune. This enables these employees to be more successful in claims-making. This is true for claims on base wages, but even more so for claims on bonus payments. However, the study shows that there is variation between different types of firms with bonuses increasing with human capital in the firm as well as stability and coverage by collective agreements.

The following chapters of the thesis are organized as follows: In chapter 2, the theoretical framework for the organizational explanation of the generation and change of wage inequality is discussed in depth. Chapter 3 lays out the research agenda in more detail. Chapters 4 to 6 encompass the three studies and chapter 7 comprises a summary of the core findings and gives some remarks on potential future avenues of research.

2 Organizational explanations of wage inequality and its change

In this chapter I present a theoretical framework that guides the empirical search for the organizational determinants of the generation (section 2.1) and change (section 2.2) of wage inequality. At its core stands a recent sociological theory called relational inequality theory (RIT) that explicitly treats work organizations as the locus of the generation of wage inequality. This theory is explicitly positioned against economic accounts to wage inequality and important differences are discussed (section 2.1.5). Having established an understanding of the different determinants of wage inequality, we can move to explanations of *change* in wage

inequality which are addressed in section 2.2. The section starts with the presentation of prominent explanations such as skill-biased technological change and financialization. However, all of these explanations more or less disregard work organizations as the actual place of wage setting. Section 2.2.3 thus discusses potential impacts of these broad trends on institutional and market environments of firms, thereby establishing a link between organizational wage mechanisms and these macroscopic trends that happen in the environment of work organizations.

Before we move to wage inequality theories, it has to be explained, what exactly is meant by the term "wage". Wage is the result of employment relations, in which an employer hires an employee in order to execute certain tasks and the employee receives some kind of compensation for the work she/he does during her/his employment. I do not differentiate between wage (which is typically paid by hour or on a daily/weekly basis, mostly for manual work) and salary (a term generally reserved for fixed compensation packages per month for professional or office work in the service sector).[2] Wages are therefore defined as all monetary compensation (including bonus payments, stock options, and other additional payments, that are convertible into money) an employee receives from his employer in exchange for his labor.

2.1 Explaining wage inequality, organizationally and sociologically

The central question in this section is: How do work organizations create wage inequality between individual workers? An obvious point to start the search for theories about the influence of firms on individual labor market outcomes is the seminal article by Baron and Bielby (1980) who build a strong case for (re-)incorporating firms into social stratification research. Although they convincingly argue *why* research interested in wage inequality should not look at individual characteristics alone and instead focus on various forms of structure in the labor market (among which firms are most promising) in order to explain individual outcomes, they do not offer a theory that explains *how* work organizations contribute to inequality formation in the labor market.

Granovetter and Tilly (1988) provide one of the first attempts at a conceptual framework designed to explain inequality in labor market outcomes in which work organizations play a central role. Simply stated, they conceptualize inequality as the result of contests or struggles

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[2] I use the term salary, earnings, income, and wage interchangeably in this thesis. When using these terms, I always refer to compensation that an employee receives from an employing firm in exchange for his work.

over the rewards of labor in which different actors are involved and that mainly take place within and between work organizations. Actors try to influence two general inequality producing mechanisms: ranking and sorting. *Ranking* denotes the process by which firms and jobs within firms are created, defined, and ranked in relation to each other and tied to different resources, rewards, and rights, ultimately establishing a hierarchical positional structure. *Sorting* is the process by which individuals and groups are placed in the given inequality structure of firms and jobs (Granovetter & Tilly, 1988, p. 177). Sorting leads to inequality not because workers are assigned to different but equal positions in the labor market, but rather to positions that offer higher or lower rewards as a result of ranking.

The idea that there is a hierarchical structure of positions in which individuals are placed and which (at least in part) determines individual labor market outcomes above and beyond individual attributes is not particularly new. Similar arguments were found going back to functionalist tradition (Davis & Moore, 1945) and the "new structuralism" that emerged in the late 1970s (Baron & Bielby, 1980; Carroll & Mayer, 1984; Groshen, 1991; Preisendörfer, 1987). New structuralism is an umbrella term for different approaches that share the common idea that wage levels and differences in wages are situated in "empty positions" predating individual workers that (later) occupy these positions. Different concepts of this positional structure include (among others) sector, occupation, class, internal or dual labor markets (Doeringer & Piore, 1971), and work organization. In their seminal paper, Baron and Bielby (1980) tried to theoretically synthesis all of these different concepts that emerged at the time arguing that work organizations "are the entities within which work is structured" (Baron & Bielby, 1980, p. 750) and are thus most relevant for research interested in social stratification. Tilly and Granovetter (1988) follow this insight. Therefore, the novelty in their perspective is not the structural argument but rather consists of two assumptions: First, inequality of labor market outcomes is the result of struggles among actors within and between work organizations and, second, these struggles mainly revolve around the control of ranking and sorting processes as the two central mechanisms that establish differences in outcomes. Thus, wage inequality predominantly exists due to "the assignment of different kinds of people to different jobs, within and across firms" (Granovetter & Tilly, 1988, p. 190).

Although Tilly and Granovetter emphasize the importance of struggle and competition revolving around the control over these mechanisms, they only offer a vague, more or less narrative description of these interactions. These descriptions are limited and, ultimately, it is not clear how one actor is able to achieve his goal and exercise control over ranking and sorting while others fail to do that. For example, take the differences in pay between male and

female employees. How is it, that female dominated tasks and occupations are often devalued and paid less (ranking) or that women are often sorted into less privileged positions in the firm's position hierarchy? Ranking and sorting are the assumed mechanisms that establish these inequalities. But how is the dominating actor able to do so?

In a series of contributions, Tomaskovic-Devey and Avent-Holt formulate a theory which they call *relational inequality theory* (RIT) and in which not only most of the ideas mentioned so far are incorporated but also a formulation of the interactional and psychological foundations of struggle over wages and other rewards (Avent-Holt & Tomaskovic-Devey, 2014; Tomaskovic-Devey, 2014). Their approach to inequality is genuine sociological because of its relational nature. Inequality is not lodged in positions nor in persons, but in their relation to each other within a meaningful organizational context. Skills of engineers are not valued per se, but in relation to coworkers and production workers. Power and status are the result of these relations and not just attributes of positions or persons.

At the center of RIT stands a mechanism called *claims-making*. Claims-making denotes a way of distributing available resources of the work organization to its members and stakeholders. The idea is that these organizational resources are distributed to those actors that make successful claims on them. In this view, wages are just one form of resource that members can raise claims for (besides further training, respect, or authority). Because the process of claims-making is embedded in the social relations at the workplace it reflects power and status dynamics in those relationships. Actors try to legitimate their claims by resorting to status expectation and hierarchies associated with categorical distinctions and conditions of the organizational environment (such as competition on the product market or laws). In time, these locally valid and legitimate practices become institutionalized forming more or less stable firm-specific inequality regimes. Firms develop specific modi of selection of persons into jobs (selection regime) and distribution of organizational resources in form of wages and bonus payments (pay regime) among employees and other stakeholders. Section 2.1.1 will discuss claims-making in more detail.

Claims-making represents the interactional basis for two other mechanisms, namely exploitation and opportunity hoarding. This raises two questions: What are exploitation and opportunity hoarding and how do these mechanisms relate to the aforementioned general mechanisms of ranking and sorting? In short: Although the ideas of ranking and sorting are still visible within RIT, these mechanisms are not explicitly mentioned anymore and, ultimately, replaced in favor of opportunity hoarding and exploitation, which are more specific and

theoretically richer concepts. In sections 2.1.2 and 2.1.3 I will introduce these two mechanisms and discuss why they are the more useful concepts for the questions this thesis raises.

The absolute amount of available organizational resources sets the upper bound for distribution within the firm. Depending on a firm's ability to pool resources and relations between employees and owners, firms also differ in the average pay of employees. Section 2.1.4 will further elaborate on firm wage differentials. Finally, section 2.1.5 draws a comparison to human capital theory and section 2.1.6 summarizes the discussion.

2.1.1 Claims-making

"Organizations are collectivities oriented to the pursuit of relatively specific goals and exhibit relatively formalized social structures" (Scott, 2003, p. 27). Work organizations are thus collectivities that deliberately structure and coordinate activities, tasks, and interactions of participants in order to produce and sell a product or service single individuals cannot. When more than one individual contributes to organizational revenue, it automatically follows the question of who is most deserving of the revenues. How are resources and revenues accumulated by a work organization distributed between the actors contributing to its making? The answer RIT gives: It is awarded to those actors who make successful claims on it. The process of claims-making is the central mechanism that distributes wages and thus generates wage inequality within work organizations.

Tomaskovic-Devey and Avent-Holt regard claims-making as a two-step process (Avent-Holt & Tomaskovic-Devey, 2014): First, an actor or a set of actors (which can be owners/capitalists, different groups of employees such as managers, professionals, or production workers, departments, and unions) make a claim. Claims can be explicit in the form of applying for a job or requesting a raise. They can also be implicit, embedded in taken-for-granted practices like the standard wage attached to a particular job. Second, the claim-making (collective) actors try to argue why they deserve the claimed portion of organizational resources (and not someone else). These arguments are directed at influential other actors in the firm (supervisors, managers, owners) with the goal to persuade them. If the claim gets recognized and seems legitimate to the decision makers, they direct the claimed portion of resources to the claim-making actor, thereby legitimating this practice of distribution and the inequality in wages and other resources that results from it. At both steps, making a claim and persuading influential others, social relations are of central importance. More powerful actors will make more claims and be able to better enforce their claims eventually resulting in higher wages.

But what does "more powerful" mean? What makes some actors more successful in claims-making than others? Power is not thought as a singular attribute of individuals or positions but as an unequal relation between these individuals and positions (Roscigno 2011: 353). Power is thus not absolute, but relative and takes effect in social relationships and interactions. RIT offers two sources of power and legitimacy that can be used as resources in the claims-making process because they refer to locally legitimate cultural frames and thus offer reasons as to why someone is more deserving than others: categorical distinctions and environmental contexts. *Categorical distinctions* such as owner-employee, manager-worker, or male-female are associated with authority, task competence, status expectations, and stereotypes (Ridgeway & Cornell, 2006; Ridgeway & Erickson, 2000) that become relevant in social interactions. These categorical distinctions generate asymmetries in status and power and thus influence the frequency and legitimacy of claims. Less powerful, low-status actors will make fewer claims and those claims are less likely to be ratified by influential others.

Categorical distinctions can be of two types. Some of these categorical distinctions are specific to the work organization. They result from the specific division of labor and the meaning that is attributed to certain jobs. Other distinctions are typically produced outside the organization and are then imported: class, gender, educational credentials, and occupational licenses. From this point of view, differences in human capital are only a special case of categorical distinctions. These differences are certainly influential but only within the claims-making process. Differences in human capital (along the dimension of tenure, work experience, skill, and education) between actors can be used as a bargaining resource in order to prove that one actor is more deserving than another by linking these distinctions to legitimate frames such as task competence and performance. Underlying these stories about competence and performance can be real differences in productivity, but this is no necessity. They can be used as resources in the claims-making process, regardless of whether they are true or not. Human capital differences do produce wage inequality in the workplace – however, not through a market valuing process but through a claims-making process (Tomaskovic-Devey & Avent-Holt, 2014).

Actors and positions are typically associated with more than one category in interactions. Inequality should thus be enlarged where multiple favorable categorical distinction overlap (male managers versus female production workers, etc.). Because locally produced and salient categories are entangled with culturally valid categories within work organizations, each work organization has its unique inequality regime. This is the reason why individual characteristics can mean something very different in different organizational contexts. For example, some

firms (e.g. small firms and firms under high market pressure) may value more years of schooling because the productivity of that person is higher (or at least it is propagated by the claim-making actor). Other firms (e.g. big, bureaucratic firms with clear job descriptions and requirements) may see education more as a credential allowing the individual to enter certain positions (while others are excluded). Furthermore, the extent of gender inequality has been shown to vary across work organizations (Avent-Holt & Tomaskovic-Devey, 2012; Study 1 in chapter 4). These firm-specific opportunity structures explain why the effects of individual characteristics vary between work organizations.

The second resource that can be used in claims-making is the *environmental context*. Unfortunately, it is not very clear what the authors mean by environmental contexts. On the one hand, in their more theoretical or conceptual publications (e.g. Tomaskovic-Devey & Avent-Holt, 2014), they probably mean the *environment of the work organization*. Work organizations operate within broader institutional as well as competitive market environments. When perceived by the actors within the work organization, these environmental contexts can strategically be used in the claims-making because they provide meaning and expectations, and thus legitimacy to certain claims, while depreciating others. Such institutionalized expectations encompass, for example, how work should be structured internally, what type of worker is to be hired for certain positions, and what reward should be attached to that position. If in a certain sector work organizations would expect managers to have a Ph.D., only individuals with this asset would typically be hired for management positions or else would face a severe penalty in wage because it is difficult for them to succeed in claims-making without being able to rely on the deemed necessary asset that proves their performance. Besides institutional, competitive contexts are also influential in shifting bargaining positions in claims-making. In highly competitive product markets, a firm's survival hinges upon the ability to operate efficiently in comparison to competitors. In such an environment, claims based on performance and contribution to the firm's success are more likely to be successful. In contrast, in less competitive environments, claims that are constructed around seniority or union status are more effective.

In other more empirical contributions of RIT (e.g. Tomaskovic-Devey et al., 2015a), "environment" seems to be *any context in which claim-making processes can take place*. The term environment then not only refers to contexts in which the entire work organization is embedded, but also to the work organization itself. This way, institutionalized firm-specific pay and selection regimes also provide an organizational structure within which future claims-making processes take place and are dependent upon. Furthermore, other firm characteristics

such as the level of inequality, coverage by collective agreements, size and so on can also act as an organizational context which mediates claims-making processes. In sum, one should not only think of one environment to the claims-making process, but instead of several layers of closer and broader environmental contexts, in which claims-making processes are embedded.

With claims-making and the two discussed resources RIT offers a detailed concept of the interactional basis of wage inequality. However, there is a potential problem with this formulation: the lack of a clear distinction between power and legitimacy. "More *powerful and persuasive* [emphasis added] actors will tend to make more and more ambitious claims and garner both more respect and rewards" (Tomaskovic-Devey, 2014, p. 56). This sentence demonstrates the fuzzy usage of those concepts. Are power and legitimacy the same? Are the more powerful actors those which have the best argument (i.e. more persuasive) and are those actors that offer a good justification for their claims more powerful? Or, on the other hand, are power and legitimacy two distinct properties with both increasing the probability for a successful claim?

Because the authors do not answer these questions satisfactorily, I make the following distinction between legitimacy and power. First, power is a property of social relations, while legitimacy is a property of claims. Second, both the power relations between actors as well as the legitimacy of their respective claims influence the chance for ratification of claims by influential decision makers in the firm. The modus operandi can therefore range from pure exertion of power to success in claims-making based on pure legitimacy of the claim – and everything in between. Categorical distinctions and environments alter the plausibility and legitimacy of claims and as a result the influence or bargaining position of actors within claims-making. Legitimacy is often derived from justice principles like the meritocratic principle or property rights (Becker & Hadjar, 2009). Claims that are constructed with a link to these socially accepted norms gain in legitimacy thereby increasing the probability of ratification. That said, claims can also be ratified based on the (unfair) exertion of power (e.g. harassment or bullying). Being the victim of such practices leads to the destruction of an actor's reputation and status and will thus greatly reduce both the probability of making claims and also their ratification (Roscigno et al., 2009). In sum, claims are more easily ratified when the claim-making actors can resort to socially accepted fairness norms or rules which increase the legitimacy of the claims. However, legitimacy is not a necessary condition for a claim to be successful. Pure power can also be exerted. In addition, by ratifying purely power-based claims by influential decision makers in the firm, such practices gain in legitimacy post hoc, making future implementation easier and more likely.

Wage inequality is the result of claims-making processes within work organizations, in which actors construct claims for shares of the firm's resources and try to legitimate their claims by activating shared expectations, status believes, and stereotypes through links to categorical distinction and organizational environments. The result of these various interactions is a more or less stable and institutionalized "unique workplace inequality regime" (Tomaskovic-Devey & Avent-Holt, 2014, p. 386) consisting of firm-specific rules about how particular individuals are selected into positions (selection regime) and how much rewards are attached to those positions (pay regime). Such rules are effective at various levels of institutionalization: They might be written down in charters of firms or in contracts between employers and employees as official policies; other times they take the form of taken-for-granted routines or practices; sometimes, such rules can only be found in the habits of decision makers (Stainback et al., 2010, pp. 230–231).[3]

Pay and selection regimes therefore structure a worker's career within the firm leading to wage inequality within the firm. In addition, pay and selection regimes can induces inequality between similar workers employed in different firms (with different firm-specific pay and selection regimes) because the same worker characteristic can be valued differently based on these regimes leading to different returns of the same characteristics in different firms. For example, a characteristic such as seniority can lead to steep wage growths within one firm, while it has nearly no effect in another firm (e.g. Abowd et al., 1999). Cardoso (2000) shows that the returns on schooling and labor market experience vary by firm size. The same variation of returns is often found between firms with and without coverage by collective agreement (Gerlach & Stephan, 2006).

2.1.2 Processes of social closure: Opportunity hoarding and exclusion

Claims-making is the interactional basis for other inequality producing mechanisms. Similar to the already mentioned mechanism of sorting, *opportunity hoarding* establishes inequality because of the assignment of workers to different positions with more or less rewards attached to them. However, unlike sorting, which essentially denotes a passive and neutral matching process between position and person, opportunity hoarding describes a process by which some actors, that are incumbents or are otherwise able to control the access to the position and its resources, actively establish barriers and thus restrict access for categorically other actors (Tomaskovic-Devey, 2014). It can be thought of as an active process of monopolization of advantages. Opportunity hoarding therefore implies that (a) there are

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[3] Kampelmann (2011) offers an extensive analysis of such rules that is not restricted to rules within firms but also includes rules generated by social norms and institutions.

"closed" positions (that is, the ability of the incumbents to control the inflow) and (b) there exists antagonistic interests between in- and out-groups.

This formulation of opportunity hoarding is very similar to the concept of social closure, first formulated by Max Weber in his classical work (Mackert, 2004; Parkin, 1974; Sørensen, 1983a). Social closure denotes an often contentious process of excluding one actor or a group of actors (out-group) from valuable goods or privileges by other actors (in-group) based on certain visible and socially relevant categorical distinctions. Social closure has become a prominent concept in sociology used as a middle range theory, particularly in social stratification research (Giesecke & Groß, 2012; Weeden, 2002). When we apply the concept to the question at hand, firms and positions within firms (and the wages that come with getting access to them) can be seen as valuable goods and privileges. Some actors are excluded from such valuable firms and positions, whereas others are able to reap the fruits of controlling them. Clearly, such strategies of social closure create social inequality between those actors.

In fact, Diewald and Faist (2011) describe opportunity hoarding as one of two variants of social closure, namely social closure *within* work organizations. Because work organizations themselves can also be seen as more or less valuable positions around which closure strategies are implemented, they use the term *exclusion* for processes of social closure *between* work organizations. Since these are in fact two different mechanisms, this distinction is reasonable, which is why I follow this suggestion and denote social closure processes within work organizations as "opportunity hoarding" and processes of social closure between work organizations as "exclusion". Section 2.1.4 describes firm wage differentials, persisting pay differences between firms, which lead to the idea that membership in high-paying work organizations can be seen as a privilege which represents the basis for exclusion processes between work organizations.

For social closure to be an effective mechanism that can be utilized by certain actors to increase their labor market outcomes (and thereby implement inequalities between and within work organizations), one needs a notion of the degree of closure of positions. This leads the theory of closed positions (Sørensen, 1983a). According to this approach, positions vary in the degree of closure. In closed positions employees have control over access to the job. This has two implications: First, when rewards are tied to positions and incumbents of these positions can stay/leave at their own discretion (rather than at the discretion of the employer) wages of the employees are no longer linked to productivity. Employees can reduce their effort and productivity without fearing consequences (e.g. job loss). Thus they are able to receive a *rent*. Rents are defined as "returns on an asset (e.g., labor) in excess of what is

necessary to keep that asset in production in a fully competitive market" (Weeden & Grusky, 2014, p. 474). Second, wage gains are achieved through upward mobility in the job ladder on internal labor markets. However, job shifts are only possible when vacancies exist – either by someone leaving her/his job or through the creation of new jobs (Kalleberg, 2005; Sørensen & Kalleberg, 2008). In essence, the theory of closed positions emphasizes cases where the market mechanism is restricted and other mechanisms of wage determination take place, i.e. social closure.

There is a huge variety of potential strategies of social closure that can be used by powerful actors. Weeden (2002) explicates several of them in the context of occupational closure such as licensing, formal educational credentialing, or unionism. Other characteristics such as tenure or work experience can also be the target of closure strategies and reasons for denying some actors access to jobs. For example, limited access to training explains a substantial part of the gender wage gap in work organizations (Tomaskovic-Devey & Skaggs, 2002). Furthermore, the availability of information is also crucial (Podolny & Baron, 1997; Shipilov et al., 2014). If some actors are not aware of an open position, they will not be able to apply for it in the first place. Thus being a member of the right informal networks with matching cultural capital also helps in applying and getting a better job. All of these strategies can be used by in-groups in order to preserve their privileged positions and thereby (re-)producing established inequality regimes in the work organization.

2.1.3 Exploitation

Exploitation is a second "classic" well-known inequality mechanism in addition to social closure. Exploitation takes place when one actor gains an advantage *at the expense* of other actors. With regards to labor market outcomes this means: "[U]nder exploitative relations, some actors *A* take advantage of some actors *B* by appropriating economic value [i.e. wages] that rightfully belongs to *B*" (Avent-Holt, 2015, p. 214).

One popular definition of exploitation is based on the concept of rent (Sørensen, 1996, 2000) which combines exploitation with neo-classical ideas of the labor market in order to revive and redefine the concept of class. It is assumed that actors try to actively generate rents by restricting supply or demand for particular assets or destroy rents by enhancing competition (Weeden & Grusky, 2014). As was already mentioned, rents occur when an actor receives returns to an asset he or she controls (e.g. certain skills, a job, an occupational license) above what he would obtain in a perfectly competitive market. Restricting supply or demand leads to imperfectly functioning markets, which is why every deviation from wages that are obtained under fully competitive markets are seen as unfair – assuming that such a market is a just

distribution system. Furthermore, the generation of rents by one actor happens at the expense of another actor. These rents only exist *because* other actors lose something (Sørensen, 1986) and thus directly result in antagonistic interests: The in-group has an interest in keeping the asset, while the out-group strives to destroy the rents or also gain control over the asset.

Within RIT, exploitation is conceptualized differently. Given that organizational resources are limited, every shift in resources between actors within work organizations can be understood as exploitation. This definition rests on Tilly's (1998) expansion of the classical Marxian capital-labor exploitation relationship to arbitrary categorical distinctions. Any actor can win or lose in claims-making and every redistribution of jointly produced organizational resources is the consequence of power used in social interactions to take advantage of other actors (Tomaskovic-Devey, 2014, p. 58). One example of exploitation of this sort is the devaluation of female occupations and tasks (Hausmann et al., 2015).

The discussion up to this point makes it clear, that RIT does not explicitly include the mechanism of ranking. Relations between persons and positions (with regard to wages and other rewards) in work organizations are the result of successful claims-making. Successful claims-making, on the other hand, is the basis of exploitation and qua claims-making legitimated exploitative relations will eventually become institutionalized in the firm's positional hierarchy consolidating the advantage of more powerful actors – when not contested by exploited actors (Tomaskovic-Devey, 2014, p. 59). This position hierarchy is then the basis for opportunity hoarding. This formulation of inequality generation therefore subsumes the concept of ranking.

The two discussed conceptualizations of exploitation have two properties in common (Tomaskovic-Devey, 2014, p. 58): They are *relational*, in that there are two or more actors struggling over sparse resources, and they are about *power*, in that one actor is able to gain resources that rightfully belong to others against their will. They differ, however, on the question regarding the normative baseline. While rent-based approaches define wages on a perfectly competitive market as fair, the notion of exploitation within RIT does not know such a universal baseline. Here, exploitation is interactional: "Exploitation is visible when one actor accumulates respect or rewards at the expense of another. Redistribution is an act of power over others […]" (Tomaskovic-Devey, 2014, p. 59).

One problem with this interactional formulation of exploitation is a strong broadening of the scope. Every time organizational resources are redistributed between actors in the firm is an example of exploitation per se, irrespective of the cause. However, exploitation always implies

unjust redistribution and the reasons why there is redistribution are important in order to assess fairness. The devaluation of female dominated tasks and occupation in relation to male's must be described as exploitation just as the strong raise in rewards of managers compared to ordinary workers in the same firm. Is this shift in resources between actors unfair? What if managers have actually become more productive, while at the same time some tasks and occupations become less important for the success of the firm? This shift in organizational resources between actors may be explained with productivity and would thus not be classified as exploitation. Thus, rent-based approaches offer a clearer notion of when to regard redistribution as exploitation – at least when one believes in the axiom of the market as a fair distribution system.

Although the rent-based approach may have a clearer notion of the normative baseline from which it is easier to identify exploitation, it is very difficult to actually detect exploitation empirically. In order to do that, the wage that is associated (or rather, would be associated) with marginal productivity must be measured and compared to the actual wage. Aside from certain pay schemes such as piece rates, this is very difficult – even more so, since productivity is not "immune" from being socially constructed within workplaces (Castilla, 2008; Castilla & Benard, 2010). Interactional exploitation is also difficult to observe, but compared to these prospects, it is much easier. Given enough data, i.e. information about workers and firms over time, shifts in rewards between persons and positions within firms can be detected (Tomaskovic-Devey et al., 2015a). Furthermore, by controlling for productivity- and revenue-related factors on the individual and firm level, it is possible to at least have a sense of the fairness of such shifts.

In sum, the trade-off is between a possible "overdetection" of exploitation (because not every shift in resources within work organizations is automatically exploitation) and a somewhat more intuitive notion of exploitation (given recent principles of justice and also given that the market mechanism is actually able to live up to the meritocratic principle), which is very difficult to observe empirically. Given these options, I tend to accept a less clear normative baseline in favor of an empirical application that is actually able to observe and detect exploitative relations. However, this choice makes it difficult to retain the original concept of rent because there is no universal baseline. Nonetheless, I think the term "rent" is useful for denoting the extent of exploitation – either against a competitive market benchmark or as the amount of redistribution between actors within work organizations.

2.1.4 Firm wage differentials

This far, we have been concerned mainly with the generation of wage inequality *within* firms. Although this is an important and quantitatively large part of overall wage variation, there is also a substantial part of wage variation *between* firms (Lazear & Shaw, 2008). There are high-wage firms that pay more than low-wage firms, irrespective of individual worker characteristics. This also implies that firm wage differentials are not just the result of sorting or segregation based on certain worker characteristics. Although the strength of RIT lies more in the explanation of within firm inequality, it is also possible to target wage inequalities between firms. From the perspective of RIT, there are essentially two sets of factors that create firm wage differentials: the absolute amount of resources available for distribution in the firm and the status and power relations between the workforce and the owners/shareholders.

Firstly, the more resources there are, the higher the probability that workers receive a larger amount of them (in absolute terms not necessarily a higher share). The amount of distributable organizational resources depends on a firm's *ability to pool resources* (Tomaskovic-Devey, 2014). Firms with a stronger ability to pool resources will accumulate more resources than firms with fewer abilities potentially leading to higher wages of all employees in these firms, thus establishing firm wage differentials. The distributable resources are essentially the revenue acquired from the sale of goods and services minus the costs in order to produce these goods and services. This sounds rather similar to neoclassical thinking, and it is. The ability depends on two factors already present in the neoclassical economic theory: the productivity of a firm and the power on product markets (i.e. the price a firm can charge for its products and services) (Granovetter, 1981).

However, the amount of distributable resources is only one factor leading to wage differences between firms. A second factor has to be considered: the relation between the workforce and owners/shareholders. Workers and shareholders both make claims on resources making the distribution a result of power and status in the relation between these two actors. Even if one firm has much more resources available, the *share* that goes to the workforce depends on claims-making.

There are different firm characteristics discussed in the literature that establish firm wage differentials: size (Hettler, 2007; Kalleberg & van Buren, 1996; Troske, 1999) , age (Brown & Medoff, 2003; Heyman, 2007), positional hierarchy and firm internal labor markets (Hedström, 1991; Kalleberg & van Buren, 1994; Lengfeld, 2010), technology and new work practices (Bauer & Bender, 2001, 2004; Chennells & Van Reenen, 1998), demography of the workforce such as the share of women in the firm (Heinze, 2009), coverage by collective bargaining agreements

and work councils (Ellguth et al., 2014; Fitzenberger et al., 2013; Hübler & Jirjahn, 2003), and organizational environments (Tomaskovic-Devey et al., 2009; Windzio, 2001). Most of these studies control for worker characteristics, making their evidence regarding firm-level effects more compelling because they are not produced by sorting based on these (observable) worker characteristics between firms. This is important because otherwise firm differences in pay could also be the result of an accumulation of high-wage employees in certain firms.

Each of these firm characteristics can be linked to either (or both) of the above discussed factors that shape inequality between firms. For example, firm size, human capital, and technology influence the ability to pool resources. These firms are more efficient in production (through the quick adoption of new, more productive technologies and work organization practices) and are able to sell their products at a higher profit rate. Other characteristics target the power of labor versus shareholders. Firm internal labor markets or union representation strengthens the power of most of the employees against owners leading to higher wages. As a result, membership in particular work organizations influences wage inequality net of individual characteristics because firms differ in their average wage level depending on their ability to pool resources (on the product market as well as through efficient production) and as a function of the status and power relation between workers and owners.

Given the fact that there are indeed high-wage and low-wage firms, sorting workers into these differently paying firms thus leads to the generation of wage inequality (exclusion). This process is one explanation for the fact that individuals with the same individual attributes and no difference in human capital receive different wages (Lengfeld, 2010). In addition, similar to opportunity hoarding of positions within firms, exclusion between firms leads to wage inequality between ascribed characteristics such as gender. Several studies show that the sorting of women to worse paying firms compared to the firms men manage to find employment explains a significant part of the overall gender wage gap (for the U.S.: Bayard et al., 2003; for Portugal: Cardoso et al., 2016; for Germany: Gartner & Hinz, 2009). These findings can be interpreted as a closure strategy of employees of profitable, high-wage work organizations that try to exclude other actors from their assets.

firm-specific pay and selection regime

work organization

environment
- competition
- union status
- laws

claims-making

interactional
basis of

categorical
distinctions
- gender
- education
- full-time
- management
  position

exclusion
(between firms)

position A

exploitation

opportunity
hoarding
(within firm)

position B
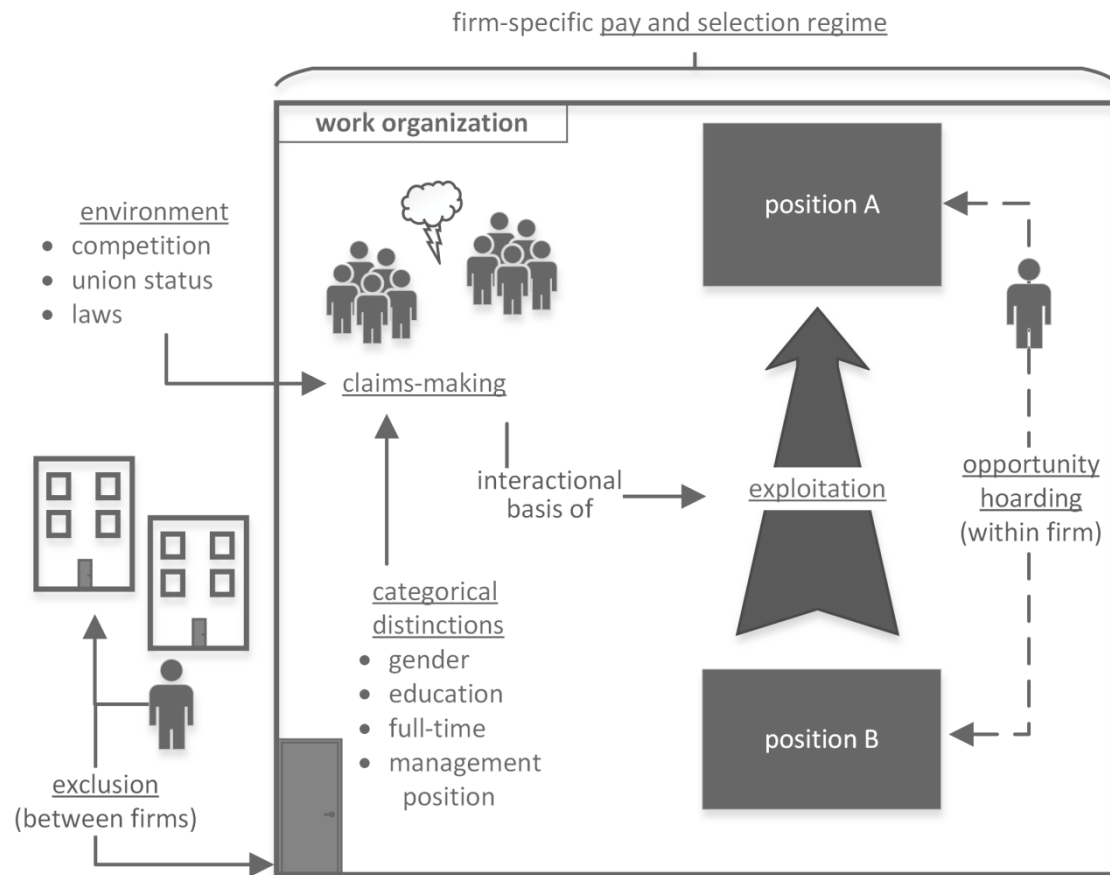
Figure 1: Inequality generating mechanism revolving in and around work organizations

In sum, the mechanisms that have been introduced so far (claims-making, social closure – with its two variants of opportunity hoarding and exclusion –, and exploitation) are able to explain wage inequality within and between firms. They also incorporate work organizations as the central arena within which these inequalities are produced in interactional processes between different actors. Opportunity hoarding and exclusion are henceforth used to describe processes of social closure within respective between work organizations. Figure 1 attempts to summarize the theoretical framework in a clear fashion. The large square represents a firm and the relevant mechanisms (either operating within or between firms) are displayed accordingly. The following section will highlight important differences between this theoretical framework and human capital theory in order to emphasize its merits.

2.1.5 Comparison to human capital theory

The theoretical framework that was laid out in the above sections differs in several points from the probably most prominent theory for the explanation of wage inequality: human capital theory. In order to achieve a more complete understanding of the merits of the proposed theoretical framework for the questions raised in this thesis I will contrast the theories.

The central idea of human capital theory (Becker, 1993; Mincer, 1974) is that workers can invest in a set of marketable skills. The acquiring of skills increases productivity and as a result, labor market outcomes. Human capital can be any worker characteristic that relates to productivity such as years of schooling, training, experience or attitudes towards work. Actors are assumed to maximize lifetime earnings. They will accumulate more human capital as long as the expected gains (higher earnings accumulated over the working life) exceed the costs (which are the investment costs and the opportunity costs of foregone earnings).

Human capital theory can be seen as an extension to the neoclassical model. As such, the labor market is only a special case of any other market in which rational actors (homo economicus) try to maximize utility under the condition of perfect competition (Sesselmeier & Blauermel, 1998). On labor markets workers offer their labor in exchange for a certain price, the wage. The wage rate is the result of supply and demand. Actors possess all relevant information and make the best decision given their preferences. Labor is seen as any other good and thus mobile and homogenous (equally productive and substitutable). Under perfect competition, firms are not able to influence wages and are thus price-takers. Given these assumptions a profit-maximizing firm would add workers only as long as the value of the additional product that can be produced with the additional unit of labor exceeds the wage of that unit. Consequently, the wage equals the value of the last product added by hiring the last unit of labor.

Human capital theory loosens the assumption of homogeneity. As discussed above, workers differ in their marginal productivity. Because all workers are paid according to their marginal product of labor (the value they add to the product) they are paid differently. As a result, human capital explains wage inequality at a certain point in time with differences in human capital investments. More productive workers can add more to the firm's revenue which is why their wage is higher. Thus, differences in wages between employees are the result of differences in human capital.

Compared to the theoretical framework outlined in the previous sections, the two theories differ in two crucial aspects: the underlying mechanisms and the assumed place of inequality generation. For human capital theory, wage inequality is the result of pricing of individual productivity by supply and demand on labor markets. RIT, on the other hand, emphasizes the control over status-related resources (categorical distinction and environments) used in claims-making processes within work organizations.

Because of this monocausal conceptualization (productivity is the single determinant of wages) firms actually do not matter for human capital theory.[4] Differences in pay between workers are (only) the result of differences in productivity. Because employers are assumed to be price-takers, difference in pay between firms (firm wage differentials) can only be the result of sorting of high- and low productive workers into certain firms. Employers may vary in their demand for (high- or low-productive) employees, but they buy labor for a predetermined price derived from supply and demand on the labor market. In addition, differences in pay between equally productive workers should not exist.[5] Because they add the same marginal product to a firm's revenue, they should receive the same wage.

Empirical studies have long found anomalies to these predictions: There are great differences in pay between different firms (Kalleberg & van Buren, 1994, 1996) and the impact of individual characteristics (performance-related as well as ascriptive) on wages varies with organizational contexts (Abowd et al., 1999; Gerlach & Stephan, 2006; Hultin & Szulkin, 2003). This evidence cannot easily be explained by human capital theory.

These empirical findings pose no problem for RIT. Because work organizations differ in their ability to pool resources and the relation between employees and owners, they have different wage levels. Also, because the wage of an individual worker is dependent on the firm-specific pay and selection regimes, it would be very unlikely that equally skilled/qualified workers would earn the same wage in different firms. The crucial point here is, productivity (or at least the legitimacy provided by productivity-related individual characteristics) may be a reason for wage inequality between workers and firms, but it is only *one* explanation among many. RIT offers the possibility to explain wage inequality based on (perceived) productivity, but, even more, it simultaneously allows us to incorporate many other categorical distinctions and environments that may change power relations within work organizations, the outcome of claims-making processes, and thus wage inequality.

Of course, firm wage differentials could be the result of one firm employing more productive workers on average. In this case, human capital theory would have no problem in explaining the wage differences. Ultimately, one could argue that it is again individual productivity that

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[4] There are other economic theories, e.g. efficiency wage theory, that are not blind to work organizations (see Alda, 2006 for an extensive discussion). However, these theories rely on market mechanisms too which is why most of the arguments presented here against human capital theory also apply to these theories.

[5] There is, of course, the notion of "firm-specific" human capital, which is know-how that is only useful in the given firm and not transferable between firms. However, this is still a worker characteristic and the same amount of firm-specific human capital should lead to the same productivity resulting in similar wages – irrespective of the firm the worker is employed.

wage inequality can be traced back to, albeit the assumed mechanism would be different (either the market or the stronger ability to pool resources and more power in claims-making with owners). However, RIT is equally able to explain these differences and, furthermore, has the ability to explore other causes of wage inequality between firms that are not based on productivity.

In sum, this comparison makes clear that by thinking the generation of wage inequality both more organizationally and more interactionally, the proposed theoretical framework allows us to tackle a wide range of empirical problems that are hard to explain with human capital theory. To name only a few: All wage differences that are not productivity-related are considered unfair discrimination by human capital theory. However, discrimination is only negatively defined; it is a residual category. For RIT, on the other hand, every categorical distinction incorporates status und power relations into the interactional process of claims-making and can be analyzed – positively and not just as a residual. The framework also introduces firm wage differentials that do not stem from mere composition of individual productivity in certain firms which makes the analysis of independent influences of work organizations on individual wages possible. It further allows researchers to treat work organizations as valuable positions around which exclusion processes revolve. And finally, the two most important aspects: First, we are not only able to make sense of the importance of either individual or firm characteristics for individual wages but also their interaction. Why does discrimination based on gender vary between different firms? Why is it that different tenures lead to different wages depending on the organizational context? And second, the possibility to include organizational contexts and environments into processes of inequality generation. Depending on the technological, legal, or market context, claims-making will proceed differently. The incorporation of organizational environments is especially important when talking about the change of wage inequality because work organizations have to cope with strong shifts in their environments in the last decades.

2.1.6 Summary and discussion

Although individual characteristics – either ascribed (e.g. gender, race, and ethnicity) or acquired (e.g. education, tenure, and experience) – are important determinants of wages, they do not tell the whole story. In particular, the effect of human capital has been studied extensively. But despite more exact measures of skills and other productivity-relevant characteristics and proxies, neither overall wage inequality in the economy nor inequality between social groups has been explained convincingly by this approach. The reason is that work organizations are of great importance in the wage determination process, but typically

not observed in these supply accounts to inequality. Work organizations influence individual wages in two crucial ways: First, each firm represents a specific opportunity structure (called pay and selection regime) that predetermines individual labor market outcomes. The regimes are the result of claims-making processes within work organizations. Because of the necessity of division of labor, work organizations define tasks and create positions and jobs responsible for the execution of the tasks. To these different positions, different rewards are attached, resulting in a positions hierarchy that is (later) filled with workers. Individual characteristics and status distinctions are important in claims-making and thus often targets of opportunity hoarding and exploitation processes. This is the reason why individual characteristics can result in different wages because they have different effects depending on the organizational context. Second, work organizations differ in their ability to pool resources (essentially the way products can be sold on the product market and more or less efficient production) as well as the exact form of the relation between workers and owners. Both factors result in between-firm wage dispersion. The exclusion of categorically different actors from high-paying firms contributes to the generation of wage inequality. High-wage firms can be seen as a valuable asset that powerful actors want to keep. Thus, they have an interest in excluding other groups from gaining access to it.

RIT was first developed with the U.S. labor market in mind where direct wage bargaining between employee and employer is the dominant mode of wage determination. However, the German context is more centralistic with wages often bargained for at the sectoral level. This is not to say that RIT is not applicable to the German context, but rather that Germany is a comparably difficult test case. In addition, coverage by collective agreements has seen a sharp decline (Kohaut & Schnabel, 2003) (comparable to many other Western countries) leading to increasing wage dispersion between firms and thus strengthening the role of work organizations as a relevant context for wage bargaining (Card et al., 2013; Goedicke, 2006).

We now know that firms play a central role in wage setting and that processes within as well as between work organizations influence wages. Lazear and Shaw (2008) conclude in their introductory chapter to a book containing international studies regarding the influence of work organizations on wages that the wage variation within firms amounts to 60 to 80 percent of the overall wage dispersion in the economy. They also find a substantial wage variation between firms, which is growing over time. Thus, rising heterogeneity between firms might also be one reason for the rise in wage inequality in Germany (and many other countries). The next section will cover this topic in depth.

2.2 Explaining the change in wage inequality

Wage inequality has been rising in Germany since the 1980s (Antonczyk et al., 2011; Dustmann et al., 2009; Giesecke & Verwiebe, 2009). The literature typically distinguishes between two phases: The first phase from the 1980s to the mid-1990s is characterized by a growth in wage inequality in the upper half of the wage distribution, whereas the lower half remained relatively stable. This increase mainly stems from top wages (typically measured with the 85th or 90th percentile) rising markedly compared to the median. In the second phase, starting from 1995, wage inequality in the upper half was still increasing, but in this period inequality also started to rise in the lower half with low wages (typically the 10th or 15th percentile) losing relative to the median.

Figure 2 displays the trends in wage inequality for men in West Germany using all of the four available samples of the German Structure of Earnings Survey (GSES), which is used throughout this thesis. The figure shows the change of five selected quantiles since 1995. It is clear to see that the median has increased slightly since 1995, but the increases of the 90th percentile is much stronger, leading to growing wage inequality in the upper half of the distribution. In addition, wage inequality also grows in the lower half of the wage distribution, mainly because of a strong decline of the 10th percentile.

Two percentiles that are less frequently examined are the 99th and 1st percentile. These percentiles demonstrate two trends: First, the development of a sector in the German economy with extremely low wages ("Niedriglohnsektor"). Especially since 2001, wages of the lower one percent have experienced a sharp decline leading to an increase in wage inequality in the very bottom of the distribution. In contrast, the top one percent of employees has been able to considerably increase their wages – even in relation to the 90th percentile resulting in growing wage inequality at the very top of the distribution. Very similar developments can be observed for the other subsamples: women in West Germany, and men and women in East Germany. Finally, these trends in wage inequality were also observed in many other Western societies – although timing, extent, and specific patterns vary (Alderson & Nielsen, 2002; Checchi & Garcia-Peñalosa, 2009).
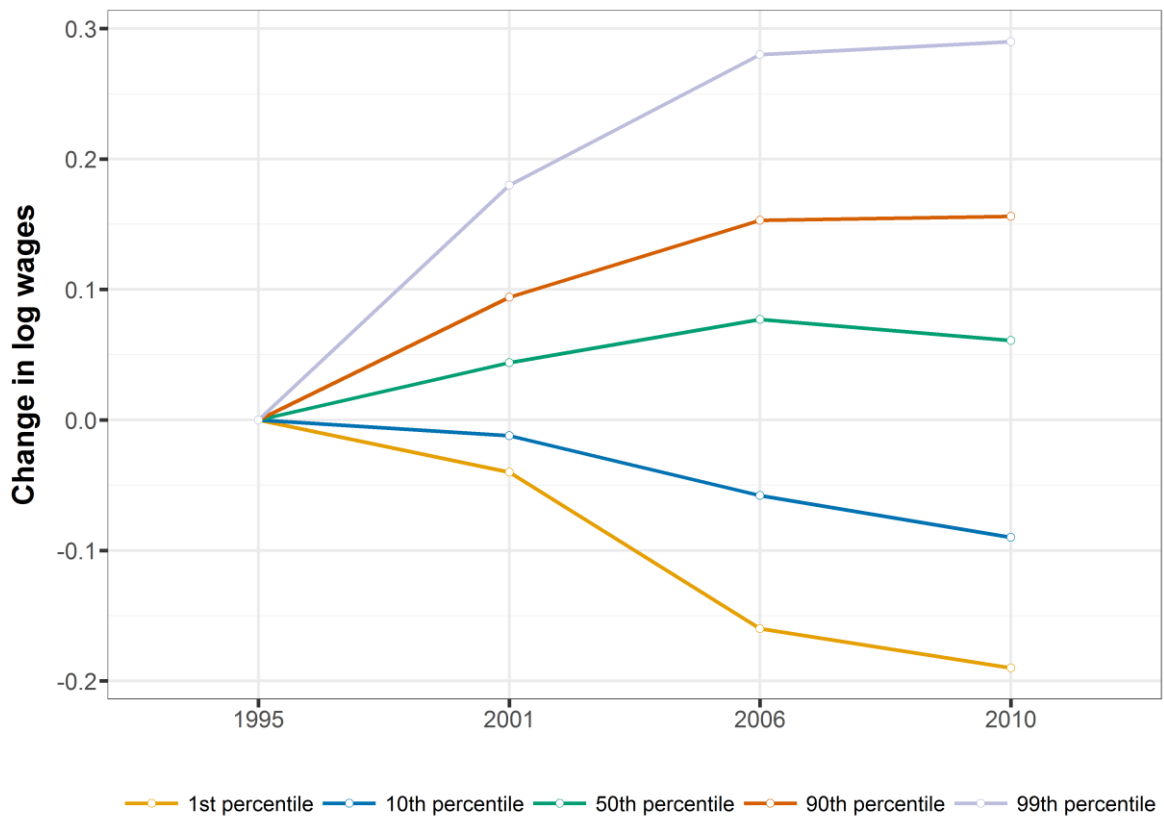
Figure 2: Change in log wages of selected percentiles since 1995, men in West Germany

Source: GSES 1995, 2001, 2006, and 2010. Own calculations, sample weighted.

Many explanations for this increase in wage inequality in most of the Western world have been proposed: Globalization and international trade, financialization, technological change, and institutional factors such as unions and minimum wage (see for an overview: Kierzenkowski & Koske, 2013; Van Reenen, 2011). Although work organizations play a crucial role for the generation of wage inequality (as was outlined at length in section 2.1), they are hardly the focal point of interest in this line of research. However, the field would profit tremendously from a closer incorporation of work organizations in its explanations of change. As proposed here, and as will be outlined in greater detail in section 2.2.4, changes in the environmental conditions (which is what globalization, technological change, and financialization can be thought of) do not have a direct effect on individual wages, but rather influence the claims-making process within work organizations and, in particular, differences in wage levels between firms (by altering the ability to pool resources as well as the firm-specific relation between labor and capital). Changes in organizational environments alter the influence of the mechanisms identified in the previous section and thus change wage inequality within and between work organizations.

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The following three sections (2.2.1, 2.2.2, and 2.2.3) will briefly review the existing dominant explanations of the rise in wage inequality and corresponding empirical findings. In the last section, we put on the "organizational lens" and try to highlight the role that firms play for the explanation of this rise.

2.2.1 Globalization and financialization

The term "globalization" has long been used as an umbrella term describing a myriad of different economic, social, and cultural trends since the postwar era. I refer to globalization as an economic process of increasing worldwide integration of markets for goods and services, capital, and labor. As Alderson and Nielsen (2002) discuss, three aspects of globalization can be identified and linked to rising wage inequality: direct investment activities, trade, and migration. *Direct investments* in developing countries could lead to rising income inequality because it induces deindustrialization in the home country. Firms facing increasing international competition are under pressure to maintain profitability. One solution is the reduction of labor costs through offshoring (i.e. international outsourcing of specific tasks or parts of the company). Multinational enterprises invest in developing countries where labor costs are low and where tasks requiring less skill can be performed by relatively low-skilled workers. This deindustrialization is complemented by a weakening of the bargaining position of labor because the typically nationally organized labor has less influence in multinational enterprises.

A second aspect of globalization that could have generated the upswing in wage inequality is *trade*. The basic idea is that less developed countries are in ample supply of low-skilled workers putting downward pressure on wages of low-skilled workers in more developed countries, while raising wage levels of high-skilled workers. Finally, the *migration* argument (typically formulated for the U.S.) builds on the observation that immigration rates have risen substantially since the 1970s and that the average education levels of new immigrants have seen a decline. Combined, both trends should lead to rising wage inequality.

Although the globalization story is very present in academia as well as other fields, empirical evidence on its influence on wage inequality is mixed. While, for example, Nielsen and Alderson (2001) find that these key aspects of globalization increase wage inequality for the U.S. case and other OECD countries (Alderson & Nielsen, 2002), some studies reject these arguments, in particular the trade argument (IMF, 2007; Stone & Cepeda, 2012).

In recent years "financialization" emerged as a second grand narrative in explaining the rise in wage inequality. Unlike globalization, financialization points to the rise of international

financial markets as the source of growing wage inequality (obviously, the emergence of international financial markets is also related to globalization). Similar to the term "globalization", "financialization" is yet another term to describe the structural changes to the economies of Western societies since the postwar era. A clear definition is not yet available, that is why financialization can mean a variety of things ranging from a broad, macro-economic process describing "the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies" (Epstein, 2005, p. 3) or the change in favor of "a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production" (Krippner, 2005, p. 174) to more narrow definitions of "increased influence of financial institutions and financial motives on non-financial activities" (Stockhammer, 2009, p. 14). However, all of these definitions share the common notion that finance has outgrown its traditional role as a capital provider for the productive economy and has initiated a far reaching economic restructuring in the process. Compared to the postwar era contemporary economies in industrialized countries are much more finance-driven and financial considerations play a much greater role.

The literature typically refers to three different levels at which financialization can be observed (e.g. Davis & Kim, 2015; van der Zwan, 2014): industry, firm, and household level. At the *industry level*, non-financial sectors of the economy accumulate an increasing amount of profit through financial activities and, at the same time, the financial sector itself has become an important sector in the economy making huge profits (Krippner, 2005). This was possible in the course of a series of deregulations and liberalizations of the finance markets as well as the invention of new types of financial products (Davis & Kim, 2015). This important role of the finance sector for the economy is predominantly found in the U.S. (and U.K.) where the share of GDP contributed by this sector was about 23% in 2001 (Davis & Kim, 2015, p. 205) (compared to the 4.5% in Germany according to the Federal Statistical Office). Although the trend in other countries is not as dominant, it still can be observed in a weakened form.

At the *firm level*, financialization can be observed in the emergence of a shareholder value doctrine which has a strong influence on corporate governance. Because firms have increasingly turned to the financial market for funding their business through equity (instead of loans given by traditional, commercial banks), they have grown more and more dependent on the new owners, the shareholders. Davis and Kim (2015) describe this process as a shift in finance from institutions (such as banks), which are interested in the payback ability of the firm they give a loan and thereby establish a long-term relationships with it, to markets, which are

more interested in short-term profit maximization. Shareholders (in particular pension funds and investment banks) make money, when the price of their share of the company becomes more valuable (rising stock prices) or the company gives out dividends to all shareholders.

This "shareholder value orientation" (that is, the interests of only one stakeholder of the company against all others such as labor or suppliers) has become the guiding principal for business decisions and corporate government (Dörre, 2012). Today, companies do not strive for market shares in the product market, but for increases in efficiency and profitability, in order to meet (or even surpass) market expectations articulated by analysts and rating agencies leading to rising stock prices and finally growing shareholder value. This orientation is connected to a set of business and restructuring strategies in order to raise profitability (such as outsourcing, sub-contracting, downsizing, and flexibilization of work arrangement) – mostly at the cost of employees (Lin & Tomaskovic-Devey, 2013b). Most importantly, the profits that are generated through such activities are not reinvested, but distributed to shareholders and investors as dividend payouts or share buybacks (Davis & Kim, 2015).

However, paradoxically not only shareholders profit from this orientation on the maximization of shareholder value, but also managers. Despite the fact that some strategies of maximizing shareholder value include making a company "lean", that is reducing overhead and hierarchies, the number of employed managers actually increased as did their compensation (Goldstein, 2012). One solution to the resulting agency problem that comes with funding a firm through the issuing of shares and thereby separating control and ownership of a firm is aligning the interests of shareholders and managers through performance-based compensation in the form of stock options. However, this creates a problematic opportunity structure in which managers are able to greatly influence their own earnings through decisions and strategies that increase stock prices on a short-term basis, but are not economically reasonable in the long run.

Finally, at the level of the *household*, more and more households and individuals control significant financial assets. Through a process that can be described as "democratization" (van der Zwan, 2014), large parts of the population come in direct contact with financial products and services. Because of declining interest rates more and more people invest their money in financial products instead of putting it in a savings account; because of the instability of public pensions, people are asked to undertake private provisions for retirement.

The concept of financialization is utilized in a growing body of literature trying to link this process to the rise in wage inequality in the U.S. (Lin & Tomaskovic-Devey, 2013a; Peters,

2011; van Arnum & Naples, 2013) and other countries (Dünhaupt, 2013; Stockhammer, 2009). The basic argument is straightforward: Rising profits in the finance sector accompanied by growing earnings of managers and professionals in other industries should lead to rising wage inequality, while, at the same time, labor has seen a reduction and downward pressure on wages. Most of these studies find a positive correlation indicating that financialization contributed to the rise in wage inequality and is also responsible for slower growth of the economy (Tomaskovic-Devey et al., 2015b).

A second line of research, that has become popular in the last decade and has often been discussed in light of financialization, has a closer look at the upper part of the wage distribution. Recent studies show that changes in these parts of the distribution make a large contribution to the overall rise in wage inequality in the U.S. (Autor et al., 2005; Piketty & Saez, 2003). Closely related to this observation is the discussion about executive compensation and performance pay as one potential cause of the extraordinary rise of top wages. Performance pay are variable forms of compensation such as bonuses or stock options and thus subject to a different pay setting mechanism compared to base wages. It is typically assumed that owners and shareholders have an interest in relating wages closer to individual productivity: First, the ability to generate rents is restricted when wages are less closely tied to positions. Furthermore, bonus payments can stipulate effort and, in particular in the case of stock options, align interests of owners and shareholders with managers' in order to solve an agency problem (Bebchuk & Fried, 2003). However, performance pay typically results in higher monitoring costs. These costs decrease with technological change leading to cheaper collecting and analyzing of information and ultimately a broader use of such variable pay schemes.

These increasingly widespread bonus and performance-related payments account for most of the growth in the level of wages as well as the growth of inequality among these top earners. Lemieux and coauthors (2009) conclude for the U.S. that performance pay „provides a channel through which underlying changes in returns to skill translate into higher wages" (Lemieux et al., 2009, p. 1). Bell and Van Reenen (2010a) find similar evidence for the U.K.. However, in the more centralized European countries, the influence of performance pay is less clear. Sommerfeld (2012) finds a growing use of performance pay schemes among German firms, but no effect on the rise in wage inequality. Barth and coauthors (2012) show that performance pay raises wage inequality in Norway, but only in firms not covered by collective agreements.

What are possible explanations for exploding bonus payments and the rise in wage inequality at the top of the wage distribution? Bebchuk and Fried (2004) offer a "managerial power perspective" that is similar to a rent-generating account for managerial occupations

("managerial rent") (Weeden & Grusky, 2014) and an account that assumes growing power of executives in within-firm claims-making process as a result of financialization (Lin & Tomaskovic-Devey, 2013b). These approaches emphasize that the bargaining power of managers have increased relative to the workforce but also in comparison to shareholders because, due to financialization, both the usage of financial instruments as a compensation device and their status, worth, and acceptability has increased. This enabled executives to obtain large bonus payments without an equivalent cut of fix base wages. These approaches stand in contrast to market-based approaches that point to growing outside options of executives – in part because of a growing demand for managerial abilities relative to firm-specific human capital (Murphy & Zabojnik, 2007).

Globalization and financialization can be seen as "grand narratives" because they offer an explanation with a single, final cause. In addition, they not only deliver an explanation for rising wage inequality but for trends in many other fields in economy and social life in general. Globalization and financialization may also drive rapid technological change and changes to labor market institutions, as discussed in the following two sections.

2.2.2 Skill-biased technological change

One of the most prominent explanations of rising wage inequality is the skill-biased technological change (SBTC) thesis (Acemoglu, 2002; Autor et al., 2008; Machin, 2008). SBTC can be seen as an expansion to human capital theory because human capital investments alone cannot explain changes in wage inequality. If, for some reason, returns on human capital investments increase, more workers would invest in their human capital thereby increasing supply of high skilled workers which would eventually lead to decreasing wages for this group. However, when a parallel increase in demand exists (that even exceeds the higher supply due to educational expansion), wages would stay high and even increase relative to workers with less human capital. The cause, according to the SBTC-thesis, for this sharp increase in demand is technological change. Technological change is seen as an external shock to the market shifting demand curves in favor of high-skilled employees that are able to efficiently operate new machines and computers, new communication technologies, and internet and computer software in the work process. This now called "canonical model" assumes that the bias is linear with new technologies complementing high-skilled workers while substituting low-skilled work.

SBTC-thesis is appealing because it offers a simple, monocausal explanation for the trends in wage inequality. However, there is also a growing body of literature (mostly for the U.S. and U.K. case) that offers evidence which is not consistent with the simple canonical model (see

Card & DiNardo, 2002; Lemieux, 2008 for on overview): (a) SBTC has problems with the timing of technological changes such as the computerization or internet technologies and developments in wage inequality; (b) different patterns of rising inequality across countries are difficult to explain with technological change alone; (c) the rise in inequality has been concentrated at the very top of the distribution (Piketty & Saez, 2003), while real wages of low-skilled workers have declined, and finally, (d) wage inequality has predominantly increased in the upper half of the distribution, whereas wage inequality in the lower half has even declined with median wages declining relative to low wages in the 1990s.

A more refined version of the SBTC introduces the distinction between skills and tasks (Autor et al., 2006), specifically targeting the last critique. The authors distinguish tasks in two dimensions: (non-)routine and (non-)manual. Table 1 is taken from Van Reenen (2011) and lists a 2 x 2 matrix of tasks in combination with a description of typical tasks, example occupations, expected effect of information and communication technologies (ICT), and corresponding educational levels.

Table 1: Tasks typology and corresponding educational levels and effects of ICT

Task type		Task description	Example of occupations	Effect of ICT	Education levels
Routine	Manual	Rules based; repetitive; procedural	Assembly line workers	Direct substitution	Low
	Non-manual		Clerical, book-keepers	Direct substitution	Middle
Non-routine	Non-manual	Abstract problem solving (analytic); mental flexibility	Managers; doctors; lawyer; scientists	Strongly complementary	High
	Manual	Environmental adaptability; interpersonal adaptability	Maids/janitors; security guards; waiters; drivers	Broadly neutral	Low

Source: (Van Reenen, 2011, p. 736)

The assumption of this version of SBTC is that routine jobs can easily be substituted with computer or computer algorithms. Machines are very good in doing the same exact thing over and over again. On the other hand, non-routine work is not repetitive: Procedures have to be adapted to new conditions, new solutions to problems have to be thought of. ICT either cannot replace such tasks (in the case of manual non-routine work) or is strongly complementary to them (i.e. making the execution of such tasks more easy and thus raising efficiency).

With this approach the decrease of median wages in relation to lower wages can be explained as a process of occupational polarization: Non-routine manual jobs are typically situated at the bottom of the wage distribution (as are routine manual jobs, although this type of job has mostly vanished). Although these jobs have low skill requirements they are not substitutable. Routine tasks on the other hand are more skill-intensive, but easily replaceable by machines, which is why the demand for these jobs decreases relative to manual jobs leading to a "hollowing-out" of the middle of the wage distribution. Finally, non-routine non-manual jobs cannot be performed by computers either. Rather, computer technology complements such tasks, which is why the demand for high-skilled workers should increase. With this approach, one can explain why inequality at the top increases, while it stays unchanged (or even decreases) in the lower half of the distribution. There are a growing number of studies that find evidence in favor of this newer version of the SBTC (Fernandez-Macias, 2012; Firpo et al., 2011; Goos et al., 2009; Goos & Manning, 2007).

Although the task-based approach is able to explain recent trends in wage inequality more conclusive than the canonical version of the SBTC, there are still open problems. For one, the organizational mechanisms are often not analyzed explicitly, neither theoretically nor empirically.[6] Somehow these technological changes must affect firm-level processes of exclusion of workers between firms, the destruction, creation and ranking of jobs within the firm, and the opportunity hoarding of these jobs. These processes should affect the relations and wage inequality between several groups of workers (not only low, mid and high skilled) as well as between employees and owners. The inquiry of such processes makes a richer theoretical framework necessary.

Other problems are timing and differing patterns across countries. Germany, in particular, seems to be a case where this explanation has its difficulties. As we have seen in Figure 2, there is no hint of a polarization process. The lower quantiles fall markedly, while the median

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[6] There are notable exception such as Caroli & Van Reenen 2001 or Bartel et al., 2007.

even slightly increases. Antonczyk and coauthors (2010a) also find little evidence of polarization (see also Antonczyk et al., 2009). Furthermore, the tremendous drop of the lowest quantiles and the strong increase of the highest quantiles are also not easily explained by SBTC. Thus, skill-biased technological change does not tell the whole story. This leaves room for alternative (or at least additional) explanations. Besides shifts in the supply and demand for certain skills and/or tasks, institutional factors are also a promising path of research that helps to explain the rise in wage inequality as well as differences between countries.

2.2.3 Changes in labor market institutions

Labor market institutions such as unions or minimum wages are of particular importance for lower wages. Even in the U.S., with its de-centralized wage setting regime, these institutions help to explain the rise in wage inequality – especially in the lower end of the wage distribution (Card, 2001; Card et al., 2004; DiNardo et al., 1996; Western & Rosenfeld, 2011). Unions have two effects on wages: The first is the within effect. Unions typically act according to the median voter model and try to raise wages for the median voter. This leads to a wage compression within the covered sector because low wages are raised disproportionately compared to high wages. The second effect is a between effect because the wage gap between covered and non-covered sector increases. However, the within effect is typically assumed to be stronger resulting in an overall inequality reducing effect of coverage by collective agreements (Freeman, 1980).[7]

A recent study by Western and Rosenfeld (2011) suggests that up to one third of the growth in wage inequality can be explained by the decline of unionism. Germany and many other advanced countries experience a similar decline in coverage of workers by collective bargaining agreements (Kohaut & Schnabel, 2003; Schnabel & Wagner, 2007). In 1996 about 70% of all employees in Germany were covered by a collective contract. This number decreased to 56% in 2010 (Ellguth & Kohaut, 2011). There is also a number of studies for Germany that show a relationship between this decline and the parallel rise in wage inequality (Antonczyk et al., 2010b; Dustmann et al., 2009; Teschner, 2009). Wage setting in Germany differs from the U.S. or U.K. case, though. Wages are typically negotiated at the industry level between an employer association and a union (and not between a single firm and a union) and all employers that are members of an employer association are obliged to stick to these agreements, although opening clauses ("Öffnungsklauseln") allow firms to adapt to their particular situation to a certain extent. As sectoral agreements are increasingly considered to

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[7] One reason could be that firms in the non-covered sector raise their wages because of fear of unionization (threat effect) which reduces the between effect (Neumark & Wachter, 1995).

be overly restrictive, the usage of opening clauses is rising. In addition, employees do not have to be union members in order to profit from collectively negotiated wages. Employees cannot be disadvantaged for refraining from joining a union which is why most employers set the negotiated wages for all workers – regardless of their union status. However, this does not mean that all employees of a covered firm are subject to these wages (Fitzenberger et al., 2013).[8]

A second process that undermines the position of labor is corporate (re-)structuring strategies such as flexibilization and outsourcing. Triggered by increased competition and the pressure to increase profitability due to globalization and financialization, firms try to become more flexible and keep only as many long-term assets as necessary (Peters, 2011). One such flexibilization strategy is the increased usage of so called atypical (or even precarious) employment relationships (Rubery, 2005). Fixed-term contracts and temporal employment are two examples. The point is that these employment relationships differ from the standard employment relationships in that they are easily disposable if necessary. Trends of the market are thus not shielded by the firm, but instead directly channeled to these types of employment relationships. These positions are characterized as "open" implying that the rewards linked to such positions cannot be raised by social closure (i.e. no rents) and are thus mostly determined by the market mechanism. In sum, the increasing use of atypical employment relationships as a mean of flexibilization destroys many formerly closed positions (and generates open positions where rents are much less possible) leading to a decline in wages for many employees (Giesecke, 2009; Giesecke & Groß, 2004).

Both of these trends, decreasing coverage by collective agreements and flexibilization of work, can be interpreted as a shift in the power to establish barriers via social closure in favor of capital and opposed to labor. However, although capital-labor is a classic social relation along which the distribution of organizational resources takes place, this relation is seldom grounded in organizational context. Claims-making and thus the interactional enforcement of power and legitimacy in the firm is the basis upon which social closure processes take place. The capital-labor-relation that is typically discussed within social closure theory can easily be incorporated in a richer theoretical framework (see section 2.1).

Before we move to the next section, I want to briefly compare the three different explanations of rising wage inequality. One central difference is the scope. Technological change and

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[8] While the minimum wage is another important factor influencing the rise in wage inequality in the U.S. or Britain, Germany not had a minimum wage until recently. Thus, data on the effects in Germany are still very scarce.

changes in labor market institutions can both be subsumed within financialization (Groß, 2015). Financialization offers a single final cause that not only explains rising wage inequality but a host of other things. It can also stipulate technological change and the declining power of labor. And whereas the SBTC-thesis also offers a single final cause (technological change), changes in social closure (such as unions and flexibilization) are more of a middle range theory, explaining certain actor configurations and relations. A second difference is the assumed wage setting mechanism. In section 2.1 I discussed the difference between marginal productivity and other mechanisms that generate inequality such as social closure or exploitation. Since the SBTC-thesis is an expansion of human capital theory, it relies on marginal productivity to explain wage inequality and its change, while changes in labor market institutions rest on the social closure mechanism. Again, financialization can mean both, although the growing power of managers compared to labor and shareholders seems to favor closure-based arguments.

Obviously, firms should be an important unit of analysis, whether one tries to test implications of the financialization thesis, SBTC, institutional changes, or other explanations. In each case firms are a central arena as well as the actual place of wage setting. However, compared to the huge body of literature occupied with the rise in wage inequality, studies that explicitly incorporate work organizations are less common. In the following section I show how work organizations can be useful in order to reach a better understanding of the ongoing processes and changes in wage inequality.

2.2.4 Work organizations and the change in wage inequality

In section 2.1, it was stated that wage inequality is the result of claims-making, opportunity hoarding, and exploitation within work organizations and exclusion processes across them. Explanations of *change* in wage inequality have to account for that. This is not to suggest that technological change, globalization, or financialization do not influence wages, but that they do so primarily through changes at the organizational level (changing the conditions within which firms operate and also the claims-making processes within firms). Figure 3 highlights some possible connections between trends in the environment of firms and claims-making processes within the firms. The introduction of new machines, software and information and communication technologies in the firm is the origin of new claims and also comes with a potential shift in power and status in relations between positions and actors – typically in favor of actors that can argue with task competence and skill demonstrated by educational credentials. New technologies also change work practices. Globalization and international trade decrease the power of less skilled or easily replaceable and displaceable workers relative to employees whose tasks are more central to the firm. Financialization shifts power relations

in favor of managers and owners because revenue is more and more decoupled from production when firms are able to make profit with financial instruments.
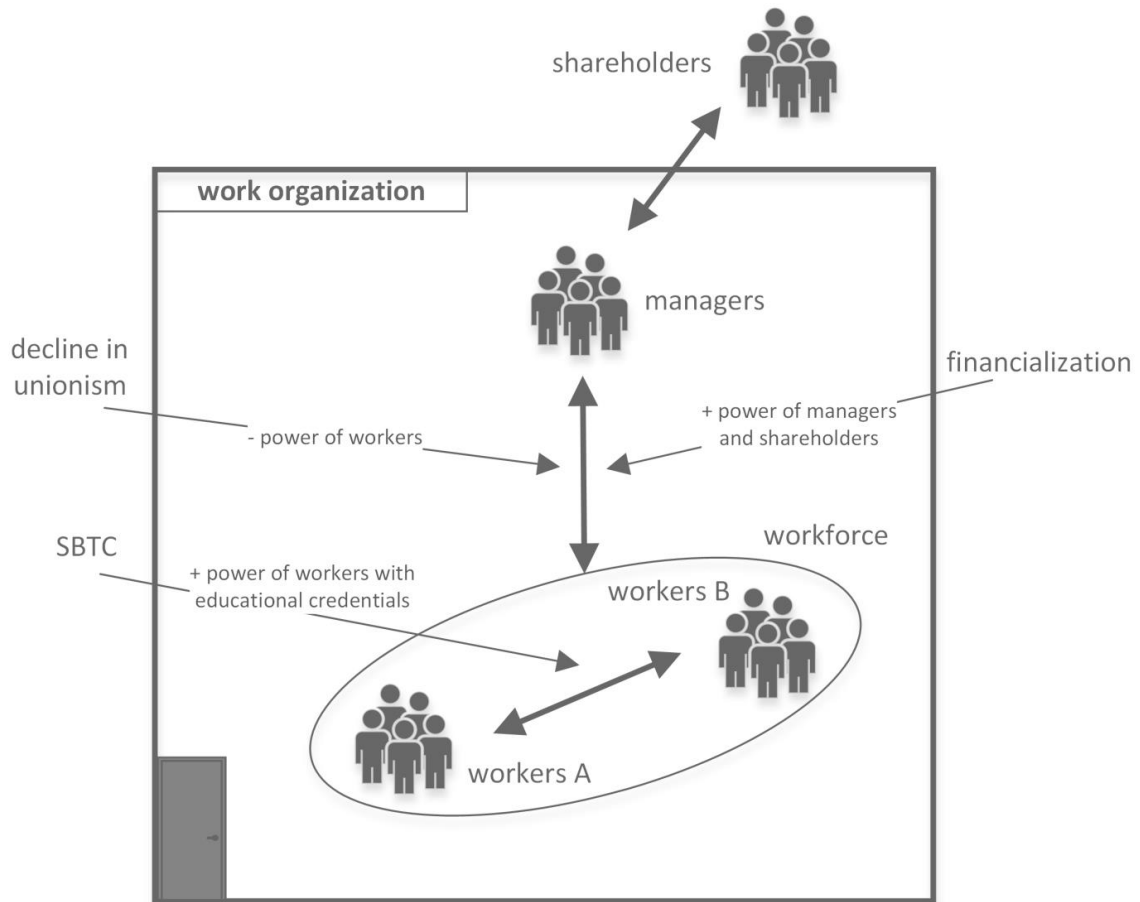
Figure 3: Influence of trends in the environment of firms on relations within the work organization

Of course, these trends not only influence claims-making within the firm, they also increase wage inequality between firms. Technological change, globalization, financialization, and the decline in coverage by collective bargaining also affect the organizational environment. Organizations adapt to these trends with different strategies resulting in higher heterogeneity between firms and thus higher wage dispersion. Firms differ in their adaptation rate to new technologies (SBTC) and their ability to invest in and implement process and product innovations (Van Reenen, 1996a), leading to growing differences in the ability to pool resources and thus rising heterogeneity between firms. Declining union power not only leads to a weakening of the bargaining position of labor, but more and more firms opt to abandon collective bargaining altogether. Finally, the pressure of shareholders on firms to generate higher profits can lead to very different strategies. Some firms attempt to lower wage levels,

others resort to innovation thereby leaving wages untouched or even increasing them for some types of workers such as professionals in the firm.

In sum, financialization, technological change, and change to labor market institutions can be conceptualized as changes in the environment of work organizations which alter the claims-making processes along a variety of different relations within the firm as well as the ability to pool resources. These changes thus lead to changing opportunity structures within the firm, new pay and selections regimes and thus rising heterogeneity between average pay levels of different firms, which is documented in an increasing number of studies (Barth et al., 2016; Card et al., 2013).

3 Research agenda

The following three empirical studies contribute to the understanding of the organizational determinants of the generation and change of wage inequality. The studies range from an analysis of gender-related wage inequality, in which the influence of firm-specific status relations on the gender wage gap is tested (Study 1), over the generation of wage inequality between certain firms characterized by the level of human capital, stability, and coverage by collective agreements and the influence of these firm characteristics on the rise in wage inequality between 1995 and 2010 (Study 2), to a closer look on bonuses, a part of the total compensation gaining importance in recent times especially for high base wage earners, and how the firm characteristics influence the amount of bonuses paid (Study 3).

All studies use one or more samples of the German Structure of Earnings Survey (GSES) as well as a distinct set of analysis methods that allow for different effects along the wage distribution as well as the assessment of the contribution of changes in these effects for changes in wage inequality over time. The following sections briefly introduce each field of research and the contribution of the respective paper to the current knowledge.

3.1 Do status relations in the firm influence the gender wage gap?

The first study is devoted to wage inequality between men and women – a field with a long history. It is well known that differences in human capital accumulation and occupational segregation can account for some of the gender differences in pay (Blau & Kahn, 2016). However, despite the great importance of firms in wage setting, the role of firms has not been

studied in detail, yet. Avent-Holt and Tomaskovic-Deveys (2012) have shown for the U.S. and Japan that the gender wage gap (GWG) varies between firms even after controlling for such individual-level factors. In addition, very recent studies show that the GWG is also a product of exclusion of women from high-wage firms (Card et al., 2015) as well as exploitation and opportunity hoarding processes within work organizations with women typically working in jobs associated with lesser earning chances compared to men (Cardoso et al., 2016). This empirical evidence points to the great importance of such firm-related inequality mechanisms for the generation of the gender wage gap. However, studies for the German case are largely missing.

The paper attempts to address this gap in research by using the GSES 2010 and examining implications of the supposed claims-making processes within the firm. The GWG should be greater in firms where women have fewer status resources at their disposal and are thus less successful in claims-making processes compared to men. Two explanatory variables operationalize the status relation between men and women: the share of women in management positions in the firm and differences in the share of university degrees. Theory further suggests that these effects should vary along the wage distribution (with certain resources being more effective with regard to claims on high or low wages) and between firms that are covered by collective agreements and firms that are not.

Results show that the GWG is smaller in firms where the share of women in management positions is higher and where they have advantages in educational credentials (i.e. higher share of university degrees than men). In addition, the effect of share in management is stronger in firms that are not covered by a collective bargaining agreement and for women in lower wage groups. Educational advantages are more effective for high-wage women.

3.2 Do firm human capital, stability, and coverage by collective agreements contribute to the rise in wage inequality in Germany?

Having established that the organizational context and environment has indeed an influence on the generation of wage inequality (at least with regard to differences between men and women), Study 2 tackles the question whether firm characteristics help to explain the rise in wage inequality in Germany between 1995 and 2010 using all four available samples of the GSES. Although the study by Card et al. (2013) convincingly demonstrates the central role of firm-level heterogeneity and sorting processes for the rise in wage inequality in Germany, they do not look at particular firm characteristics. In contrast, we develop hypotheses that relate

changes in the environment such as technological change, globalization, and financialization to particular adaptation strategies of work organizations. Heterogeneity on the firm level is rising because firms react differently to changes in the environment by applying different adaptation strategies. Firms with a high level of human capital in the workforce can invest in innovations – either in their products or in their processes. Both should yield higher profits, thereby keeping up with competitors. In contrast, unstable firms (with high turnover rates) and firms not covered by a collective agreement can try to cut wages. By looking at specific firm characteristics we can relate them to the ability to pool resources and the influence changes in the environment have. These changes alter the relations between capital and labor (resulting in shifts in between-firm heterogeneity) as well as between different groups of workers within the firms (low-skilled workers and managers, etc.)

Findings indeed show that the premium of working in a firm with high human capital increases between 1995 and 2010 – especially for high-wage employees. In contrast, the positive effects of stability and coverage by collective agreements decrease – both predominantly for low-wage employees. A decomposition analysis reveals that the decline in coverage, which is documented in a number of other studies, also helps to explain the rise in wage inequality.

3.3 Does the amount of bonuses vary with firm human capital, stability, and coverage by collective agreements?

Finally, the third paper, analyzes bonus payments, a variable pay component that has become more relevant in recent years, and their variation across different organizational environments. Recent studies show that bonuses and other variable, performance-based compensations contribute to rising inequality, especially in the upper parts of the wage distribution (Lemieux et al., 2009). However, probably even more than wages, bonuses are determined by a firm's ability to pool resources as well as claims-making processes within work organizations (especially between managers and the rest of the workforce, but also between managers and the board of directors and shareholders). To our knowledge these questions have not yet been studied for bonuses in the German case. The primary aim of the paper is not to explain the rise in wage inequality in Germany with increasing usage of variable payment schemes (although we present some results in this regard too), but rather the identification of relevant organizational environments which allow for higher or lower bonuses and the variation of these effects along the bonus distribution.

We find that the average human capital of a firm, which are firms that are successful in resource pooling either on the product market (through high prices for their high-quality products) or through efficient production which is achieved by process innovation, is positively associated with bonus payments. However, although all employees have an advantage from being employed in a high-skilled firm, it is the employees at the very top of the bonus distribution that profit the most. Stability and coverage rate by collective agreements in the firm also have a positive effect on bonuses, but here the effects are larger for employees in the lower part of the distribution. A decomposition analysis between 1995 and 2010 further shows that there is a composition effect of coverage indicating that top bonus earners disproportionately profit from the decline in collective bargaining.

4 Study 1 – In welchen Betrieben verdienen Frauen mehr? Der Einfluss betrieblicher Statusrelationen auf die geschlechtsspezifische Lohnungleichheit

4.1 Einleitung

Nach wie vor verdienen Frauen in Deutschland weniger als ihre männlichen Kollegen. Die unbereinigte geschlechtsspezifische Lohnungleichheit (gender wage gap, GWG) gemessen am Bruttostundenlohn liegt seit Jahren bei über 20%.[9] Deutschland gehört damit im europäischen Vergleich zu den Ländern mit der größten Lohnungleichheit zwischen den Geschlechtern. Erklärungsversuche greifen zumeist auf das Humankapitalframework zurück: Die Lohnungleichheit ist demnach eine Folge unterschiedlicher Investitionsentscheidungen in Humankapital und sich akkumulierenden Unterschieden im Lebenslauf. Daneben werden auch die Segregation in bestimmte (geringer entlohnende) Berufe, Branchen und Unternehmen und Diskriminierung als mögliche Ursachen diskutiert (vgl. Blau & Kahn, 2016 für einen Überblick).

In den letzten Jahren wird aber verstärkt darauf hingewiesen, dass der Lohnbildungsprozess, wie ihn sich die Humankapitaltheorie vorstellt, eine zu grobe Vereinfachung darstellt (Lips, 2013). Insbesondere hat sich die Erkenntnis durchgesetzt, dass die *Arbeitsorganisation* ein zentraler Ort der Produktion sozialer Ungleichheit im Allgemeinen und geschlechtsspezifischer Lohnungleichheit im Besonderen ist (Acker, 1990; Baron, 1984; Baron & Bielby, 1980; Tomaskovic-Devey, 2014). Mit der Theorie der relationalen Ungleichheit (Avent-Holt & Tomaskovic-Devey, 2014; Nelson & Bridges, 1999; Stainback et al., 2010; Tomaskovic-Devey, 2014) wird hier auf ein theoretisches Modell zurückgegriffen, das explizit den Betrieb als Ort der Produktion von Lohnungleichheit konzeptualisiert, und dabei andere Lohnsetzungsmechanismen vorschlägt. Akteure im Betrieb erheben Anspruch auf organisationale Güter. Dabei stehen den Akteuren Ressourcen in Form von Statuskategorien (Managementposition, Bildungstitel) zur Verfügung, um ihre Ansprüche auf diese organisationalen Güter durchzusetzen. Daraus ergibt sich die zentrale Implikation des Modells: Die geschlechtsspezifische Lohnungleichheit nimmt in dem Maße ab, wie sich die Statusrelationen zwischen den Geschlechtern im Betrieb zugunsten von Frauen verschieben.

Der vorliegende Beitrag überprüft, inwiefern zwei betriebliche Statusrelationen, nämlich der Frauenanteil im Management und die Differenz im Besitz von Hochschulabschlüssen, einen Zusammenhang mit der geschlechtsspezifischen Lohnungleichheit aufweisen und ob dieser entlang der Lohnverteilung und zwischen tarifgebundenen Betrieben und Betrieben mit

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[9] Nach aktuellen Zahlen des Statistischen Bundesamts 3/16/2016 liegt der GWG bei 21%.

individuellen Lohnverhandlungen variiert. Die Implikationen des relationalen Modells werden mit der Verdienststrukturerhebung von 2010 getestet. Dabei handelt es sich um einen administrativen, verknüpften Arbeitnehmer-Arbeitgeber-Datensatz, der sich aufgrund seiner unzensierten Einkommensangaben sehr für Verdienstanalysen eignet. Die Ergebnisse weisen auf die Bedeutung von betrieblichen Statusrelationen hin: Je höher der Frauenanteil im Management und je größer die Bildungsvorteile von Frauen relativ zu Männern im Betrieb, desto höher ist der relative Lohn von Frauen – insbesondere in Betrieben ohne Tarifbindung.

Der Beitrag ist wie folgt gegliedert: In Abschnitt 2 wird die Theorie der relationalen Ungleichheit vorgestellt. In Abschnitt 3 werden Hypothesen abgeleitet und der zugehörige Forschungsstand diskutiert. Abschnitt 4 enthält eine Beschreibung der verwendeten Daten und der Analysestrategie. In Abschnitt 5 werden die Ergebnisse präsentiert und Abschnitt 6 fasst sie zusammen.

4.2 Die Theorie der relationalen Ungleichheit: Wie entsteht Lohnungleichheit im Betrieb?

Wie ist zu erklären, dass der GWG unabhängig von der Humankapitalausstattung zwischen verschiedenen Betrieben schwankt? Eine zentrale Antwort ist Diskriminierung. Hinter diesem Begriff versteckt sich allerdings eine Reihe von Ansätzen, von denen Beckers Diskriminierungsmodell einer der bekanntesten ist (Becker, 1971): Diskriminierende Arbeitgeber stellen weniger Frauen ein und zahlen ihnen geringere Löhne bzw. den männlichen Kollegen eine zusätzliche Kompensation dafür, dass sie mit Frauen arbeiten „müssen". Sie verhalten sich also so, als verursachten Frauen Kosten. Die Implikationen des Modells wurden bereits häufig mit gemischten Resultaten getestet (z.B. Heinze, 2009; Ludsteck, 2014) – was nicht zuletzt an einem großen Selektivitätsproblem und dem Problem der Messung von Diskriminierungsneigung liegt. Davon abgesehen berücksichtigt ein solches Modell auch nicht die vielfältigen und an den jeweiligen betrieblichen Kontext gebundenen Interaktionsprozesse die hinter der Präferenz für Diskriminierung stehen, die im Zentrum der nun zu beschreibenden Theorie stehen.

4.2.1 Claims-making

Die zentrale, genuin soziologische Annahme der Theorie der relationalen Ungleichheit (relational inequality theory, RIT) ist der *relationale* Charakter von Ungleichheit (Tilly, 1998). Lohnungleichheit in Erwerbsorganisationen resultiert nicht aus den (absoluten) Unterschieden

in den Attributen von Personen oder Positionen, sondern entsteht aus den sozialen Beziehungen zwischen ihnen. Die Autoren konzeptualisieren den Lohnbildungsprozess daher als Aushandlungsprozess zwischen (kollektiven) Akteuren um die vor Ort angemessene oder als legitim geltende Verteilung der im Betrieb vorhandenen Geldmengen (Tomaskovic-Devey, 2014). Sie bezeichnen diesen Prozess, bei dem Akteure um die Zuteilung von Geldmengen kämpfen, als *claims-making*. Dieses besteht aus zwei Stufen (Avent-Holt & Tomaskovic-Devey, 2014, p. 384): Zunächst erhebt ein Akteur Anspruch. Dies kann explizit geschehen wie die Nachfrage nach einer Beförderung oder Gehaltserhöhung oder das Anstrengen von Tarifverhandlungen im Fall von Gewerkschaften. Es können aber auch Änderungen einer impliziten, selbstverständlichen Praxis sein (das Budgets einer Abteilung oder das Grundgehalts eines Jobs). Dem Anspruch wird dann im zweiten Schritt durch geeignete Mittel und Ressourcen Nachdruck verliehen. Dabei geht es vor allem darum, relevanten Entscheidern aufzuzeigen, warum der eigene Anspruch legitimer ist als derjenige anderer Akteure. Gelingt dies, werden die relevanten Entscheider dieser Forderung eher entsprechen und die geforderten Geldmengen zuteilen. An beiden Stufen des claims-makings wird Ungleichheit generiert: Statusniedrigere Gruppen erheben seltener Anspruch und diesem wird weniger häufig entsprochen. Im folgenden Abschnitt werden zwei Ressourcen besprochen, die diesen Erfolg beeinflussen.

4.2.2 Kategorien und betriebliche Umwelt als Ressourcen im claims-making

Den Akteuren stehen im claims-making vor allem zwei Ressourcen zur Verfügung: Kategorien und die betriebliche Umwelt. *Kategorien* bilden Grenzen. Sie teilen die Akteure im Betrieb in Gruppen ein, sodass einige dazu gehören und andere nicht. Einige Kategorien sind nur lokal, in diesem Betrieb gültig. Sie entstehen aus dem Produktionsprozess und der lokal implementierten Arbeitsteilung (Eigentümer-Arbeiter, Fließbandarbeiter-Meister). Andere kategoriale Unterscheidungen haben eine externe, soziale Gültigkeit (Mann-Frau, Hochschulabschluss-kein Hochschulabschluss). Akteure nutzen diese Gruppenzugehörigkeit, um im interaktionalen Prozess des claims-makings ihren Anspruch durchzusetzen.[10] Kategorien aktivieren in Interaktionen Erwartungen, Klischees, Vorurteile und Stereotypen. Diese Erwartungen können im Arbeitskontext genutzt werden um Statushierarchien zu aktivieren und so den Anspruch des einen Akteurs gerechtfertigter erscheinen zu lassen als den eines anderen (Tomaskovic-Devey, 2014). Im Folgenden verwende ich daher auch den Begriff

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[10] Bildung ist in diesem Modell ebenfalls eine solche Kategorie: Akteur A hat Qualifikation X und es ist daher *gerechtfertigt*, dass er einen höheren Lohn erhält *als* Akteur B. Dies spiegelt aber nicht die höhere Produktivität der Arbeitskraft wider, sondern ist Resultat des claims-makings, in dem Bildung als Ressource eingesetzt werden kann, um den Anspruch des Akteurs gegenüber anderen Akteuren zu legitimieren.

„Statuskategorie". Gerade die Geschlechtskategorie ist in quasi jeder Interaktion eine bedeutsame Statuskategorie und daher auch (und gerade) im Arbeitskontext wirksam im Hinblick auf das Einkommen (Gorman, 2005; Moss & Tilly, 2003; Ridgeway, 1997; Roscigno et al., 2007). Die größte legitimatorische Wirkung erzielen Kategorien dann, wenn sie sich überschneiden. Insbesondere da, wo sich betriebsinterne Kategorien mit externen, kulturell geprägten Kategorien (Männer im Management vs. weibliche Arbeiter, Männer in Vollzeit vs. Frauen in Teilzeit, etc.) verbinden, sollte das Ausmaß der Ungleichheit am größten sein. Betriebe bilden spezifische Verläufe von Kategoriengrenzen und Relationen zwischen Statuskategorien (hier als „Statusrelationen" bezeichnet) aus (Avent-Holt & Tomaskovic-Devey, 2014, p. 386). Es sind diese betriebsspezifischen Statusrelationen entlang der Geschlechtskategorie, die das Ausmaß des GWG im Betrieb beeinflussen.

Neben sozialen Kategorien kann auch die betriebliche *Umwelt* eine Ressource bei der Durchsetzung von Ansprüchen sein. Institutionelle Umwelten formulieren Regeln für das angemessene Verhalten von Akteuren. Dies kann einerseits auf der Ebene der Organisation selbst eine Rolle spielen. Unternehmen (insbesondere große und damit für die Öffentlichkeit sichtbare) müssen die Legitimität der organisationalen Entscheidungen und Praktiken gegenüber anderen Akteuren sicherstellen. Aber auch für die interne Arbeitsorganisation (Arbeitsteilung, Qualifikationsvoraussetzungen für bestimmte Jobs, Grundgehälter für bestimmte Positionen) gibt es Regeln und Erwartungen, die von Akteuren (Gewerkschaften, Berufsverbände, Gesetze) in diesem Feld formuliert werden. All diese Regeln beeinflussen das claims-making im Betrieb, indem sie den Anspruch des einen Akteurs eher stützen, während der von anderen entkräftet wird.

Das claims-making stellt nun die interaktionale Grundlage für einen zweiten Mechanismus dar, mit dem der Zugang zu „guten" Positionen und Jobs im Betrieb nur für bestimmte Akteure möglich wird („Chancenhortung").

4.2.3 Chancenhortung

Betriebe bilden Positionshierarchien aus, sodass höhere Positionen mit einer höheren Entlohnung verbunden sind. Lohnungleichheit kann hergestellt werden, indem Positionsinhaber den Zugang für bestimmte Akteure beschränken, während er für andere Akteure (Personen aus dem eigenen Netzwerk, Freunde, bestimmte Bildungstitel, kategorial ähnliche Personen) ermöglicht wird. Im Rahmen der RIT werden diese Prozesse als

„opportunity hoarding" (Chancenhortung) bezeichnet.[11] Dieses Matching von Personen zu Positionen im Betrieb ist ein zentraler Mechanismus der Herstellung von (geschlechtsspezifischer) Lohnungleichheit. Chancenhortung setzt auf dem claims-making auf, das diesen ungleichen Zugang zu Positionen im Betrieb legitimiert. Insofern werden Erfolge im claims-making teilweise über den Prozess der Chancenhortung in Lohnungleichheiten übersetzt.

Zahlreiche nationale wie auch internationale Studien weisen auf den Zusammenhang von Jobsegregation und GWG hin.[12] Studien für Deutschland zeigen, dass die Jobsegregation innerhalb von Betrieben gemessen am Duncan-Index bei über 70% liegt (Achatz, 2010, p. 116). Gartner und Hinz (2009) zeigen ebenfalls, dass der GWG innerhalb von Jobs kleiner ist als im ganzen Betrieb – sich allerdings mit etwa 85% im Jahr 2006 im Vergleich zu den USA oder Schweden auf einem relativ hohen Niveau bewegt. Die geschlechtsspezifische Zuweisung von Personen zu Positionen ist also einer der zentralen Mechanismen der Herstellung von Lohnungleichheit.

4.3 Hypothesen und Forschungsstand

Der Ausgang des claims-makings wird von den Statuskategorien beeinflusst, die den beteiligten Akteuren zur Verfügung stehen. Das Ausmaß der geschlechtsspezifischen Lohnungleichheit hängt folglich vom Unterschied zwischen den Geschlechtern in der Kontrolle dieser Statuskategorien im Betrieb ab. Im Folgenden werden nun zwei zentrale betriebliche Statusrelationen vorgestellt, die je eine betriebsinterne (Managementposition) und eine kulturelle (Bildungstitel) Statuskategorie aufgreifen, und deren Einfluss auf den relativen Lohn von Frauen aufgezeigt.

4.3.1 Frauenanteil im Management

Personen in Managementpositionen gelten als Leistungsträger und genießen daher eine hohe Autorität. Wenn der Anteil an Frauen in diesen Positionen im Vergleich zu Männern steigt, sollte die Gültigkeit von Frauen als untergeordneter Statusgruppe abnehmen (Tomaskovic-Devey et al., 2015a). Diese Aufwertung des Status der Kategorie „Frau" gilt betriebsweit und sollte daher die Lohnansprüche aller Frauen im Betrieb verbessern – unabhängig von ihren

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[11] Chancenhortung ist eng verbunden mit dem Konzept der sozialen Schließung. Folgt man Diewald und Faist (2011), bezeichnet Chancenhortung Schließungsprozesse *innerhalb* von Organisationen (im Unterschied zur Exklusion, die Schließungsprozesse *zwischen* Organisationen beschreibt).

[12] Als aktuelle internationale Studie sei hier Cardoso, Guimarães und Portugal (2016) erwähnt. Die Autoren zeigen mit einem sehr informationsreichen LEED für Portugal, dass die Segregation von Frauen in niedrigentlohnenden Betrieben und Jobs einen großen Teil des GWG erklärt.

individuellen Merkmalen. Zudem können Frauen im Management auch einen direkteren Einfluss ausüben, indem sie als Verbündete fungieren, um anderen Frauen zu helfen, ihre Ansprüche gegenüber männlichen Kollegen durchzusetzen. Männliche Manager bevorzugen häufig (bewusst oder unbewusst) ihnen ähnliche Bewerber bei der Besetzung von Positionen (homosoziale Rekrutierung), wodurch Frauen auch bei gleicher Eignung für die Stelle systematisch benachteiligt werden (Broadbridge & Hearn, 2008; Castilla, 2011; Holgersson, 2013). Ein höherer Frauenanteil im Management sollte daher einerseits dieses homosoziale Rekrutierungsverhalten von Männern beschränken. Zudem können weibliche Manager ein ähnliches Verhalten aufweisen und systematisch weibliche Bewerber bevorzugen (Kunze & Miller, 2014).

H1: Je höher der Frauenanteil im Management von Betrieben, desto höher der relative Lohn von Frauen.

Eine Reihe von internationalen Studien zeigt, dass Betriebe, in denen Frauen stark im Management repräsentiert sind, einen geringeren GWG und eine höhere Beförderungswahrscheinlichkeit von Frauen in mittlere und gehobene Managementpositionen aufweisen (Schweden: Hensvik, 2014; Hultin & Szulkin, 1999, 2003. Portugal: Cardoso & Winter-Ebmer, 2010. USA: Cohen & Huffman, 2007; Huffman et al., 2010; Kurtulus & Tomaskovic-Devey, 2012). Die Studie von Hirsch (2013) ist eine der wenigen Studien, die diesen Zusammenhang bisher für Deutschland untersucht hat. Auch sie kommt mit den LIAB-Daten von 2008 zum Ergebnis, dass ein höherer Frauenanteil im Management den GWG im Betrieb (genauer: in Jobzellen) reduziert.

4.3.2 Geschlechterunterschiede in den Bildungstiteln

Bildungstitel (Hochschulabschlüsse, Meister) beeinflussen Löhne nicht nur in Form von Produktivität und als Zertifikat für den Zugang zu bestimmten Positionen, sie verändern auch die Statushierarchie im Betrieb zugunsten der Träger dieser Titel, da der Besitz von Bildungstiteln mit einem höheren Status assoziiert ist. Wenn sich Bildungstitel mit anderen positiv assoziierten Merkmalen wie dem männlichen Geschlecht überlappen, entstehen entlang dieser Statusrelation besonders große Lohnungleichheiten. Entsprechend sollte sich der Status aller Frauen im Betrieb (und damit die relativen Löhne aufgrund der besseren Position im claims-making) im Vergleich zu Männern erhöhen, wenn die Vorteile bei den Bildungstiteln anwachsen. Frauen haben also einen Vorteil, wenn sie in Betrieben arbeiten, in denen Frauen im Vergleich zu ihren männlichen Kollegen beispielsweise einen höheren Anteil an Hochschulabschlüssen aufweisen – unabhängig von ihrem eigenen Bildungsstand.

Tomaskovic-Devey und Coaturoen (2015a) zeigen für Schweden, dass die Lohnungleichheit zwischen Einheimischen und Immigranten abnimmt, wenn die Bildungsvorteile der Immigranten steigen.

H2: Je größer die Bildungsvorteile von Frauen im Vergleich zu Männern im Betrieb, desto höher der relative Lohn von Frauen.

Die vorgestellten Statuskategorien stellen also zwei Möglichkeiten dar, um den relativen Status und damit die Legitimität der Ansprüche von Frauen im claims-making im Vergleich zu Männern im Betrieb zu konzeptualisieren. Je nach betrieblicher Umwelt können sich diese Statusrelationen aber mal mehr, mal weniger auf das claims-making auswirken. Im folgenden Abschnitt wird mit der Tarifbindung ein solcher Umwelteinfluss besprochen.

4.3.3 Betriebliche Umwelt: Tarifbindung des Betriebs

Obwohl auch in Deutschland ein dramatischer Rückgang der Tarifbindung in den letzten Jahren zu beobachten ist, sind immer noch viele Arbeitsverhältnisse durch zentral für eine ganze Branche (Flächentarifvertrag) ausgehandelte Löhne bestimmt. Anhand dieser Differenzierung nach Tarifbindung soll ein zusätzlicher Prüfstein für die RIT eingeführt werden. Die ungleichheitsgenerierende Wirkung von Statusunterschieden entlang der Geschlechtskategorie sollte in tarifgebundenen Betrieben abgeschwächt sein, da lokale, im Betrieb gültige Statusrelationen ein geringeres Gewicht bei der Bestimmung von Löhnen haben. Zentrale Lohnverhandlungen auf Brancheneben lassen weniger Spielraum für die betriebsspezifische Etablierung von Lohnungleichheiten entlang der Geschlechtskategorie.

H3: Der Einfluss betrieblicher Statusrelationen auf den GWG sollte unter Tarifbindung schwächer sein.

4.3.4 Unterschiede entlang der Lohnverteilung

Eine Reihe aktueller Studien zeigt übereinstimmend, dass der GWG entlang der Lohnverteilung variiert (Arulampalam et al., 2007; Kassenboehmer & Sinning, 2014). Dabei zeigt sich zumeist eine Verbreiterung der Lohnlücke in den oberen Regionen der Verteilung. Dieses Phänomen wird häufig als gläserne Decke (*glass ceiling*) bezeichnet. Diese Studien werfen die Frage auf, ob die bisher identifizierten Statusrelationen eine unterschiedliche Wirkung an verschiedenen Stellen der Lohnverteilung (d.h. bei unterschiedlichen Lohnniveaus) haben.

Sowohl ein steigender Frauenanteil im Management als auch steigende Bildungsvorteile von Frauen relativ zu Männern erhöhen den Status der Kategorie Frau. Dies geschieht vor allem über die Zuschreibung von Leistungsfähigkeit und Kompetenz, die Managementpositionen wie

auch Bildungstitel signalisieren. Da hohe Lohnansprüche häufig mit genau solchen Argumenten legitimiert werden, sollten die Effekte auf hohe Löhne größer sein als im unteren Bereich der Lohnverteilung. Durch die zunehmende Verbreitung von Bonuszahlungen am oberen Ende der Lohnverteilung wird dieses Argumentationsmuster zunehmend wichtiger (Lemieux et al., 2009; für Deutschland: Sommerfeld, 2013) – gerade in Betrieben ohne Tarifbindung. Beim Frauenanteil im Management kommt hinzu, dass es Frauen auf Ebenen unter dem Management aufgrund des reduzierten homosozialen Rekrutierungsverhaltens von Männern leichter fallen sollte, in höhere Positionen zu gelangen, sodass auch hier zu erwarten ist, dass der Effekt im oberen Teil der Lohnverteilung stärker ausfällt.

H4: Der positive Einfluss des Frauenanteils im Management auf die relativen Löhne von Frauen nimmt entlang der Lohnverteilung zu.

H5: Der positive Einfluss von Bildungsvorteilen auf die relativen Löhne von Frauen nimmt entlang der Lohnverteilung zu.

Insgesamt zeigt die vorherige Diskussion, dass die Implikationen der RIT bisher vergleichsweise wenig mit empirischen Studien überprüft wurden. Am häufigsten wurde in – vorwiegend internationalen Studien – der Einfluss des Frauenanteils im Management auf den relativen Lohn der Frauen untersucht. Andere Indikatoren und insbesondere deren Variation nach Tarifbindung und Lohnniveau wurden bislang kaum erforscht. Die vorliegende Studie versucht hier einen Beitrag zu leisten, indem zum einen überhaupt die RIT dazu verwendet wird, empirische Forschung anzuleiten, und zum anderen die zentralen Implikationen des Modells am Beispiel Deutschland überprüft werden.

4.4. Daten und Analysemethoden

4.4.1 Daten

Die Analysen basieren auf der Verdienststrukturerhebung (VSE) 2010.[13] Die VSE ist eine vom Statistischen Bundesamt bereitgestellte zweistufige Querschnittsstichprobe: Auf der ersten Ebene werden Betriebe aus dem Unternehmensregister gezogen. Auf der zweiten Ebene werden Beschäftigte aus diesen Betrieben ausgewählt. So entsteht ein Datensatz, in dem die Personen zusammen mit ihren jeweiligen Betrieben beobachtet werden (linked employer-

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[13] Weiter Informationen zur VSE finden sich in Günther (2013).

employee data, LEED).[14] Die Auswahlgrundlage umfasst Betriebe mit mindestens zehn sozialversicherungspflichtigen Beschäftigten aus allen Wirtschaftsbereichen.

Die VSE hat eine Reihe von Vorteilen: Erstens besitzt sie einen großen Stichprobenumfang. Für das Jahr 2010 stehen fast zwei Millionen Beobachtungen auf der Personenebene und über 30.000 Beobachtungen auf der Betriebsebene zur Verfügung. Zweitens beinhaltet die VSE eine sehr genaue Messung des Lohns, die zudem nicht zensiert ist. Die Arbeitgeber haben eine Auskunftspflicht, was die Qualität der Daten im Vergleich zu freiwilligen Haushaltssurveys erhöhen dürfte. Damit eignet sich die VSE für detaillierte Verdienstanalysen – insbesondere auch am oberen Ende der Lohnverteilung. Schließlich wird die Arbeitszeit in Stunden erhoben, was eine Analyse von Stundenlöhnen und damit den Einbezug von Teilzeitbeschäftigten ermöglicht. Diese letzten beiden Vorteile in Verbindung mit den detailliert erhobenen Bonuszahlungen legen die Nutzung der VSE im Gegensatz zum LIAB des IAB, der zweiten bekannten Datenquelle in Deutschland, nahe – insbesondere wenn es um die Analyse der oberen und unteren Ränder der Lohnverteilung geht.[15]

Aus dem vollen Datenbestand werden Beamte, Heimarbeiter, Auszubildende, Personen in Alterszeit und Personen in marginaler Beschäftigung (Arbeitszeit von weniger als 18 Stunden in der Woche) entfernt. Das Analysesample beschränkt sich damit auf Erwerbstätige im Alter zwischen 16 und 65 mit einer wöchentlichen Arbeitszeit von mindestens 18 Stunden. Es werden zudem nur solche Betriebe berücksichtigt, die mindestens fünf Frauen und fünf Männer beschäftigen und die wenigstens eine Managementposition aufweisen. Diese Bedingung ist notwendig, damit den pro Betrieb berechneten Statusrelationen eine ausreichende Datenbasis zugrunde liegt. Diese Selektionsentscheidung führt dazu, dass kleine Betriebe tendenziell unterrepräsentiert sind.[16] Darüber hinaus sind Betriebe aus dem produzierenden Gewerbe leicht überrepräsentiert. Insgesamt sind die Unterschiede allerdings gering, insbesondere die Branchenzusammensetzung ändert sich kaum. Die Analysen werden getrennt für West- und Ostdeutschland durchgeführt, wobei der Fokus der Analyse auf den alten Bundesländern liegt.

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[14] Es werden entsprechende Gewichte bei allen Analysen verwendet, um die unterschiedliche Ziehungswahrscheinlichkeit durch die geclusterte und geschichtete Stichprobe auszugleichen.

[15] Der LIAB hat durch seine Panelstruktur und reicheren Informationen auf der Betriebsebene andere Vorteile, die für die vorliegende Studie aber nicht entscheidend sind. Vielmehr könnte man das Panel in einem zweiten Schritt nutzen und die hier gefundenen Ergebnisse überprüfen.

[16] Das arithmetische Mittel der Betriebsgröße steigt durch diese Selektion von 1.194 auf 1.496 Personen pro Betrieb. Der GWG (berechnet als Differenz des logarithmierten Bruttostundenlohns) erhöht sich von 0,215 (0,038) im Westen (Osten) auf 0,254 (0,137) Logpunkte durch diese Selektion und wird daher vor allem für Ostdeutschland leicht überschätzt.

4.4.2 Variablen

Die abhängige Variable ist der Bruttostundenlohn in Euro. Er ergibt sich aus der Division des Bruttomonatsverdiensts (inklusive regelmäßiger monatlicher sowie unregelmäßiger Sonderzahlungen zum Jahresende) und der monatlich tatsächlich geleisteten Arbeitszeit (inklusive bezahlter Mehrarbeitsstunden).[17] Eine Logarithmierung korrigiert die rechtsschiefe Verteilung des Bruttostundenlohns.

Die theoretischen Ausführungen legen nahe, dass betriebsspezifische Statusrelationen die geschlechtsspezifische Lohnungleichheit beeinflussen. Entsprechend werden entlang der Geschlechtskategorie zwei Indikatoren konstruiert. Dabei geht es nicht um den absoluten Besitz von Statuskategorien, sondern um *Relationen* zwischen den Geschlechtern. Diesem Umstand wird bei der Operationalisierung Rechnung getragen, indem für jeden Betrieb Differenzen oder Anteile von Statuskategorien berechnet werden, die auf die beiden Geschlechter entfallen.

Für den *Frauenanteil im Management* wird auf die Angabe der „Leistungsgruppe" zurückgegriffen. Arbeitgeber müssen MitarbeiterInnen in eine von fünf Leistungsgruppen einordnen. Dabei handelt es sich um lokal gültige Rangunterschiede, die insbesondere Unterschiede in der Aufsichts- und Dispositionsbefugnis und der Komplexität der Tätigkeiten widerspiegeln. Leistungsgruppe 1 „Arbeitnehmer/innen in leitender Stellung mit Aufsichts- und Dispositionsbefugnis" wird als Management definiert.[18] Für jeden Betrieb wird dann der Anteil an Frauen in diesen Positionen der Leistungsgruppe 1 berechnet. Für die Operationalisierung von *Bildungsvorteilen* wird auf die Information über den Besitz eines Hochschulabschlusses zurückgegriffen. Die betriebliche Statusrelation wird als Differenz im Anteil an Hochschulabschlüssen zwischen den Geschlechtern pro Betrieb berechnet.[19]

Neben diesen zwei zentralen Betriebsmerkmalen werden zahlreiche Kontrollvariablen verwendet. Dies schließt zum einen typische allgemeine und spezifische Humankapitalfaktoren auf der Individualebene ein. Es wird für Betriebszugehörigkeitsdauer, Alter in Jahren,

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[17] Aktuelle Studien zeigen, dass Sonderzahlungen gerade am oberen Ende der Lohnverteilung einen großen Einfluss auf die Lohnungleichheit haben (Lemieux et al., 2009; Schweiker & Groß, 2016). Es ist eine Stärke der VSE, dass durch die Verfügbarkeit dieser Sonderzahlungen das gesamte Ausmaß des GWG besser erfasst werden kann.

[18] Mit den vorhandenen Informationen ist es allerdings nicht möglich, das Top-Management trennscharf von mittleren oder gehobenen Managementpositionen abzugrenzen. Insofern befinden sich in Leistungsgruppe 1 nicht nur Geschäftsführer und Vorstände, sondern bspw. auch Abteilungs- oder Ressortleiter.

[19] Es wurde darüber hinaus eine alternative Operationalisierung getestet, wobei pro Betrieb der Korrelationskoeffizient zwischen Geschlecht und Hochschulabschluss berechnet wurde. Die Ergebnisse unterscheiden sich kaum.

Bildungsjahre und Teilzeitbeschäftigung kontrolliert. Zum anderen werden Jobmerkmale wie ein befristeter Arbeitsvertrag und der berufliche Rang miteinbezogen. Letzterer wird verwendet, um zumindest näherungsweise die betriebliche Jobstruktur abzubilden, da davon ausgegangen wird, dass die Zuweisung von Personen zu unterschiedlichen Jobs ein zentraler Mechanismus der Herstellung des GWG ist. Für die Konstruktion des beruflichen Ranges wird der 3-Steller der Klassifikation der Berufe (KldB 88) verwendet und ein Ranking anhand des jeweiligen Durchschnittseinkommens erstellt. Der Indikator hat einen Wertebereich von 0 bis 1, wobei der Wert ausdrückt, welcher Anteil an Berufen unter dem betreffenden Beruf liegt (für eine genauere Beschreibung siehe Tomaskovic-Devey et al. 2015a).

Daneben werden zahlreiche Kontrollvariablen auf der Betriebsebene verwendet: durchschnittliche Bildungsjahre der Mitarbeiter im Betrieb, durchschnittliche Betriebszugehörigkeitsdauer, Anteil Frauen im Betrieb, Betriebsgröße und eine Reihe von Branchenindikatoren. Schließlich stehen auch Informationen darüber zur Verfügung, ob und, wenn ja, welche Art von Tarifvertrag im Betrieb Anwendung findet. Es wird zwischen Betrieben mit Branchentarifbindung und Betrieben, die auf individuelle Lohnverhandlungen setzen, unterschieden.

4.4.3 Analysestrategie

Die bisherigen Überlegungen implizieren einen variierenden GWG zwischen Betrieben, der mit betriebsspezifischen Statusrelationen zusammenhängt. Damit sind primär nicht Personenmerkmale von Interesse, sondern Interaktionen zwischen dem Geschlecht und Betriebsmerkmalen. Ausgehend hiervon bieten sich bieten sich Multilevel Modelle für die Analyse an (Rabe-Hesketh & Skrondal, 2012). Genauer wird ein Random-Intercept-Random-Slope-Modell mit zwei cross-level-Interaktionen geschätzt. Es kann wie folgt beschrieben werden:

$$\log(Lohn_{ij}) = (\beta_1 + \varsigma_{1j}) + (\beta_2 + \varsigma_{2j})Frau_{ij} + \beta_3 Frau * \%FrauManagement + \beta_4 Frau * DiffHochschule + \cdots + \beta_p x_{pij} + \beta_p w_{pj} + \epsilon_{ij}$$

, wobei log($Lohn_{ij}$) der logarithmierte Bruttostundenlohn von Mitarbeiter *i* in Betrieb *j* ist und die Terme ς_j und ϵ_{ij} betriebsspezifische respektive personenspezifische Fehlerterme darstellen. Der Term ς_{2j} bezeichnet die Abweichung des Koeffizienten für Frauen zwischen Betrieben vom mittleren Koeffizienten.[20]

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[20] Die Modelle wurden mit Stata 13 und dem Befehl „xtmixed logLohn X || BetriebsID: Frau, cov(unstructured)" geschätzt.

In einem ersten Schritt werden diese Modelle für deskriptive Zwecke verwendet. Zunächst wird ein Modell geschätzt, in das nur ein Indikator für Frauen und alle Kontrollvariablen auf der Individualebene aufgenommen werden. Damit kann gezeigt werden, wie stark der Effekt des Frauenindikators (und damit des GWG) zwischen Betrieben variiert – nachdem für individuelle Unterschiede im Humankapital kontrolliert wurde.

Im zweiten Schritt werden den Modellen cross-level Interaktionen zwischen dem Frauenindikator und den zwei betrieblichen Statusrelationen sowie dem Frauenanteil im Betrieb hinzugefügt. Die geschätzten Koeffizienten geben an, inwiefern sich der durchschnittliche Bruttostundenlohn von Frauen in bestimmten betrieblichen Kontexten verändert und liefern damit Tests für die Hypothesen H1-H2. Die Modelle werden in drei Schritten aufgebaut: M1 enthält die Interaktionen und alle Haupteffekte sowie die bereits erläuterten Personen- und Betriebskontrollen – mit Ausnahme des individuellen beruflichen Rangs. Diese Variable wird in M2 hinzugefügt. Ein zentraler Mechanismus der Herstellung von Lohnungleichheit im Betrieb ist die Zuweisung zu unterschiedlichen Jobs (Chancenhortung). Die betrieblichen Statusrelationen sollten sich zumindest teilweise über diese Schließungsprozesse auf den relativen Lohn der Frauen auswirken (Mediatoreffekt). In M3 werden schließlich noch weitere Interaktionen zwischen dem Geschlecht und individuellen Merkmalen wie Bildung, Betriebszugehörigkeitsdauer und beruflicher Rang hinzugefügt, um zu kontrollieren, ob sich der Einfluss dieser individuellen Ressourcen auf den Bruttostundenlohn zwischen den Geschlechtern unterscheidet. Um zu überprüfen, ob der Einfluss der Statusrelationen in tarifungebundenen Betrieben höher ist (H3), werden die Modelle ferner getrennt für Betriebe mit individuellen Lohnverhandlungen und mit Tarifbindung geschätzt. Schließlich werden alle Modelle getrennt für Ost- und Westdeutschland berechnet.

Um Effekte nicht nur auf den Mittelwert, sondern auf beliebige Quantile der Verteilung zu erhalten, werden im zweiten Analyseteil Quantilsregressionen berechnet (H4-H5). Ein Problem von Standardquantilsregressionen ist allerdings, dass sich die Koeffizienten nur als Einfluss auf das *bedingte* Quantil interpretieren lassen. Gerade bei Ungleichheitsanalysen ist aber weniger der bedingte (d.h. der Effekt innerhalb von Gruppen definiert durch die Kovariablen) als vielmehr der marginale Effekt von Interesse, da dieser den Einfluss auf die unbedingte Lohnverteilung der Geschlechter anzeigt und somit direkt Aussagen über die Veränderung der GWG erlaubt. Firpo et al. (2009) stellen in einem neuen Ansatz eine Möglichkeit vor, wie man die Einflüsse von Kovariablen auf Quantile der unbedingten Lohnverteilung schätzen kann. Sie greifen dabei auf ein Konzept aus der robusten Statistik zurück: die Einflussfunktion (recentered influence function, RIF). Fortin et al. (2009) zeigen, dass die geschätzten

Koeffizienten einer OLS-Regression auf diese RIF-Werte als Einfluss auf das marginale (unbedingte) Quantil interpretiert werden können.[21]

4.5. Ergebnisse

Es werden zunächst in Abschnitt 5.1 die Variation des GWG zwischen Betrieben und entlang der Lohnverteilung dargestellt. In Abschnitt 5.2 werden die Ergebnisse der Multilevel Modelle und in Abschnitt 5.3. die der Quantilsregressionen vorgestellt.

4.5.1 Die Variation der geschlechtsspezifischen Lohnungleichheit zwischen Betrieben und entlang der Verteilung

Folgt man der Argumentation der RIT, sollte der GWG zwischen Betrieben variieren, da die jeweiligen betrieblichen Kontexte die individuellen Lohnchancen beeinflussen. Abbildung 4 stellt die Dichtefunktion der geschätzten random effects des Frauenindikators getrennt für Ost- und Westdeutschland dar. Deutlich zu sehen ist, dass der Mittelwert dieser Verteilung für beide Landesteile im negativen Bereich liegt. Im Schnitt verdienen Frauen also im Betrieb weniger als ihre männlichen Kollegen – nach Kontrolle relevanter Humankapitalmerkmale. Es zeigt sich ebenfalls, dass der GWG in den alten Bundesländern stärker ausgeprägt ist als in den neuen. In einigen Betrieben werden allerdings auch positive Koeffizienten geschätzt. Dort verdienen Frauen also mehr.

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[21] Die Modelle wurden mit Stata 13 unter Verwendung des ados „rifreg", das von Nicole Fortin auf ihrer Website bereitgestellt wird, berechnet.
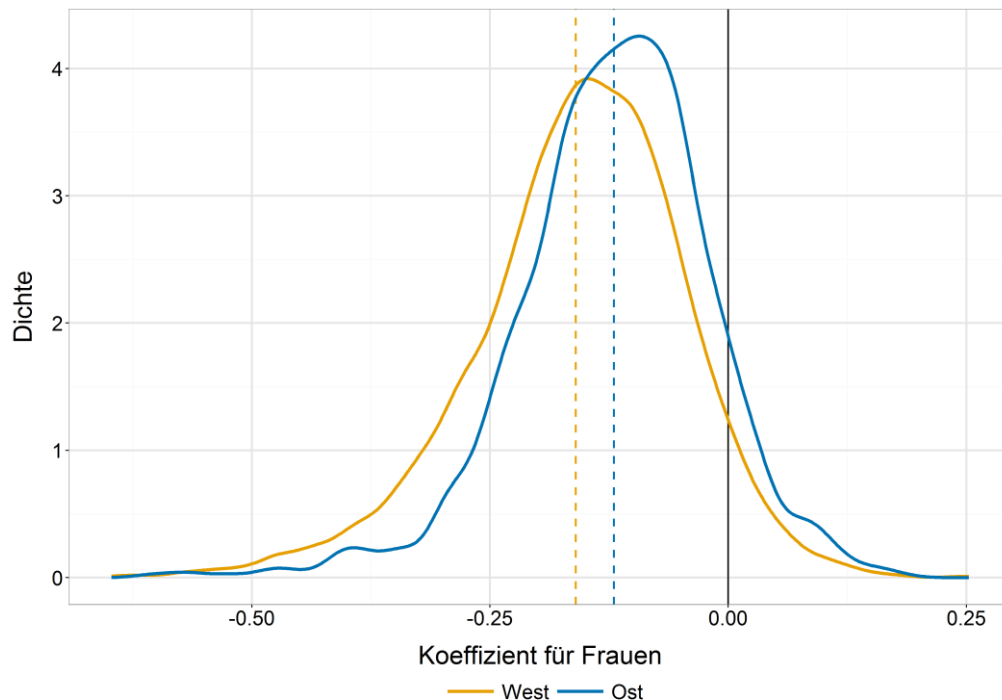
Abbildung 4: Variation des GWG zwischen Betrieben getrennt für Ost- und Westdeutschland

Anmerkung: Dargestellt ist die Dichteverteilung des Koeffizienten für Frauen über alle Betriebe aus einem random coefficient model mit Kontrollvariablen auf der Personenebene.

Neben der Variation des GWG zwischen Betrieben zeigen aktuelle Studien auch eine Variation entlang der Lohnverteilung. Bisher liegen für Deutschland noch keine Studien vor, die den GWG entlang der gesamten Verteilung darstellen und dabei sowohl Teilzeitbeschäftigung als auch Sonderzahlungen berücksichtigen. Abbildung 5 stellt Quantilsdifferenzen im logarithmierten Bruttostundenlohn für das 1. bis 99. Perzentil und die Unterschiede im mittleren Lohn (horizontale Linie) für die beiden Landesteile dar. Zunächst zeigt sich der bekannte Unterschied im mittleren GWG. Diese liegt in Westdeutschland bei 0,25 Logpunkten und ist damit deutlich größer als in Ostdeutschland (0,14). Unterschiede im Mittelwert verdecken aber die ausgeprägte Variation des GWG entlang der Verteilung. Für Westdeutschland beträgt sie bis zum 25. Perzentil unter 0,2 Logpunkte, danach steigt sie auf über 0,5 Logpunkte am 99. Perzentil. Damit können mit der VSE die Ergebnisse von Arulampalam und Coautoren (2007) untermauert werden, wonach es auch in Deutschland (neben vielen anderen europäischen Ländern und den USA) eine „glass ceiling" zu geben scheint. Nach unten hin (vor allem zwischen dem 1. und 5. Perzentil) nimmt der GWG dagegen deutlich ab. Die Kurve für Ostdeutschland folgt diesem generellen Trend, zeigt aber einen deutlichen Bauch in der Mitte der Verteilung. Im Osten steigt der GWG also weniger linear an, sondern nimmt zum Median hin zunächst ab, um dann stark anzusteigen.
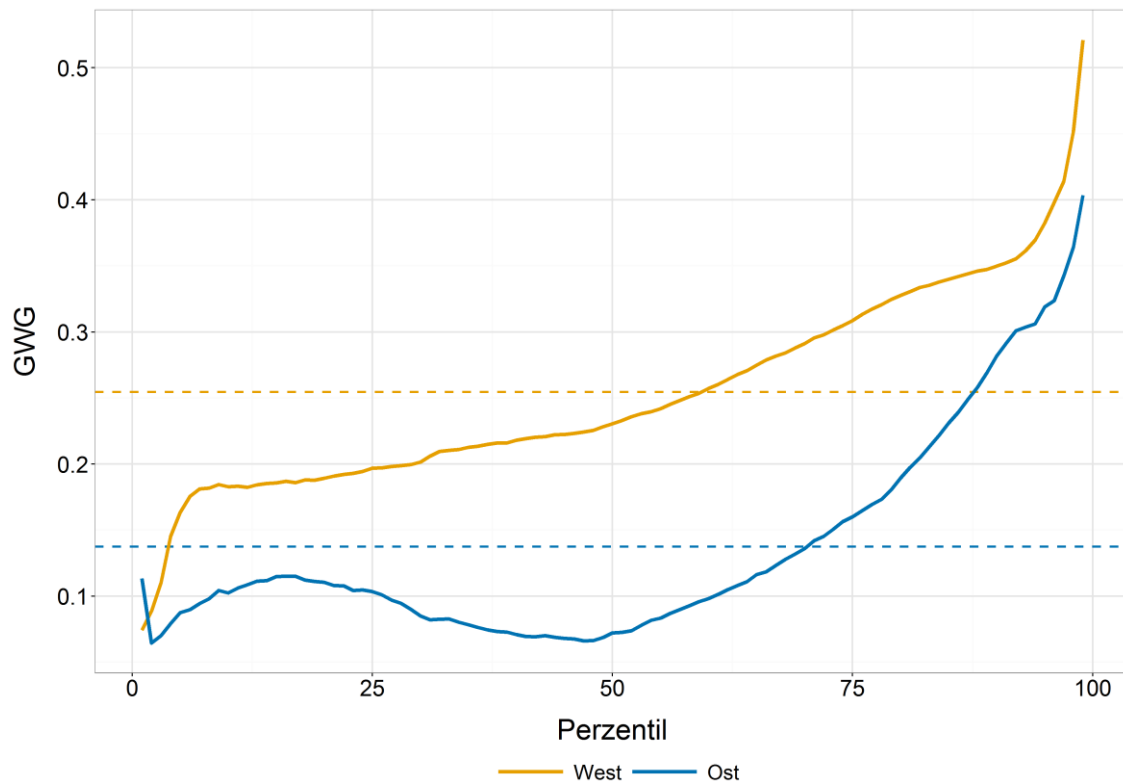
Abbildung 5: Variation des GWG entlang der Lohnverteilung getrennt für Ost- und Westdeutschland

Anmerkung: GWG berechnet als samplegewichtete Differenz zwischen dem arithmetischen Mittel bzw. dem jeweiligen Perzentil des log. Bruttostundenlohns der Männer und demjenigen der Frauen.

Insgesamt zeigt sich also, dass der GWG sowohl zwischen Betrieben als auch entlang der Lohnverteilung variiert. Die folgenden multivariaten Analysen versuchen nun diese Variation mit den betrieblichen Statusrelationen zu erklären.

4.5.2 Der Einfluss betrieblicher Statusrelationen auf die mittleren relativen Löhne von Frauen

Im Folgenden werden die Ergebnisse der Multilevel Modelle für Westdeutschland präsentiert (Tabelle 2). Hypothese 1, wonach sich der relative Lohn von Frauen mit dem Anteil von Frauen im Management erhöht, findet Unterstützung. Der Koeffizient des Interaktionseffekts ist positiv und hochsignifikant. Dieses Resultat bestätigt Ergebnisse aus der Literatur, die ebenfalls einen positiven Effekt finden (Hirsch, 2013; Hultin & Szulkin, 2003; Kurtulus & Tomaskovic-Devey, 2012). Mit steigendem Frauenanteil im Management erhöht sich der Status von Frauen im Betrieb und damit die Durchsetzungskraft von Ansprüchen im claims-making, was sich schließlich in höheren relativen Löhnen von Frauen in solchen Betrieben zeigt. Der Effekt ist ferner signifikant stärker in Betrieben ohne Tarifbindung, da sich hier Statusrelationen stärker auf die Verteilung der Löhne zwischen den Geschlechtern auswirken können. In Modell 2 wird

der berufliche Rang in das Modell aufgenommen, um zu überprüfen, ob sich ein wachsender Frauenanteil in einen besseren Zugang zu höheren Positionen übersetzt. Der Effekt sinkt in Modell 2 zwar leicht, bleibt insgesamt aber relativ stabil. Ein höherer Frauenanteil wirkt sich also nur geringfügig über den besseren Zugang zu Positionen auf den Lohn aus. Vielmehr scheinen Frauen innerhalb von Positionen einen Vorteil zu haben, wenn der Frauenanteil im Management steigt. Gerade in Deutschland, wo der GWG im gleichen Job vergleichsweise hoch ist (Gartner & Hinz, 2009), könnten Betriebe, in denen der Frauenanteil im Management hoch ist, eine Antidiskriminierungspolitik fahren und so Benachteiligungen von Frauen gerade auch innerhalb von Jobs reduzieren. Die Ergebnisse für Ostdeutschland unterscheiden sich kaum von den hier beschriebenen (s. Tabelle A-2 im Anhang).

Das Diskriminierungsmodell von Becker könnte diese Ergebnisse ebenfalls erklären, wenn man davon ausgeht, dass diskriminierende Arbeitgeber weniger Frauen im Management beschäftigen und gleichzeitig alle Frauen im Betrieb geringer entlohnen. Gegen diese Interpretation gibt es zwei Hinweise: Zum kann der Frauenanteil im Betrieb als Proxy für Diskriminierungspräferenz aufgefasst werden, welche damit kontrolliert ist.[22] Zum anderen zeigt die Interaktion zwischen dem Frauenanteil im Betrieb einen negativen Effekt auf den Lohn von Frauen. In Beckers Modell würde man stattdessen einen positiven Effekt erwarten – genauso wie für den Frauenanteil im Management. Dagegen hat die RIT keine Probleme diese unterschiedlichen Effekte zu deuten: Die bloße Anzahl an Frauen im Vergleich zu Männern im Betrieb ist keine Ressource. Im Gegenteil: Angesichts des hohen Grads an Institutionalisierung der Kategorie wirkt sich der Frauenanteil sogar negativ auf den Lohn von Frauen aus. Der Frauenanteil im Management kann dagegen als Ressource im claims-making verstanden werden, die den GWG senkt.

Die Interaktion zwischen Geschlecht und der Differenz im Anteil an Hochschulabschlüssen im Betrieb ist ebenfalls signifikant positiv. Der relative Lohn von Frauen steigt also mit zunehmenden Vorteilen beim Anteil an Hochschulabschlüssen im Vergleich zu den männlichen Kollegen im Betrieb. Damit erhalten alle Frauen in solchen Betrieben einen höheren Lohn, in denen diese Statusrelation eher Frauen bevorzugt – unabhängig von individueller Bildung und weiteren Personenmerkmalen. Anders als erwartet, ist der Effekt allerdings nicht schwächer in tarifgebundenen Betrieben, sondern leicht stärker. Wird in Modell 2 zusätzlich für den individuellen beruflichen Rang kontrolliert, wird der Effekt deutlich kleiner. Dies ist ein Hinweis

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[22] Statt als Diskriminierungsindikator kann man dieses Merkmal auch als Exklusionsindikator auffassen, wonach Frauen von hoch entlohnenden Betrieben ausgeschlossen werden (Avent-Holt & Tomaskovic-Devey, 2012).

auf Chancenhortung. Die Aufwertung von Frauen als Statusgruppe relativ zu den männlichen Kollegen verbessert die Erfolgschancen im claims-making, was sich über die besseren Möglichkeiten des Zugangs zu guten Positionen im Betrieb auf den Lohn auswirkt. In Ostdeutschland ist der Einfluss dieser Statusrelation stärker und geht auch in Modell 2 nur leicht zurück, was darauf hindeutet, dass hier die relativen Löhne von Frauen auch innerhalb von Positionen positiv beeinflusst werden.

Tabelle 2: Multilevel Modelle getrennt nach Tarifbindung, Westdeutschland

	Individuelle Lohnverhandlungen			Tarifbindung		
	M1	M2	M3	M1	M2	M3
Frau * Anteil Frauen im Management	0,212*** (0,01)	0,183*** (0,01)	0,184*** (0,01)	0,143*** (0,02)	0,122*** (0,02)	0,124*** (0,02)
Frau * Differenz Anteil an Hochschulabschl.	0,062** (0,02)	0,024 (0,02)	-0,012 (0,02)	0,072** (0,03)	0,042 (0,03)	0,025 (0,03)
Beruflicher Rang		0.525*** (0.01)	0.544*** (0.01)		0.474*** (0.01)	0.470*** (0.01)
Frau * berufl. Rang			-0.060*** (0.01)			0.006 (0.01)
Frau * Bildungsjahre			-0.005*** (0.00)			-0.009*** (0.00)
Frau * Jahr im Betrieb			-0.001** (0.00)			-0.000* (0.00)
Frau * Befristung			0.050*** (0.01)			0.036*** (0.01)

*Anmerkung: Standardfehler in Klammern. Alle Modelle beinhalten die genannten Personen-, Betriebs-, und Branchenkontrollvariablen. Die vollständigen Modelle sind im Anhang dargestellt (Tabelle A1). * p < 0,05; ** p < 0,01; *** p < 0,001.*

In Modell 3 werden schließlich weitere Interaktionen zwischen Geschlecht und individuellen Ressourcen wie dem beruflichem Rang, Bildungsjahren, Betriebszugehörigkeitsdauer und Befristung hinzugefügt. Die Interaktionen zeigen die erwarteten negativen Koeffizienten: Der Lohnanstieg pro Bildungsjahr und pro Jahr im Betrieb fällt bei Frauen geringer aus als bei Männern. Lediglich in Befristung scheinen Frauen mehr zu verdienen als Männer. Unterschiede zwischen Betrieben mit und ohne Tarifbindung zeigen sich bei der Interaktion mit beruflichem Rang: Während es in tarifgebundenen Betrieben keinen Effekt gibt, erhalten Frauen in Betrieben ohne Tarifbindung auf dem gleichen beruflichen Rang einen geringeren Lohn als ihre männlichen Kollegen. Hier zeigt sich erneut die Bedeutung betrieblicher claims-making-Prozesse aufgrund der fehlenden überbetrieblichen Standardisierung von Löhnen in Betrieben mit individuellen Lohnverhandlungen.

In Abschnitt 5.1 wurde gezeigt, dass der GWG entlang der Verteilung größer wird. Die folgenden Ergebnisse der Quantilsregressionen zeigen, inwiefern die in den Multilevel Modellen gefundenen Einflüsse entlang der Lohnverteilung variieren.

4.5.3 Der Einfluss betrieblicher Statusrelationen entlang der Verteilung

Abbildung 6 zeigt die Ergebnisse von mehreren unkonditionalen Quantilsregressionen. Jeder Punkt repräsentiert den Koeffizienten der Interaktion von Frau und Frauenanteil im Management aus einem Modell mit allen Kontrollvariablen, jedoch ohne die Interaktionen auf der Individualebene (M2), das für insgesamt 21 Quantile berechnet wurde.[23] Unbedingte Quantilsregressionen lassen sich ähnlich wie OLS-Regressionen interpretieren, die Veränderung im Lohn bezieht sich nur nicht auf den Mittelwert, sondern auf das entsprechende Quantil.

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[23] Die Ergebnisse für Ostdeutschland sind im Anhang dargestellt (Abbildung A-1 und A-2). Die Modelle 1 und 3 ähneln den hier gezeigten Modellen stark. Die Koeffizienten aus diesen Modellen sowie diejenigen für Ostdeutschland werden hier nicht dargestellt, können interessierten Lesern aber auf Anfrage zur Verfügung gestellt werden.
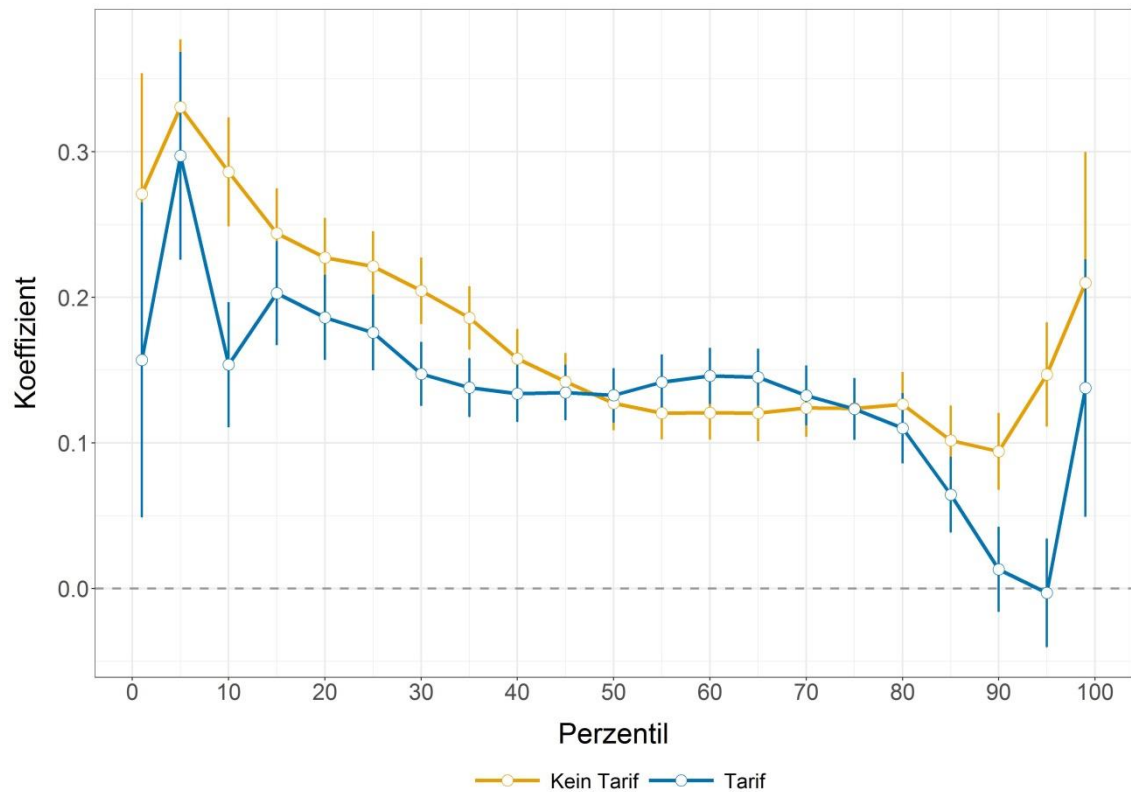
Abbildung 6: Effekt der Interaktion von Frauen mit dem Frauenanteil im Management, Westdeutschland

Anmerkung: Die Koeffizienten stammen aus je 21 Quantilsregression, die für jedes der dargestellten Perzentile getrennt nach Tarifbindung geschätzt wurden. Alle Modelle beinhalten die genannten Personen-, Betriebs-, und Branchenkontrollvariablen (M2). Vertikale Linien stellen 95%-Konfidenzintervalle dar.

Abbildung 6 zeigt zunächst, dass die Effekte auf fast alle Perzentile positiv sind. Es ist also irrelevant, ob es sich um hohe oder niedrige Löhne handelt: Frauen jeder Lohngruppe profitieren davon, wenn sie in einem Betrieb arbeiten, in dem der Frauenanteil im Management hoch ist. Darüber hinaus zeigt sich aber, dass, entgegen den Erwartungen, der Effekt für die unteren Lohngruppen stärker ist als für die oberen. Es gibt zwar einen Anstieg der Effekte ab dem 90. Perzentil, der auf die vermuteten Zusammenhänge hindeutet (nämlich die höhere Wirksamkeit von Leistungs- und Kompetenzargumenten bei höheren Löhnen). Die hohen Effekte in der unteren Hälfte der Verteilung könnten aber eher dafür sprechen, dass Betriebe mit einem hohen Frauenanteil im Management größeren Wert auf den Abbau solcher geschlechtsspezifischer Lohnungleichheit legen, was gerade unteren Lohngruppen zugute kommt. Dies ist auch der Lohnbereich, in dem sich Tarifverträge am stärksten positiv auf den Lohn beider Geschlechter auswirken (Fitzenberger et al., 2013; Kohn & Lembcke, 2007), weshalb es in tarifgebundenen Betrieben vermutlich weniger Spielraum für die relative

Verbesserung der Löhne von Frauen gibt. In Ostdeutschland zeigt sich dagegen der erwartete Anstieg der Effekte über die Verteilung (s. Abbildung A-1 im Anhang).

Das entgegengesetzte Bild zeigt sich in Abbildung 7. Während steigende Bildungsvorteile von Frauen für untere bis mittlere Lohngruppen (bis zum Median) zu relativen Lohnverlusten führen, wirkt sich diese Statusrelation positiv auf den relativen Lohn der Frauen im oberen Teil der Lohnverteilung aus. Hochschulabschlüsse weisen auf Kompetenz und Leistungsfähigkeit hin. Diese Erwartungen können vor allem Frauen mit hohen Lohnniveaus dazu nutzen, ihre Ansprüche gegenüber männlichen Kollegen durchzusetzen, da bei hohen Gehältern und insbesondere Bonuszahlungen häufig mit individueller Leistung und Verantwortung argumentiert wird. Dies zeigt sich vor allem an den starken Effekten bei den Toplöhnen (90., 95. und 99. Perzentil) in Betrieben ohne Tarifbindung. Auch hier ist wieder zu beachten: Es handelt sich um Effekte *betrieblicher* Statusrelationen und nicht individueller Bildungstitel. Eine vorteilhafte Statusrelation in Bezug auf Bildung wertet den Status von Frauen im Betrieb auf und hilft insbesondere Frauen im oberen Lohnbereich ihre Ansprüche, deren Legitimation sich in diesem Lohnbereich oft auf individuelle Leistung stützt, glaubhaft anzumelden.

Frauen im unteren Teil der Lohnverteilung profitieren davon allerdings nicht. Vielmehr verringern sich die relativen Löhne der Frauen in diesem Bereich mit steigenden Bildungsvorteilen – wobei dieser negative Effekt in Ostdeutschland schwächer ausfällt (s. Abbildung A-2). Eine mögliche Erklärung könnte sein, dass eine günstige Relation bei den Hochschulabschlüssen nur bestimmten Berufsgruppen etwas nützt. Gerade im unteren bis mittleren Lohnbereich finden sich viele Ausbildungsberufe, in denen betriebsweite Bildungsvorteile den Status der dortigen Frauen womöglich nicht heben, sondern eher senken. Diese Sicht wird dadurch unterstützt , dass der negative Effekt in tarifgebundenen Betrieben geringer ausfällt (mit Ausnahme des 1. und 5. Perzentils). Zugangsvoraussetzungen und die Aushandlung der Löhne erfolgt hier zumindest teilweise auf der überbetrieblichen Ebene, weshalb die negativen Folgen des claims-makings eingeschränkt sind.
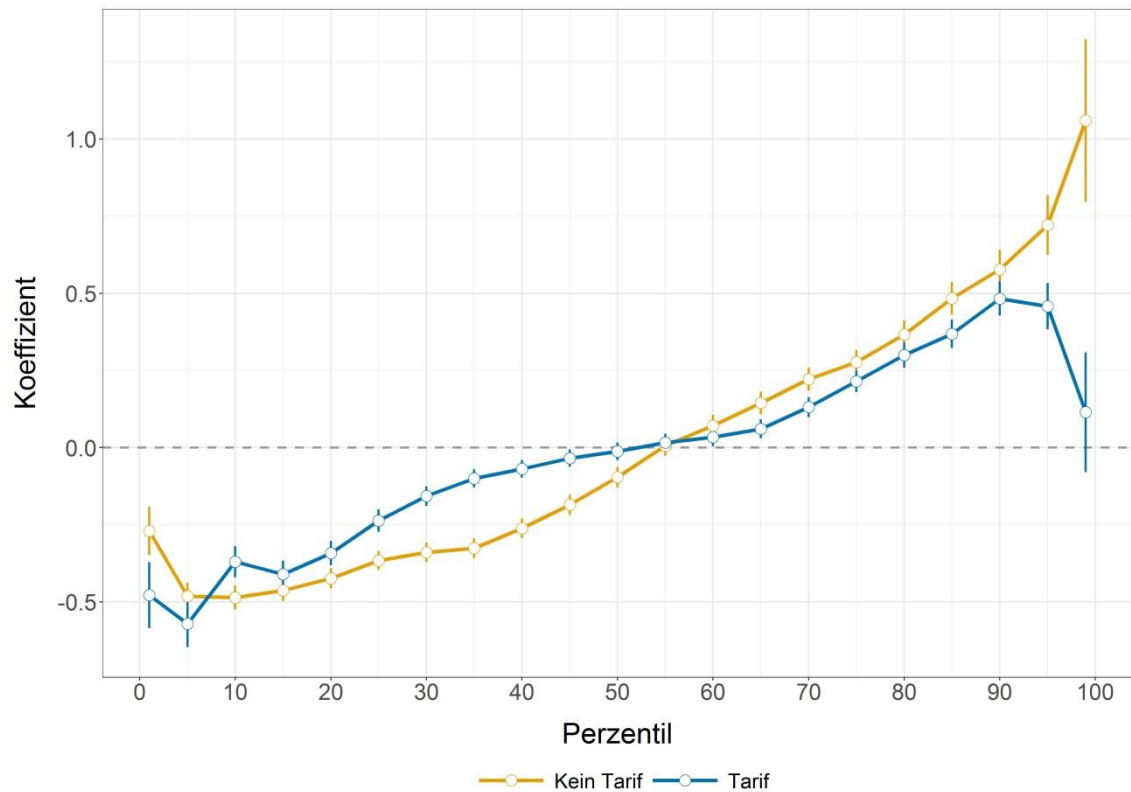
Abbildung 7: Effekt der Interaktion von Frauen mit der Differenz im Anteil an Hochschulabschlüssen, Westdeutschland

Anmerkung: Die Koeffizienten stammen aus je 21 Quantilsregression, die für jedes der dargestellten Perzentile getrennt nach Tarifbindung geschätzt wurden. Alle Modelle beinhalten die genannten Personen-, Betriebs-, und Branchenkontrollvariablen (M2). Vertikale Linien stellen 95%-Konfidenzintervalle dar.

Zusammenfassend ergibt sich also ein durchaus differenziertes Bild des Einflusses von betrieblichen Statusrelationen auf die geschlechtsspezifische Lohnungleichheit. Alle Frauen profitieren von einer Beschäftigung in Betrieben mit einem hohen Frauenanteil im Management – jedoch insbesondere Frauen in unteren Lohngruppen in Betrieben ohne Tarifbindung. Wachsende Bildungsvorteile von Frauen im Betrieb erhöhen die relativen Löhne nur im oberen Bereich, während sie für Frauen in unteren Lohngruppen sogar negative Konsequenzen haben.

4.6 Diskussion und Fazit

In der Literatur setzt sich zunehmend die Erkenntnis durch, dass die Arbeitsorganisation ein zentraler Ort für die Herstellung von Lohnungleichheit ist. Mit der Theorie der relationalen Ungleichheit wurde hier ein Modell diskutiert, das die Entstehung von Ungleichheit als

interaktionalen Prozess zwischen verschiedenen Akteuren im Betrieb betrachtet. Akteure formulieren Lohnansprüche und versuchen diesen Anspruch gegenüber anderen Akteuren durchzusetzen, indem sie relevanten Entscheidern im Betrieb die Legitimität ihres Anspruchs verdeutlichen (claims-making). Entscheidend für den Erfolg ist der Besitz von Statuskategorien in Relation zu anderen Akteuren. Die relativen Löhne von Frauen sollten demnach umso höher ausfallen, je eher betriebliche Statusrelationen zu ihren Gunsten ausfallen und damit die Legitimität von Lohnansprüchen begründen.

Mit den Daten der Verdienststrukturerhebung 2010 und Multilevel Modellen konnte gezeigt werden, dass das Ausmaß des GWG zwischen Betrieben variiert, und zwar als Funktion der betrieblichen Statusrelationen entlang der Geschlechtskategorie: Mit steigendem Anteil von Frauen im Management eines Betriebes und mit steigenden Vorteilen beim Besitz von Hochschulabschlüssen im Vergleich zu Männern, erhöht sich der relative Lohn von Frauen. Für letztere Statusrelation konnten zudem Hinweise auf Chancenhortung gefunden werden. Hier übersetzt sich der Vorteil von Frauen im claims-making teilweise in einen leichteren Zugang zu besser bezahlten Positionen im Betrieb.

Mit Quantilsregressionen konnte darüber hinaus dargestellt werden, dass die Interaktionseffekte des Frauenindikators mit dem Frauenanteil im Management und mit den Unterschieden beim Anteil an Hochschulabschlüssen über die Lohnverteilung variieren. Während ein steigender Frauenanteil im Management eines Betriebs vor allem Frauen in unteren Lohngruppen zugutekommt, profitieren Frauen mit hohen Lohnniveaus stärker von Vorteilen bei den Hochschulabschlüssen. Frauen im unteren Bereich der Lohnverteilung zeigen sogar einen negativen Effekt, der impliziert, dass sich der GWG in diesem Teil der Verteilung mit steigenden Bildungsvorteilungen von Frauen im Betrieb vergrößert.

Leider handelt es sich bei der VSE nicht um ein Panel, weshalb die vorliegenden Ergebnisse nicht kausal interpretiert werden können. Auch die Identifikation von Chancenhortungsprozessen würde von solchen Daten profitieren. Dennoch weisen die Ergebnisse auf die große Bedeutung des betrieblichen Kontextes für die Herstellung von Lohnungleichheiten hin und Reihen sich damit in einen größer werdenden Forschungszweig ein, der auf diese Zusammenhänge hinweist (Beblo et al., 2011; Heinze & Wolf, 2010). Auch nach Kontrolle der typischen Humankapitalfaktoren finden sich signifikante Einflüsse betrieblicher Statusrelationen auf den relativen Lohn von Frauen. Dies stützt einige zentrale Implikationen der RIT, sollte aber gleichzeitig Anstoß für weitere empirische Überprüfungen der Theorie geben. Aus sozialpolitischer Sicht wird die anhaltende Bedeutung von

Tarifverträgen für den Abbau von Lohnungleichheiten zwischen den Geschlechtern unterstrichen. Ferner liefern diese Ergebnisse weitere Argumente für den Nutzen eines stärker egalitär besetzten Managements für die Reduzierung geschlechtsspezifischer Lohnungleichheit.

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5 Study 2 – The role of firms for the rise in wage inequality in Germany: The contribution of firm human capital, stability, and coverage by collective agreements

5.1 Introduction

Recent decades have seen a large increase in wage inequality in most of the advanced economies with a considerable amount of research in economics and sociology devoted to this phenomenon (Autor et al., 2006, 2008; Avent-Holt & Tomaskovic-Devey, 2010; Dustmann et

al., 2009; Dustmann et al., 2014; Giesecke & Verwiebe, 2009; Goos & Manning, 2007; Gosling & Lemieux, 2001; Lemieux, 2006). While economists highlight the impact of technological change on the wage distribution, sociologists underline the role of social closure for the development of inequality. That is, sociologists see the main cause for rising inequality in changing power relations between different groups of actors in labor markets.

With the increasing availability of suitable linked employer-employee data (LEED) a growing number of studies analyze the role of work organizations for the *generation* (e.g. Abowd et al., 1999; Cardoso, 2000; Goux & Maurin, 1999) and *change* (e.g. Card et al., 2013; Cardoso, 1999) of wage inequality. Firms are the central place where wages are distributed, so it seems natural to look for organizational characteristics determining personal wage levels as well as the dispersion of wages within firms. However, there is still an open debate surrounding the role that firms play in the rise in wage inequality. This study investigates how organizational characteristics, specifically mean firm-level human capital, firm stability, and the proportion of employees covered by collective agreements within a firm, affect wages and how changes in organizational wage determination mechanisms have affected wage inequality between 1995 and 2010 in Germany.

This study uses large employer-employee datasets that enable the separation of organizational effects from individual effects on wage inequality. Controlling for several individual characteristics we find that all three firm characteristics have a positive effect on individual wages. Furthermore, the magnitude of these effects depends on the position in the wage distribution: top earners profit the most from employment in firms with a higher level of human capital. In contrast, coverage rate and stability favor low wage employees. All these effects increase over time. Finally, these changes in the effects of firm characteristics as well as the change of their distribution over time help to explain the rise in wage inequality in Germany.

The remainder of this paper is organized as follows: In Section 2 we outline our theoretical argument and Section 3 describes the data and analytical strategy, with results presented in Section 4. Finally, Section 5 gives a short summary and discusses our findings.

5.2 Wage inequality and work organizations
In the following section we briefly review the existing literature. Thereafter we present a theoretical discussion in which we argue that work organizations are the central place for the

generation of wage inequality and thus worth looking at when analyzing trends in wage inequality (Section 2.2 and 2.3). In Section 2.4 we present our hypotheses.

5.2.1 Firms and the rise in wage inequality: What do we know?

Previous studies mainly focus on the *individual level* and try to explain the rise in wage inequality with "skill-biased technological change" (SBTC) (Acemoglu, 2002; Autor et al., 2008; Goos & Manning, 2007) or closure theory (e.g. Bol & Weeden, 2015; Mouw & Kalleberg, 2010; Weeden, 2002; Weeden & Grusky, 2014). These theories stress different mechanisms for wage determination: The SBTC-thesis is based on human capital theory where wages are the result of market processes. Closure theory, on the other hand, highlights the role of structural characteristics and institutions of labor markets for the wage determination process. However, recent studies broaden the view of wage inequality in the labor market beyond these accounts. They show that a significant amount of the increase in wage inequality occurred *between establishments* (e.g. Card et al., 2013) for Germany and Barth et al., 2016 for the U.S.). These findings emphasize the importance of firms in explaining the rise in wage inequality.

Arguably the most studied firm characteristic explaining the trend in wage inequality is the decline in coverage by collective agreements. Western and Rosenfeld (2011) show that about one third of the rise in inequality between 1977 and 2007 in the US is linked to that process (see also Card et al., 2004). Dustmann and colleagues (2009) analyze the period of 1995 to 2004 and report that the decline in unionism accounts for about 28% of the increase in the lower half of the distribution. Antonczyk and coauthors (2010b) find that the decline in coverage by collective bargaining contributed to the rise in inequality in Germany between 2001 and 2006. There are also studies that link other firm characteristics to rising wage inequality: firm size (Davis & Cobb, 2010), exporting firms (Baumgarten, 2013) or firm productivity (Faggio et al., 2010). These studies also find evidence of the contribution of respective firm characteristics to the rise in wage inequality.

5.2.2 Organizational Regimes

Although studies of a firm's contribution to wage inequality have recently flourished, we are far from a perfect understanding of their role in generating inequality, and in particular their impact on the *change* of inequality. We try to deepen this understanding by looking at three firm characteristics (firm human capital, firm stability, and coverage by collective agreements) and their impact on the generation and change of wage inequality in Germany between 1995 and 2010. We choose the mentioned characteristics because they relate to the ongoing discussion of market based or institutional causes for the rise in wage inequality. These

characteristics can also be applied to the discussion at the firm-level where the implications of the different approaches can be tested.

A firm forms an arena where job mobility is structured and where wages are negotiated (Sørensen, 1983b). Each firm has specific patterns that govern mobility flows and set wages in accordance to specific criteria, hereafter called "mobility regimes" and "payment regimes"[24]. The criteria used to make mobility and wage setting decisions result from struggles between various groups involved in the production process, with each trying to maximize their own rewards. Avent-Holt and Tomaskovic-Devey (2014) describe these struggles as "claims-making", an interactional process in which claims regarding the organizational surplus or revenue are translated into wages. Actors use "categorical distinctions" that are either relevant at the workplace (such as permanent contracts, hierarchy position) or culturally accepted (such as gender, ethnicity or educational credentials) as resources in order to legitimate their claims. More powerful actors receive higher wages because they can make claims (asking for a raise, a promotion or a higher budget) and because they are more able to persuade influential others to agree to these claims, thereby legitimating their higher wages.

These struggles may result in regimes that implement mobility and payment criteria that fulfill the demands of human capital theory: payment and advancement according to individual productivity. But the results may, in accordance with closure theory, depart greatly from such demands, favoring groups that have more resources allowing them to ride the conflicts out and to generate rents, while disadvantaging the weaker groups, who will be exploited.

Furthermore, the power and legitimacy of certain claims depends on the environment in which the organization operates. Environmental conditions alter the claims-making process in that they shift the power relations. Work organizations in high competitive market conditions will establish mobility and pay regimes based on efficiency criterions so to make sure that recruiting/promotions and pay is related to the productivity of the employee. In contrast, less competitive environments allow actors to enforce non-efficiency-based claims (e.g. seniority, gender, type of contract). Here, power relations are given more weight in shaping the regimes (Avent-Holt & Tomaskovic-Devey, 2014).

Pay and mobility regimes are quite stable over time, and they have an impact on worker's wage levels beyond their individual characteristics. Moreover, they are also responsible for the

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[24] See Kampelmann 2011 for an extensive analysis of such structures; however, we prefer the term pay (mobility) "regime" over "pay rules" to highlight the idiosyncratic shape of systems of rules in a given organization.

fact that characteristics at the individual level have *different* effects on wages and mobility in different firms (Cardoso, 1999). A certain amount of human capital might be more highly valued in one firm opposed to another, leading to higher or lower wages or a quicker or slower promotion. This means that one can distinguish "high-pay-regimes" from "low-pay-regimes", meaning that on average some firms pay better and some worse, which influences wages over and above individual-level characteristics. Even lower qualified workers may profit from employment in a firm with a high-pay regime and highly qualified workers might be worse off under a low-pay regime.

5.2.3 Changing organizational environments

As mentioned above, a firm's environment provides claims with power and legitimacy. While pay and mobility regimes have some constancy in time, they have to adapt to changing environments in order to ensure the survival of the firm. There have been many recent technological changes, as well as changes to labor and product market regulations. These changes have been quite diverse, urging firms to reorganize their work organization (Blossfeld et al., 2006; Sennett, 2006). Although it is almost impossible to fully account for these various changes, two "grand narratives" arose to summarize these changes in a similar manner, but giving them different interpretations: "globalization" and "financialization".

"Globalization" (Nielsen & Alderson, 2001) primarily means that product and labor markets expand worldwide. In general, globalization enhances market competition, thereby putting pressure on firms to organize production more efficiently and cutting rents for labor, and puts even more pressure on workers to accept these cuts. This process is enhanced by the "financialization" of economies (Lin & Tomaskovic-Devey, 2013a; van Arnum & Naples, 2013), meaning that financial markets are becoming more and more important for firms: they increasingly reach liquidity through stocks (instead of bank loans) and make more profit from financial investments (instead of selling goods). These changes affect the struggles regarding pay und mobility regimes in firms. The most important role in this respect is played by large investors such as hedge funds with strong interests in maximizing short term profits that exert more and more influence over the organization of work in firms (Peters, 2011). Work has to be reorganized in order to maximize "shareholder value", resulting in processes such as outsourcing of departments which are not productive enough and lead to the cutting of employee rents by weakening unions and the use of more flexible work forms.

Thus, there is great pressure on firms to adapt to enhanced competition (as highlighted by the "globalization narrative") and to increase rents for shareholders (as underlined by the

"financialization narrative"). Both approaches lead to the expectation that pay and mobility regimes will significantly change to fulfill the demands called for by these changes. But there are different ways to reach this goal. We will distinguish between two main routes to react to enhanced competition and maximize shareholder value: Innovation and employees´ rent destruction.

Innovation is an option for firms with highly qualified workforces. The main point is here that by product innovation (e.g. investments in R&D) firms are able to create a temporary monopoly in the product market so that rents can be generated (Van Reenen, 1996b). In addition, these firms adopt new technologies as well as new employment systems faster, leading to advances in productivity (process innovation) and the generation of quasi-rents. These rents can be split between the conflict parties in and around the firm. Still, it is possible and it is often the case that shareholders and management try to maximize their rents at the cost of the rents of the employees. However, the employees (and even the less powerful ones) should receive some part of the firm's revenues thus leaving them better off than employees in other firms. Following the SBTC-thesis, demand for highly qualified employees to perform non-routine work is expected to grow in these firms.

Rent destruction is more easily achieved in labor market segments where human capital is not used so intensively or at least exists in abundant supply. Here wage cuts can be achieved by weakening unions, outsourcing labor, or using more flexible ("atypical") work forms. These strategies are at the expense of most of the workforce which is why most of the employees have a clear interest in preventing them. However, because these are also the less powerful (or even exchangeable) employees they are not able to do so. Many studies show that such measures have been used to increase mobility in the work force and, in turn, to cut wages (Booth et al., 2000; Giesecke & Groß, 2004; Kalleberg, 2000; Lin & Tomaskovic-Devey, 2013a; Peters, 2011; van Arnum & Naples, 2013).

We propose that the two strategies of adapting to changing environments alter the claims-making process in firms and therefore the wage inequality generation. While it also affects struggles between different groups within the workforce (e.g. the decreasing relevance of non-manual routine work), the main distinction is between employee and employer. The latter either generates new rents that can be shared with employees or tries to destroy rents of employees. In both cases, we expect increasing differences between firms contributing to the overall rise in wage inequality.

5.2.4 Firm Characteristics and wage inequality

Firms contribute to wage inequality since they have specific mobility and pay regimes, and they contribute to the *change* in wage inequality because they adapt these regimes to changes in the environment. But as outlined above, there are different methods and different possible ranges of adaption, and chosen adaptation strategies will vary with firm characteristics. We focus on three firm indicators which capture the specific measures to adapt pay regimes or capture different opportunities to adapt. Importantly, the characteristics work not just additively to individual characteristics, but also interactively: pay policies affect different groups of workers in different ways. We acknowledge this by building hypotheses that propose different effects of firm characteristics at different points of the wage distribution, assuming that we find weaker workers at the lower end of the wage distribution and vice versa.

In all, we formulate four different sets of hypotheses. First, we draw hypotheses about the effects of the three firm characteristics on wages and the variation of these effects along the wage distribution (a). Second, we highlight the assumed changes of these effects over time (b). Third we formulate hypotheses about the contribution of these changes of effects to the change of the overall wage inequality ("wage structure effect", c). Fourth, we hypothesize what effects changes in the distribution of the firm characteristics on the overall wage inequality have ("composition effect", d).

Mean firm-level human capital

As outlined above, the capability to innovate depends on the qualification of the workforce. Firms need highly qualified employees to generate (quasi-)rents on the product market as well as through productivity gains due to the adoption of technological and organizational innovation enhancing the production process. In turn, a firm's profit has to be divided between the employer and employees. In firms with larger profits the workforce is able to capture a relatively larger part compared to other firms. Thus, there is a premium for all employees working in such firms, but in particular so for the more powerful/better educated employees who are able to enforce their claim based on their (proposed) contribution to the firm's success.[25] We arrive at hypothesis 1a: The higher the mean human capital of a firm, the higher the wages at this firm. This should result in a positive effect at all quantiles of the unconditional wage distribution, but the effect should increase along the distribution. Since we assume that innovation is an adaptive strategy to enhanced competition which can utilize the growing opportunities of globalized markets, we formulate hypothesis 1b: The effect of mean

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[25] An alternative explanation used by economists is based on efficiency wages or remuneration for a real increase in marginal productivity.

firm-level human capital will also grow over time. Since workers at the top of the wage distribution will gain more than the ones at the bottom, this change of the effect should result in higher wage inequality (hypothesis 1c).

Furthermore, following the SBTC-thesis we expect that the demand for high-qualified employees increases in these firms. Over time, more and more high qualified employees are expected to work in firms with high human capital (Bauer & Bender, 2004), resulting in a higher share of firms with a high mean human capital.[26] Since these firms pay better than firms with low human capital inequality should not only rise because of growing differences in the effects but also because of changes in the composition (1d).

Firm stability

Next we look at the stability of firms. Stability in this case means stability of employment relations. Long individual tenure is a widely used indicator of closed positions (Pfeifer, 2014) with a high potential of rent generating, which is not possible in systems with unstable employment: High turnover rates can be used to keep wage levels down because newcomers without seniority rights are paid less (they lack this central resource to enforce their claims to higher wages) and the threat of losing their job weakens the bargaining position of employees (Dencker & Fang, 2016). At the same time, the foundation of a new firm gives abundant opportunities to implement work regimes that allow for rent destruction (or that inhibit rent generation from the very beginning), whereas in older firms existing pay regimes will only change slowly. Therefore, wages in younger firms should on average be lower than in older ones (Brown & Medoff, 2003; Heyman, 2007).

Thus, we expect stability having a positive effect on wages. We expect this effect to become smaller over the wage distribution: High turnover rates are not so bad for highly qualified workers who might gain from frequent job changes in occupational labor markets. Even in young firms, highly qualified workers can avoid unfavorable working conditions. This leads to hypotheses 2a: The stability of a firm has a positive effect at all quantiles of the wage distribution. Furthermore, we expect this effect to shrink along the wage distribution. We have hypothesis 2b accordingly: the effect of stability will also grow over time since recently founded firms and firms with unstable employment are able to adapt faster to the changing economic conditions as outlined above widening the gap between stable and unstable firms.

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[26] As already mentioned, this process of increasing concentration in certain firms has to be distinguished from general upskilling in the course of educational expansion. Since we use aggregated firm-level measures this poses a potential problem. We try to tackle it by controlling for individual-level education in the decompositions.

On the other hand, growing relative advantages of employees in stable firms at the lower end of the wage distribution means that the change of the stability effect reduces overall-inequality (hypothesis 2c) since low wage workers are increasingly better off in stable firms.

Again, one can think of a compositional effect accompanying this structural effect. Because of flexibilization and the reduction of internal labor markets, turnover rates increase and firms become less stable (DiPrete et al., 2006; Giesecke & Heisig, 2010; Grimshaw et al., 2001). This leads to a larger share of employees who work in less stable firms depressing wages especially in the lower part of the wage distribution and thus increasing inequality. However, these processes are mainly found in service sector industries. Since our sample mainly encompasses firms in the production sector where external-numerical flexibilization is less common (Giesecke & Heisig, 2010), we expect only small composition effects in the lower parts of the wage distribution (hypothesis 2d).

Collective bargaining regime

Finally, an important characteristic of the firm´s pay regime is whether the firm uses collective bargaining agreements or not. In Germany, collective bargaining is strongly regulated and it makes a large difference for wage setting processes whether a firm takes part in the collective bargaining system or not (and in fact, it has the choice to do so by getting a member of an employer´s association resp. by leaving this association). Again, we expect changing effects over the wage distribution: It is well known and empirically supported that collective wage agreements are favorable for employees, but this effect diminishes over the wage distribution and even disadvantages higher status groups (Card et al., 2004). So we arrive at Hypotheses 3a: firms that are subjected to collective bargaining regimes pay more than firms that rely on individual contracting and this effect diminishes over the wage distribution.

But it is unclear what the changing environments of firms could mean for the effect of collective bargaining on wages: On the one hand, firms could try to cut the advantages of collective bargaining (rent destruction), diminishing the positive effects for lower wage groups over time. On the other hand, collective bargaining is valid mostly for the "core workforce" in the "primary labor markets" (Wallace & Kalleberg, 1981) which means that this will not be the first target for wage cutting. Instead, employers could try to cut wages in the "peripheral" workforce (which entails more flexible work arrangements that are typically not covered). These wages can be cut more easily, leaving the wages for the core employees untouched – a process that would lead to stable or even growing effects of collective bargaining on wages.

Thus, we neither have a clear hypothesis regarding possible changes of effects of collective bargaining agreements, nor about the impact of such changes on the wage inequality.

However, we expect the main effect of collective bargaining on wage inequality not to be structural in nature, but rather compositional: employers might attempt to avoid the costs of collective bargaining not by limiting the advantages of collective bargaining, but by abandoning the collective bargaining system altogether. In fact, there has been considerable erosion of the system of collective bargaining in Germany since the early 1990s (Ellguth & Kohaut, 2011; Fitzenberger et al., 2013), so that fewer and fewer workers benefit from collective bargaining. So in hypothesis 3c, we expect a compositional effect of shrinking participation in collective bargaining on the change of the wage distribution, especially in the lower end of the distribution leading to rising wage inequality (hypothesis 3d).

5.3 Data and analytical strategy

5.3.1 Data

We use four samples (1995, 2001, 2006, and 2010) of the German Structure of Earnings Survey (GSES, "Gehalts- und Lohnstrukturerhebung"; the surveys have been called "Verdienststrukturerhebung" since 2006) for our empirical analysis (c.f. Hafner & Lenz, 2008 for an extensive description). The GSES is a cross-sectional linked-employer-employee dataset (LEED) which is sampled in two steps: In the first stage, firms with a minimum of ten employees are randomly drawn from the business register within each federal state of Germany ("Bundesland"). In the second stage, individuals are sampled within the selected firms. "Firm" refers to the actual establishment workplace at which the individual is employed. This can either be an individual establishment or a plant/subsidiary of a larger principal enterprise.[27]

The GSES is one of the biggest LEED available for Germany so allowing for very detailed analyses. Because the responses are mandatory for employers, the data quality is high and more reliable than individual-level household surveys. Furthermore, there is almost no censoring of income information. In 1995 only extremely high wages were top-coded (at 25,000 DM per month equivalent to 12,782 Euro).[28] Since 2001 wages have been reported without any censoring and such features make the GSES a good choice for research targeting

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[27] In the following, we use the terms firm, plant, establishment, and workplace interchangeably.
[28] Our results should not be affected by that censoring because we employ quantile regression and the 9th decile is the highest quantile we look at.

wage inequality. We focus on male full-time employees aged 16 to 65 in West Germany in our main analysis. Results for the other subsamples, namely full-time female employees in West Germany and employees in East Germany, are not discussed in detail. However, we mention notable differences in our discussion of the findings and the results for these subsamples can also be found in the Online Appendix. In addition, we also only take firms with at least ten employees into account.

We are especially interested in changes across time. The sample base becomes more diverse over time, gradually incorporating more industries and employment status over the four samples. This poses a problem as we are potentially comparing different populations. In order to ensure comparability, we harmonize the samples by dropping all employment types and industries in the later samples that were not already sampled in 1995.[29] This leaves us with industries mainly in the production sector and only some industries in the service sector (e.g. finance and insurance). We tried to assess the impact of this decision for the years 2001, 2006 and 2010 by comparing our reduced samples with the full samples that include all industries. Although wage inequality is higher in the full samples, the differences are not large. When we examine 2010, the year we expect there to be the biggest differences between the two, we find that the wage inequality is 0.40 points higher as measured by the 90/10 quantile ratio in the full sample. In addition, we repeated the whole analysis keeping all industries in each year, which makes comparisons over time difficult, and compared these results with our reduced samples with stable industry composition over time. While this comparison reveals some notable differences, they are for the most part amplifying the results presented here and thus fit well into our theoretical considerations. In sum, given the facts that (a) the manufacturing sector is still quantitatively large and makes a significant contribution to GNP in Germany and (b) some industries from the service sector are still included, we think that the reduced sample is a solid representation of the German economy. However, by choosing to exclude many service sector industries in the later samples, we underestimate the rise in wage inequality.

The major drawback of our data is that it is cross-sectional. Differences in pay between firms can result from non-random sorting of unobservable personal attributes. The *growing* importance of certain firm effects could also follow from increased sorting across firms or growing returns to these abilities. Others studies (e.g. Card et al., 2013) use LEED with multiple observations for individuals and firms over time. In particular, with this data it is possible to control for such sorting effects. But since unobservable attributes are typically correlated with

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[29] These ineiude: occupational training, public service, partial retirement and marginal employment.

observables we capture some part of this sorting problem. Nonetheless, with this data it is not possible to identify causal relations.

5.3.2 Variables

The dependent variable is the log hourly gross wage measured in Euros per hour computed by dividing deflated monthly gross wages (with overtime payments as well as regular and irregular, year-end bonuses) by actual working hours and then taking the logarithm in order to adjust for the (right) skewness of the distribution.[30]

The multivariate analysis focuses on three firm characteristics. *Mean firm-level human capital* is measured by the average schooling of the employees within a given firm. Unfortunately, there is no information on firms' products, profits or market positions in the data. Because firms offering high quality products or services need qualified personnel, we rely on average schooling as an indicator for surplus as well as the ability to change. As an indicator of *firm stability* we use the average tenure of the employees in the firm. Unfortunately, this measure mixes two different phenomena because we are not able to control for the firm age: Firms with low mean tenure have fewer stable employment relations, but at the same time, they are necessarily younger firms. But, as we argued in Section 2.4, we expect mean individual tenure and age of the firm to work in the same direction. Finally, we use individual-level coverage information to calculate the *coverage rate* in a firm. This is a good representation of the German bargaining system where covered firms typically recognize collective bargaining outcomes for most of their employees and not only for union members. However, there are often some employees who are not covered even if the firm has recognized collective contracts, so it makes sense to have a continuous indicator for coverage to capture a firm's commitment to collective bargaining (Fitzenberger et al., 2013).

We also make use of several control variables at the firm level. First, we include a measure of firm size which is a characteristic that has a long history of analysis. Although it is seldom the firm's size itself that influences wages, firm size operates as a proxy for internal labor markets, age or market share (Kalleberg & van Buren, 1994, 1996). Furthermore, we control for the gender composition in the firm and the industrial sector in which the firm is located. The latter is of special importance as this partly captures mechanisms that are not located on the firm

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[30] A number of recent studies show that regular and irregular, year-end bonuses have to be accounted for because they have a notable influence on wage inequality and its growth – especially in the upper parts of the distribution (see e.g. Lemieux et al., 2009; Bell & Van Reenen, 2010b). Fortunately, our data include detailed information on the amount of bonuses paid to employees.

level but the industrial level. If we had not controlled for these, we could wrongly attribute those effects to firms when in reality they display differences at the industrial level.

Finally, we consider several standard human capital indicators and job characteristics at the individual level. We use years of schooling, age, age-squared, and tenure as measures for general human capital specific characteristics. We also have information on whether jobs are fixed-term or not.[31]

5.3.3 Methods
In order to test our hypotheses as accurately as possible we use two different analysis techniques.

Unconditional quantile regression
In order to estimate the effects of firm characteristics on wages, we use quantile regression as we want to capture potential variation of effects along the wage distribution. This relates directly to our theoretical exposition, where we assume different effects of firm characteristics dependent on the individual's place in the wage hierarchy. We also expect that the rise in wage inequality over time is not so much driven by changes in the means, but by changes in the lower and upper part of the wage distribution (see e.g. Fitzenberger et al., 2013). Quantile regression allows us to investigate different trends at different parts of the wage distribution, expanding the narrow perspective of linear regression that focuses on the mean of the distribution.

However, one problem with standard quantile regression is that the coefficients can only be interpreted as the influence of independent variables on the *conditional* quantile, which – unlike linear regression – are different from the effects on the marginal (or unconditional) distribution. Although the conditional interpretation can be useful, it is typically the latter interpretation that is of interest in inequality research. We therefore employ a new method developed by (Firpo et al., 2009) called *unconditional* quantile regression. The authors rely on influence functions (IF), a well-known concept in robust statistics and show that a standard OLS regression of the values of a re-centered influence function (RIF) on a set of X predictors show the influence of these variables on the marginal (unconditional) quantile of the wage distribution.

Detailed decomposition on the basis of RIF
While we address hypotheses a) and b) with quantile regressions, we resort to decomposition methods in order to test hypotheses c) and d) regarding the change over time. Decomposition

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[31] See Table A-3 in the appendix for a full list and description of all variables.

methods have become an important tool in social stratification research and other fields. These methods "are useful for quantifying the contribution of various factors to a difference or change in outcomes" (Fortin et al., 2011, p. 2) between two groups (or, as in our case, years). The decomposition method developed by Oaxaca (1973) and Blinder (1973) was used to decompose the gender wage gap into two components: an *explained effect* that reflects compositional differences between the two groups (e.g. with respect to education, tenure etc.) and an *unexplained effect* (also called "structural effect" or "price effect") corresponds to differences in the coefficients of a wage regression and is traditionally associated with the analysis of gender wage discrimination, examining factors in the gender wage gap.

Since the introduction of Oaxaca-Blinder wage decompositions, major steps have been taken to extend the methodology to detailed decompositions, that can not only distinguish aggregated wage structure and composition effects but the detailed contribution of each factor, and to distributional parameters other than the mean. One such newer method was introduced by Firpo et al. (2007). They suggest the standard Oaxaca-Blinder (OB) decomposition of the values of a RIF instead of the original wages. They show that this method not only allows for detailed decomposition of differences in quantiles but is also path independent. The latter point is a central problem of most detailed decomposition methods because the contribution of a certain factors is typically dependent on the factors introduced earlier.

In an analogy to standard OB decompositions, the total difference in wage quantiles between two time points A and B at the quantile τ can be decomposed as follows (Fortin et al., 2011):

$$\hat{\Delta}_T{}^\tau = \bar{X}_B \left(\hat{\beta}_{B,\tau} - \hat{\beta}_{A,\tau} \right) + (\bar{X}_B - \bar{X}_A)\hat{\beta}_{A,\tau}$$

$$\hat{\Delta}_T{}^\tau = \qquad \hat{\Delta}^\tau{}_S \qquad + \qquad \hat{\Delta}^\tau{}_X$$

where X is vector containing variables determining wages, $\hat{\Delta}^\tau{}_S$ is the total structural effect and $\hat{\Delta}^\tau{}_X$ is the total compositional effect. For both these effects a detailed decomposition is available.

We use this methodology in order to decompose the rise in wage inequality between 1995 and 2010.

5.4 Results

The results are given in two parts. In Section (4.1) we present the results of the unconditional quantile regressions, thoroughly describing the effects of the firms` characteristics on wages varying along the wage distribution and the change of these effects over time. In Section 4.2 we discuss the results of the decomposition, focusing on the structural and compositional effects of firm characteristics on wage inequality.

5.4.1 Quantile regressions results

Figure 8 shows the results from several unconditional quantile regressions. Each point in the graph represents the effect of mean human capital in the firm on individual wages at a certain quantile from a model that includes individual-level (education, age, age squared, tenure and fix-term) and firm-level (establishment size, proportion of female employees, and industry) controls. Figures 9 and 10 display the same graphs for the other two firm characteristics, firm stability and coverage rate.

Figure 8: Effects of mean human capital on individual wages at selected quantiles (men in West Germany)

Note. Series of unconditional quantile regressions including all individual-level and firm-level controls as well as a set of industry dummies. Each point represents the effect of mean human capital from a full model at the depicted quantile and year. Vertical lines represent a 95% confidence interval.

The first point to note is the positive effect of firm-level human capital on a person's wage. All of the coefficients are greater than zero and are highly statistically significant. An increase of firm mean human capital results in an increase of the depicted quantiles of the unconditional wage distribution. These graphs illustrate the fact that firms do play a role in determining individual wages net of standard individual-level human capital controls. In addition, this positive effect becomes stronger along the wage distribution. It is the high wage groups that profit the most from the level of human capital in the firm. However, in all four years the effects decline after peaking at around the 9th decile.[32] Overall this pattern confirms hypotheses 1a which predicted positive and growing effects over the distribution.[33] In addition, the figure points to increasing effects over time (supporting hypothesis 1b), especially at the median and surrounding quantiles suggesting that the mean human capital of the firm becomes more important for wage determination, even after controlling for individual characteristics. This partly confirms hypothesis 1b, where we expected such trends as the result of the "innovation strategy" of adapting to economic changes in response to globalization and financialization. Firms with high mean levels of human capital are ever more capable of generating (temporal) rents through process and product innovation that can be shared with their employees. However, we expected these trends to be more pronounced at the upper end of the wage distribution, which is not what we find. We discuss the influence of this change in effects on wage inequality in more detail in Section 4.2, where we present the decomposition results.

When looking at Figure 9 which displays the coefficients for firm stability, one sees a different pattern. The stability of a firm is positively associated with individual wages but the effect is strongest for low wage groups. This is to be expected because individuals with low wages profit disproportionally well from employment in stable firms with internal labor markets and seniority rights (hypothesis 2a) (see e.g. Lengfeld and Ohlert (2015) who come to a similar conclusion).

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[32] One explanation could be that *individual* characteristics become more important for those exceptionally high wages. This view is supported by strong positive effects of individual years of schooling on those quantiles (not shown in the paper).

[33] We find similar effects and patterns in the other three subsamples (female employees in West Germany and male and female employees in East Germany)
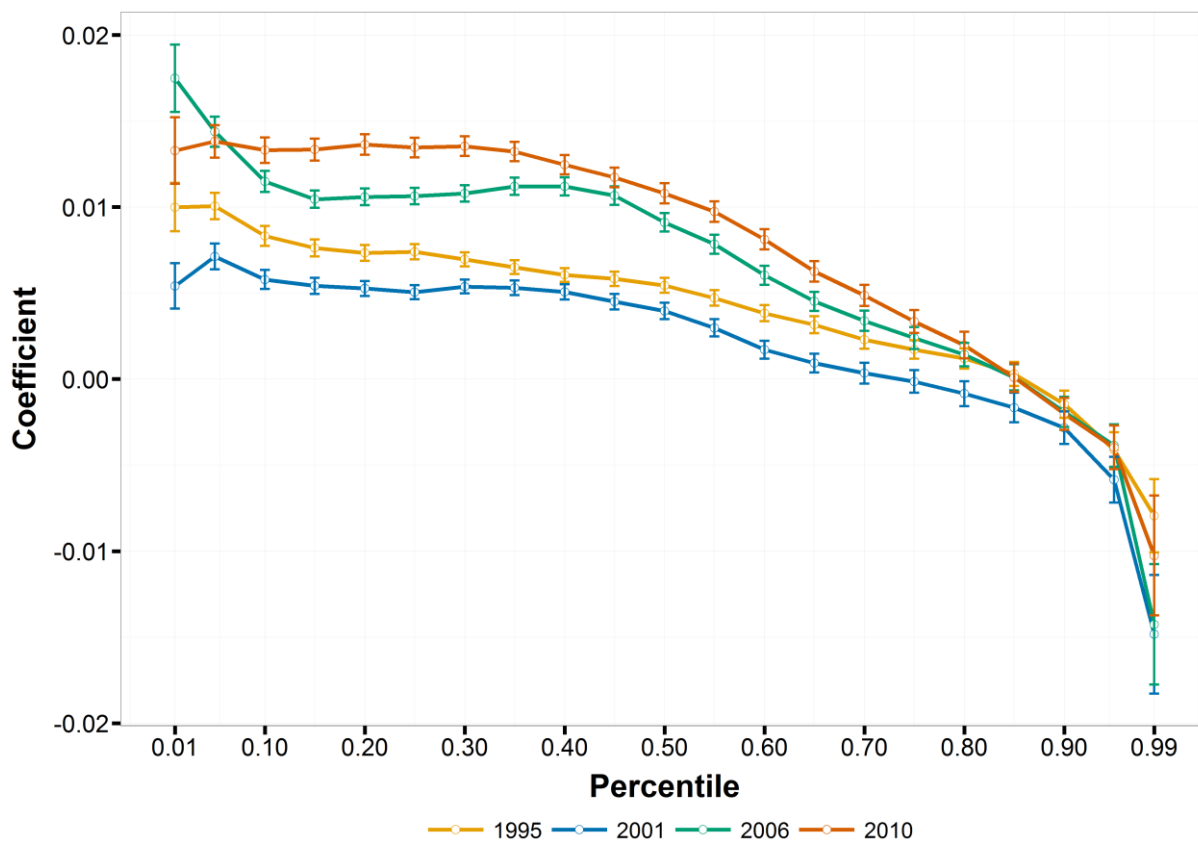
Figure 9: Effects of firm stability on individual wages at selected quantiles (men in West Germany)

Note. Series of unconditional quantile regressions including all individual-level and firm-level controls as well as a set of industry dummies. Each point represents the effect of firm stability from a full model at the depicted quantile and year. Vertical lines represent a 95% confidence interval.

Moving up the distribution the influence becomes weaker and eventually insignificant. Groups at the very top of the distribution even seem to be disadvantaged. This points to the fact that wages are more compressed in more stable firms due to standardized careers ladders and fairness norms that not only favor the weaker groups in the firm but prevent excessive bonus payments (that are in particular found at the top of the wage distribution) at the same time.[34] For these top wage groups the within effect (compression of wages within stable firms) might dominate the between effect (stable firms pay more than less stable ones) resulting in the displayed negative effects. This pattern is repeated in the other three subsamples. However, the effects for male and female employees in Eastern Germany are weaker and slightly inversely u-shaped with the strongest influence on the median and the 6th decile. Finally, the graphs also show a trend over time. Up to the 7th decile the effects on wages increase over time (except from 1995 to 2001, where at slight decrease is observed), while they are not

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[34] See for example Bebchuk & Grinstein 2005 for a rent-based account to executive payments.

statistically different in the upper part of the distribution. Seemingly, the influence of firm stability on these quantiles increases between 1995 and 2010 due to either younger firms implementing less favorable pay regimes compared to older ones, or high-job-turnover-firms cutting wages for entrants (or both). These developments were to be expected from the "rent destruction" strategy to adapt to the economic changes as described above (hypothesis 2b). We will turn to the consequences of these trends for wage inequality in more detail in the following section.

Figure 10 presents the coefficients of coverage rate by collective agreement. The curves mainly reproduce previous findings (Card et al., 2004; Fitzenberger et al., 2013) – and confirm hypothesis 3a. The graphs show positive effects of the coverage rate on most of the percentiles (except for the percentiles above the 80th). This means that an increase of the coverage rate in the firm leads to an increase of the percentiles (of the unconditional wage distribution). In addition, the effect is strongest for low wage groups and then declines gradually along the wage distribution eventually becoming negative for the top wage groups. The graphs for Eastern Germany show an inversely u-shaped pattern where the effect on the median is strongest. Additionally, the coverage rate has a positive influence on the wages of top wage earners (in contrast to the negative effect found in West Germany). This pattern corresponds closer to the median voter theorem as well as to findings for the U.S. than the pattern found for West Germany. However, West Germany comes closer to the "median voter" over time, as the increasing effects of coverage in the middle of the distribution show.
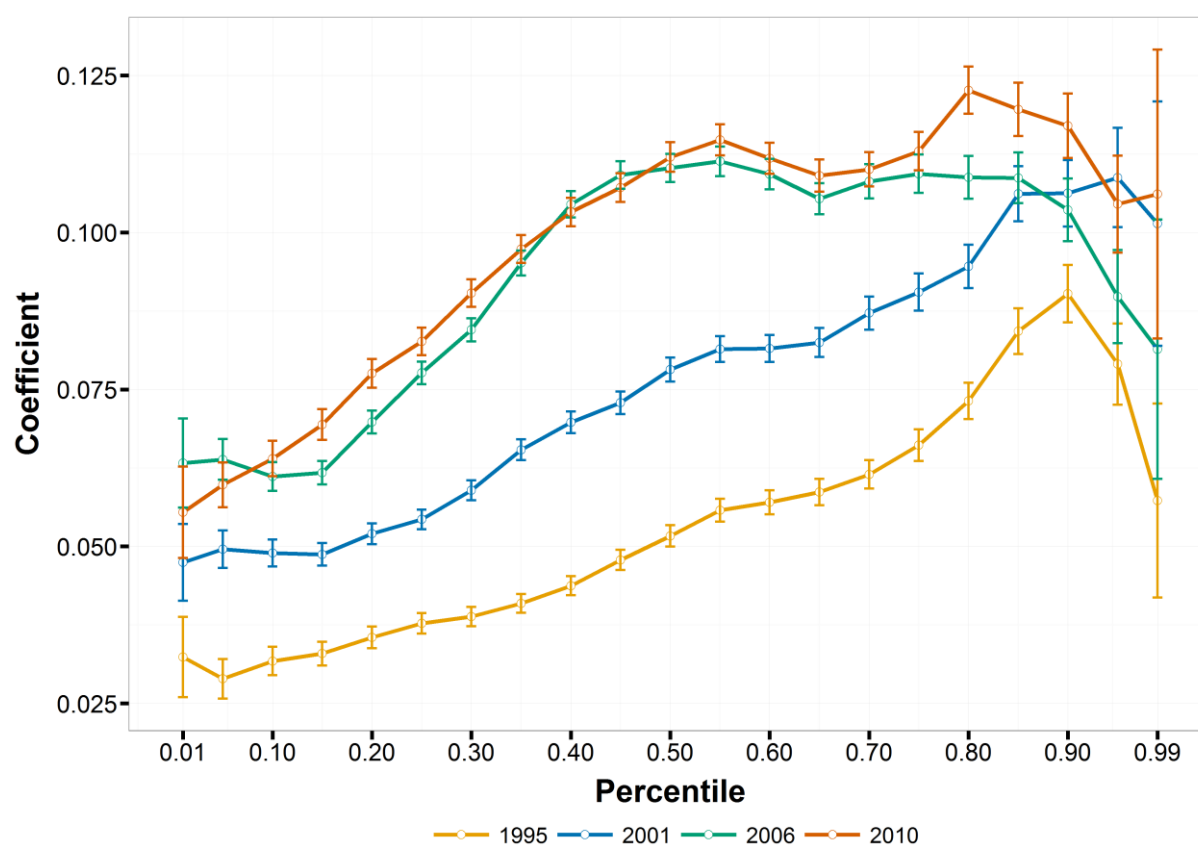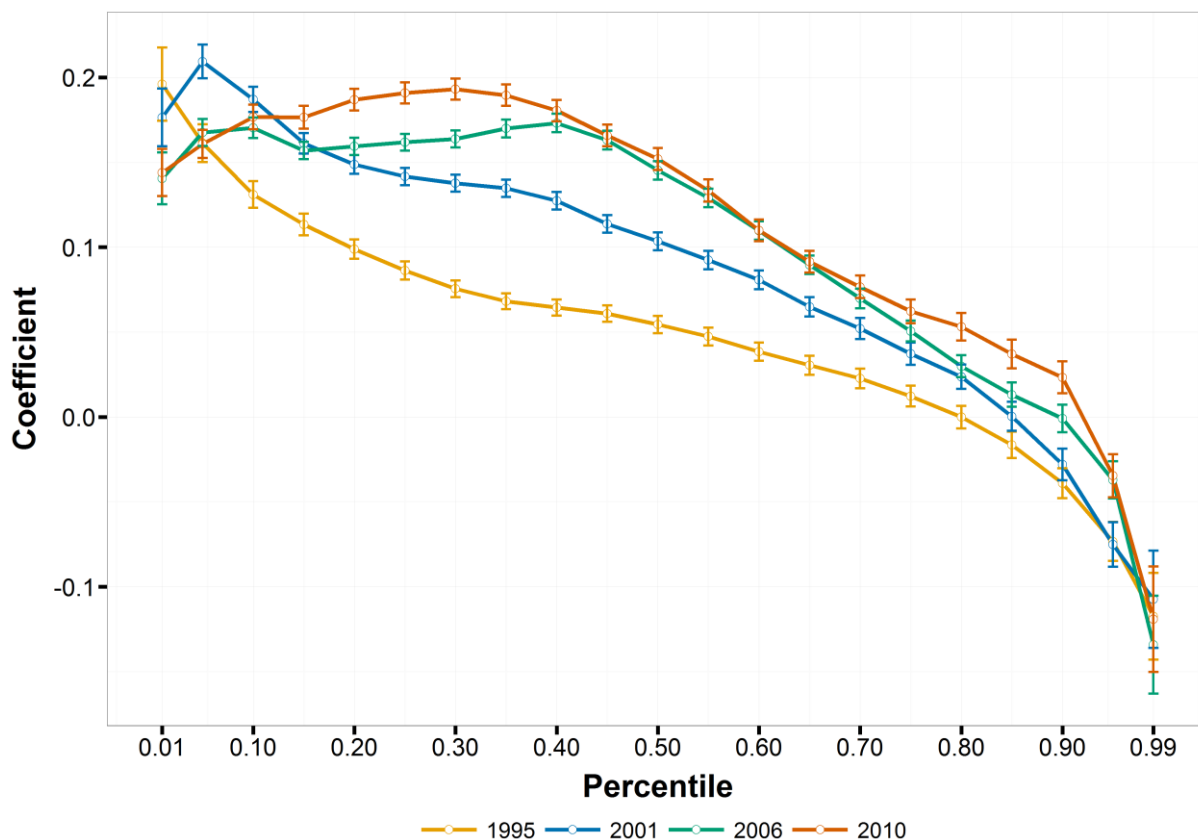
Figure 10: Effects of coverage rate on individual wages at selected quantiles (men in West Germany)

Note. Series of unconditional quantile regressions including all individual-level and firm-level controls as well as a set of industry dummies. Each point represents the effect of coverage rate by industry contract from a full model at the depicted quantile and year. Vertical lines represent a 95% confidence interval.

This first set of findings generally confirms our hypotheses regarding the effects of the three firm characteristics under consideration and their pattern over the wage distribution. We also pointed to trends in the effects over time: Generally, the effects become stronger, indicating a growing importance of the employer for wage determination.[35] But what is the impact of these changes on wage inequality? Wage inequality increased in Germany between 1995 and 2010. A natural question that follows is then, how much have the changes in the effects of firm characteristics presented in this section contributed to this rise in wage inequality? And related to that question: How much of this rise can be explained by changes in the distribution

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[35] There is a potential problem concerning the comparison of coefficients over time. The coefficients display the influence of a firm characteristic on a given quantile of the unconditional wage distribution. Because the density of the unconditional distribution is used to calculate the RIF-values, one backdrop of this method is that, if one compares effects over time, an increase of effects could also stem from changes in the density, while the influence of a firm characteristic (i.e. the "payoff" of a variable) could virtually stay the same. We additionally estimated conditional quantile regressions as a robustness check and get very similar results indicating that there are indeed changes in the payoffs of the firm characteristics.

of firm characteristics (e.g. due to or increasing flexibilization or abandoning of collective bargaining)? The following section will present the results of a series of RIF-decompositions that allow us to quantify the contribution of changes in these RIF-coefficients as well as the contribution of changes in the composition of the predictors to the change in wage inequality between 1995 and 2010.

5.4.2 Decomposition results

In a final step of our analysis we employ decomposition methods in order to quantify the influence of changes in the distribution of the Xs (composition effect, hypotheses d) and of changes in the RIF-coefficients (wage structure effect, hypotheses c) on the change in wages for all percentiles. The results of the RIF-based decompositions between the years 1995 and 2010 are presented in the Figures 11 to 14.[36] Similar to the figures above, they capture results from decompositions at each percentile ranging from the first to the 99th.

Figure 11 depicts observed differences in percentiles of log wages between the two years in conjuncture with the aggregate decomposition of these differences into composition and wage structure effects. As can be seen from the observed changes, lower quantiles (up to the 20th percentile) decreased between 1995 and 2010, while the quantiles above this mark increased. These changes were strongest in the tails of the wage distribution: The lower 10% of employees experienced severe wage losses, while the top 5% (and especially the top 1%) were able to considerably increase their wages over time. As a results, inequality rose markedly between 1995 and 2010 – especially in the lower half and the top of the distribution.

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[36] We used two Stata ados to calculate these decompositions: One is *rifreg* provided by Nicole Fortin on her website. This ado implements unconditional quantile regression as outlined in Firpo et al. 2009. The other is *oaxaca* by Jann 2008.
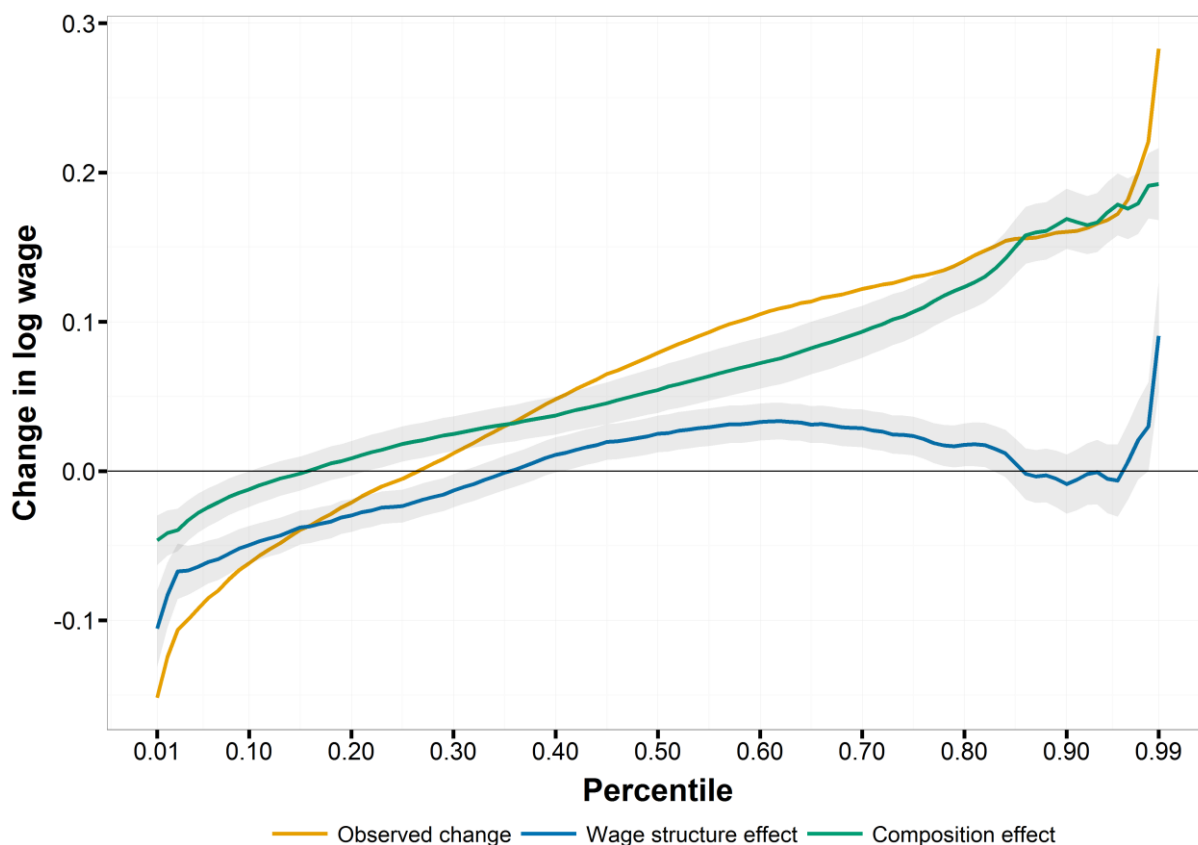
Figure 11: Observed changes in log wage between 1995 and 2010 and aggregate decomposition (men in West Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from the first to the 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.

The next step then is to explore what drives these changes over time. To this end, we construct two counterfactual distributions: First, what would the wage change look like if the composition of the workforce (i.e. the distribution of the X) had been the same at the two time points (here: the 2010 composition would prevail in 1995) and only the effects of the X (i.e. the RIF-coefficients as seen in the previous section) on wages had changed? These changes mirror the "wage structure effect". Second, what would the wage change look like, if the wage structure had stayed constant (i.e. the effects from 1995 operating at both time points) and only the distribution of the X had changed (composition effect)? Per definition, both contributions add up to the observed change at each quantile. Figure 4 illustrates these two hypothetical cases. Both compositional changes (such as the abandoning of collective bargaining) and changes in the wage structure (such as increasing effects of firm human capital) "explain" some portion of the wage changes. For example, the 90th percentile of 1995 would be 0.169 points higher, if the composition of 2010 would have been in place indicating

that compositional changes between 1995 and 2010 led to an increase of this quantile. The observed changes therefore almost entirely stem from changes in the composition (e.g. the composition effect) such as the decline in union coverage. On the other hand, the wage structure effect is small and statistically not significant meaning that changes in the RIF-coefficients do not contribute to the increase of the 90th percentile between 1995 and 2010. However, wage structure effects are significant at the lower parts of the distribution (in particular between the first and third percentile) and gain in importance especially above the 95th percentile where they "explain" a substantial portion of the change in wages.

The aggregate decomposition results are informative because they depict the general importance of changes in the levels of the predictors and changes of their effects for the change of the wage distribution. However, the aggregation does not show the contribution of individual variables to the change in wages (which could have even contradicting contributions to the overall composition or structural effects). Figures 12, 13, and 14 display the detailed results for the three firm characteristics.

Figure 12 shows the results of *mean human capital*. The wage structure effects follow an inversely u-shaped pattern with strongest positive effects around the median. As we have already seen in the previous section, the effects of mean human capital on wages increase over time and the biggest increase was found at the median. The wage structure effects are in line with this pattern: Holding the composition constant, this change leads to an increase of the depicted percentiles, predominantly around the median, contributing to the observed increase of these percentiles from 1995 to 2010. Consequently, instead of increasing wage inequality in the upper half of the distribution (which is what we expected in hypothesis 1c), changes in the effects of mean human capital on wages contribute more to an increase of wage inequality in the lower half of the wage distribution. For example, wage inequality in the lower half of the distribution (as measured by the difference of the 50th and 10th percentile) increases by 0.304 log points, whereas wage inequality in the upper half (measured by the difference of the 50th and 90th percentile) decreases by -0.333 log point. Such a pattern is consistent with the strong stand of employees with vocational training in Germany whose wages predominantly reside in the middle of the wage distribution – especially given the overrepresentation of the manufacturing sector in our sample. Only when we look at the absolute top wages (97th – 99th percentile) we find the expected strong wage structure effects which lead to a pronounced increase of wage inequality in the upper 10 percent of the distribution (0.316 log points, when measure by the 90-99 percentile difference) and again highlights the importance of changes in these top regions of the wage distribution. The results

for East Germany are more in line with our expectations, since the wage structure effects are much stronger at the upper percentiles.
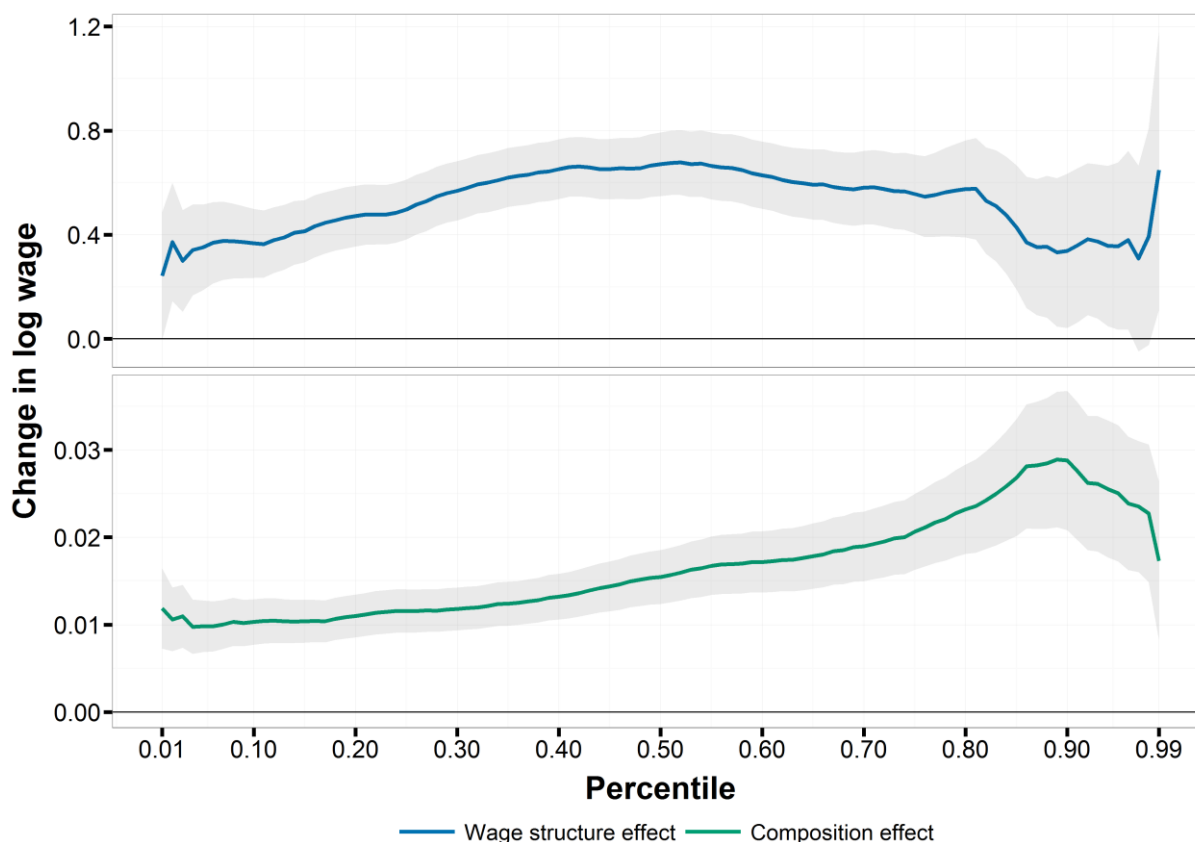
Figure 12: Detailed decomposition mean human capital (men in West Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from first to 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.

The composition effect is also positive for all percentiles. This means that the composition of mean human capital has changed in a way that all percentiles become larger between 1995 and 2010, thereby contributing to the observed increase of the 20th percentile and above (see Figure 11). In contrast, this composition effect does not explain the drop in the lower percentiles. Without these compositional changes, the drop would be even more pronounced. This pattern can be explained with the SBTC argument: Due to technological innovations the demand for qualified personnel has risen in many firms. Consequently, we can observe an increase in the mean of firm-level human capital in our sample. This compositional change lifts all percentiles, but the influence is strongest at the upper percentiles (peaking at the 9th decile) where high skilled employees are to be found leading to an increase in wage inequality, especially in the upper half. This finding is in accordance with hypotheses 1d.

In sum, changes in the distribution but primarily in the effects of mean human capital contribute to the change of the wage distribution. Because of the strong wage structure effect on the median, inequality increases in the lower half of the wage distribution, while it decreases in the upper half. This decreasing influence is slightly reduced by the small composition effect, which lifts the upper percentiles relative to the median due to an upskilling of firms.

Figure 13 displays the decomposition results for firm *stability*. The wage structure effects resemble the trends of the effects already shown in the previous section: Especially the lower to mid percentiles are higher, if we hold the composition constant between 1995 and 2010. This means that overall the wage structure effects have an inequality reducing impact because they lift the bottom quantiles relative to the median and even more so in relation to the upper quantiles (hypothesis 2c). These results are in line with findings from Lengfeld and Ohlert (2015) indicating that unskilled and low-skilled employees profit the most from stable internal labor markets.
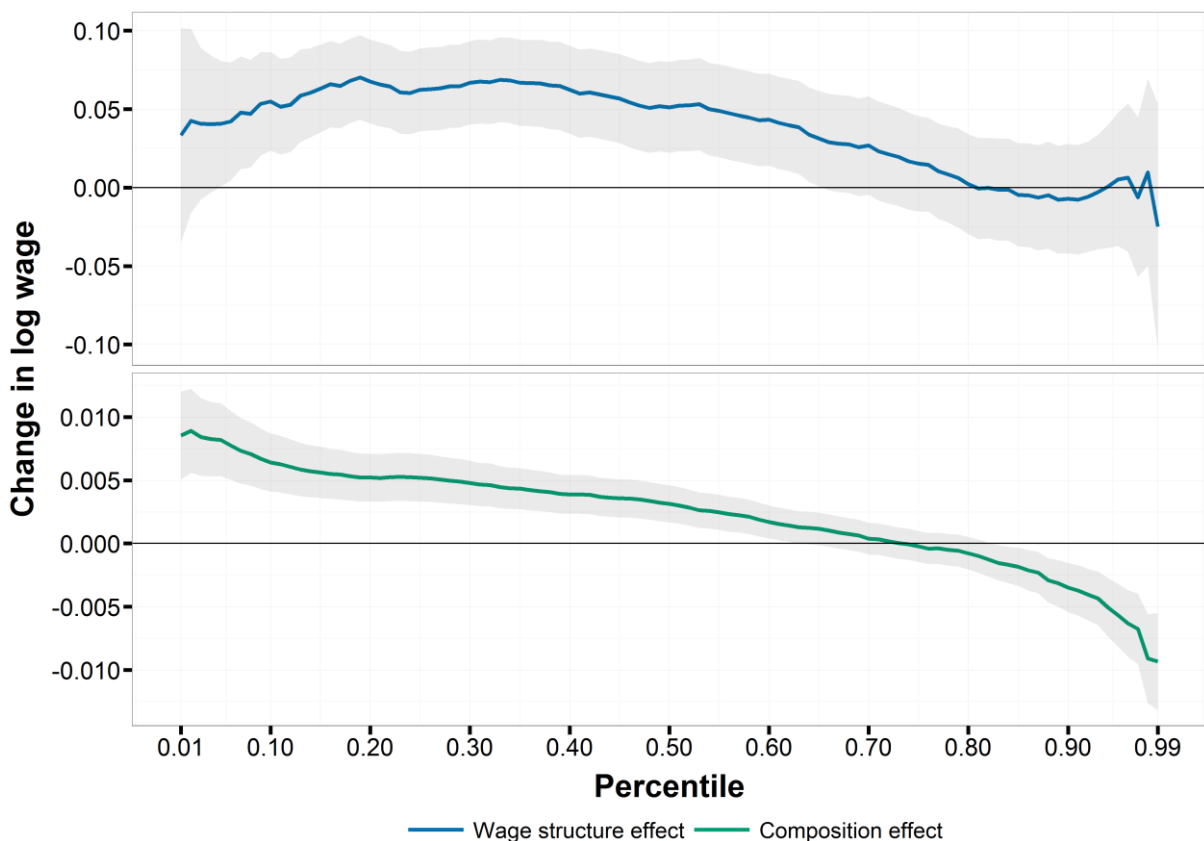
Figure 13: Detailed decomposition firm stability (men in West Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from first to 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.

Due to flexibilization and the reduction of internal labor markets we expected negative composition effects (hypothesis 2d) – especially at the bottom of the distribution. This is clearly not the case as the effects have the wrong sign (in contrast to East Germany, where we find such negative composition effects). In fact, with our data we are not able to detect flexibilization and decreasing stability (unlike e.g. Giesecke & Heisig, 2010) because the mean in stability actually increases, especially for big firms in manufacturing. It is the employees in the lower half of the distribution that profit from this change in the composition leading to a decrease in wage inequality. While this is true for Western Germany, we find the expected negative effects in Eastern Germany. In this part of Germany firm stability decreases between 1995 and 2010 leading a drop of all percentiles. However, this drop is more pronounced in the upper half of the distribution leading to a slight reduction of wage inequality.

Finally, the decomposition results for the *coverage rate by collective agreement* of a firm are shown in Figure 14. The wage structure effects are negative for the bottom of the distribution indicating that changing effects of union coverage (holding the composition constant) lead to a decrease of the lowest percentiles which contributes to the observed decrease of these percentiles between 1995 and 2010. This shows that besides leaving the collective bargaining system altogether, employers are able to reach favorable agreements within the system enabling them to cut wages of weak employees at the bottom of the distribution (Zimmer, 2015). Apart from that we find positive wage structure effects. In particular, employees around the 40th percentile profit from growing positive effects of coverage by collective agreements on wages over time. One explanation could be that unions whose bargaining power has suffered in the last decades increasingly focus on the median voter as their core clientele. The pattern of the wage structure effect over the distribution (strongly positive in the middle and negative at the bottom) thus indicates a contribution to the rise of wage inequality in the lower half of the distribution. In fact, the 50-10 percentile difference increases by 0.017 log points. We find similar patterns for East Germany and women.
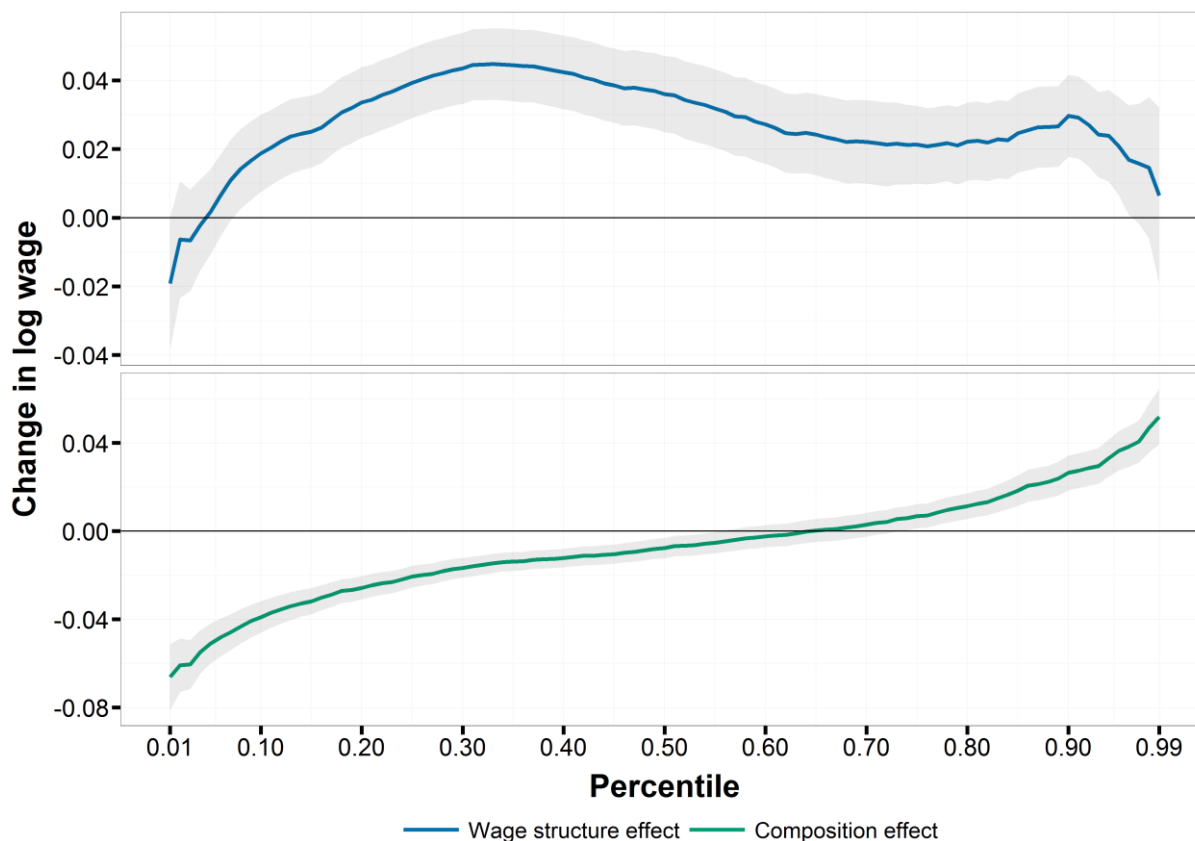
Figure 14: Detailed decomposition of coverage by collective agreement (men in West Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from first to 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.

The composition effect resembles previous findings for Germany (e.g. Dustmann et al. 2009). The change of the coverage rate by industry-level contracts between 1995 and 2010 leading to a pronounced drop of all quantiles below the 6th decile. The shrinking coverage of workers by collective bargaining agreements is responsible for the decreasing wages of workers at the lower end of the wage distribution (hypothesis 3d). At the same time, quantiles above the 8th decile are lifted by this change in the composition. Thus, the great decline in coverage by collective bargaining, which can be observed in Germany and many other countries, contributes to rising wage inequality in Germany between 1995 and 2010 to a quite large extent (0.065 log points when measured by the 90-10 percentile difference). Dustmann et al. (2009) find similar effects using a different decomposition technique. The composition effect for men in East Germany is negative for all percentiles and even slightly negative for upper quantiles, which indicates that the abandoning of the collective bargaining system led to a

decrease of all quantiles between 1995 and 2010, although the decrease is much stronger at the median.

5.5 Conclusion

Germany has seen a significant rise in wage inequality over the last two decades. Although there are now theoretical expositions available that exceed the simple supply and demand framework of the "SBTC"-thesis by incorporating structural factors of the labor market, empirical research has been mainly bound to individual-level analyses. In this paper we make use of linked employer-employee datasets in order to explore the organizational contribution to rising wage inequality. We perceive work organizations to be the central place where inequality is produced. Firm-specific wage determination mechanisms that are institutionalized in pay and mobility regimes govern a firm's overall wage level, as well as the distribution of wages within the firm. An employee's wage is also dependent on the employer, irrespective of the employee's personal attributes. The question then becomes not one of diverging evaluation of personal characteristics by the market, but rather one of changing organizational pay regimes in the face of substantial trends in the environment and their effects on individual wages.

We looked at three firm characteristics that are associated with certain pay regimes and analyze their influence on wages with four samples of the GSES (1995, 2001, 2006, and 2010) focusing on men in Western Germany. In all, the results for East Germany slightly differ from the West in a way that makes them more in line with our expectation. The results for women are very similar to men's in their respective part of the country. Employing unconditional quantile regression we find that all three firm characteristics, namely mean human capital, firm stability, and coverage rate by collective agreements, influence individual wages net of employee characteristics. Additionally, there are substantial differences depending on the location on the wage distribution. All employees receive a wage premium for being employed in a firm that has a high human capital usage, but it is the most valuable employees (and possibly also the highly qualified ones) that profit the most. On the other hand, it is the low wage (and possibly low qualified) groups that gain the biggest advantage from a firm's stability and coverage rate, whereas top wage groups are even disadvantaged. Furthermore, these effects mostly grow over time, but again there is much variation along the wage distribution. The increase is strongest around the median and the very top percentiles for mean human

capital. For coverage by collective agreement and stability the effects grow markedly at the lower to mid percentiles.

Our second analysis consisted of a series of detailed RIF-decompositions between the years 1995 and 2010 revealing an impact of the changes in these effects as well as changes in the composition of the three firm characteristics on the change in wage inequality. The changes in the wage structure of all three firm characteristics contribute to the rise of wage inequality in particular in the lower half of the distribution. But we also find evidence that changes in the effects of mean human capital contribute to the rise in wage inequality at the very top of the distribution.

Besides changes in the wage structure we also expected compositional changes to have an effect on the change in wage inequality. In the case of coverage we suggested that it is not changing coverage rate effects that drive the rise in wage inequality. Instead, the declining number of covered firms should lead to more wage dispersion, given that the switch from the covered to the uncovered status is accompanied with an adaption of pay regimes. The results of the decomposition support this view. Although the wage distribution is compressed in (a declining number of) covered firms, inequality rises due to increasing between-firm effects as well as a substantial composition effect. In addition, compositional changes in mean human capital increase inequality in the upper half of the wage distribution, while changes of firm stability seem to reduce it.

These changes in the wage structure as well as in the composition reflect reactions of firms to environmental pressures. They try to apply situationally-valid strategies that changes the claims-making in the firm and thus alter previous pay regimes. As a result, firms' pay regimes become more and more diverse and differences in mean pay levels between firms increase. It is thus of growing importance for individual success to find the *right* employer. By destroying rents for low wage groups, while on the same time groups in the middle of the wage distribution retain or even increase their advantages such changes on the firm level increase inequality especially in the lower half of the distribution. In case of mean human capital we also find considerable premiums for the top 3% of the wages distribution increasing inequality at the top. We attribute this to bonus payments that are increasingly common for top earners. Seemingly, firms with high human capital share their profit with these employees.

Our results highlight the advantages as well as the need to incorporate work organizations in stratification research. Wage setting processes can only be understood fully when employees and employers are analyzed simultaneously. Researchers should make more use of now widely

accessible LEED, not only for analyses of rising wage inequality, but also for a variety of other questions (the (re-)production of gender or ethnic inequalities at the workplace, manager salaries and bonuses, etc.). By using such datasets in this work, we were able to demonstrate that developments at the firm level contribute to rising wage inequality in Germany.

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6 Study 3 – Organizational environments and bonus payments: rent destruction or rent sharing?

6.1 Introduction

Several recent studies on rising wage inequality have focused on bonus payments because these payments constitute a considerable contribution to the income of high wage earners – in particular at the upper end of the wage distribution where the effect on overall inequality is strongest (Autor, Katz, & Kearney, 2008; Barth, Bratsberg, Haegeland, & Raaum, 2012; Bebchuk & Grinstein, 2005; Bell & van Reenen, 2010; Pannenberg & Spieß, 2004; Sommerfeld, 2012). That is, bonus payments are an essential element of wage inequality. For instance, Lemieux, MacLeod, and Parent (2009) show that as much as 21% of the rise in overall inequality can be traced back to changes in performance payments.

These results draw attention to the role of firms in generating wage inequality. Bonus payments can be viewed as a part of a firm's pay regime that makes wages more flexible, either because bonus payments are directly tied to the performance of workers and/or firms (performance related pay, PRP) or because bonus payments are granted voluntarily by firms (i.e. in addition to contracted wages). This means that the bonus payments can be easily cancelled if the economy slows or other events urge firms to cut labor costs. Thus the question arises whether firms differ in their use of bonus payments and how firms adapt their payments to changing environments.

In particular, bonuses that are paid irregularly (e.g. infrequent lump sums as a year-end bonus) need attention since they may make up a large share of wages, especially for the top-earners, but are disregarded when measuring wages on a weekly basis (Bell & van Reenen, 2010). This paper investigates the development of irregular paid bonuses in Germany using the German Structure of Earnings Survey (GSES, four samples: 1995, 2001, 2006, and 2010). These datasets have some drawbacks, but also some striking advantages: data quality is high, with almost no top coding present, and they provide large numbers of observations – features that are especially important when looking at top wages and bonus payments.

Though bonus payments are more important at the upper end of the wage distribution, they are also common at the lower end, especially when both performance and non-performance based bonus payments are taken into account. In contrast to previous studies that focus on performance payments and/or higher wages we include all types of irregularly paid bonuses and investigate their role for the whole wage distribution. Results show that indeed bonus payments affect wage inequality over the whole distribution, but different mechanisms are

revealed for small and large bonuses[37]: Small bonuses (which are paid to people with small base wages/low qualifications) steadily decline, reflecting firms' intention to cut costs and thereby destroying rents, while larger bonuses are more volatile, rising for a considerable period of time (pointing to rent sharing between employers and more powerful employees) but experiencing a cut due to the financial crisis. These developments result in a larger, more rapidly increasing overall wage inequality as compared to the inequality in base wages up to 2006, but a slower increase from 2006 to 2010.[38]

The main focus of this paper lies on the role that firm characteristics play for bonus payments. While high-skill-firms pay larger bonuses (in particular at the upper end of the bonus distribution), collective bargaining regimes are important for the receivers of small bonuses. Firms' stability also plays an important role: it favors receivers of small bonuses, while instability is more advantageous for the receivers of large bonuses. These patterns reflect the two very different mechanisms behind bonus payments at different parts of the wage distribution: While small bonuses for low base wage receivers reflect collective power relations, the larger bonuses are more subject to individualistic strategies of social closure.

6.2 The generation of bonus inequality

Firms use a huge variety of extra-payments. Some of them are paid in the same period as the base wage (as extra pay for overtime hours or shift work), some are paid irregularly as Christmas allowances (which provide fixed amounts of money), or commissions and stock options (paying variable amounts of money). Some depend on the effort of the employee receiving the bonus payment or the overall success of the firm (commonly called "performance pay"), others are independent of performance, the amount of money paid being agreed upon in bargaining agreements or reflecting the custom of the corporate culture. We focus here on *irregular* payments. These kinds of payments may make up a large share of the total wages

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[37] Commonly in studies on wage inequality, the "lower end" of the wage distribution is distinguished from the "upper end", reflecting that different mechanisms affect smaller vs. larger wages; as such, we distinguish "small bonuses" vs. "large bonuses" referring to the lower vs. upper end of the bonus distribution since we want to establish that different mechanisms are at work here as well.

[38] In the following, we investigate three different kinds of distributions: Inequality of base wages, inequality of bonuses, and inequality of wages when bonuses are included (total wages). The last one we refer to as "overall-inequality".

especially for top wage earners, and are welcome supplements for workers at the lower end of the wage distribution.[39]

Since it can be assumed that different wage determination processes are working for base wages and bonuses (Lemieux et al., 2009), a separate investigation of these two components of wages is necessary for a full understanding of mechanisms driving overall wage inequality. We focus here on the latter component, including all types of irregular payments, considering not only performance payments as many previous studies do (e.g. Pannenberg & Spieß, 2004) because we assume that non-performance related payments also contribute considerably to wage inequality.[40] Below we outline the theoretical arguments that allow formulating hypotheses about the impact of a firm's characteristics on irregular payments.

6.2.1 The relational model of wage inequality

Usually bonuses are viewed as incentives to enhance productivity, because either such payments attract highly qualified workers or they motivate the employees already in the firm. Performance related payments (PRP) in particular are believed to encourage motivational power which is in line with efficiency wage theory (Akerlof, 1984) and solve an agency problem in the firm (Bebchuk & Fried, 2003). Many studies of bonus payments investigate the extent to which the goal of enhanced productivity is achieved by PRP (Hall & Liebman, 1998; Himmelberg & Hubbard, 2000). From this point of view, the determination of bonuses follows the rules that are outlined by the human capital approach widely used in economic research: the more productive workers are, the higher the bonuses they receive.

But sociological approaches to explain wage inequality (and thereby inequality of bonus payments) raise doubts about whether the human capital approach is an appropriate model to explicate the wage determination process in general and bonus payments in particular. The relational inequality theory (RIT) underlines that wages always result from bargaining processes between "actors embedded in a set of social relations within organizations" (Avent-Holt & Tomaskovic-Devey, 2014, p. 379). These actors claim, "that they deserve some portion of the revenue stream," and these claims are met when other influential actors agree, "legitimating the funneling of the claimed portion of revenue to the actor" (Avent-Holt &

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[39] The mean share of irregular bonus payments of the total wage amounts to 20% for the top percentile in our data. Others, e.g. Bell & van Reenen (2010) who use a broader definition of bonuses (i.e. not only irregular), find that bonuses can constitute up to 40% of the total wage for the top percentile.

[40] Beyond substantial reasons for including all types of irregular payments, the data urges us to proceed in this manner because the GSES only distinguishes between regular payments and irregular payments. While we believe that there are good reasons to take all types of irregular payments into account we regret that the data does not allow us to single out the contribution of the different types of irregular payments.

Tomaskovic-Devey, 2014, p. 385). Claims to wages are based on "categorical distinctions," which might be related to productivity, education, or experience – but this relation is not as close as human capital theory assumes. Claims can also be based on categorical distinctions such as gender, ethnicity, union status, or other factors that are unrelated to productivity.

These claims vary in the degree of legitimacy and power with which they can be enforced, with both factors depending on the environmental contexts of the organization. *Institutional contexts* define expectations for the actors which enhance or diminish the legitimacy and power of certain claims. For example, in Germany employment regulations give a strong weight to claims which are based on collective bargaining or stable employment relationships. These employment regulations create power resources for employees who are subject to the regulations, allowing collective strategies of social closure. At the same time, these regulations are widely accepted as legitimate in Germany, thus legitimating the claims of the respective employees. *Competitive contexts* give more weight to claims which are based on productivity-related categorical distinctions.[41] For instance, when high-skill firms compete in markets where high quality products are sold, claims of highly qualified employees who are needed to produce the respective goods gain power and legitimacy in the bargaining process.

From the point of view of RIT, the human capital approach describes only a special case of wage determination, coming into effect when organizations are embedded in strong competitive, but weak institutional contexts, giving productivity-related categorical distinctions the most legitimacy possible and suppressing the impact of power relations that cannot be derived from supply and demand relations on bargaining processes. But usually, claims are subject to power relations beyond the "market power," and institutional contexts legitimate claims which are not productivity related, so that the marginal product theorem of human capital theory does not hold.

Employees being paid more than their productivity would demand and receive a "rent" (Sørensen, 1983), meaning that they are *paid more than they deserve*, while employees who earn less than their productivity equivalent would be "exploited," earning less than they deserve.[42] Even though productivity is hard to measure, because rents or exploitation are difficult to observe, these concepts play an important role in the bargaining process,

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[41] If organizations are neither embedded in strong institutional contexts nor in strong competitive contexts, local (organization specific) wage determination procedures gain weight, allowing for more variation in the wage determination process between organizations (c.f. Avent-Holt & Tomaskovic-Devey, 2014, p. 392).

[42] For a discussion of exploitation and closure (referred to as "opportunity hoarding") in the relational model see Tomaskovic-Devey (2014).

strengthening or weakening the legitimation of claims and being a source of economic conflicts (Sørensen, 2000a, 2000b).

Whether or not rents can be generated by employees depends on two factors. First and foremost, the organization's revenue places the limiting condition on aggregate wage distribution (Avent-Holt & Tomaskovic-Devey, 2014, p. 390). Organizations that generate rents in the product market (for example by using monopolies based on technological innovations) have large enough revenues to pay rents to their workforce, while organizations in highly competitive contexts may be forced to avoid rents as much as possible. Second, the ability of generating rents depends on the power of the worker and the legitimacy of their claims as derived from their categorical distinctions relevant for their relations to the other workers in the organization.

6.2.2 Effects of firm characteristics on bonus payments

Three empirical expectations can be derived from the relational model (Avent-Holt & Tomaskovic-Devey, 2014, pp. 390-393): 1. Organizations affect wage inequality (above and beyond individual characteristics as predicted by human capital theory); 2. The impact of individual characteristics on wages varies between organizations; and 3. Organizational environments influence wage distribution.[43] In the following, we exploit this conceptual framework to formulate hypotheses about the impact of organizational characteristics on bonus payments.

For our analyses, we use three characteristics of firms: level of human capital in the firm, firm stability, and the type of bargaining regime (collective vs. individual bargaining). These characteristics are viewed as indicators which inform us about the organizational environment enabling some groups of employees (defined by a set of categorical distinctions) to enforce their claims while others have to concede drawbacks. Additionally, the impact of changes in the organizational environment on bonus payments is revealed by comparison of the effects of organizational characteristics on these payments over time.

When speaking of the "relations of actors in the firm" we focus on two types of cleavages in the firm. For one, the two main groups of actors are employer vs. employees, with both of

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[43] The impact of organizational environments on workers' claims often involves a two-step process: The environment of an organization (e.g. competitiveness of markets) shapes an organization's structure (e.g. makes employment relations unstable). These structures are in turn contexts for individual claims (unstable employment relations weaken the power base of claims). Presupposing the environment's impact on structures we use the organizational characteristics as indicators of these environments and use the terms "organization's environment" and "organizational context" interchangeably.

them trying to maximize their rents. Since we estimate the effects of organizational characteristics on bonuses that are wage components (and not profits), employer rent maximization can be detected by organizational effects that decrease bonuses and vice versa: organizational effects that increase bonus payments diminish rents of employers. For another, the success or failure of claims based on different categorical distinctions of employees is revealed by investigating the varying impact of firm's characteristics over the bonus distribution: effects of organizational characteristics at different points of the bonus distribution show how successful the claims of different types of employees are. From the considerations outlined so far we derive three hypotheses.

First, we expect bonuses to be higher in firms with a high level of human capital[44] (in the following referred to as "high-skill firms") since this characteristic indicates the usage of complex technologies. This allows firms to produce and sell high quality goods or services (product innovation) in markets which allow the generation of rents because of (at least temporary) monopolies, and firms will share these rents to a certain extent to attract and motivate the personnel needed to run these complex technologies (Van Reenen, 1996b). In addition, the adoption of newer technologies allows for process innovation (e.g. more efficient work organization), whose expected efficiency gains might also generate (quasi-) rents. However, the lion's share of rents goes to the upper ranks, since the claims of the higher qualified workers in the firm gain legitimacy and power in this type of environment.[45] So we arrive at a related hypothesis:

H1a: The mean level of human capital in a firm has a strong positive impact on the amounts of bonuses paid, in particular at the upper end of the distribution of bonuses.

Second, employment stability is a power and legitimation resource as well. Firms with a high share of newly hired workers – these are firms with high turnover and/or newly founded firms that are potentially under pressure from competitors – are better able to destroy rents since the wage setting mechanism is not constrained by seniority rights of workers, custom of the

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[44] It is important to distinguish this firm characteristic as a context effect from the effects of individual human capital. Of course, we can observe a selection effect: High-skill firms pay on average higher bonuses because the workforce that is employed in such firms is more qualified. But on top of that, high-skill firms pay more since rents are to be shared – meaning that workers *at all educational levels* will earn more in high-skill firms than in low-skill firms. We ensure the operationalization of mean human capital as a context effect by controlling for individual human capital in the respective wage equations, see the methodological section.

[45] For instance, legitimacy would be derived from narratives which underline and praise the high value of knowledge in modern times. Power would be derived from the increasing information asymmetries that come with new technologies.

wage setting regime and so on; e.g. Christmas allowances are more easily abandoned if firms are newly founded (and may not be given at all) or employment in these firms is instable. But seniority rights and other facets of employment stability favor the claims of actors at the lower part of the bonus distribution while the more qualified workers who receive the larger bonuses may gain advantages of mobility between firms, especially in Germany's occupationally structured labor market.

H1b: Firm stability affects bonus payments positively at the lower part of the bonus distribution and negatively at the upper part.

We also expect that collective bargaining – the process through which power relations enter the wage setting process most obviously – has an influence on bonuses, but affects different types of bonuses differently. Unions try to avert individual performance payments preferring not to have bonus payments systems at all or to have group bonus systems which compress wages (Barth et al., 2012). On the other hand, unions try to establish and to raise non-performance related bonuses such as Christmas allowances. Since the latter prevail in the low-bonus area while the former are more prominent in the high-bonus area, we expect:

H1c: Collective bargaining heightens the low bonuses and lessens the high bonuses.

In sum, we expect different processes at work at the upper and the lower part of the bonus distribution. In the upper part, highly qualified employees can raise claims which are more legitimate especially in contexts where qualified employees using advanced technologies are able to create rents, which then are shared between employers and these employees ("composite rents" in the language of closure theory (Sørensen, 2000a). In the lower parts of the distribution, institutional contexts including collective bargaining regimes, employment protection or seniority are more important, strengthening the claims of certain groups of employees whose categorical distinctions are target of these institutional regulations, resulting in "monopoly rents" for these groups.

6.2.3 Development over time

In general, bonus payments should develop as base wages, for which a markedly increasing inequality has been observed – i.e. low wages have become lower and high wages have increased. Still it is not clear what the main driving factors of the rising inequality are: globalization (Alderson & Nielsen, 2002) financialization (Lin & Tomaskovic-Devey, 2013) and technological change (Acemoglu, 2002; Lemieux, 2008) are the main candidates under discussion. However, it seems clear that supply and demand factors (the "skill-biased

technological change" – these being the most prominent here) as well as institutional factors (affecting power relations between and legitimacy of claims of different groups in the labor market) resulting from these developments have shaped the pay regimes of firms. The former are more important for the upper tail of the wage distribution: Skill biased technological change (SBTC) drives wages of highly qualified workers up.[46] The latter are more important for lower wages, especially in Germany: erosion of collective bargaining regimes, spread of atypical employment and changes in welfare regulations diminish low wages even more. In other words: the *institutional contexts* have changed in a way that monopoly rents of the groups at the lower end of the wage distribution have declined while changes to the *competitive contexts* have strengthened the claims of the groups at the upper end of the wage distribution.

We expect the same processes at work concerning the distribution of bonus payments, but with some modifications especially at the upper end because bonus payments are more volatile (i.e. means to make wages more flexible) than base wage payments.

Lower bonus payments shrink over time because firms try to reduce costs (i.e. try to cut wages for the less powerful employees) reacting to changing environments; indeed, employers recently often made claims to cut wages for the unqualified in particular, calling for a "low wage sector." Bonus payments should be affected even more than the base wages because they can be cut more easily. This should especially be the case for the unprotected areas of the labor market. So we formulate our next hypothesis:

H2a: Effects of collective bargaining processes and stability of firms on lower bonus payments increase, while effects of mean human capital should not change much over time in this area of the bonus distribution.

The parallels to base wages are not as clear at the *upper end of the distribution* because bonus payments are more volatile reflecting changes to the competitive environment. That means that we expect them to increase even faster than base wages at the upper end (as predicted by financialization, globalization and SBTC-theses) – but only up to 2006. The 2010 survey should reflect the financial crises and the reduction of high bonus payments in reaction to this crisis.

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[46] There are some variants of the SBTC which can explain the increasing inequality at the lower end also (Autor et al., 2008; Dustmann, Ludsteck, & Schönberg, 2009; Goos & Manning, 2007), but here institutional factors seem to play a more important role (c.f. Dustmann et al., 2009).

H2b: Increasing competition due to globalization and financialization should enhance the effect of mean human capital on higher bonus payments but only up to 2006.

There are no changes to expect stemming from stability of firms or collective bargaining at the upper end of the bonus distribution since these are only relevant for the lower parts of the distribution as outlined above.

6.3 Data and analytical strategy

6.3.1 Data

We use four samples (1995, 2001, 2006 and 2010) of the German Structure of Earnings Survey (GSES, "Gehalts- und Lohnstrukturerhebung"; since 2006 the surveys are called "Verdienst-strukturerhebung") for our empirical analysis (c.f. Günther (2013) for an extensive description). The GSES is a cross-sectional linked-employer-employee dataset (LEED) which is sampled in two steps: In the first stage, firms with a minimum of ten employees are randomly drawn from the business register within each federal state of Germany ("Bundesland"). In the second stage, individuals are sampled within the selected firms.[47] "Firm" refers to the actual establishment at which the individual is employed. This can either be an individual establishment or a plant/subsidiary of a larger principal enterprise.[48]

The GSES is one of the biggest LEED available for Germany allowing for very detailed analyses. Because the responses are mandatory for employers, the data quality is high and more reliable than individual-level household surveys. Furthermore, there is no censoring of the wage information. In 1995 only extremely high wages were top-coded (at 25,000 DM per month equivalent to 12,782 Euro). Since 2001, wages have been reported without any censoring. These features make the GSES a good choice for research targeting wage inequality, especially when top earnings are the focus of investigation. We limit our analysis to bonus-receiving male full-time employees aged 16 to 65 in West Germany.[49] In addition, we also take only firms with at least ten employees into account.

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[47] We used sample weights in all of our analyses to correct for the stratified two-staged sample. The target population of the sample from 2010 is the entire German economy (with some marginal exceptions). The respective target populations of the earlier samples (2006, 2001, and especially 1995) are smaller because fewer industries belonged to the sampling frame.

[48] In the following, we use the terms firm, plant, establishment, and workplace interchangeably.

[49] We restrict our sample in this way because we expect different inequality producing mechanisms for men compared to women. Furthermore, the situation in Eastern Germany is still quite different, which also suggests separate analyses (see e.g. Card, Heining, & Kline (2013) for a similar sample selection). In addition to the noted selection, we excluded observations based on plausibility checks (e.g. employees

The GSES poses some problems when looking at the development of bonus inequality. The samples become more diverse over time, gradually incorporating more industries and employment status. In order to ensure comparability, we harmonized the samples by dropping all employment types and industries in the later samples that were not already sampled in 1995.[50] As a result, we are mainly left with firms in the manufacturing sector and only some industries from the service sector, mostly financial services and retail trade.[51] We tried to assess the impact of this decision for the years 2001, 2006 and 2010 by comparing our reduced samples with the full samples that include all industries. Although the bonus level is generally lower and bonus inequality (as well as overall inequality) is higher in the full samples, the differences are not large. When we examine 2010, the year we expect there to be the biggest differences between the two, we find that the mean bonus level in the full sample is about €15 lower than in the reduced sample and bonus inequality is 4.12 points higher as measured by the 90/10 quantile ratio. Given the facts that (a) the manufacturing sector is still quantitatively large and makes a significant contribution to GNP in Germany and (b) some industries from the service sector are still included, we think that the reduced sample is a solid representation of the German economy. However, because bonus inequality itself as well as the overall increase in bonus inequality is slightly more pronounced in the industries not included in the sample, it is likely that we underestimate the contribution of bonuses to increasing wage inequality.

6.3.2 Variables

The GSES not only includes regular monthly earnings, but also the amount of all irregular additional payments that are paid during the observation year. One drawback of this variable is that it mixes a wide variety of different payments. Ideally, we would have liked to distinguish between variable performance related components (profit-sharing, premiums, stock options) and fixed ones (commissions, 13th monthly salary installment, Christmas and vacation pay) as they represent quite different inequality producing mechanisms. So our definition of "bonus" should not be confused with the operationalization of other studies that explicitly analyze PRP only (e.g. Lemieux et al., 2009).

Our descriptive analyses use deflated monthly bonuses in Euros computed from the information about irregular bonuses received in the current year as a dependent variable. This

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working more than 400 hours per month). We further excluded employees with bonus payments of less than €1 in order to ensure comparability for the absolute and log dependent bonus variable.

[50] That means we exclude employees in occupational training, public service, partial retirement and marginal employment from the later surveys.

[51] A detailed list of all included industry variables with 2-digit codes from the German Classification of Economic Activities (WZ93) can be found in Table A1 in the appendix.

monthly measure gives a quite intuitive measure of bonus payments. In section 4.1.3 we assess the impact of bonuses on the rise of wage inequality in Germany. Here we use two different wage measures: One is the log hourly gross *base* wage measured in Euros per hour computed by dividing deflated monthly gross wages (without irregular bonuses) by actual working hours and then taking the logarithm in order to adjust for the (right) skewness of the distribution.[52] The other is constructed in the same way but uses the *total* wage (base wage + irregular bonuses) the respondent received.

The multivariate analysis focuses on firm-level variables. The three firm characteristics are operationalized as follows: *Mean firm-level human capital* is measured by the average years of schooling of the employees within a given firm and tries to capture the technological level of the firm. As an indicator of *stability,* we calculate the proportion of employees that have worked for more than three years in the given firm. We choose this boundary in order to capture the share of employment relationships that were meant to be permanent in comparison to others that are easily replaceable. An additional institutional rational for the three year boundary are different statutory schemes in the past altering the maximum duration of fixed-term contracts in Germany. The three year boundary ensures that these employment relations are not mistakenly categorized as non-permanent.[53] Finally, we use individual-level coverage information to calculate the *coverage rate* in a firm.[54] We distinguish between firm-level or in-house agreements that are only valid for a specific firm and sectoral or industry-wide agreements. Since sectoral agreements are the dominant type in the German centralistic system we focus on this type of contract and include firm-level agreements only as a control variable. This operationalization is a good representation of the German bargaining system where covered firms typically recognize collective bargaining outcomes for most of their employees and not only for union members. However, there are often some employees who are not covered even if the firm has recognized collective contracts, so it makes sense to have a continuous indicator for coverage to capture a firm's commitment to collective bargaining (Fitzenberger, Kohn, & Wang, 2011).

We also make use of several additional control variables at the firm and individual level. First, we include a measure of *firm size*. Furthermore, we control for the *gender composition in the*

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[52] The monthly gross wage does, however, include *regular* bonuses paid on a monthly basis.

[53] The results are not sensitive to this decision. Experiments with two and five year boundaries produced similar results.

[54] Since we do not observe all employees in the firm (because in most firms a sample is drawn from the entire workforce) the coefficients of these aggregated firm-level variables reported in section 4.2 and 4.3 may be attenuated due to measurement error.

firm and the *industrial sector* in which the firm is located. On the individual level we make use of several measures of general resp. specific human capital including *years of schooling*, *age* and *tenure*. We also have information on whether a contract is *fixed-term* in contrast to a permanent contract. Because the former offers much less dismissal protection we use this measure as an indicator for open positions. Finally, we include a dummy that indicates whether or not an employee is in a *manager position*. For a complete list of variables used and their distributional statistics, see Table A1 in the appendix.

6.3.3 Analytical strategy

First we provide descriptive analyses regarding the incidence of bonus payments, the amounts paid and trends over time, and the overall impact on wage inequality. Following that, our core interests lie in the organizational determinants of bonuses. Since we assume different mechanisms at different parts of the distribution, we employ (unconditional) quantile regression instead of a standard OLS regression. However, one problem with standard quantile regression is that the coefficients can only be interpreted as the influence of independent variables on the *conditional* quantile, which – unlike linear regression – are different from the effects on the marginal (or unconditional) distribution. Although the conditional interpretation may be useful, it is typically the latter interpretation that is of interest in inequality research. We therefore employ a method developed by Firpo, Fontin, and Lemieux (2009) called *unconditional* quantile regression. The authors use influence functions (IF), a well-known concept in robust statistics, and show that a standard OLS regression of the values of a re-centered influence function (RIF) on a set of predictors shows the influence of these variables on the marginal (unconditional) quantile of the wage distribution.

In order to further illustrate the effects of firm characteristics on the bonus distribution and their change over time, we employ a decomposition method based on these RIF-Regressions (Fortin, Lemieux, & Firpo, 2011). With this method, changes in quantiles between two points in time can be decomposed into a *composition effect* that shows the effects of compositional changes in the workforce between the two points in time (e.g. with respect to education, tenure etc.) on the bonus distribution and a *structure effect* that quantifies how changes in effects that group characteristics have on bonuses alters the bonus distribution.

6.4 Results and discussion

We first present the descriptive results regarding the distribution of bonus payments in Germany, its development, and its influence on total wage inequality (section 4.1). In section

4.2 findings from the multivariate models are discussed. Finally, in section 4.3, we show the results of a RIF-decomposition between 1995 and 2010 at selected quantiles.

6.4.1 Descriptive findings

Incidence of bonus payments in Germany between 1995 and 2010

Bonuses are a very common phenomenon in the West German labor market. In our data, almost every employee receives some kind of irregular payment. These numbers show a slight upward trend: In 1995, 88.5% of all employees received such payments and 89.9% in 2010. Because we cannot distinguish between different forms of additional payments, we are not able to identify shifts in how the different components were used. Presumably the increase in the share of performance related pay components (being more important for the upper part of the bonus distribution) that is documented in other studies (Sommerfeld, 2012) has been counterbalanced by a shrinking share of non-performance related bonuses (being more relevant for the lower part of the bonus distribution). Both trends might have led to the relatively stable shares of bonus receivers in our data. Only the base wage group of the lowest one percent shows a clear trend of falling bonus incidences from 56.6% to 52.5% in 2010, hinting at the fact that the share of lower bonuses declined.

To explore the development of the incidence of the different bonus components in more detail we use data from the German Socio-Economic Panel (GSOEP) (c.f. Wagner, Frick, & Schupp, 2007) that allow us to distinguish at least some types of bonus payments. Figure 15 shows the proportion of employees that receive a 13th monthly salary installment, a Christmas bonus, a vacation bonus or profit-sharing from 1995 to 2010. This shows that in 1995 fixed payments such as a 13th monthly salary installment and Christmas payments were important wage components for the majority of the labor force, while only about 10% of the employees received payments from profit-sharing. Over time the picture changes remarkably. The proportion of employees with fixed additional payments steadily declines, while profit-sharing applies to about 20% of all employees in 2009.[55] We gain two insights from these results: First, fixed bonus payments are reduced. If our assumption is correct and this reduction hits especially low base wage groups, we would expect increasing total wage inequality due to the exclusion of low base wage groups from valuable additional pay components. Second, this

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[55] As a result, the proportion of employees that is excluded from any kind of additional payment increases to almost 28% (from about 10% in 1995). This proportion is higher in the GSOEP than in the GSES. There are two reasons for that: First, the GSES captures more types of additional payments (e.g. commissions). Second, our sample incorporates mainly firms in the manufacturing sector in which additional payments are more likely than in the service sector. In the GSOEP-analysis no industries were dropped due to sample size limitations.

increase in inequality is fueled by an increasing incidence of profit-sharing that is mainly reserved for high wage/high qualification groups (Bispinck, 2007) until 2009. There is a notable decline after 2009 that could reflect a reduction of such payments due to the financial crisis that hit Germany during that time – a pattern that is mirrored in our GSES data.
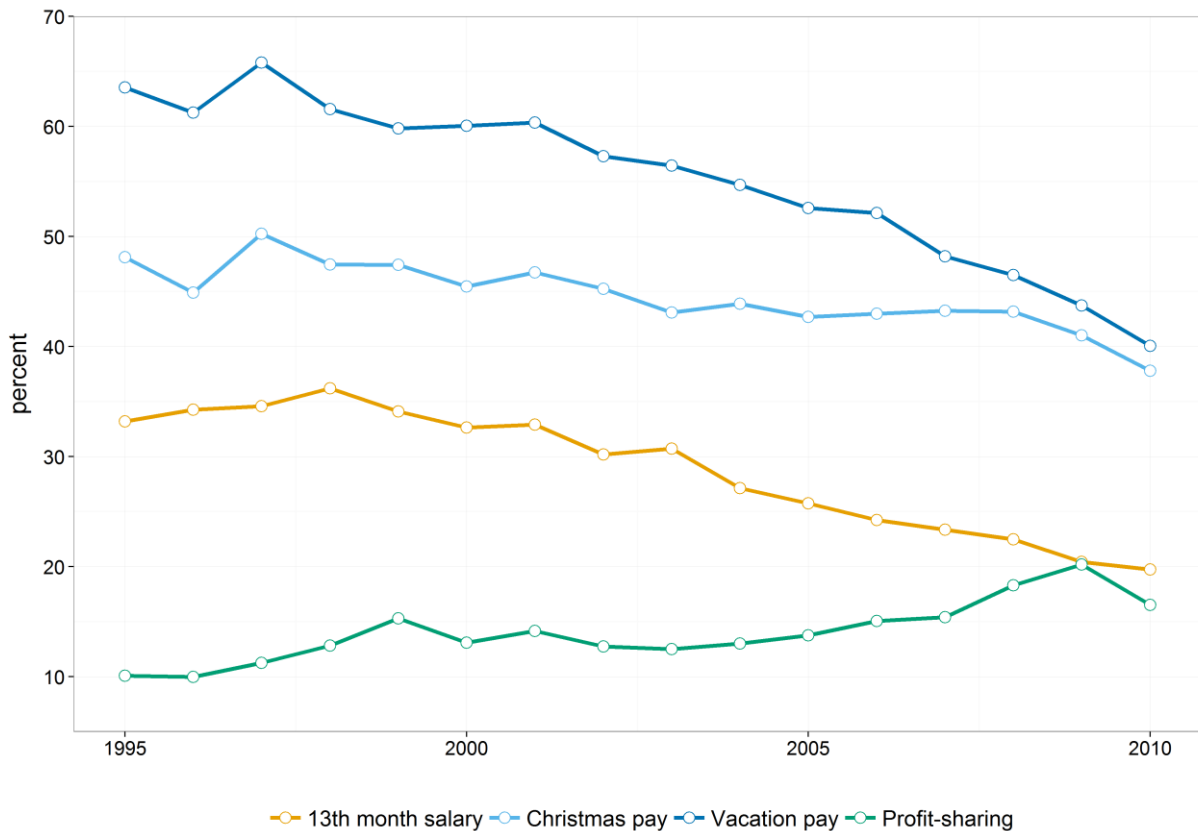
Figure 15: Incidence of additional payment types

Source: GSOEP 1995-2010. Sample weights used. Full-time employed men aged 16-65 in Western Germany.

Level of bonus payments in Germany between 1995 and 2010

Though the GSES does not allow us to distinguish different types of bonuses, it encompasses complete and precise information about the bonus *levels*. Table 3 presents key summary statistics on these levels and their development over time for all employees that received at least €1 of additional payments in the respective year. In 1995 employees received €376 of additional payments per month on average. The mean increases to about €491 in 2006 and then decreases to €455 per month in 2010. By the end of 2008, the financial crisis hit Germany. Although the German labor market managed to deal relatively well with the upcoming challenges (Dustmann, Fitzenberger, Schönberg, & Spitz-Oener, 2014), bonuses

were obviously affected not only through the decrease to mean payments, but also to all wage quantiles. However, there is an interesting difference between the upper and the lower part of the bonus distribution: While bonuses below the median are *steadily* decreasing (even *before* the crisis), bonuses above the median increase over time, with the exception of 2010.

This is a first hint at the fact that the two different mechanisms that determine wages operate differently in the upper and the lower part of the distribution. As with base wages, bonuses shrink steadily in the lower part of the distribution, the claims of the weaker groups in the labor market losing ground. In the upper part of the distribution the more powerful groups of employees increase their bonuses. But unlike the base wages, the bonus distribution is more volatile in reacting to economic cycles.

Table 3: Key summary statistics of the monthly bonus distribution

	Mean	1st perc	10th perc	50th perc	90th perc	99th perc	N
1995	375.52	47.64	158.79	300.26	635.67	1,649.41	454,503
2001	443.24	29.27	129.20	309.02	793.19	2,475.88	260,748
2006	490.59	14.38	88.48	331.38	894.21	3,008.88	406,154
2010	454.76	12.50	76.17	310.17	816.67	2,876.33	316,409

As a result of these trends, the inequality of bonuses rose substantially (see Table 4). In 1995 the upper ten percent of the distribution received about four times as much bonuses compared to the lower ten percent. In 2010 this was almost eleven times as much. As captured by the 50-10 ratio, inequality more than doubled in the lower half. The tails of the distribution also contributed to increasing inequality – especially via falling bonuses of the lowest one percent and exploding bonuses at the very top. Bonus inequality grew only very slowly after 2006.

Table 4: Measures of bonus inequality: quantile ratios

	10/1	50/10	90/50	99/90	90/10
1995	3.33	1.89	2.12	2.59	4.00
2001	4.41	2.39	2.57	3.12	6.14
2006	6.41	3.75	2.70	3.36	10.10
2010	6.07	4.07	2.63	3.52	10.72

Bonuses are strongly related to base wages: The more that is earned in terms of base wages, the higher the value of bonus payments. In 2010, the lower one percent of the base wage distribution received on average about €72 (1995: €126) in bonuses, while the top one percent obtained €4,351 per month (1995: €1,659) on average. Between these two extremes, we observe nearly consistent increases in bonuses throughout the base wage distribution. This pattern suggests that (a) inequality of total wages is larger than inequality of base wages and (b) the growth of overall inequality is steeper than the growth of base wage inequality.[56] In the following section we present a simple descriptive measure that illustrates this relation between bonuses and wages.

Bonus payments and total wage inequality

When bonuses are strongly related to base wages and the distribution of bonuses has become more unequal over time, it seems plausible that additional payments contribute to the rising overall wage inequality in Germany. We cannot follow Lemieux et al. (2009) or Sommerfeld (2012) who employ decomposition methods in order to analyze this question due to the fact that our bonus measure is quite different from theirs. In particular, the high (and nearly stable) incidence rate of bonus payments in our data does not allow us to separate their "composition" and "structure" effects on the overall wage inequality in a meaningful way. Instead, we opt for a descriptive analysis and calculate growth rates of inequality measures for two different wage measures: base wage and total wage.[57] These growth rates represent the

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[56] Additional descriptive analyses show that the amount of bonus is not only positively associated with base wages but also with the level of education and the likelihood of holding a manager position. High bonus earners also tend to have higher tenure but the relationship is u-shaped with the top bonus earners having lower tenure. These findings are consistent over time and across industries.

[57] Note that in this analysis employees with no bonus are included in order to unravel the impact of bonus payments on the overall wage inequality, while in the following quantile regressions and decompositions they are excluded.

(percent) change of a dependent variable (here: different measures of inequality) between two points in time. The results are presented in Table 5.

Table 5: Growth rates of inequality measures for base and total wage

	Period	10/1	50/10	90/50	99/90	90/10
Base wage	1995-2010	9.42	13.01	7.81	8.03	21.83
	1995-2001	3.10	4.45	3.03	4.94	7.62
	2001-2006	4.55	6.57	2.06	1.66	8.76
	2006-2010	1.51	1.52	2.53	1.27	4.09
Total wage	1995-2010	9.50	15.49	8.71	13.59	25.55
	1995-2001	3.32	5.23	4.22	8.17	9.67
	2001-2006	4.89	8.33	2.47	4.48	11.00
	2006-2010	1.04	1.31	1.80	0.51	3.14

Growth rates are calculated as follows for each of the four periods and all inequality measures: (Inequality$_{t1}$ – inequality$_{t0}$) / inequality$_{t0}$. Inequality measures are calculated from (sample weighted) quantiles.

When we compare these two distributions, it should be noted that there is more inequality in total wages than there is in base wages – in all parts of the distribution as captured by the different inequality measures.[58] This is not surprising as we have already illustrated the strong connection between base wages and bonuses. If we want to assess the contribution of bonuses to the *rise* in wage inequality, it is not the differences in means or quantiles between the two distributions that are of interest, but rather the comparison of their growth rates over time. If additional payments really contributed to the rise in wage inequality, total wage inequality should have grown faster than base wage inequality. For the period from 1995 to 2006 this is exactly what we find. All measures of inequality grow faster, when bonuses are accounted for and especially so for the inequality at the very top.[59] For instance, inequality of

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[58] This absolute level of inequality is not presented in the table. See table A-9 in the appendix for these numbers. The table shows that when bonus payments are added to base wages overall wage dispersion increases, regardless of the measure used. For example, the 90/10 ratio increases by 4.4% in 1995 and 7.1% in 2010. This is the amount that wage inequality would decrease by if bonuses were not included.
[59] Inequality as measured by the 10/1 only grows marginally faster when bonuses are accounted for because for these employees bonus levels are very low and are thus not able to really push wages. More

base wages grew by 8.76% from 2001 to 2006 as measured by the ratio of the 90th and 10th percentiles. However, overall inequality – including irregular bonuses – increased by a rate of 11%. We find similar differences when we compare the samples from 1995, 2001 and 2006 for almost all inequality measures used here. The difference in growth rates between the two distributions is greatest with the 99/90 ratio, which highlights the substantial amounts of bonuses in the top one percent.

However, it is again the period from 2006 to 2010 that stands out. Here, inequality growth rates of the total wages are smaller than the rates of base wages. This presumably reflects the downward trend of bonus levels from 2006 to 2010 due to the financial crisis, which had a more significant effect on the upper tail of the distribution when compared to the lower tail.

We have now drawn a detailed picture of the bonus distribution, its development over the period from 1995 to 2010, and the impact on the rise of overall wage inequality. But what are the determinants of bonus levels? Because additional payments are a key component of a firm's pay regime, we expect different firms to pay different bonus levels to different employees. In the following section we present quantile regression results that show the influence of firm-level characteristics on the individual bonus level and its development over time.

6.4.2 The structure of bonus payments

Now that we have established the important role of bonus payments for overall wage inequality, we focus on our core interest: Which employees have access to large bonuses and how do firms differ in the offer of bonuses? For these analyses we use quantile regression with the monthly bonuses as dependent variable.[60] For each year we ran these regressions for eleven quantiles ranging from the first to the last percentile (with intervals of ten between the 10th and 90th percentile). For each of the depicted quantiles we ran a full model incorporating all individual and firm-level characteristics.[61] In order to simplify the presentation of the

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important here are the developments of base wages. These wages fall rapidly and even more so for employees in poor jobs that receive no bonus at all.

[60] We deviate from the convention in the wage inequality literature of using a logged variable because the coefficients roughly indicate percentage changes in y when x changes. This interpretation hides the large differences in bonus payments along the distribution. For example, a 5% increase in bonus payments has very different implications in absolute terms when looking at the first percentile (which is found at around €12) versus the 99th percentile (located around €2,876 in 2010). Moreover, although the estimated coefficients and the figures look quite different, the actual implications from the models do not differ very much and concern only the tails of the distribution.

[61] Individual-level: years of schooling, age, age squared, tenure, fixed-term contract, manager position. Firm-level: mean human capital, stability, share of sectoral coverage, share of firm coverage, share of females, firm size, set of industry controls.

results, we display the coefficients of interest in the Figures 16 - 18 where the relevant coefficients for each year are connected by lines to highlight the developments of the coefficients over time.[62]

Looking at Figure 16, which displays the effect of *mean firm-level human capital*, one sees a clear positive effect over the entire bonus distribution. In other words, the higher the average human capital of a firm, the higher the bonuses for all employees – net of individual human capital factors. Furthermore, we expected that the top bonus receivers (which are also the high qualified top base wage earners) would gain the most from an employment in such firms because they should be able to capture the biggest part of a firm's profit. Put differently: When high-skill firms are firms that are able to make (relatively) high profits (either due to a strong position on the product market or due to efficient production and work organization), it should be those employees at the top whose claims are powerful and legitimate, thus capturing a large share arising from the good performance or success of the firm. This expected difference along the distribution is clearly visible in the graph confirming H1a.
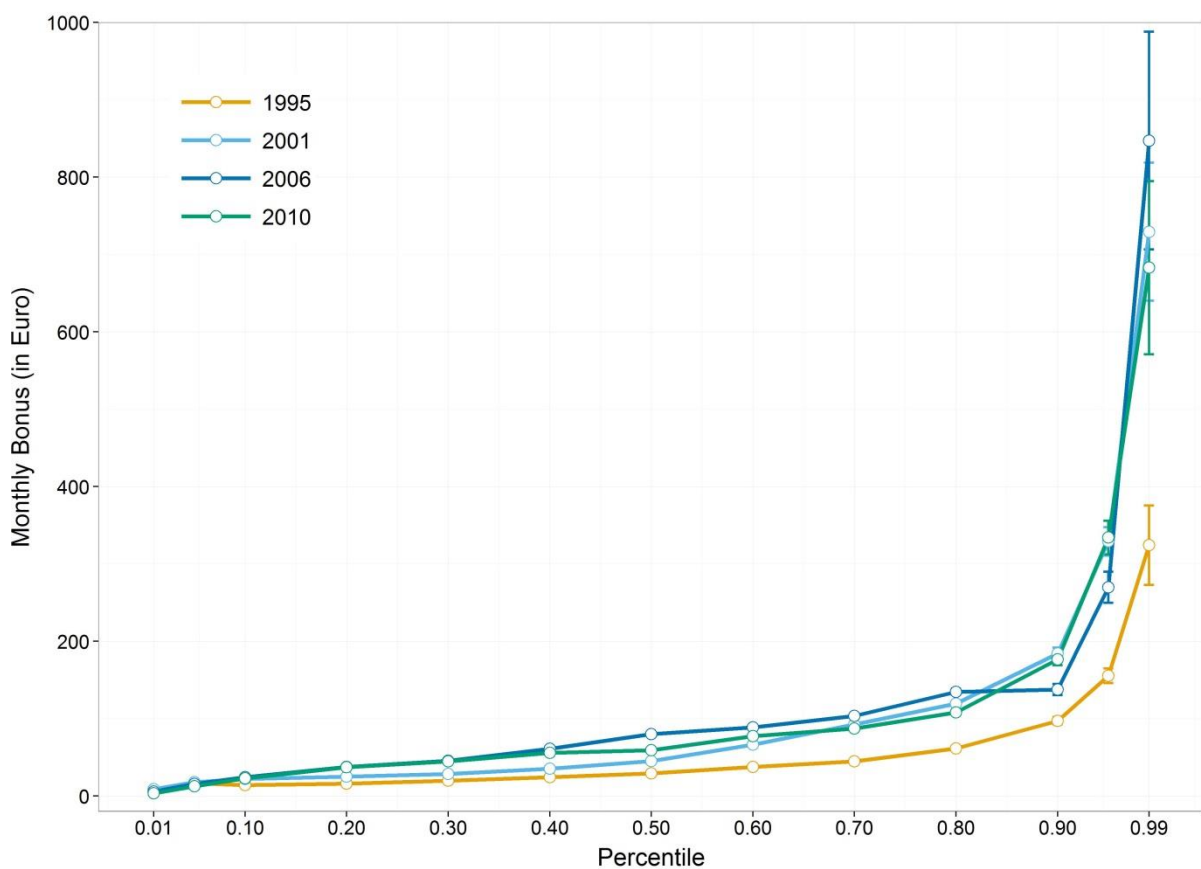
Figure 16: Effects of mean human capital on bonuses at selected quantiles

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[62] The coefficients are presented in full detail in Tables A4-11 in the appendix.

Note: Each dot represents the change of the given Percentile when mean human capital is increased by one unit. Effects are taken from a series of full quantile regression models at each of the depicted percentiles. Models include all individual-level and firm-level controls as well as a series of industry dummies. Vertical lines represent a 95% confidence interval.

The hypothesis about the growing effect of this firm characteristic also receives some support (H2b). Effects become stronger after 1995 at the 10th percentile and onwards. Furthermore, the increase is greatest at the 99th percentile. The point estimates also show the suggested trend of increasing effects until 2006 and then a decline in the course of the financial crisis. However, the differences between 2001, 2006 and 2010 are not statistically significant at the 99th percentile. Nonetheless, these results support the view that high-skill firms outperform non-high-skill firms with low technology, which leads to a more pronounced gap in bonuses between firms over time at almost all quantiles. However, the top one percent of bonus receivers profits most from these additional payments.

Figure 17 shows the effect of firm stability on bonuses. We expected these effects to be positive at the lower end of the distribution and negative at the upper end (H1b). Indeed, we find positive effects up to the 9th decile (except for 2001, where the effect already drops below zero at the 8th decile). For the bonuses above this boundary negative effects can be detected, meaning that highly qualified employees may gain from the high occupational mobility in and around unstable firms. But, as expected, especially the claims of low wage/low qualified employees seem to profit from low turnover or from being employed in older firms.

We also expected that these effects would be more pronounced over time (H2a), since young and/or less stable firms can better react to enhanced competition by lowering labor costs than older/more stable firms. But there is no definite trend in the development of the effects, so H2a is not supported. However, there are two notable changes: First, the effects of firm stability on the first and fifth percentile drops after 1995 and second, effects on the lower to mid quantiles seem to increase between 1995/2001 and 2006/2010. Seemingly, the degree of stability provides less and less protection for employees with no power (low wage/low qualification) at the bottom of the bonus distribution. In contrast, effects on quantiles surrounding the median increase. This could be the case because core employees in stable employment relations (that are located in the middle of the distribution) are able to utilize their higher power within these kinds of firms in order to generate rents (possibly at the expense of the other groups).
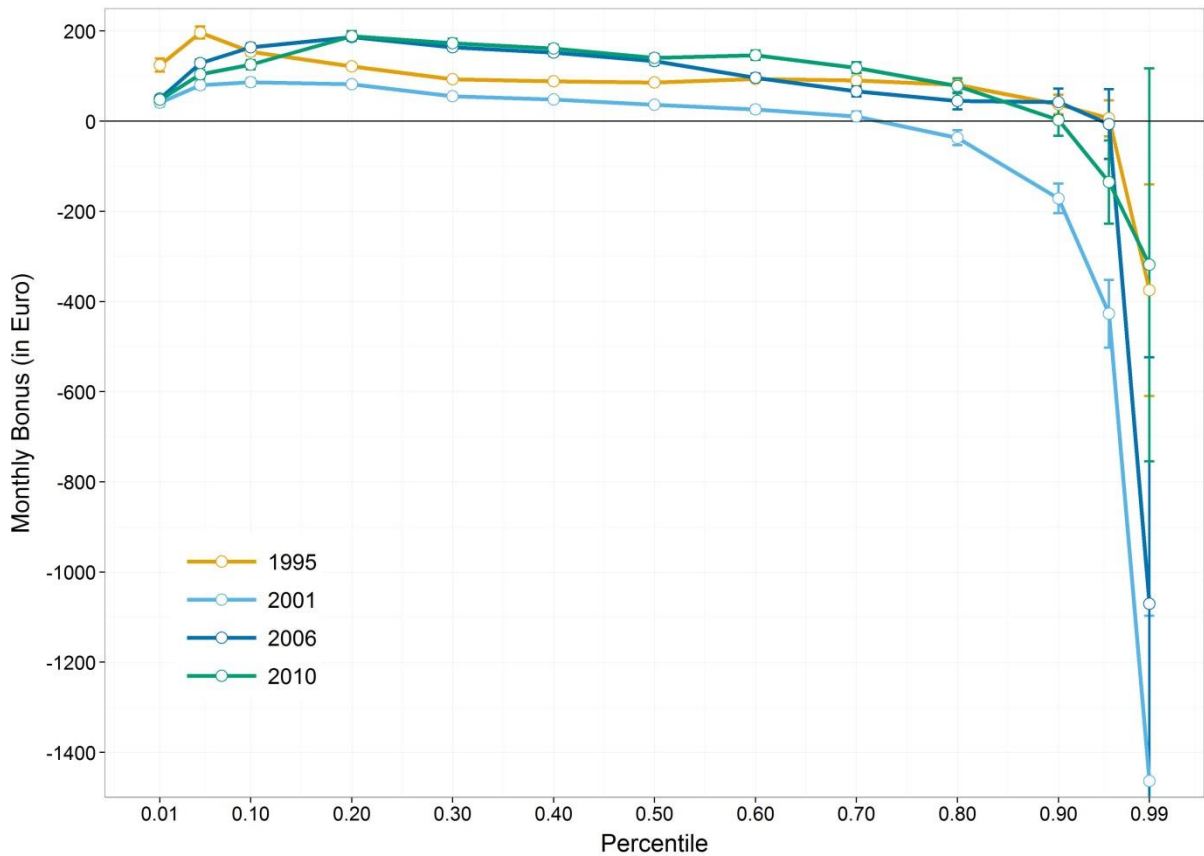
Figure 17: Effects of firm stability on bonuses at selected quantiles

Note: Each dot represents the change of the given Percentile when stability is increased by one unit. Effects are taken from a series of full quantile regression models at each of the depicted percentiles. Models include all individual-level and firm-level controls as well as a series of industry dummies. Vertical lines represent a 95% confidence interval.

Finally, Figure 18 displays the effects of the share of coverage by a collective (industrial-level) agreement in the firm. The curves resemble those that are already well known for quantile regressions of wages on this firm characteristic (c.f. Card, Lemieux, & Riddell, 2004; Fitzenberger, Kohn, & Lembcke, 2013): Looking at 1995, the effect on the lower quantiles is quite strong. It then declines along the distribution and eventually becomes negative (H1c). Unions fight for non-performance related bonuses like Christmas pay. Because these are typically smaller bonuses, we see a positive effect on those smaller percentiles. These employees in the lower parts of the distribution (presumably less qualified employees with small base wages) profit the most from working in firms covered by collective bargaining agreements (compared to employees in uncovered firms). In other words: the German "Tarifvertragswesen" provides an institutional context that strengthens the claims of these workers. On the other side, unions try to avoid forms of PRP, which are more important in the upper end of the distribution. Thus collective agreements may restrict the amount of bonuses

top earners can obtain. Uncovered firms do not have such restrictions, which is why top earners can receive higher bonuses in that sector.

However, the picture changes over time, because the effects on the first and the fifth percentiles decline after 1995. It seems that collective agreements are less and less able to ensure bonuses for employees at the bottom. On the other hand, effects increase in the mid of the distribution. The advantage of working in covered firms becomes larger for these employees. Furthermore, the negative effect on the 99th percentile grows from 1995 to 2006 and then falls back to its 2001 level. Seemingly, top bonuses in the period until 2006 can better be achieved outside the covered sector. With the general decline of bonuses due to the financial crisis the negative effect of coverage is also reduced. In all, H2a is partly supported looking at collective bargaining.
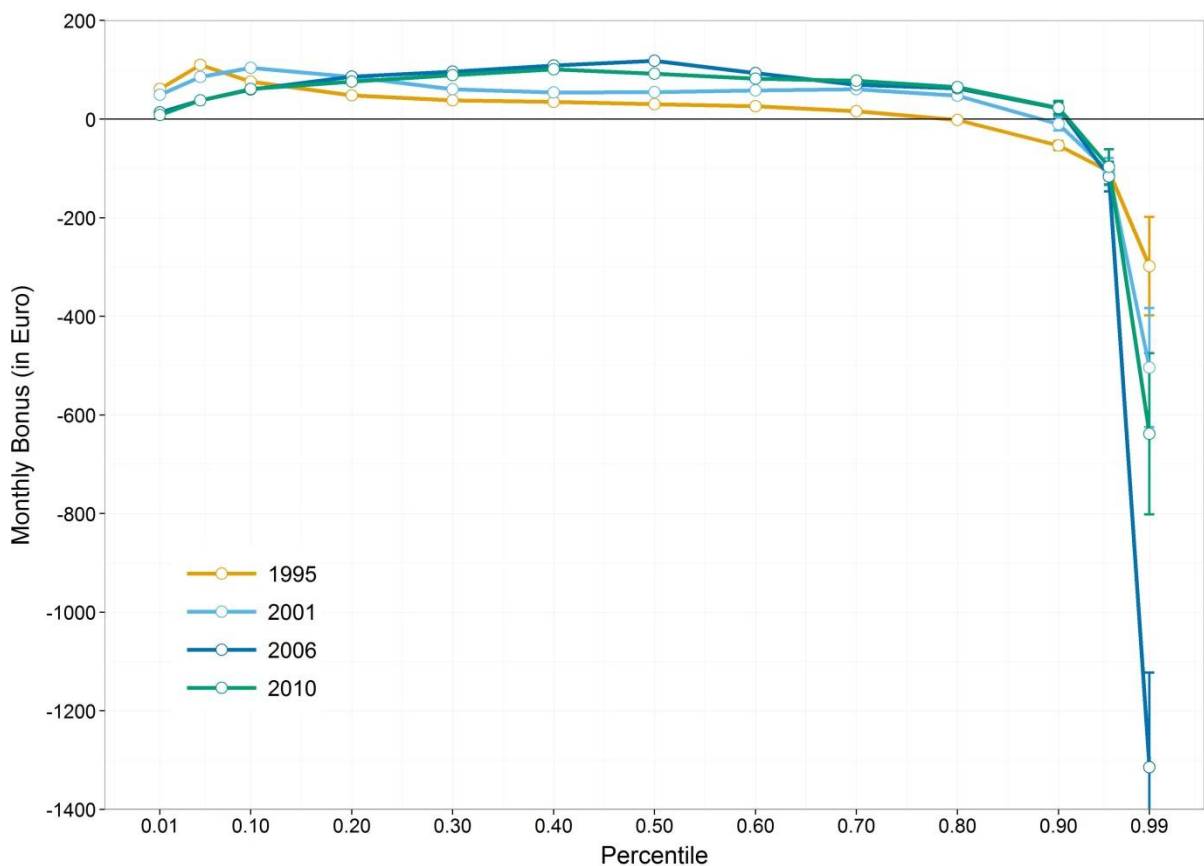
Figure 18: Effects of collective coverage on bonuses at selected quantiles

Note: Each dot represents the change of the given Percentile when the share of covered employees is increased by one unit. Effects are taken from a series of full quantile regression models at each of the depicted percentiles. Models include all individual-level and firm-level controls as well as a series of industry dummies. Vertical lines represent a 95% confidence interval.

Summarizing the results so far, all three firm characteristics show the expected effects on bonus payments from a cross-sectional point of view. The hypotheses regarding the development of these effects receive less support. But although the trends are not as clear as expected, we have nonetheless observed declining effects of stability and coverage on the lowest quantiles and growing effects at the median that underscore our expectations. Due to financialization and globalization (and the shrinking power of unions), less powerful actors at the bottom of the bonus distribution lose. The powerless employees gain an advantage from working in stable and covered firms, but this advantage diminishes over time. As we saw in section 4.1, the exclusion of employees from any kind of additional payment is also a strong inequality producing mechanism. On the other hand, the more powerful highly educated workers win, especially in high-skill firms. The core employees and top-earners can increase their bonuses – at least in these kinds of firms. These results hint to an increasing polarization between core employees that still receive sizeable bonuses (or are even able to increase them) in favorable firms and employees in a growing "low wage sector" with corresponding small bonuses. However, we also detect the detrimental consequences of the financial crisis, which affected top earners the hardest, pointing to a high volatility at the upper end of the distribution: large gains in good times created the grounds for large cuts in bad times.

6.4.3 Decomposition

As a last step of our analysis, we employ RIF-decomposition (Fortin et al., 2011) to add depth to our understanding of the processes that have occurred over the last few years.

With this method, changes in quantiles between two points in time can be decomposed into a *composition effect* that shows the effects of compositional changes of the workforce in time (e.g. with respect to education, tenure etc.) on the bonus distribution and a *structure effect* that quantifies the impact of changing effects of these characteristics (as depicted for instance by changing regression coefficients) on the distribution of bonuses. The results of a decomposition can be interpreted in a counterfactual sense: What would the difference in quantiles of the bonus distribution between 1995 and 2010 look like if the "price" of certain characteristics had remained at its level in 1995 (i.e. differences in quantiles would reflect compositional changes only) or if the distribution of these characteristics had remained the same (i.e. differences in quantiles would reflect structural changes resp. effect changes only)?

We choose the years 1995 and 2010 because these years cover our entire observation period and also the whole magnitude of the decline of quantiles below the median (see section 4.1.2). Before we discuss the results of the decomposition a brief look at some descriptive measures

of the three firm variables might help to understand the composition effects (see Table A1 in the appendix for means and standard deviations). First, due to the technological change and the related upskilling of the workforce we also see an increase in the mean of the mean human capital variable, as well as an increasing heterogeneity indicated by the increasing standard deviation. In contrast, the average of firm stability decreases over time, while the standard deviation increases. This could be an expression of flexibilization strategies in the German economy, by which employers seek to reduce employment stability and the number of closed positions (e.g. Giesecke & Groß, 2004). Finally, we observe a considerable decrease in the mean of coverage rate by collective bargaining. In Germany, as well as in many other Western societies, coverage by collective contracts has fallen sharply (Ellguth & Kohaut, 2011).

The decomposition results are presented in Table 6. The first panel ("overall") shows the value of selected percentiles for the two samples, the raw difference and the aggregated composition and structure effects. Over time, the first and tenth percentiles decrease which leads to a positive raw difference between the years. Much of this difference in quantiles between the two years can be accounted for by changes of the effects of the explaining variables under consideration ("structural effect"). The other percentiles increase over time (i.e. differences are negative) which can mostly be attributed to changes in the composition of the workforce in respect to these variables.

Aggregate decomposition results often hide relevant changes in distribution or effects of single variables because they just add up all the effects over all variables. In the following, we therefore focus on the detailed decomposition results in respect to the firm characteristics.[63] The structure effects mainly mirror the RIF-regression results from above: The change of the effects of mean human capital on bonuses has led to an increase in all percentiles of the later bonus distribution (except for the first one), but the increase is much more pronounced for the 99th percentile, raising inequality especially at the upper end of the bonus distribution. Also, if the effects of stability on bonuses had not changed over time, the first percentile of the distribution from 2010 would have been €63.57 higher, while the median would have been about €100 lower (or, in other words: changing effects of stability on bonuses has lowered the first percentile and increased the median), meaning that the changing effects of stability increased bonus inequality at the lower part of the bonus distribution. Finally, changes in the effects of percent coverage by a sectoral agreement in the firm lead to a decrease of the first

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[63] A complete results table can be found in the appendix (Table A-10) including all individual and firm-level variables used in the decomposition.

and tenth percentiles, while they induce an increase of the median and the 90th percentile. Thus, these decomposition results highlight and strengthen the regression results from above.

Additional insights can be found in the composition effects. First, there is a significantly negative composition effect for mean human capital at every quantile, being larger for higher quantiles, especially for the top one percent. This means that technological change and the related upskilling of the labor force benefits all workers, but more so, the employees at the upper ranks than the ones at lower ranks, which again increases inequality at the upper end in particular. In contrast, stability mainly has a positive effect, which is strongest for the median, meaning that compositional changes between 1995 and 2010 resulted in lower percentiles (1st, 10th, and 50th) – confirming the hypothesis that flexibilization of employment (as depicted by increasing shares of unstable employment relations and hence shrinking stability) lowers the bonus chances at the lower end of the distribution. This has no effect on the upper two percentiles. The powerful employees in this part of the distribution obviously do not depend on stable employment relations. Finally, changes in the composition of the workforce, which reflect a remarkable drop in coverage rates as, for example, Ellguth and Kohaut (2011) and Kohaut and Schnabel (2003) have shown, lead to a decrease in bonuses over almost the whole distribution – even for the 90th percentile. We find the strongest effect at the median, where we find the group of workers that is targeted by unions. The negative effect (increasing bonuses) at the top percentile hints at the fact that top employees gain from a shrinking influence of the unions on the wage setting process. If the composition had stayed the same, the quantile would have been €182 lower for them.

Table 6: RIF-decomposition of differences in quantiles between 1995 and 2010

	1st perc	10th perc	50th perc	90th perc	99th perc
Overall					
1995	49.76	160.91	302.32	641.55	1664.32
2010	14.61	83.98	321.18	831.46	2875.14
Raw difference	35.15	76.94	-18.87	-189.92	-1210.82
Total composition effect	**3.33**	**16.71**	2.45	-155.29	**-996.10**
Total wage structure effect	**31.82**	**60.23**	**-21.32**	-34.62	**-214.73**
Composition					
% coverage (industry contr.)	**2.88**	**21.22**	**32.00**	7.86	**-221.62**
Mean human capital	**-1.35**	**-8.48**	**-21.98**	**-65.68**	**-253.90**
Stability	**1.84**	**4.83**	**5.41**	0.09	-12.26
Structure					
% coverage (industry contr.)	**39.53**	11.01	**-45.83**	**-56.96**	253.49
Mean human capital	31.24	**-102.71**	**-353.18**	**-942.78**	**-4253.13**
Stability	**63.13**	23.80	**-44.75**	28.53	-46.13

Weighted RIF-decomposition of quantiles from the monthly bonus distribution between 1995 and 2010.
All models contain individual and firm-level controls. Bold coefficients are significant at $p < 0.05$.

In summary, the decomposition results underline the results described in section 4.2. Growing bonuses at the top of the wage distribution are mainly attributable to changes in the effects and the distribution of mean human capital; additionally we find a composition effect in respect to coverage. On the other hand, decreasing percentiles at the bottom can be explained by structural as well as compositional effects of coverage and stability.

6.5 Conclusion

Bonus payments are – in addition to base wages – a central component of organizational pay regimes. While economists mainly see bonuses as instruments to attract and motivate highly qualified employees or to stimulate productivity and effort, sociologists depart from this market approach to explain bonus inequality. Like wages, bonuses are seen as a part of the compensation that different actors in the organization raise claims for. Success in this interactional process of "claims-making" is dependent on the legitimacy and power base of the claim. Different actors may rely on different resources: While the highly educated actors can use more individualistic closure strategies, less powerful employees have to rely on collectivistic closure strategies in a context that is more shaped by institutions than by market competition. The actual amount of bonuses is therefore the result of two very different mechanisms. Bonuses do not simply reflect productivity. Rather they are the result of different

employees raising claims in different organizational environments altering the power and legitimacy of these claims.

The multivariate analysis with data from the German Structure of Earnings Survey (GSES) reveals substantial firm-level effects after controlling for various individual-level characteristics. Bonuses generally grow with the level of human capital in a firm, supporting the hypothesis that high-skill firms share a part of their (temporary) rent in the product market with most of their workforce. However, rent-sharing is – for the most part – relevant to the large bonuses. It is the powerful employees in these firms who are successful in enforcing their claims. In contrast, stable firms have internal labor markets and institutionalized seniority rights that favor claims based on loyalty and seniority, resulting in positive effects on mid and lower quantiles. It is not easy for employers to destroy these rents compared to less stable firms with high turnover rates. For low and mid-sized bonus payments, the collective bargaining coverage of a firm is also important, highlighting the role of power relations for the wage setting process.

We expected that in the course of globalization and financialization these mechanisms would become more important, accelerating the growth of overall wage inequality and strengthening the effects of firms on bonus payments. Indeed, we can show that bonus inequality grew from 1995 to 2006 due to declining bonuses for the lower 50% of the bonus distribution and gains for the upper 50% – especially at the very top. Inequality only grows marginally from 2006 to 2010 due to bonus cuts at the top in the course of the financial crisis. Further research will show what happens when the consequences of the financial crisis have been totally overcome. While the hypotheses on the changing firm effects on the bonus distribution are only partly supported, we see some hints that the lower qualified/weak groups in these firms seem to lose the fight for their small bonuses, while more powerful employees can increase their large bonuses. This view is further supported by the decomposition results. Composition effects reveal that institutional changes such as the decline in coverage by collective agreements and flexibilization tendencies in the German labor market mainly hit low and mid bonus receivers, while technological change favors the large bonus receivers.

In any case, the organizational effects are evident: It is not just human capital that determines wages and bonuses, but also the social relations within work organizations that are influenced by organizational environments. Organizations have an effect on bonuses net of individual characteristics and the effect of individual characteristics varies between different organizations. Furthermore, how an organization reacts to broader environmental conditions

and developments such as globalization, financialization, technological change or new legislation (such as the Hartz reforms implemented in 2003 to liberalize the German labor market) influences individual chances and labor market outcomes. Organizations shape institutional change by adapting to these developments through strategies such as flexibilization or abandoning collective bargaining. This has led to decreasing employment stability and increasing insecurity regarding compensation because of the growing importance of (volatile) bonuses for overall compensation. These results demonstrate once again the necessity to include organizations in social stratification research.

6.6 References

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7 Concluding discussion

Work organizations are central to the wage setting process and are thus key units of research that is interested in the generation and change of wage inequality. The thesis at hand contributed to a growing field of research in sociology and economics that follows this insight. Using four samples of a large German linked employer-employee dataset, it was shown that characteristics of firms influence the gender wage gap, contribute to the rise in wage inequality in Germany, and also determine bonus inequality.

The theoretical framework, which was laid out in chapter 2, provided the basis for the three empirical studies. The framework identifies a set of mechanisms involved in the (re-)production of wage inequality. These mechanisms were explicitly positioned against human capital theory in order to highlight the fundamental differences: While human capital theory (and related theories) places the wage setting process on a labor market where the "price" of labor is the result of marginal productivity that is valued in accordance to supply and demand, the theoretical framework, that is offered here, assumes that there are other mechanisms at work and that these mechanisms operate within and between work organizations and not markets.

Building on the work of Tomaskovic-Devey and colleagues, who formulated so called relational inequality theory (RIT), as well as ideas of "new structuralists" and social closure theory, the role of work organizations was described. The first core concept proposes that firms represent a specific opportunity structure which we described as pay and selection regimes. Firms develop rules and norms regarding how positions within the firm are created, defined, and rewarded eventually forming a positional hierarchy (pay regime) and how certain workers gain access to these positions (selection regime). The hiring to a particular positon within a particular firm greatly determines wages. Thus, the processes of matching persons to work organizations (inclusion/exclusion) and positions within work organizations (opportunity hoarding) are key inequality producing mechanisms. Most career mobility happens between and within work organizations.

This does not mean that individual characteristics have no influence on wages, but rather that it is not market processes of valuing individual performance. Instead, in-/exclusion, opportunity hoarding, and exploitation mechanisms are targeted at these individual characteristics. They activate status expectations and stereotypes in social interactions at the workplace influencing the power and status of actors and thereby their chances in making and enforcing wage claims, a process that was described as claims-making.

As was also shown, when connected to trends in the environment (such as financialization or technological change) the framework can also be used to explain the change in wage inequality. The environment influences not only the claims-making processes within firms, but also the ability to pool resources. Trends in the environment thus change within- as well as between-firm inequality. Financialization, for example, shifts status and power relations in the firm in favor of managers, while, at the same time, claims of workers are weakened by new business strategies explicitly targeted at workers in order to save costs and raise profitability. RIT therefore can act as a middle range theory, connecting macro with micro-level processes.

Since the framework is too rich to test it in total, three smaller problems were selected and tackled. This reduction in complexity occurred at two points: First, wage inequality within firms was only analyzed with respect to gender, while many other categorical distinctions relevant in the distribution of wages were not addressed. Second, the analysis of differences in wages between firms focused on three firm characteristics, namely human capital, stability, and coverage by collective agreements. The following section will summarize the main findings and potential avenues for future research (section 7.2). I end with a brief conclusion in section 7.3.

7.1 Summary of the core findings

Study 1 is occupied with the gender wage gap in Germany in 2010. Specifically, the study tests a central prediction of RIT: The gender wage gap should be smaller in firms where more status-related categories are controlled by women. The study shows that categorical distinctions as well as environmental conditions can be used as resources in internal claims-making processes between men and women affecting the gender wage gap in work organizations. This could be shown for two resources: management positions and educational credentials. Work organizations proved to have a smaller gender wage gap when the relation between men and women in controlling these status-related resources is in favor of women. Furthermore, the effect of share of women in management is stronger in firms that are not covered by a collective agreement delivering additional evidence that status relations have a greater influence on wages where organizational environments have more weight in determining wages (as compared to firms that are covered by a collective agreement at the industry level leaving less room for wage determination at the firm level). Using quantile regression techniques, it was also shown that the effects vary considerably along the wage distribution. While a rising share of female managers has a positive effect for all wage groups, it is the female employees with smaller wages that profit the most relatively. In contrast, advantages in university degrees in the firm compared to men predominantly helps women with high wage

claims. Finally, for the latter effect I find hints on a mediation by occupational rank. The segregation of women in less paying jobs within the firm (opportunity hoarding) is a central mechanism of the generation of wage inequality. Successful claims-making by women via educational resources is translated in a weakened ability of men to exclude women from high-wage jobs. All of these effects were found despite controlling for typical human capital factors.

In sum, this first study finds preliminary evidence for the predictions of relational inequality theory. Firm-specific status relations, as tested by the share of female managers and differences in educational credentials, influence wages independently of individual characteristics. This is not to say that individual characteristics do not matter, but they do so within a specific organizational opportunity structure. The same women would receive a higher wage in a firm with a higher share of female managers (compared to a firm with a lower share) simply due to the fact that she is employed at that firm and thus embedded in the firm-specific pay and selection regime. These results emphasis the important role of wage determination mechanisms operating within work organizations in comparison to marginal productivity whose "price" is determined on the market. Although the accumulation of human capital, the acquiring of educational credentials, and the preferences and eventually choices for a certain occupation on the individual level do matter for wage attainment, however, they do so primarily through the access to certain firms and jobs within firms. These are processes that are not governed by the market, but by social closure processes (inclusion and opportunity hoarding).

However, the empirical evidence presented in the paper can only be seen as a first step. Although many other factors at the firm and the individual level were already controlled for, evidence using fixed-effects models which eliminate all time-invariant factors would be much stronger. In particular, the detection of the mechanisms that are connected to claims-making – opportunity hoarding and exploitation – would benefit from such data and methods. Nonetheless, the results of the first study highlight the role of firms in the (re-)production of wage inequality and thus lay the ground for the two following studies.

While Study 1 examined the causes of an unequal distribution of organizational resources to male and female employees, *Study 2* was primarily occupied with the influence of certain firm characteristics on the wage level of all employees and the changes of these effects between 1995 and 2010. Work organizations differ not only in their within wage inequality, but also in the average wage levels between them. Depending on their ability to pool resources on the product market and through efficient production work organizations differ in the amount of resources that can be distributed to employees – independent of individual characteristics.

Although this between-firm heterogeneity is quantitatively not as important as the within component, the between-firm component becomes more important over time (Lazear & Shaw, 2008). The second study shows that the average skill-level in a work organization, the amount of stability, and the share of covered employees by a collective agreement influence individual wages net of worker attributes. In addition, these three types of firms differ in their ability to adapt to changes in the environment (globalization, technological change, and financialization). They choose different adaptation strategies, investments in innovation or cutting of employee rents, in order to cope with these changes, thus increasing firm heterogeneity. Hence, over time it becomes more important for certain employees to be employed by the right employer: While the advantage of an employment in high-skill firms grows over time, especially for high-wage employees, it gets destroyed for low-wage employees in covered and stable firms.

Our core analysis consisted of a series of decompositions that were calculated for each percentile. This decomposition technique allowed us to decompose the change in these percentiles between 1995 and 2010 in wage structure and composition effects, which enables to derive a quantification of the contribution on the rise in wage inequality. The results provide evidence that the changes at the level of work organizations have contributed to rising wage inequality in Germany – especially in the lower half of the wage distribution. We also find that the change in the effect of human capital of the firm also increases wage inequality at the very top of the distribution. This can be interpreted as very successful claims-making of managers and professionals that are increasingly paid in stock options, bonuses, and other variable payments. This topic is picked up by Study 3.

Although existing research has pointed to increasing heterogeneity between firms as an important source of rising wage inequality (Card et al., 2013), not much is known regarding the dimensions along which firms become increasingly different in pay. By focusing on three central firm characteristics, Study 2 could show that the wage premiums associated with these characteristics change over time which leads to growing differences between firms and thus "explains" the mentioned rise in heterogeneity. In other words: By looking at single firm characteristics we were able to deconstruct the aggregate rise in heterogeneity and identify significant dimensions of this trend and their contribution to the overall rise in wage inequality.

Finally, *Study 3* has had a closer look at bonus payments. Literature has identified that changes in the upper part of the wage distribution greatly contribute to the overall rise in wage inequality and that bonus payments play a key role in this regard (Lemieux et al., 2009). The

third study looks at the organizational determinants of those bonus payments and identifies types of firms where certain employees are more able to generate rents (i.e. capture a greater share of the organization's available resources via bonuses), while in other types of firms rents of employees are more easily destroyed. Evidence suggests that high-skill firms are able to pool more resources and thus share rents in form of bonus payments with their workforce – especially the top bonus receivers, which are individuals with high base wages and qualifications that can build upon a story of performance and competence in claims-making. Firm stability and coverage by collective agreements also influence bonuses positively for most bonus groups, except the very top of the distribution. Over time, we identify a polarization pattern: While the bonuses in high human capital firms for high-bonus employees such as managers experience a substantial growth, bonuses in stable and covered firms decrease for low-bonus (and also low-wage and low-qualification) groups at the bottom of the bonus distribution. Not surprisingly, an additional descriptive analysis demonstrates that bonus payments actually contribute to the rise in overall wage inequality in Germany between 1995 and 2010.

Because the exact amount of bonuses payed is seldom measured, bonuses are also seldom analyzed. Study 3 not only examines bonuses, but also shows how firms influence the height of such payments and how this influence changes over time. To our knowledge, this is the only study that does this for Germany. In addition, the study further contributes to the understanding of the influence of firms on the rise in wage inequality. The amount of bonuses paid to top earners such as managers and professionals rose dramatically between 1995 and 2006, while at the same time, bonuses for low-wage employees decreased. However, bonus payments are the results of claims-making between actors within and around the firm, which is why the amount of bonus payment is dependent on the available organizational resources and the relation of managers to shareholders on the one hand and to the workforce on the other. Where there is a strong workforce (such as in stable firms with internal labor markets or covered firms), bonuses of top earners are likely to be smaller, while they are boosted in high-skill firms. Here, because of the stronger ability to pool resources, more resources are available to all employees, but managers are able to capture the largest part. In addition, bonus payments to employees at the lower margin are widely destroyed highlighting again the negative consequences of financialization and technological change for the weakest employees. Their ability in the claims-making process crucially depends on collective claims (either within an internal labor market or as part of union or collective wage agreement), but these employees are increasingly excluded from such structural advantages through

flexibilization and atypical employment and the decreasing power of unions that more and more focus on the median voter.

In summary, these studies represent three examples of why it is important to incorporate work organizations in research of wage inequality and social stratification research in general. They structure individual wage chances because of persistent wage differentials between firms and firm-specific pay and selection regimes within them. This is the reason why the analysis of individual attributes alone is not enough: Wages are determined by firm characteristics net of individual characteristics and individual characteristics have different effects depending on the organizational context. Furthermore, firms are agents of change. Because they are located at an intermediated level of society they translate macroscopic changes such as financialization or technological change, which alter the environment in which work organizations reside und thus the conditions under which work organizations act, into changes of individual wages chances. Firms react to trends in the environment using different adaptation strategies that alter firm wage differentials and the internal opportunity structure. In addition, these trends can shift weights in internal claims-making processes. It is these organizational adaptation strategies (flexibilization, innovation, cutting cost, outsourcing) that change individual chances and the distribution of wages over time. For example, the introduction of new machines or new workplace practices challenges the existing taken-for-granted way of doing things. This includes the relative importance of particular tasks, the area of responsibility, the authority and reward of particular positions, and the criteria of access to certain positions. Moreover, when firms are able to make profits with financial instruments (and not with their core product or service), revenue is less dependent on production, lowering the bargaining power of workers in relation to managers and owners. This is the reason why work organizations are so important and grow even more important for social stratification research.

7.2 Implications for future research

This relatively nascent organizational perspective for analyzing wage inequality and social stratification in general leaves open many avenues for future research.

7.2.1 Examination of other categorical distinctions and firm characteristics

A first natural extension of the analysis at hand is the examination of other categorical distinctions and firm characteristics beyond gender and firm human capital, stability, and coverage. Although gender is an important social category along which wage inequality is produced, other categories easily come to mind. For one, if we look for categories that are

established within the production process, an investigation of wage inequality that is produced between different atypical employment types would be fruitful. This is, of course, no new topic in social stratification research (e.g. Giesecke, 2009), but the organizational context is often not taken into account in these studies. However, similar to gender, the relation between employees with standard contracts and, for example, fixed-term contracts varies between work organizations and so does the wage inequality produced between this categorical distinction. Such a perspective disregards approaches that think the generation of wage inequality independently of organizational contexts on a labor market in favor of an approach that emphasizes firm-specific inequality regimes. Such an approach may also help to understand changes in wage inequality because financialization and technological change should affect such relations in the firm by shifting status and power in favor of employees holding permanent contracts. Again these macroscopic trends in the environment of firms do not suppress wages of atypical employed workers the same way in every firm. Rather, these trends are mediated by organizational contexts. Furthermore, the same applies to other categorical distinctions like university degree vs. secondary school or native vs. immigrant that are not just derived from the production process but relevant in society as a whole. In light of the recent wave of immigration to the European Union and Germany the latter categorical distinction increases in importance. It will be interesting to see whether and how the German labor market is able to integrate these new workers and further, how this affects the inequality between natives and immigrants and the wage inequality in Germany in general.

As with categorical distinctions, there are many other firm characteristics worth exploring. For example, to better operationalize the ability of firms to pool resources measures of revenues, profits, stock prices, dividends, and spending would be very useful. Such information could be used to precisely calculate the amount of organizational resources that can be distributed between managers, other employees, shareholders, and other stakeholders. In addition, information about the investments in new work practices and processes or the spending on new information and communication technologies would make it possible to directly transfer the notion of technological change to the firm level. Firms can then be differentiated by the rate of adoption of new technologies and the impact on the ability to pool resources as well as on internal claims-making processes between various actors leading to changes in wage inequality. Additional measures of organizational structure, such as the existence and degree of closure of internal labor markets or the number of hierarchies in the firm, could not only help to better understand organizational restructuring strategies, but also their effects on wage inequality within and between firms.

Finally, there are also more possibilities to capture firm environments. For example, conditions on the local labor market or the degree of competition in the product market not only influence a firm's ability to pool resources, but also claims-making processes in that legitimation of claims derived from competence and productivity should gain in importance. Although a lot of these firm characteristics have already been used in empirical research, most studies either could not control for segregation of certain workers in certain firms when assessing effect of firm characteristics because they had no LEED available or the firm characteristics were not directly related to internal conflicts about the distribution of resources or the rise in wage inequality.

7.2.2 Possibilities of panel data: Identification of movers and foundation and closure of firms

One disadvantage of the VSE is that it is no panel. Neither firms nor employees are observed over time. With the linked employer-employee dataset of the Institute for Employment Research (LIAB) there is, however, a German panel dataset available. Although the LIAB has other disadvantages (e.g. no hours worked and censored wage information), I briefly want to point out why a replication of the studies presented here with panel data would be sensible.

In general, all three empirical studies presented here would profit from the possibility of introducing fixed effects to the quantile regressions. This has two related advantages: First, fixed effects only capture within unit variance (i.e. the variance over time within employees and within firms) thereby eliminating time-constant observed and unobserved influences. Second, the effects in the models thus display the influence of a *change* in the explanatory variables on a change in the dependent variable. The reduction of unobserved heterogeneity and the change in interpretation bring us closer to a *causal* understanding of the relationships.

Beyond this more general argument, using a panel opens up the possibility to examine two processes which we were not able to study with the VSE: movements of workers between firms and changes in the population of firms (i.e. foundation and closure of firms). Exclusion from high-wage firms was identified as a central mechanism producing inequality between individuals in the theoretical framework. However, the VSE does not allow us to study such a mechanism explicitly. Take again the gender wage gap. As Cardoso and coauthors (2015) show for Portugal, a substantial part of the gender wage gap can be traced back to exclusion from high-wage firms and to lesser gains of women from joining a high-wage firm. With the VSE, the only result we would see is the crowding of women in low-wage firms and men in high-wage firms and their respective effects on individual wages. However, we would not be able to calculate the reduced likelihood of women to *move* into high-wage firms with the VSE. In

addition, the detection of movers is also important for the explanation of the rise in wage inequality. Card and coauthors (2013) show that increased sorting across firms is part of the explanation. Using a panel dataset, we could expand the analysis at hand to explore certain firm characteristics responsible for this increased matching. In sum, having information over the movement of persons within a set of firms enables the detection of exclusion mechanisms on the firm level and their contribution to changes in wage inequality.

In the theoretical section about the role of work organizations for the change in wage inequality we argued that financialization and technological chance lead to changes and adaptation strategies at the firm level. This implies that *existing* firms change in order to survive. However, adaptation can also happen through the demise of existing firms (i.e. going out of business) and the foundation of new firms. For example, studies regarding the abandoning of the collective bargaining system find evidence in favor of intergenerational change. That is, the change of the coverage rate of individuals is due to existing firms changing their coverage status, but also due to the closure of covered firms and the foundation of new firms that never participate in collective bargaining in the first place (Kohaut & Ellguth, 2008). Foundation and closure of work organizations induce change as well as mobility of employees between firms. Changes in the population of work organizations and its effects on wage inequality could be studied more extensively.

7.2.3 Changes in within-firm wage inequality

The last possible expansion of this thesis I wish to discuss is the study of within-firm inequality and its contribution to the rise of wage inequality. Remember a central finding of Study 3: the polarization of bonuses. When firms shrink internal labor markets in favor of flexible employment relations which predominantly hit low-wage employees and, at the same time, pay ever higher bonuses to employees at the top, changes in within-firm inequality seem plausible. This thesis has not analyzed changes to within-firm wage inequality, nor its contribution on overall wage inequality. While we point to differences of effects along the wage distribution using quantile regression in Study 2 and 3, the location of an employee in the unconditional wage distribution is only loosely related to the position in a firm's wage hierarchy. Also, the gender wage analysis in Study 1 looked at the GWG between different types of firms characterized by their status relations.

Although the study by Lazear and Shaw (2008) finds only marginal changes in the within-firm wage component over time for the U.S., we find that the within-firm component also grows over time using a simple variance components model. Thus, I think it is worthwhile taking a closer look at this wage variance component from the perspective of relational inequality

theory. Especially an inquiry of the evolution of the within-firm categorical distinction between managers and production workers and their contribution to the overall rise in wage inequality seems promising.

7.3 Conclusion

Since the 1970s, beginning in the U.S. and followed a bit later by almost all industrialized societies, wage inequality has been rising drastically. In addition, despite political effort gender-related wage inequality remains and is comparatively high in Germany. Despite their theoretical importance, work organizations have long tended to be sidelined in social stratification research. This thesis has added to a growing body of literature that tries to "bring the firms back in" using rich linked-employer-employee datasets. It has proven that this perspective is fruitful in addressing central problems of social stratification research, such as the gender wage gap and the rise in wage and bonus inequality. As these datasets become increasingly available, we learn more about the role of firms in shaping and changing wage inequality.

But where does this race end? Will industrialized societies become ever more unequal, risking social cohesion and stability? How much inequality can a society endure before it breaks? And how much inequality between certain groups can persists before conflict escalates? At least in the case of the general rise in wage inequality, the trend seems to have come to a halt in Germany. In a recent press release, the Federal Statistical Office announced that wage inequality measured by the 90-10 quantile ratio did not increase between 2010 and 2014 (Statistisches Bundesamt 9/14/2016 - 322/16). However, this pattern is the result of two opposite developments: While inequality in the lower half of the distribution has decreased (the bottom 10% gained relative to the median), the trend of increasing inequality in the upper half persists (i.e. the top 10% of wage earners widened the gap to the median). Interestingly, the trend in the lower half stopped before the introduction of the minimum wage in Germany in January 2015. What are the causes of this stop? What are the roots of the persisting trend in the upper half? What impact will the introduction of minimum wages have on wage inequality and employment rates? Are minimum wages bought with other disadvantages such as even lesser access to or further cuts to additional payments in the bottom of the wage distribution or even more flexible and insecure employment relations? These questions highlight two insights: First, these questions can only be answered satisfactorily when work organizations are part of the explanation; and second, they demonstrate that the inquiry of the generation

and change of wage inequality will not cease to attract interest any time soon and keep generations of researchers to come occupied.

8 References

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Appendix

9.1 Study 1

Table A-1: Vollständige Multilevel Modelle, Westdeutschland

	Individuelle Lohnverhandlungen			Tarifbindung		
	M1	M2	M3	M1	M2	M3
Frau	-0.144***	-0.162***	-0.058***	-0.107***	-0.112***	0.005
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Teilzeit	-0.066***	-0.053***	-0.053***	-0.057***	-0.046***	-0.046***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Bildungjahre	0.067***	0.045***	0.046***	0.069***	0.046***	0.050***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Jahre im Betrieb	0.006***	0.006***	0.006***	0.005***	0.004***	0.004***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Alter in Jahren	0.043***	0.042***	0.042***	0.034***	0.034***	0.034***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Alter in Jahren (quad.)	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Befristung	-0.156***	-0.141***	-0.167***	-0.117***	-0.122***	-0.138***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
%Frauen im Mana.	-0.134***	-0.110***	-0.108***	-0.096***	-0.075***	-0.076***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Diff. %Hochschul.	-0.180***	-0.112***	-0.083**	-0.190***	-0.139***	-0.118***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Ø Bildungsjahre im Betr.	0.048***	0.034***	0.037***	0.058***	0.041***	0.044***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ø Jahre im Betrieb	0.009***	0.007***	0.008***	0.007***	0.005***	0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
%Frauen im Betrieb	-0.068**	-0.022	-0.013	-0.044	0.017	0.014
	(0.03)	(0.02)	(0.02)	(0.04)	(0.03)	(0.03)
Betriebsgröße	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Frau*%Frauen im Mana.	0.212***	0.183***	0.184***	0.143***	0.122***	0.124***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Frau*Diff. %Hochschul.	0.062**	0.024	-0.012	0.072**	0.042	0.025
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Frau*%Frauen im Betr.	-0.160***	-0.094***	-0.117***	-0.102***	-0.069***	-0.068***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Baugewerbe (Ref.)	/	/	/	/	/	/
Bergbau	0.205**	0.218**	0.214**	0.024	0.020	0.020
	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
Verarbeitendes Gewerbe	0.098*	0.096*	0.092*	0.150***	0.128***	0.128***
	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)
Energie- und Wasserversorgung	0.345***	0.330***	0.327***	0.118**	0.105**	0.105**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
Handel	0.125*	0.116*	0.114*	0.045	0.045	0.045
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)

Kredit- und Versicherungsgewerbe	0.390***	0.304***	0.306***	0.151**	0.012	0.012
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
Gastgewerbe	0.008	0.129*	0.119*	-0.135*	-0.049	-0.050
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Verkehr und Lagerei	0.138**	0.118*	0.115*	0.037	0.023	0.023
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
Grundstück- und Wohnungswesen	0.129**	0.107*	0.104*	-0.039	-0.053	-0.054
	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)
Erziehung und Unterricht	0.027	0.012	0.008	-0.051	-0.049	-0.048
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)
Gesundheits- und Sozialwesen	0.155**	0.188***	0.181***	0.036	0.048	0.049
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
Sons. Dienstleistungen	0.102*	0.098*	0.095*	-0.048	-0.048	-0.048
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
Beruflicher Rang		0.525***	0.544***		0.474***	0.470***
		(0.01)	(0.01)		(0.01)	(0.01)
Frau * berufl. Rang			-0.060***			0.006
			(0.01)			(0.01)
Frau * Bildungsjahre			-0.005***			-0.009***
			(0.00)			(0.00)
Frau * Jahre im Betrieb			-0.001**			-0.000*
			(0.00)			(0.00)
Frau * Befristung			0.050***			0.036***
			(0.01)			(0.01)
Konstante	0.299***	0.512***	0.438***	0.484***	0.765***	0.694***
	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)	(0.06)
sd(Frau)	0.126***	0.119***	0.118***	0.094***	0.095***	0.094***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
sd(Konstante)	0.237***	0.214***	0.213***	0.179***	0.160***	0.160***
	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Korrelation(Frau, Konstante)	-0.610***	-0.530***	-0.524***	-0.518***	-0.444***	-0.438***
	(0.02)	(0.02)	(0.02)	(0.00)	(0.04)	(0.04)
sd(Residuen)	0.287***	0.269***	0.269***	0.237***	0.221***	0.221***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
N	361.693	361.693	361.693	245.417	245.417	245.417

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A-2: Vollständige Multilevel Modelle, Ostdeutschland

	Individuelle Lohnverhandlungen			Tarifbindung		
	M1	M2	M3	M1	M2	M3
Frau	-0.135***	-0.164***	-0.012	-0.067***	-0.092***	-0.077*
	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.03)
Teilzeit	-0.060***	-0.044***	-0.046***	-0.069***	-0.044***	-0.042***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Bildungjahre	0.084***	0.054***	0.058***	0.080***	0.051***	0.053***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Jahre im Betrieb	0.007***	0.006***	0.006***	0.004***	0.004***	0.003***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Alter in Jahren	0.027***	0.025***	0.025***	0.034***	0.032***	0.032***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Alter in Jahren (quad.)	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Befristung	-0.153***	-0.138***	-0.153***	-0.147***	-0.141***	-0.176***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
%Frauen im Mana.	-0.145***	-0.114***	-0.112***	-0.100*	-0.090*	-0.089*
	(0.02)	(0.02)	(0.02)	(0.05)	(0.04)	(0.04)
Diff. %Hochschul.	-0.148**	-0.065	-0.036	-0.257***	-0.181**	-0.181*
	(0.05)	(0.05)	(0.05)	(0.08)	(0.07)	(0.07)
Ø Bildungsjahre im Betr.	0.046***	0.028***	0.027***	0.037***	0.023**	0.023**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Ø Jahre im Betrieb	0.011***	0.010***	0.010***	0.013***	0.011***	0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
%Frauen im Betrieb	0.011	0.045	0.046	-0.068	-0.060	-0.063
	(0.04)	(0.04)	(0.04)	(0.08)	(0.06)	(0.07)
Betriebsgröße	0.000***	0.000***	0.000***	0.000*	0.000**	0.000**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Frau*%Frauen im Mana.	0.148***	0.100***	0.099***	0.139***	0.121***	0.120***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Frau*Diff. %Hochschul.	0.053	0.032	-0.006	0.103*	0.093*	0.095*
	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)	(0.05)
Frau*%Frauen im Betr.	-0.069*	0.023	0.004	-0.158***	-0.091*	-0.086*
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
Baugewerbe (Ref.)	/	/	/	/	/	/
Bergbau	-0.043	-0.023	-0.023	0.070	0.062	0.061
	(0.11)	(0.11)	(0.11)	(0.08)	(0.08)	(0.08)
Verarbeitendes Gewerbe	-0.240***	-0.195**	-0.196**	0.177**	0.200***	0.200***
	(0.07)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Energie- und Wasserversorgung	-0.051	-0.063	-0.063	0.308***	0.277***	0.278***
	(0.08)	(0.08)	(0.08)	(0.05)	(0.05)	(0.05)
Handel	-0.130	-0.095	-0.095	0.322***	0.359***	0.359***
	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)	(0.06)
Kredit- und Versicherungsgewerbe	0.110	-0.009	-0.007	0.376***	0.249***	0.248***
	(0.09)	(0.09)	(0.09)	(0.07)	(0.06)	(0.06)
Gastgewerbe	-0.328***	-0.205**	-0.207**	-0.113	0.008	0.010
	(0.08)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)
Verkehr und Lagerei	-0.132	-0.127	-0.127	0.080	0.076	0.077
	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)	(0.06)
Grundstück- und	-0.165*	-0.142*	-0.141*	0.121	0.141*	0.140*

|						
Wohnungswesen						
	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Erziehung und Unterricht	-0.215*	-0.233**	-0.232**	0.081	0.102	0.103
	(0.09)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)
Gesundheits- und Sozialwesen	-0.102	-0.097	-0.095	0.215**	0.189**	0.186*
	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)
Sons. Dienstleistungen	-0.186*	-0.170*	-0.169*	0.114	0.151*	0.151*
	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
Beruflicher Rang		0.597***	0.628***		0.541***	0.525***
		(0.01)	(0.02)		(0.02)	(0.03)
Frau * berufl. Rang			-0.082***			0.031
			(0.02)			(0.03)
Frau * Bildungsjahre			-0.009***			-0.004
			(0.00)			(0.00)
Frau * Jahre im Betrieb			0.000			0.001*
			(0.00)			(0.00)
Frau * Befristung			0.031**			0.073***
			(0.01)			(0.02)
Konstante	0.382**	0.738***	0.691***	0.274*	0.610***	0.599***
	(0.12)	(0.11)	(0.11)	(0.13)	(0.11)	(0.11)
sd(Frau)	0.111***	0.110***	0.110***	0.094***	0.089***	0.089***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
sd(Konstante)	0.216***	0.201***	0.200***	0.185***	0.160***	0.160***
	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Korrelation(Frau, Konstante)	-0.247***	-0.205***	-0.201***	-0.364***	-0.312***	-0.321***
	(0.02)	(0.02)	(0.02)	(0.00)	(0.04)	(0.04)
sd(Residuen)	0.259***	0.236***	0.236***	0.228***	0.208***	0.208***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
N	98.401	98.401	98.401	40.410	40.410	40.410
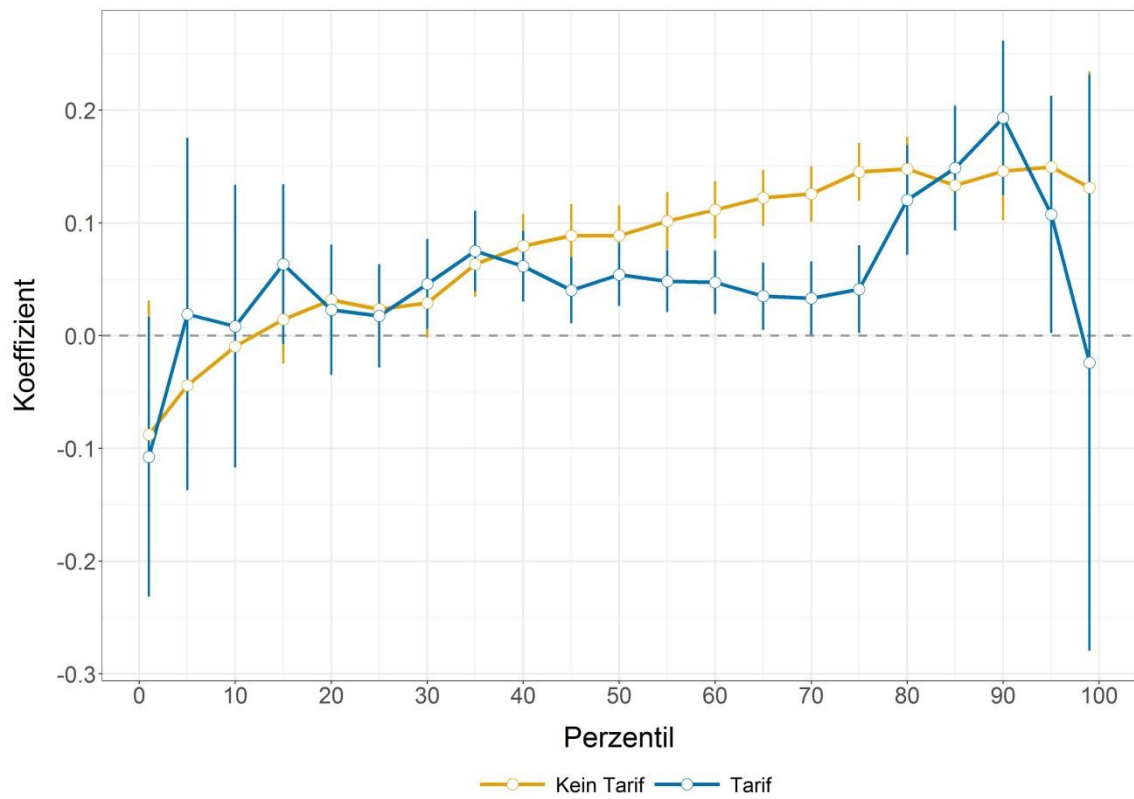
Figure A-1: Effekt der Interaktion von Frauen mit dem Frauenanteil im Management, Ostdeutschland
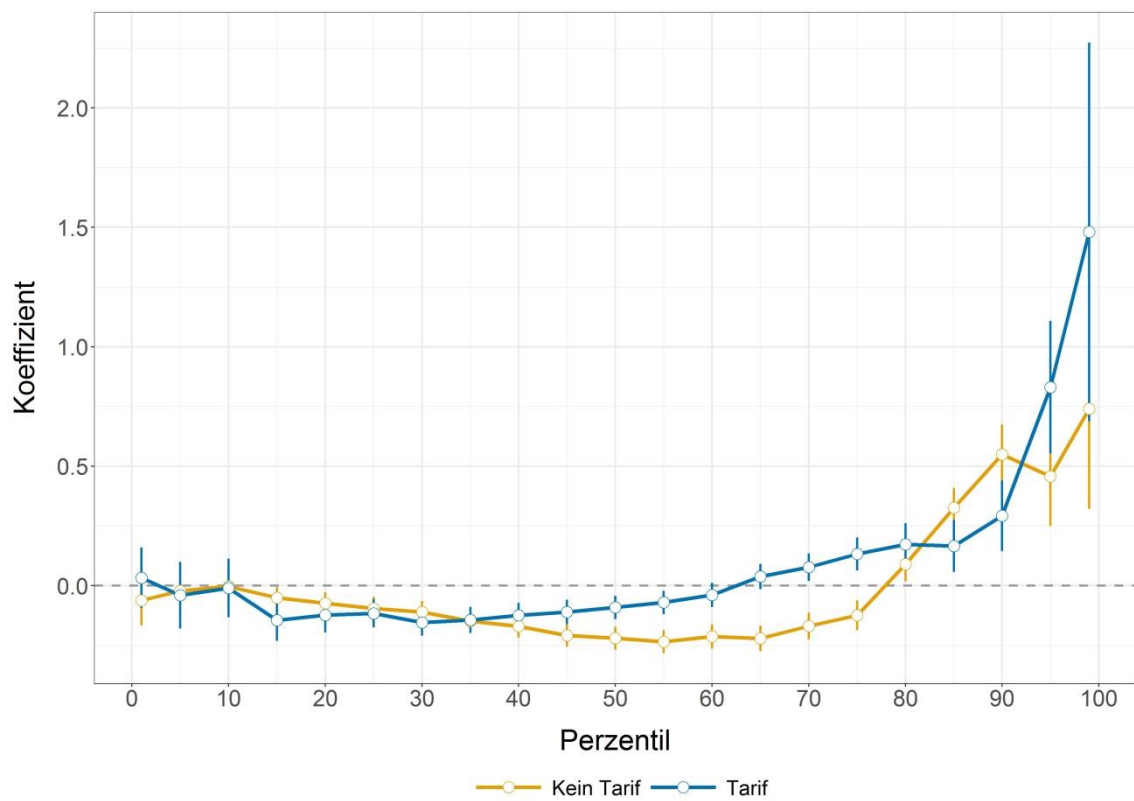

Figure A-2: Effekt der Interaktion von Frauen mit der Differenz im Anteil an Hochschulabschlüssen, Ostdeutschland

9.2 Study 2

Table A-3: Descriptive statistics of all variables, men in West Germany

Variable	Description	1995 N=486,075		2001 N=287,405		2006 N=411,814		2010 N=315,869	
		mean	std. dev	mean	std. dev	mean	std. dev	mean	std. dev
Wage (log)	Monthly gross wage + irregular bonuses divided by actual working hours	3.03	0.34	3.07	0.39	3.10	0.43	3.09	0.44
Fixed-term	Binary, having a fixed-term contract yes/no	0.02	0.13	0.03	0.16	0.03	0.18	0.03	0.18
Years of schooling	Years in the educational system	11.96	1.89	12.17	2.05	12.36	2.09	12.44	2.13
Age	Age of the respondent	39.87	10.71	40.39	10.06	41.46	9.90	42.47	10.33
Tenure	Duration of employment in given firm	12.25	10.12	11.74	10.09	12.71	10.01	13.53	10.44
Firm human capital	Mean years of schooling in a firm	11.85	0.84	11.93	1.00	12.11	1.06	12.20	1.07
Firm tenure	Mean tenure in firm	11.78	4.43	10.98	4.86	11.95	5.18	12.71	5.26
%industry contract	Share of employees paid according to an industry contract	0.73	0.38	0.58	0.40	0.41	0.41	0.37	0.41
%firm contract	Share of employees paid according to a firm contract	0.05	0.20	0.05	0.19	0.05	0.20	0.03	0.17
%female	Share of female employees in the firm	0.21	0.18	0.23	0.18	0.23	0.18	0.23	0.17
Size	Size of firm	1981.88	6076.29	2150.17	6923.31	2059.48	6341.85	1896.61	6182.27
Mining		0.02	0.14	0.01	0.11	0.01	0.10	0.01	0.09
Manufacturing		0.64	0.48	0.63	0.48	0.64	0.48	0.62	0.49
Supply		0.03	0.17	0.02	0.15	0.03	0.16	0.03	0.17
Commerce		0.15	0.35	0.17	0.37	0.18	0.38	0.19	0.39
Finance		0.04	0.20	0.07	0.25	0.06	0.24	0.06	0.24
Construction		0.13	0.33	0.10	0.31	0.09	0.28	0.09	0.29

Note. Own calculations. Sample weighted.

Table A-4: Wage deciles and wage inequality 1995 – 2010, men in West Germany

	1th decile	5th decile	9th decile	5th -1st	9th -5th	9th -1st
1995	2.629	2.968	3.486	0.339	0.519	0.858
2001	2.617	3.012	3.580	0.395	0.568	0.963
2006	2.571	3.045	3.639	0.474	0.594	1.068
2010	2.539	3.029	3.642	0.490	0.614	1.103

Note. Own calculations. Sample weighted.

Table A-5: Wage deciles and wage inequality 1995 – 2010, women in West Germany

	1th decile	5th decile	9th decile	5th -1st	9th -5th	9th -1st
1995	2.375	2.748	3.190	0.373	0.442	0.815
2001	2.392	2.827	3.321	0.435	0.494	0.929
2006	2.338	2.838	3.397	0.500	0.559	1.059
2010	2.310	2.841	3.405	0.531	0.564	1.095

Note. Own calculations. Sample weighted.

Table A-6: Wage deciles and wage inequality 1995 – 2010, men in East Germany

	1th decile	5th decile	9th decile	5th -1st	9th -5th	9th -1st
1995	2.185	2.516	2.975	0.331	0.459	0.790
2001	2.205	2.533	3.107	0.328	0.574	0.902
2006	2.162	2.536	3.183	0.374	0.647	1.021
2010	2.142	2.547	3.230	0.405	0.684	1.088

Note. Own calculations. Sample weighted.

Table A-7: Wage deciles and wage inequality 1995 – 2010, women in East Germany

	1th decile	5th decile	9th decile	5th -1st	9th -5th	9th -1st
1995	1.960	2.465	2.911	0.505	0.445	0.950
2001	1.932	2.469	3.001	0.537	0.531	1.068
2006	1.914	2.446	3.081	0.532	0.635	1.167
2010	1.941	2.449	3.118	0.508	0.669	1.177

Note. Own calculations. Sample weighted.

Figure A-3: Observed changes in log wage between 1995 and 2010 and aggregate decomposition (women in West Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from first to 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.
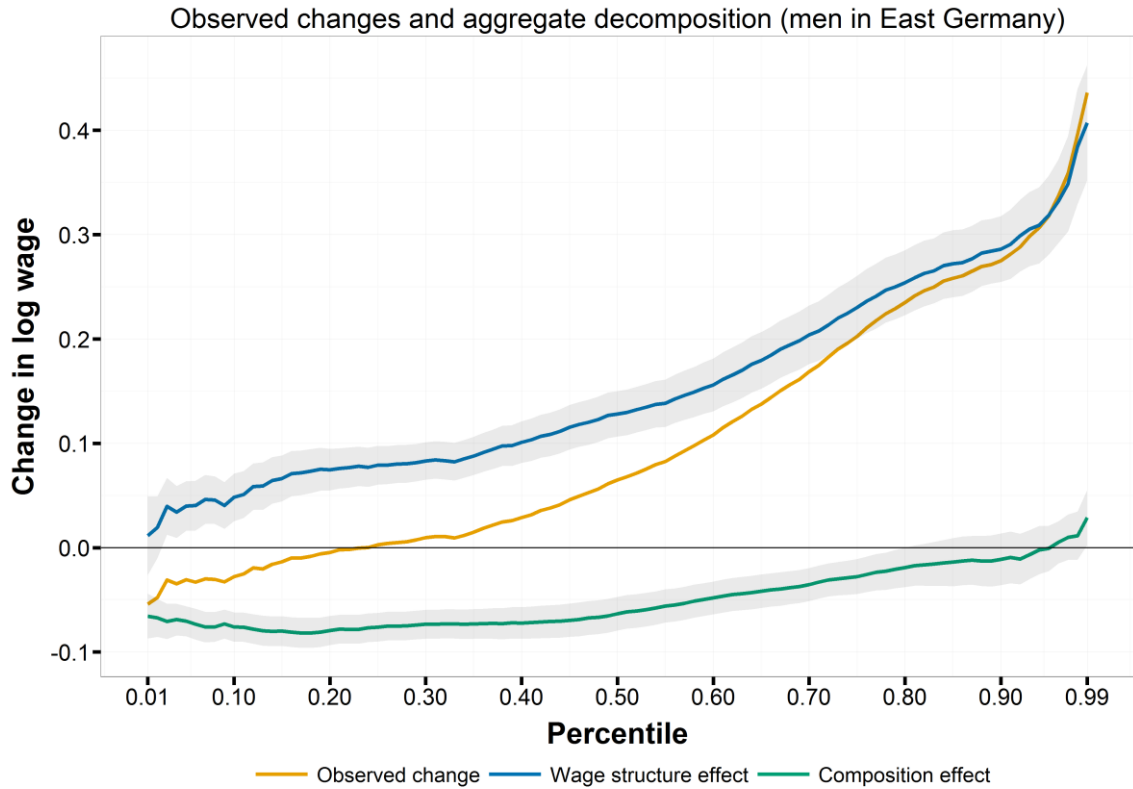
Figure A-4: Observed changes in log wage between 1995 and 2010 and aggregate decomposition (men in East Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from first to 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.

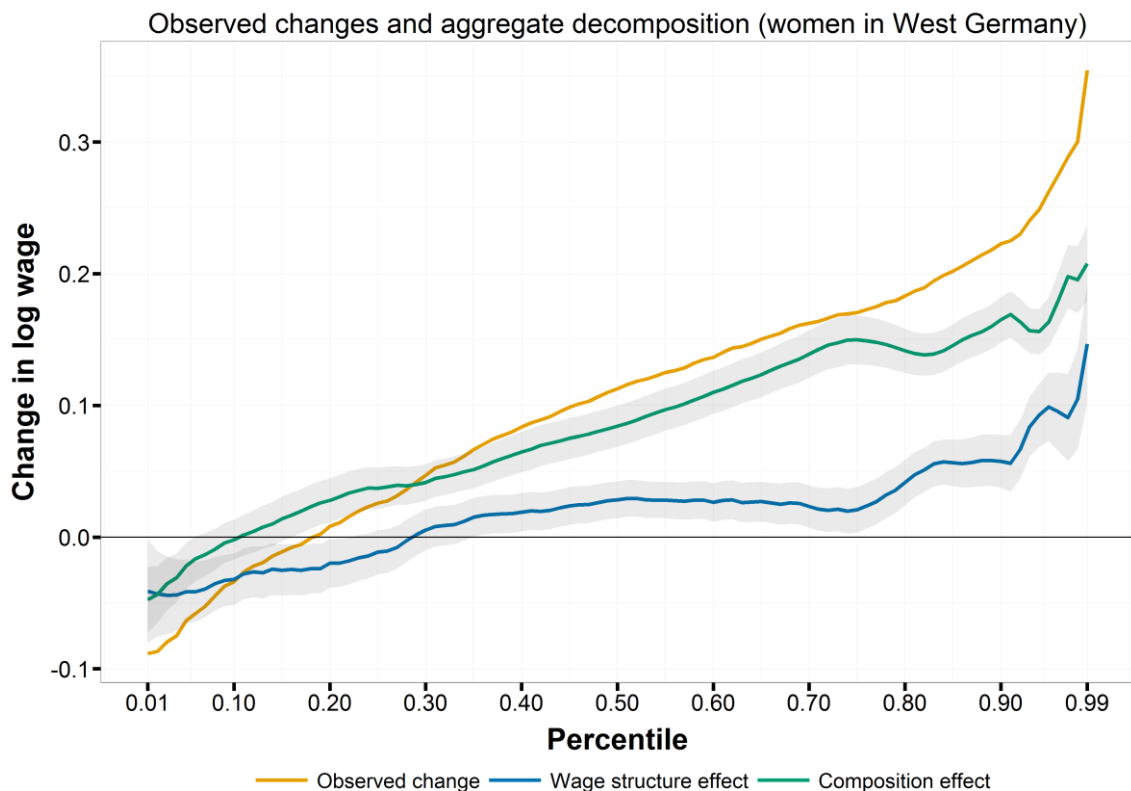## Observed changes and aggregate decomposition (women in East Germany)
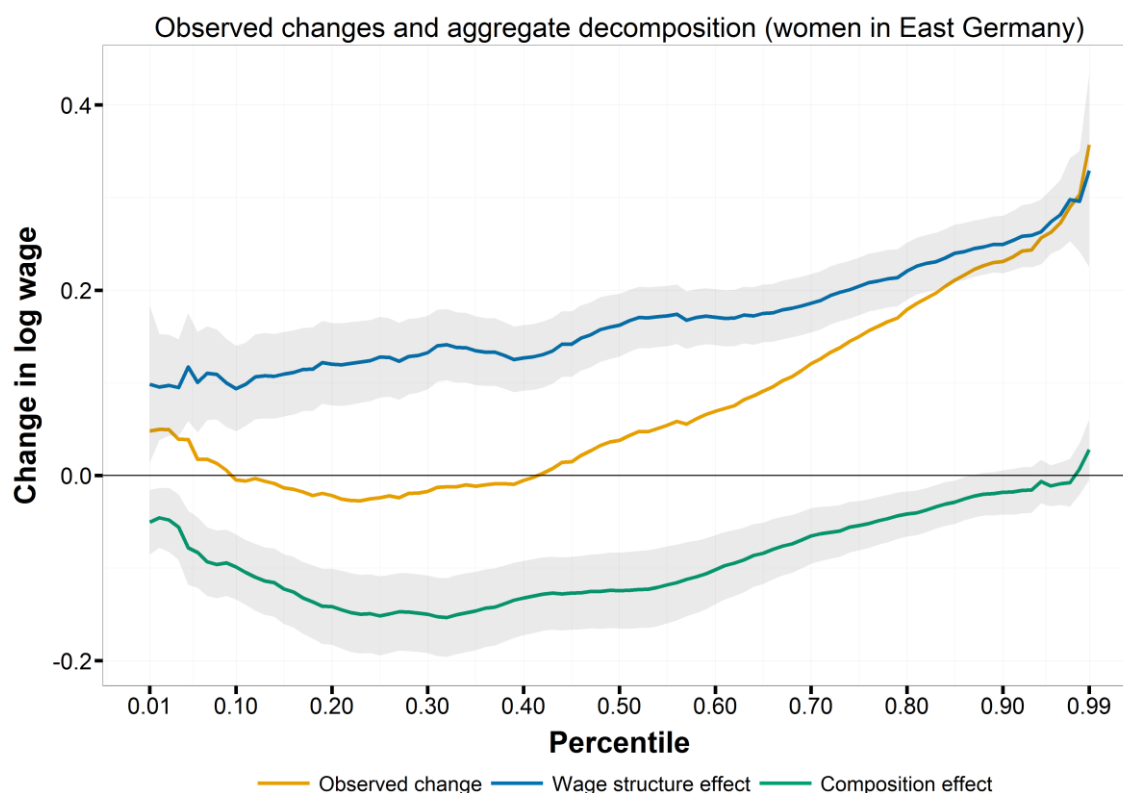
Figure A-5: Observed changes in log wage between 1995 and 2010 and aggregate decomposition (women in East Germany)

Note. Sample weighted RIF-decompositions of log wages between 1995 and 2010 for all percentiles ranging from first to 99th including all individual-level and firm-level controls as well as a set of industry dummies. Grey areas represent a 95% confidence interval.

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Table A-8: Selected quantiles for base and total wage

	year	1st perc	10th perc	50th perc	90th perc	99th perc	N
Base wage	1995	10.07	13.00	17.69	29.33	47.77	506,172
	2001	9.70	12.98	18.61	31.93	54.94	305,404
	2006	8.70	12.42	19.05	33.40	58.51	447,102
	2010	8.47	12.10	18.85	33.96	60.52	348,223
Total wage	1995	10.46	13.85	19.45	32.67	54.76	506,172
	2001	10.04	13.69	20.33	35.89	65.11	305,404
	2006	8.93	13.07	21.00	38.04	72.03	447,102
	2010	8.67	12.67	20.67	38.18	73.07	348,223

Data: GSES 1995, 2001, 2006, and 2010. Measures were calculated using sampling weights. Sample for this analysis includes all respondents – whether or not they receive a bonus payment in the respective year.

Table A-9: Absolute level of inequality measures

	Period	10/1	50/10	90/50	99/90	90/10
Base wage	1995	1.29	1.37	1.65	1.63	2.26
	2001	1.34	1.43	1.72	1.72	2.46
	2006	1.43	1.53	1.75	1.75	2.69
	2010	1.43	1.56	1.80	1.78	2.81
Total wage	1995	1.32	1.40	1.68	1.68	2.36
	2001	1.36	1.48	1.77	1.81	2.62
	2006	1.46	1.61	1.81	1.89	2.91
	2010	1.46	1.63	1.85	1.91	3.01

Data: GSES 1995, 2001, 2006, and 2010. Measures were calculated using sampling weights. Sample for this analysis includes all respondents – whether or not they receive a bonus payment in the respective year.

Table A-10: RIF-decomposition of differences in quantiles between 1995 and 2010 (complete)

	1st perc	10th perc	50th perc	90th perc	99th perc
Overall					
1995	49.76	160.91	302.32	641.55	1664.32
2010	14.61	83.98	321.18	831.46	2875.14
Raw difference	35.15	76.94	-18.87	-189.92	-1210.82
Total composition effect	**3.33**	**16.71**	2.45	-155.29	**-996.10**
Total wage structure effect	**31.82**	**60.23**	**-21.32**	-34.62	**-214.73**
Composition					
Fixed-term	**0.77**	**3.10**	**2.45**	**0.89**	**-21.07**
Schooling	-0.05	**-0.78**	**-7.49**	**-59.30**	**-286.01**
Age	**-3.75**	**-16.13**	**-26.98**	**-68.42**	-59.92
Age²	**3.46**	**15.45**	**25.67**	**44.63**	-88.50
Tenure	**-0.34**	**-1.50**	**-3.39**	**-4.52**	-1.62
Manager	0.00	0.00	0.016	0.13	2.19
% coverage (industry contr.)	**2.88**	**21.22**	**32.00**	7.86	**-221.62**
% coverage (firm contract)	0.10	0.61	-0.76	-0.12	1.66
Mean human capital	**-1.35**	**-8.48**	**-21.98**	**-65.68**	**-253.90**
Stability	**1.84**	**4.83**	**5.41**	0.09	-12.26
%female	-0.10	**0.79**	**0.79**	**-2.61**	-6.01
Firm size	-0.00	-0.00	0.02	-0.02	-0.44
Mining	0.09	**1.05**	0.74	**2.29**	7.28
Manufacturing	0.23	1.64	3.17	1.52	0.55
Supply	0.02	0.18	0.41	0.72	-0.16
Wholesale and retail trait	-0.35	**-3.31**	**-2.92**	-1.79	-5.23
Finance	-0.12	**-1.98**	**-4.67**	**-10.99**	**-51.03**
Structure					
Fixed-term contract	0.04	**0.58**	**0.34**	0.19	-2.76
Schooling	6.01	**25.75**	**25.86**	**-412.07**	**-3170.30**
Age	**63.91**	4.72	8.32	-179.66	**-2508.86**
Age²	**-32.49**	8.20	19.19	18.89	509.04

Tenure	0.35	**-10.28**	**-19.86**	**33.66**	**239.01**
Manager position	0.034	0.05	**-0.74**	**-3.36**	-153.60
% coverage (industry)	**39.53**	11.01	**-45.83**	**-56.96**	253.49
% coverage (firm)	**1.95**	-0.03	1.58	-3.55	-12.17
Mean human capital	31.24	**-102.71**	**-353.18**	**-942.78**	**-4253.13**
Stability	**63.13**	23.80	**-44.75**	28.53	-46.13
%female	**-12.18**	7.78	**10.65**	4.47	20.30
Firm size	-1.49	-0.60	0.20	21.58	60.32
Mining	-0.14	**-1.00**	**-3.00**	**-4.68**	**-17.62**
Manufacturing	0.65	**-32.67**	**-94.55**	-29.06	1.926
Supply	-0.04	**-1.98**	**-5.62**	-1.35	-10.40
Wholesale and retail trait	1.73	**-15.78**	**-18.62**	**-14.41**	-54.41
Finance	1.11	**-2.04**	**-5.54**	3.62	-57.90
Ref: construction					
constant	**-131.53**	**145.44**	**504.25**	**1502.33**	**8988.48**

Weighted RIF-decomposition of quantiles from the monthly bonus distribution between 1995 and 2010.
All models contain individual, firm-level, and industry controls. N (1995) = 436,761; N(2010) = 291,181.
Bold coefficients are significant at $p < 0.05$.